Decentralized Privatization and Change of Control Rights in China

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Abstract

The design and implementation of privatization in China is unique in that both are decentralized and administered by the local governments. Based on a proprietary survey data set containing 3,000 firms in over 200 cities, this paper studies privatization choices and outcomes, as well as the mechanism behind the outcomes. We find that less political opposition to labor downsizing and greater fiscal capacity prompt cities to choose direct sales to insiders (MBOs). This method transfers control rights to private owners, retains limited government supports, imposes hardened budget constraints, allows for restructuring, and achieves performance improvement. (*JEL* D22, D23, L29, H19, P31, P39)

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Introduction

Privatization in China between the late 1990s and the mid-2000s was arguably the largest in the world, and still has a profound influence on the governance of the Chinese economy.[1] Our understanding of this vast transformation, however, remains limited, because there is little data, other than that available from the small fraction of firms that underwent share issue privatization (SIP) and became publicly listed.

A distinct feature of China's privatization is that both its design and its implementation are highly decentralized and are administered by the local governments. This feature is in contrast to privatization in most other nations, which followed a nationwide policy and was implemented in a top-down manner.[2] No de jure national privatization policy took place in China. Instead, a few city governments first initiated China's de facto privatization at a time when the central government was cautious about privatization. Later, after the central government endorsed the practice of selling state-owned enterprise (SOE) assets to private owners, for most SOEs, city governments decided whether to privatize, and, if the decision was yes, what privatization approach to adopt. As a result, privatization methods across Chinese cities varied widely. This decentralized feature of China's privatization is not only critically important for understanding the Chinese economy, but also provides a rich laboratory to study privatization and institutions in general.

We design and conduct a large-scale nationwide survey of 3,000 firms in more than 200 cities. This proprietary survey data allows us to carry out a systematic study of China's decentralized privatization, in an attempt to draw implications for privatization design and, more generally, the design of economic institutions. We seek to understand how local governments choose different privatization methods and how these various methods transfer

[1] As discussed in Section 1.1, a conservative estimate of total industrial assets privatized is 5.7 trillion RMB, or roughly 700 billion USD based on the exchange rate at the time.

[2] For example, see privatization in transition economies such as Central and Eastern Europe and Commonwealth of Independent States (CEE-CIS), Mexico, India, and Brazil as in the surveys by Megginson and Netter (2001) and Estrin et al. (2009).

control rights of the firms differently, leading to diverse mechanisms with respect to restructuring and performance. Specifically, we ask the following questions: How do different privatization methods reallocate control rights among the stakeholders of the firm? Why do city governments choose a particular privatization method? Do firms still obtain favorable treatment and soft budget constraint after privatization? Which methods result in more effective post-privatization restructuring and which better enhances performance?

We collect comprehensive information on reallocation of control rights, to the detail of distribution of eight distinctive decision rights among five parties before and after privatization. Our data shows that, while privatization in China has made substantial progress in reallocating control rights from the government to private owners, the degree of remaining government influence on corporate decisions varies significantly across privatization methods. These methods include direct sales, either to insiders (through management buyouts, or MBOs hereafter) or to outsider private owners, public offerings, joint ventures, leasing, and employee shareholdings. The privatization method that transfers the most control rights to private owners is MBO, which accounts for close to half of all privatization programs. Accordingly, the government provides the least support, in the forms of subsidies, bank financing, and protected entry, to these MBOs, while imposing the most hardened budget constraint.

Our analysis further indicates that city governments' decisions on how to privatize are critically determined by the political and fiscal constraints they face, and their choice of privatization approaches has a profound impact on the governance and performance of privatized firms. Specifically, when cities face less political opposition to labor downsizing and have stronger fiscal capacity, they tend to choose MBOs. Consistent with private owners' enhanced incentives to make changes, MBOs are most effective in implementing restructuring measures, including a change of core management teams, strengthening of managerial incentives through compensation policies, establishing boards of directors, and introducing international accounting and independent auditing. Not surprisingly, the performance of MBO

firms improves significantly after privatization, by 4.4% in ROA and close to 6,000 RMB or 750 USD per employee per year. For other privatization methods, the government tends to retain its influence in key corporate decisions. These firms are less effective to restructure and do not achieve statistically detectable improvement in performance.

A common challenge in the privatization literature on performance comparison is the section bias, which arises because certain types of firms that are likely to have better future performance (e.g., due to stronger fundamentals or better government support) might be purposely chosen for MBOs. A distinctive advantage of our study is that our detailed data allows us to better deal with the selection concern, by explicitly examining why firms are chosen for MBOs, as well as the mechanisms of performance improvements, which is perhaps the strongest guard against endogeneity. To rule out the selection bias even further, we conduct a number of additional analyses, including examining whether there is any pre-existing trend in performance, fully accounting for city-level economic prospects by including city-year fixed effects, explicitly controlling for product market competition, and adopting an IV estimation using city characteristics (such as fiscal capacity and private sector development) as the instruments.

Our Chinese survey contributes to the literature in a number of ways. First, it supports and significantly extends an important theme in the literature; that is, reallocation control to different types of owners has disparate effects on restructuring and performance; thus looking only at aggregate results without knowing why could be misleading (Frydman et al. 1999; Estrin et al. 2009). There is a well-known, but puzzling, result from other transition economies; that is, privatization to managers does not result in efficiency gains in transition economies. This result appears to be in contrast to our findings that MBOs are the most effective means of privatization in China. The difference lies in to what extent managerial ownership is really market based. Frydman et al. (1999) propose that ineffectiveness of privatization to managers in CEE and CIS nations is due to two “special characteristics” of managerial ownership. That is, managers are selected under the old regime and they are

offered to buy the shares at preferential prices but with restrictive terms, designed to favor existing employees. The Chinese MBOs do not share these characteristics and are much more in common with the managerial ownership in market economies. In this sense, the Chinese MBOs constitute a nice counterfactual analysis for other transition economies (and vice versa). They confirm the conjectures in the literature regarding why managerial ownership does not work in CEE-CIS nations.

Our paper goes beyond the question of the type of owners and illustrates how the market-based managerial ownership in China improves performance by aligning other economic forces, namely the role of managers, product market competition, and hardened budget constraint, that have been documented to be important in shaping privatization outcomes (e.g., Djankov and Murrel 2002). To our knowledge, no prior work has answered, in one study, these many facets of questions as comprehensively as we have. Moreover, in a number of these analyses, our Chinese survey offers advantages in dealing with measurement and identification challenges.

Our second contribution is that we explore two important aspects of privatization that the previous literature has not examined. Most notably, enabled by our detailed data, we shed new light on the privatization mechanism through the reallocation of control rights. As Jones and Mygind (1999) and Gupta (2005) point out, a common feature of privatization around the world is it is partial and transferring of control rights is incomplete. Thus, our finding regarding the impact of remained state ownership and control is quite general. The second aspect is the role of political factors in shaping the design of privatization programs. Despite that theoretical work and anecdotes all suggest a significant influence of political factors (e.g., Biais and Perotti 2002), there have been very few formal empirical studies and our paper joins a more recent effort (e.g., Dinc and Gupta 2011), on this important topic. In the Chinese setting, political economy considerations, specifically a lack of fiscal resources and political opposition to unemployment, prevent the commitment to withdrawal of state control and adoption of the more effective privatization method.

Finally, our analysis extends earlier work on China's privatization and deepens our understanding of the Chinese economy. Previous work has documented the ineffectiveness of share issue privatization (SIP) (Sun and Tong 2003; Deng, Gan, and He 2010), a lack of a significant effect of privatization on performance (Jefferson and Su 2006), and the importance of reducing state ownership in privatized firms for performance improvement (Bai et al. 2009).[3] Our data permit us to cover a wide spectrum of privatization methods and to go beyond performance comparison by identifying the mechanisms of performance improvement (or a lack of it). Equally importantly, the decentralized privatization studied in this paper contributes to a growing literature on China's regionally decentralized authoritarian regime, particularly on local governments' decisions and career concerns (Maskin et al. 2000; Li and Zhou 2005; Jin et al. 2005; Xu 2011; Jia et al. 2015; Persson and Zhuravskaya 2015).

1. Institutional Background of Decentralized Privatization in China

In this section, we first discuss how China's decentralized privatization evolves against the country's political and economic background in the 1990s. Then we introduce the different privatization methods adopted by the local governments. Finally, we discuss government considerations about MBOs, the most effective privatization method.

1.1 Political and economic background

In the governance system of the Chinese economy, political and personnel decisions are highly centralized and the central government appoints and assesses local government officials, whereas administrative and economic matters, including those of the SOEs, are

[3] Our findings on the role of transferring control rights are consistent with these results, because the SIP does not transfer control rights (see the next section). The literature, however, disagrees on the impact of the remaining state shares on performance (Sun and Tong 2003; Li et al. 2009; Tian and Estrin 2010). Estrin et al. (2009) summarize that "in China the results to date are less clear cut." The mixed results highlight two identification challenges. First, other than Deng et al. (2010) which emphasize expropriation as the driver of impaired performance, the studies do not identify the mechanism and are subject to endogeneity problems. Second, the studies often cannot sharply identify privatization. Some infer privatization from census data by looking at changes in the registration of the firms, which, as our survey reveals, may suffer from type II errors, (see the Appendix), whereas others have to rely small and/or nonrepresentative samples (e.g., Li and Rozelle 2000; Wang, Xu, and Zhu 2004; Guo and Yao 2005; Yusuf et al. 2005; Dong, Putterman, and Unel 2006).

mostly decentralized to local governments. Such a system is termed by some scholars as regionally decentralized authoritarianism (RDA).[4] Under the RDA regime, the control rights of SOEs, except for the very large ones, are assigned to the municipal governments, giving them the residual claims to enterprise earnings (Granick 1990; Li 1997). This means that the local SOEs were very important for city government officials, both as a source of fiscal revenue and as a contributor to local GDP growth which is a critical criteria used by upper-governments in promotion decisions (Maskin, Qian, and Xu 2000; Xu 2011).

Endowed with the "local" ownership of SOEs, China's state sector reforms have been mostly driven by local experiments, sometimes even before the central government's official mandates (Xu 2011). By early 1990s, deteriorating performance of SOEs put increasing pressure on the fiscal conditions of local governments. A few cities "quietly" initiated de facto privatization, without explicit approval from upper-level governments.

One of the first local privatization attempts was in Zhucheng, a city in Shandong province. In 1992, more than two-thirds of the SOEs experienced losses amounting to over 18 months of the city government's fiscal revenue. The city government then sold many SOEs within its jurisdiction to the employees of these SOEs. Another example is Shunde in Guangdong, where the city government encountered a serious debt problem before it privatized most of its state and collective firms in 1992. When these experiments became publicly known, the central government did not prohibit the practice, which was interpreted as an implicit approval (Garnaut et al. 2008).

The continued deterioration of the state sector's financial performance imposed a severe strain on the country's banking system.[5] The central government gradually accepted privatization as a remedy for the country's ailing SOEs, as indicated in a number of progressively market-based reform policies. In 1993, the 3rd Plenum of the 14th Communist Party Congress endorsed a principle of diversifying ownership structure of state-owned firms.

[4] This term is first used by Xu (2011) in summarizing the literature on the political economy of China. It has then been used in the subsequent literature (e.g., Jia et al. 2015).

[5] Nationwide, in 1998, the state sector incurred a total loss of 307 bn RMB, and the overwhelming bad-loan problem associated with these losses was regarded as the biggest threat to the economy (Xu 2011).

In 1995, the central government announced the famous policy of "retaining the large, releasing the small" (*zhuada fangxiao*). That is, the state was to keep a few hundred of the largest SOEs in strategic industries; for the remaining smaller local SOEs, which constitute the vast majority, the stated intention is to let competitive forces to make them more efficient. Finally, 15th Communist Party Congress (1997) further approved privatization, granting de jure ownership of local SOEs to local governments and authorizing the "owners," mostly city governments, of SOEs to design and implement privatization on their own.[6] Thus, China has no centrally designed nationwide privatization program, which makes its privatization distinctively different from that in the rest of the world.

This wave of privatization ended in 2005. This is both because the vast majority of SOEs had been privatized by then and because of the publicized controversies over some of the privatization programs in 2004 and 2005. While there is no explicit statistics on the percentage of all SOEs privatized by 2005, according to NSB's own report, close to three-quarters of large and medium industrial SOEs were privatized (the NSB Web site). Consistent with the "retaining the large, releasing the small" policy, our reading of available city-level statistics shows that about 85% of SOEs were privatized by 2005. If we use three-quarters as a conservative estimate of proportion of firms privatized, given that total industrial SOE assets at the end of 1999 was 7.6 trillion RMB, we estimate that the total assets privatized amounted to 5.7 trillion RMB, or roughly 700 billion USD, based on the exchange rate at the time.

1.2 Privatization methods

Our data shows that the most popular method was *direct sales (*or *open sales*), to insiders or to outside private owners, which, respectively, accounted for 47% and 22% of all privatization programs. Other methods included *public offering* (1%), *joint ventures* (2%),

[6] Due to ideological aversion to capitalism, the term "privatization" was never used in the official documents; instead, government documents used the term "gaizhi," meaning "transforming the system."

leasing (8%), and *employee shareholding* (10%). These patterns are consistent with those in Garnaut et al. (2005).[7]

Under *direct sales*, the firm was openly sold to insiders (through MBOs) *or* outside private owners through auctions or negotiations between the local government and the potential buyers. Although we later find that MBOs were the most effective in improving efficiency, it was the most controversial method, mainly due to its lack of transparency, and there was public concern that state assets may have been sold too cheaply.

Public offering was share issue privatization (SIP). Under the policy of "retaining the large, releasing the small," the large SOEs are privatized through SIP. By design, SIP was not meant to transfer control rights and only non-controlling shares were sold in the public capital market. SIP accounted for a tiny proportion (1% according to our survey) in terms of the number of firms and we estimate that it accounted for around 10% of privatized assets.[8] Nevertheless, SIP has been the most-studied type of privatization in China simply because of availability of data.

Joint venture or *merger* involved privatization in which an SOE formed a joint venture or merged with a private domestic or foreign firm. Under *leasing*, the company was leased to the management, employees, outside private firms, or other SOEs. In most cases, it involved inside managers as the lessees, and the firms are often privatized later through MBOs.

Employee shareholding converted the company into a limited liability company or cooperative. It was one of the most important *gaizhi* measures employed at the early stage of local experiments, both because the central government required that each privatization plan be approved by employees (other than corporate executives) and because shares were often offered as a compensation for removing employees' "tenured" state-employment status. As our

[7] Another often-mentioned *gaizhi* measure was internal restructuring, including incorporation, spinning off, introducing new investors, and debt–equity swaps, as well as bankruptcy/reorganization. Internal restructuring often involved partial privatization but may also involve no privatization when the restructuring occurs among state-owned firms. The latter case was concentrated in large-scale SOEs owned by the central government, and they enjoy monopolistic powers in such markets as oil, electricity, and telecommunication.

[8] Based on numbers reported in Huyghebaert and Quan (2009), SIP (exclude financial firms) between 1995 and 2005 involve 539 billion RMB of assets. As discussed in Section 1.1, 5.7 trillion RMB of industrial assets is privatized, implying that SIP accounts less than 10% of assets privatized.

data verify, at later stages of *gaizhi*, the managers often purchased the majority shares from employees, which qualified the firms as MBOs.

1.3 Government considerations for MBOs

To further understand the government's considerations regarding MBOs, we choose 32 cities with the most MBOs and the least MBOs and review all the publically available documents related to MBOs decisions.

Across all the cities, the governments shared similar concerns and, as a result, they typically stipulated against MBOs in three types of firms: (1) firms with government-granted monopolistic permits to operate; (2) firms with government subsidies because of their responsibilities for social welfare; and (3) firms that obtained land or other resources whose value could not be easily assessed. As a result, small firms were often targeted to be "liberalized" and encouraged to be sold to managers. These patterns were perfectly consistent with what we later find in the data about post-privatization government support of MBOs (Section 3.2) and determinants of MBO choices (Section 4).

2. Nationwide Survey and Sample

2.1 Nationwide Survey

Our large-scale nationwide survey was conducted in 2006. The sampling procedure involved two steps. We started with the 2004 National Bureau of Statistics (NBS) census, which contained all industrial firms with sales above 5 million RMB as the population, and drew a random sample of 11,000 firms stratified by region, industry, size, and ownership type. Given that only 20% of firms in the 2004 population were SOEs and our intention was to study privatization, we supplemented the main survey sample with an additional random sample of 5,500 from the 1998 NBS database, again stratified based on region, industry, and size. We chose to use the 1998 NBS data because 1998 was the first year the database was available, and large-scale privatization started in the late 1990s. Thus, using the 1998

population maximized our chance of including SOEs not yet privatized. In total, we had 16,500 firms for the survey.

We designed the questionnaires through an "iterated" process. We started with a pilot survey of 720 firms in four provinces and nine cities, including Beijing, Laizhou (Shandong province), Taizhou and Changxing, (Zhejiang province), Changchun and Jilin (Jilin Province), Shijiazhuang, Pingshan, and Tangshan (Hebei province). It was conducted through both on-site interviews and telephone interviews. This pilot survey helped improve our survey design and later guide our empirical analysis. For example, because of the controversy surrounding MBOs, many of the MBO firms "disguised" themselves by reporting themselves as other less controversial methods, such as employee shareholdings. Thus, in our empirical analysis, we verify each firm's self-reported privatization methods with its answers to questions on changes in ownership. In soliciting certain sensitive financial variables, instead of asking for the information directly, we experimented with using multiple-choice questions (of percentage intervals), and the response rate increased substantially.

The main survey was conducted through telephone interviews. We hired a professional survey company that had a close relationship with the NBS and had previously helped NBS conduct its own surveys. We spent a week training the survey company's staff to understand each question. Throughout the survey, we worked closely with the staff and carefully supervised the process. The chief executives of the firms (or their representatives), the chief accountants, or the heads of human resources answered the questions.

To facilitate a difference-in-differences analysis, we prepared two sets of questionnaires: one for privatized firms (the "treatment" group) and one for all other firms (including the "control" group). The survey asked every firm whether it was privatized, and accordingly used the appropriate questionnaire. The two sets of questionnaires were identical except that for privatized firms, (1) we asked questions related to privatization, for example, the year in which the firm was privatized and the privatization method; (2) for questions on

ownership and control, we asked the firms to provide information on both the pre- and post-privatization periods. Appendix 1 contains the survey questions that are relevant to this study.

We obtained 3,132 responses, yielding a response rate of 19%. Our survey sample contains 899 privatized firms, 475 non-privatized SOEs and collectively owned enterprises (non-privatized SOEs hereafter), and 1,758 de novo private firms. In our survey, we do not notice any systematic selection bias of firms that responded to our survey. Indeed, as reported in Table 1, our survey sample matches the distribution of the population reasonably well in terms of both region and industry. The size distribution of our sample is skewed toward larger firms because we purposely over-sampled SOE firms, which tend to be larger for this study. Figure 1A further shows the regional distribution of the privatization sample is roughly in line with the presence of SOEs in the country. Figure 1B reports the staggered nature of privatization by region (Appendix 2 shows the breakdown by province).

2.2 Data

We obtain the financial information of surveyed firms from the NSB database, which is equivalent to Compustat for US listed firms. NSB data is available to us from 1998 to 2007. While it is the most comprehensive data about Chinese firms, some scholars have questioned its data quality. Appendix 3 examines the NSB data in detail and demonstrated that its weakness does not significantly affect our results.

To ensure all privatized firms have at least one year of performance information prior to privatization, we drop 168 firms that were privatized prior to 1999. We then exclude firms without valid financial information. Given the staggered nature of privatization, our final sample for regression analyses is an unbalanced panel of 717 privatized firms, 460 SOEs that have not been privatized, and 1,685 de novo private firms for the period of 1998-2007.

In our analysis of the role of government incentives in privatization decisions, we use the *China City Statistical Yearbook* to obtain city-level (at and above the prefecture level) fiscal and regional economic variables from 1997 to 2007.

We note that, while the data may seem old, they are suitable to study the largest wave of privatization in China (and worldwide), for two reasons. First, we conducted the survey in 2006, while this wave of privatization ended in 2005 (see discussions in Section 1.1). Second, the survey data can be merged with 10 years of NSB data during 1998-2007, which allows us to study performance before and after privatization. It is well known among scholars studying China that the quality of data available to researchers is low in 2008 and 2009, and that, due to tightened control of data, it is almost impossible to obtain the data after 2009. Thus, it is a nice coincidence that privatization occurred before the end of 2005 and quality NSB financial data was available till 2007, enabling us to cover this historical episode well and to the best extent.

2.3 Preliminary observations from our sample

Table 2 reports the summary statistics of the main variables used in our empirical analysis. In Panel A of Table 2, we report the basic facts about China's privatization. Between 2000 and 2005, the number of privatizations increases steadily. Direct sales to insiders (MBOs) are by far the most widely used method, accounting for 47% of all privatized firms. The next is direct sales to outsiders, accounting for 22% of the firms. Thus, direct sales in total account for close to 70% of privatization programs in China. Other privatization methods include public offerings (1%), joint ventures (2%), leasing (8%), and employee shareholding (10%).

The ownership structure of Chinese privatized firms is highly concentrated. The largest shareholders on average hold 60% of the shares and the second- and third-largest shareholders hold 26% of shares. MBOs have the lowest ownership concentration, with the largest shareholders holding 37% of the shares, whereas the largest shareholder of the firms

sold to outsiders has 64% ownership on average. For firms privatized by other methods, the largest shareholders on average hold 91% of the shares.[9]

Panel B is a summary of the financial variables. We use two measures of operating performance: operating profits (earnings before interest, tax, and depreciation and amortization, or EBITDA) over assets, and operating profits over the number of employees. Panel B1 compares privatized, nonprivatized, and de novo non-state (private) firms. Compared with nonprivatized SOEs, privatized firms tend to be larger and generally exhibit greater operating efficiency. Later we show that this is due to post-privatization performance. Compared with de novo private firms, privatized SOEs tend to be larger and less profitable.

Panel B2 of Table 2 compares the financial variables before and after privatization. Assets and sales generally increased after privatization. The firms tend to become less leveraged after privatization, consistent with a hardened budget constraint. While there is generally an improvement in performance (all at the 1% level, except for the mean of *Profits/#employee*), performance gain appears to be larger for MBOs, consistent with our later findings that MBOs drive the performance gain.

2.4 Financial aspects of privatization

We now discuss the financial aspects of privatization, including the issuance method, payment arrangement and sources of funds for top managers. Other than SIPs, which cover large companies in strategic industries, the transfer of ownership is through secondary offerings of existing shares, consistent with the government's stated intention of transferring of ownership and of "letting go" of these companies.

As reported in Table 3, in 77% of privatization cases, the government receives a lump sum payment, as opposed to multi-year installments. Reflecting a greater transfer of ownership, MBOs are significantly more likely to be paid with lump sum payments (80%),

[9] For the other method, the total ownership shares of the largest shareholders and the second- and third-largest shareholders are above 100%, because the ownership of the latter is based on the subsample that reports this information.

whereas leasing is least likely to use this arrangement. If multiple installments are used, the first payment, on average, accounts for one third of the total proceeds and it takes about 5 years to pay the full amount.

Personal saving is predominately the most important source of funds by the top managers, used in 99% of firms. 95% of firms report that personal savings account for at least 70% of financing (panels A and B) and we further estimate that they contribute to 96% of all privatization payments (panel C). Other sources of financing include borrowings from friends and relatives, bank loans, and future salaries, used by 8%, 5%, and 6% of firms, and each account for 1% to 2% of total payments.

3. Mechanisms of Efficiency Gain

The essence of ownership structure is its allocation of control rights among the firms' stakeholders (Grossman and Hart 1986; Hart and Moore 1990). This section investigates reallocation of control rights as the mechanism of performance gain, and the resulting government support and freedom to restructure.

3.1 Reallocation of control rights and performance

We find that the government retains, on average, 20% ownership of the privatized firms. While it is much lower than share issue privatization, in which the government retains more than half of the ownership, 20% is still substantial and significant enough to exert influence.

Reflecting the concept of property rights as a bundle of rights, we focus on a set of eight decision rights, including the appointment of senior managers, investment, hiring and laying off of employees, salary and bonus, distribution of profits, production and marketing, financing, and use of funds. We ask how these control rights are allocated, before privatization and after privatization, among five parties, including the government, the party committee at the firm, board of directors, general manager, workers representative committee,

board of supervisors, and shareholder committee in making the above-mentioned key corporate decisions. The firms rank, for each of the corporate decisions, the importance of each decision maker on a five-point scale (0 = *negligibly unimportant*, 5 = *indispensably important*).

As shown in Figure 2 and Table 4, the most prominent change in control rights is the reduction of government influence. For non-privatized SOEs and pre-privatization SOEs, local governments exercise fairly strong control over these firms' major decisions, with average scores of 2.3 and 1.8, respectively and the government's control rights are particularly strong in the appointment of top management, scoring 3 and 2.4 (Panel A of Table 4). By contrast, the government has no control power over decisions within de novo private firms. After privatization, both the overall government control and its control in personnel drop substantially, from 1.8 to 0.4 and from 2.4 to 0.6, respectively. Moreover, the government control decreases the most for MBOs, with the average score dropping from 1.8 to 0.1. Direct sales to outsiders come the second, with average government control decreasing from 1.9 to 0.4.

A unique feature of corporate governance in China is that almost all firms in China have a committee of the Chinese Communist Party. As shown in Panels A and B of Table 4, the influence of party committees is similar to that of the government. After privatization, the party committees' control generally decreases less than the government's control.

Given that the government may influence corporate decisions through both its direct control rights and its intervention via firm-level party committees, we use the max of these two as the score for overall state influence (*State influence score*). Despite a drop in the score from 2.8 to 1.4 after privatization, state influence is still quite important in a significant proportion of firms, with 39% of firms having a score above 2 (*somewhat important*) and 15% above 3 (*moderately important*). In the following analysis, we consider firms with *State influence score* above 2 as under significant state influence in corporate decisions.

Across privatization methods, MBO firms have the lowest level of state control. Only 1% of MBO firms have government ownership above 20%, the mean, significantly lower than the sample average of 50% (Table 5). The state is also much less likely to intervene in MBOs' major decision-making (16% vs. 59% sample mean). Direct sales to outsiders are under substantially more state influence than MBOs, but, compared to privatization methods, they receive less state intervention, though the difference is only significant for corporate decision-making, not for state ownership.

Given that corporate decisions are multidimensional, we further examine government and party influences using principal component analysis (PCA). PCA is effective in shrinking dimensionality: the first principal component accounts for 90% and 75% of the government and party influences respectively, whereas the second component accounts for only 4% and 6%, respectively. Thus we report, in Panel B of Table 5, the first components and *PCA State Control*, defined as either the first component of government influence or the first component of party influence is above the mean. Consistent with Panel A of Table 5, *PCA State Control* is significantly lower in MBOs.

Other notable changes in control rights include the increased decision power of the board of directors and shareholder meetings, suggesting a general trend of professionalization of management in privatized firms. This change is most prominent among MBOs.

3.1.1 State control and post-privatization performance. This subsection further investigates the impact of state control on post-privatization performance, by estimating the following model on the sample of all privatized firms:

$$Performance_{it} = \alpha_i + \beta_t + \gamma\, Post_{it} + \lambda\, State\ Control_i \times Post_{it} + \delta X_{it} + \varepsilon_{it}, \qquad (1)$$

where $Performance_{it}$ is measured by both ROA and earnings per employee. $Post_{it}$ is a dummy variable indicating years after privatization (it is set to zero for those SOEs that have never

been privatized). *State Control* is one of the three binary variables: state ownership above 20%; *State Influence Score* above 2; and *PCA State Control*, defined in the same way as in Table 5. X_{it} are firm control variables, including size (measured as log of assets) and leverage (debt over assets). α_i is a firm fixed effect that controls for time-invariant firm characteristics. β_t is a year fixed effect. Coefficient γ is the difference-in-differences estimate of the effect of state control on post-privatization performance.

Linking detailed measures of government control rights to performance improves upon the existing literature which typically assigns a linear relationship between ownership and performance. Our analysis is similar in spirit to López-de-Silanes (1997), who finds, in Mexico's privatization, that transferring of controlling share packages is associated with a higher price premium - an ex ante measure of future performance.

Table 6 demonstrates that state control significantly hinders performance of privatized firms. In columns (1) and (2) of Table 6, higher state ownership is associated with significantly worse post-privatization performance, for both operating efficiency measures (at the 1% levels). In columns (3) - (6), both the measure based on *State Influence Score* above 2 and *PCA State Control* are associated with significantly lower operating efficiency. The results are all economically significant. Take the example of the point estimates of *State Influence Score* Above 2 (columns (3) and (4)). They imply that, all else equal, state control in decision making reduces ROA by 6% and earnings per employee by 6252 RMB (close to 800 USD) per employee per year. Both are substantial, especially considering the sample mean is 12.8% for ROA and 15.9K RMB for earnings per employee.

3.2 Government support

While ownership and decision rights are perhaps the most straightforward measures of government influence, there may be a tangled web of relation between the firm and the government. Specifically, it is possible that government exerts influence through other channels, such as connection of the manager to the party, implicit or explicit subsidies, and

regulatory barriers to entry. In our survey, we design questions that allow us to further explore these aspects of state influence. Given the dramatic control change via the MBO route, we mainly focus on the comparison between MBOs and other privatization methods. This analysis will also help understand our later results on MBO performance.

Panel A of Table 7 displays the firm's political connections along three dimensions, namely, whether top officials are appointed by the government, whether the firm has are government officials on the board, whether the top manager is a former government official. It turns out that the strongest form of political connection in China's privatized firms is through personnel appointment: in 23% firms, the chairman or top manager is appointed by the government. Such connection, however, is much weaker in MBOs involving only 0.3% of the firms and the difference is significant at the 1% level. Political connection in the form of government officials on the board or being the top manager is not common and is in only 4% and 2% of privatized firms respectively. The numbers are even lower among MBOs, involving, respectively, 0.3% and 1% of firms, and the difference is significant at the 1% and 5% levels.

Panel B of Table 7 shows that MBOs receive less government subsidies. Land is the most important government subsidy. MBOs are significantly less likely to obtain land subsidy, 59% vs. 67% (a significant difference at the 1% level). The composition of land subsidy is also telling: MBOs are less likely to obtain direct allocation of land (19% v. 31%, significant at 1% level), which represents a large subsidy, whereas they are slightly more likely to purchase land at substantially subsidized prices (40% vs. 36%). Government funded R&D projects are not common, involving 3% of the firms. The number is even lower for MBOs, 1%, and the difference is significant at the 1% level.

Panel C of Table 7 demonstrates that MBOs receive less government support in financing. While MBOs have a similar likelihood to have bank loans, their loan applications are significantly more likely to be rejected, 26% vs. 22% (a significant difference at the 10% level). When asked about the reasons for loan rejection, MBOs are more likely quote bank

credit rationing (4% vs. 3%) – state-owned banks typically have quarterly or annual limits imposed by their regulatory agents – and a lack of relationship with the government (4% vs. 3%). The differences are significant, respectively, at the 5% and 10% levels. Finally, there is no difference in the chance of obtaining government loan guarantees between the two groups of firms.

Panel D of Table 7 examines soft budget constraints in privatized firms. It should be noted that soft budget is not easy to measure, because the empirical measure has to meet two criteria. One is that it has to capture the expectation of future bailout; the other is that the expectation is contingent on financial distress. Neither is available in standard company financial statements. As noted by Djankov and Murrel (2002), a survey method provides measures that come closest to theoretically prescribed ones. In our survey, we ask about a number of expected supports in case of financial distress, including tax reduction, subsidies, capital injection, and subsidized loans. The data shows that Chinese privatization is very effective in hardening soft budget constraints: each individual form of soft budget involves less than 1% of the firms, and the proportion of firms with any one form of the soft budget is 0.6%. MBOs are even less likely to have soft budget in terms of all forms of support, except for subsidized loans, arguably the weakest form of support.

Panel E of Table 7 reports government support in the form of protected entry, based on the question "How many competitors does your firm have?" The possible answers are none, few, some, and many. We categorize the firm as in a competitive market if there are some or many competitors. The vast majority of firms (75%) are in competitive markets. MBOs are even more likely to be in competitive markets, 84%, and the difference is significant at 1%. 14% firms are monopolies with no competitors, whereas significantly less MBOs, a mere 2%, are monopolies (at the 1% level). While most SOE monopolies in China arise from protected entry, it is theoretically possible that the firm has developed or purchased advanced technology. We find that this is not true: only 4% of monopoly firms have patents, much lower than other firms, 30%, and the difference is significant at the 1% level.

We further check the market structure of industries that are often perceived as having protected entry, including energy, utilities, car, and pharmaceuticals. It turns out that only utilities seem to possess monopolistic power: an average of 67% firms report themselves as an monopoly and 13% report that the market is competitive. There is only one firm in oil and gas; although it is a monopoly, there is not a big enough sample to make a reliable inference.

Taken together, our analysis demonstrates that, after privatization, the government substantially reduce its support and subsidiaries to all firms and particularly so for MBOs. This, however, is not surprising. It is consistent with the guiding rule of "retaining the large, letting go of the small," where the small ones, which is the vast majority, were generally in competitive sectors. Moreover, given that the government keeps the least ownership and control in MBOs, it is economically rational to provide even less support.

3.3 Post-privatization restructuring and professionalism

We ask about four restructuring measures. The first restructuring measure is whether the firm changed its core management team—the introduction of new human capital into management is shown to be important in improving efficiency in other privatization settings (e.g., Barberis et al. 1996 López-de-Silanes; 1997, who emphasizes change of CEO). The second is whether the firm incentivizes its executives through increased performance-based pay. Regarding corporate governance, we ask whether the firm established a board of directors and whether it adopted international accounting standards.

Panel A of Table 8 reports, by privatization methods, the proportion of firms implementing each of the restructuring measures. MBO firms are significantly more likely to use performance-based bonuses (54% vs. 47%), to establish a board of directors (84% vs. 76%), and to adopt international accounting standards and professional independent auditing (11% vs. 8%), all significantly at the 1% or 5% level. MBO firms are not likely to have performance-based share compensation for their executives, which is not surprising, since managers are now owners. Compared with the whole sample, direct sales to outsiders are less

likely to establish a board (67% vs. 76%) but are more likely to adopt performance-based share compensation (15% vs. 7%), both differences are significant at the 1% level.

The logit model in Panel B of Table 8 further confirms the effect of privatization methods on restructuring. Moreover, the economic magnitudes are substantial: the odds ratios for MBO firms to restructure their management teams, to adopt international accounting, and to establish a board are, respectively, 1.5, 2.7, and 2.2 times of non-MBOs.[10] Regarding the compensation policy, the cash compensation of MBOs has 20% more in bonuses, whereas the odds ratio of MBOs to adopt share compensation is 71% below that of non-MBOs, consistent with owner-manager alignment. Selling to outsiders is more likely to restructure the compensation policy. It is significantly more likely to use performance-based share compensation (at the 1% level) and the odds ratio is 6 times of other methods; they also use significantly more bonuses in cash compensation (at the 1% level) and the incremental effect is 14%, lower than MBOs. But this privatization method is not more likely to undertake other restructuring measures. These findings are consistent with the fact that MBOs entail the greatest transfer of control rights from the state to the firm and that thus have the most freedom in implementing performance-enhancing restructuring.

4. Political Constraints, Governments' Incentives, and MBO Choices

As we have shown in the previous section, MBOs are most effective in transferring the control rights to the private owners and in promoting post-privatization restructuring. This finding inevitably leads us to ask why many city governments choose not to privatize via the MBO approach. This section examines the political and economic constraints that the local governments face at the time of privatization.

Two well-documented factors result in poor SOE performance. One is surplus workers: according to Dong and Putterman (2003), surplus workers ranged from 23.5% to 44% of the SOE labor force during 1993−1996 and a World Bank survey in 1994 indicates that one-third

[10] The odds ratio is $exp(\beta)$ times of non-MBO firms, where β is the coefficient on MBO.

of firms reported a labor-redundancy rate exceeding 20% (Bai et al. 2006). The other relates to various policy burdens, such as pension, social welfare, and perhaps uncompensated uses of corporate resources by the local governments. As we have shown, MBOs represent a commitment from the local government to relinquish its control. Several factors could affect its incentive to make such a commitment.

The first is local political opposition to layoffs. Empirically, we measure it as the share of SOE employment in total urban employment. The implicit unemployment problem is most severe in cities dominated by SOEs, resulting in stronger political opposition to layoffs. Moreover, a greater share of SOE employment indicates slower development of the de novo private sector, which makes finding new jobs harder for the laid-off workers and increases political opposition to layoffs. Finally, the share of SOEs may be negatively related to MBOs for a subtle reason. Development of the de novo private sector is affected by the local governments' attitudes toward private ownership. In the early days of reform, some local governments provided ad hoc local protections and promises to private firms when the constitution did not protect private ownership, whereas others discouraged the growth of private firms. To the extent that MBOs represent a more "thorough" privatization, city governments that are more pro-private ownership are more likely to implement MBOs.

The second factor is the ability of local governments to bear the costs of layoffs and social responsibilities. One measure of such ability is the government's fiscal resources. The more fiscal resources available, the greater the government's ability is to pay for the layoffs and/or redeployment of laid-off workers. Moreover, the impact of greater government fiscal capacity is likely to be non-linear: it is more important in regions where unemployment is a bigger concern, because larger fiscal capacity allows the government to provide better support for redeployment of laid-off workers in MBOs. Fiscal resources also reduce local governments' reliance on SOEs to achieve their social and political goals, as well as for uncompensated use of resources.

The political pressure against layoffs can be exerted through the Employee Representative Congress. At the early stage of privatization, most SOEs had an Employee Representative Congress, which may have influenced the redeployment of employees and the choice of privatization methods.[11,12] As a result, employment was an important negotiation point between the government and the potential buyers. The city government sometimes provided a monetary subsidy for each additional worker the firm would keep.

We also include, as additional measures of government incentives, policy subsidies, namely allocation of land (for free or at below-market price) and the city government's loan guarantees, two of the most probable types of government support. As we discuss earlier, SOEs obtaining significant government resources are explicitly discouraged to use the MBO method to privatize. Moreover, to the extent that these policy subsidies reflect pre-existing "ties" between the firm and the government, the government may have more difficulty committing to a more complete withdrawal of influence.

We estimate the following logit model to quantify the influence of government incentives on the choice of MBOs:

$$Prob(MBO = 1) = \Lambda(Y), \text{ where}$$
$$Y = a + b\,Government\ Incentives + cX + Industry\ Dummies + \varepsilon, \quad (2)$$

and $\Lambda(.)$ is the logistic cumulative distribution function. *Government Incentives* include government fiscal resources as measured by government revenue as a percent of GDP, the share of SOE employment, government allocation of land, and government guarantee of loans. To capture the impact of fiscal resources in cities where unemployment is a greater concern, we also include an interaction term between fiscal resources and a dummy variable indicating

[11] See http://china.findlaw.cn/lawyers/article/d28876.html and http://finance.sina.com.cn/chanjing/b/20120117/185911224916.shtml for rules (in Chinese) governing the power of Employee Representative Congress in Shanghai and Shijiazhuang. In both cities, the Employee Representative Congress must approve layoffs.

[12] In our interviews, we found that employment concern is also part of the reason why, at the initial period of privatization, a significant portion of SOEs were privatized through employee shareholding to avoid dispute between the firm and the employees. Later, because employee shareholding could not achieve efficiency, many of these firms introduced a second round of privatization through MBOs.

a high share of SOE employment (defined as % of SOE employment greater than the sample median). All *Government Incentives* variables are measured in the year prior to privatization. *X* contains three sets of control variables: (1) city-level variables, including GDP per capita and population growth; (2) firm-level variables, including profitability (EBITDA over sales), size (log of assets), and leverage—again all measured in the year prior to privatization; and (3) privatization-year dummies.

Panel A of Table 9 presents the summary statistics. Indicative of our later findings, MBOs are significantly more popular among cities with better fiscal balance, or with a lower share of SOE output. Moreover, MBO firms are statistically less likely to have obtained land from the government, though the difference is not economically substantial.

Panel B of Table 9 presents our regression results. In column (1), the impact of a higher share of SOE employment is negative as expected (at the 5% level). The interaction term between *Fiscal revenue/GDP* and *High share of SOE employment* enters with a positive sign (at the 1% level), suggesting that, in cities where political opposition to layoffs is stronger, greater fiscal resources allow the government to provide better support for redeployment of laid-off workers, resulting in more MBOs. Government allocation of land is significantly negative (at the 1% level), suggesting preexisting government-firm ties make committing to MBOs harder for the government.

In column (2) of Table 9B, we further add firm-level variables in the year prior to privatization, including size, profitability, and leverage. Firm size is significantly related to MBO choices with a negative sign (at the 10% level), consistent with our earlier discussion that small firms are targeted for MBOs (Section 1.3). Notably, profitability is not statistically significant in determining the restructuring choices.

The results are economically significant for measures of city governments' incentives. Using the point estimates in Column (2) of Table 9B, a 10% increase in SOE shares reduces the odds ratio of MBOs by 7.3% (=1-exp(-0.754*0.1)). In cities with high share of SOEs and thus greater political pressure against layoffs, a 10% increase in fiscal resources increases the

odds ratio of MBOs by 1.3 times. The odds ratio of MBOs among firms with government land subsidies is 13% lower than those without.

5. Choice of Privatization Methods and Firm Performance

This section empirically evaluates the effect of privatization methods on performance. In our sample, firms are privatized in different years, whereas the NSB's financial information is only available from 1998 to 2007. To fully utilize the data, we use the following panel regression:

$$Performance_{it} = \alpha_i + \beta_t + \gamma\, Post_{it} + \lambda\, MBO_i \times Post_{it} + \delta X_{it} + \varepsilon_{it}, \qquad (3)$$

where $Performance_{it}$ is measured as earnings over assets (or ROA) and earnings per employee. $Post_{it}$ is a dummy variable indicating years after privatization. X_{it} contains firm control variables, including size (measured as log of assets), leverage (debt over assets). α_i is the firm fixed effect and β_t is the year fixed effect. Coefficient γ captures performance improvement after privatization, whereas the coefficient λ is difference-in-differences estimate of the performance gain of MBOs as compared with other methods.

5.1 A first look at the performance of Chinese firms

We first present an overall picture of the operating performance of Chinese firms, by estimating Equation (3) without the coefficient λ, on the sample of all firms including privatized firms, nonprivatized SOEs, and de novo private firms. Columns (1) and (2) of Table 10 show that, consistent with popular reports that SOEs are in a much weaker competitive position as compared to de novo private firms, the SOE dummy is significantly negative for both performance measures (at the 1% levels). In columns (3) and (4), we add a dummy indicating privatized firms, it is not significantly different from zero. Meanwhile, the

Post dummy is insignificant, suggesting that, when we pool all privatized firms together, regardless of how they are privatized, we find no evidence of performance improvement.

5.2 Privatization methods and firm performance

We now examine the differing effect of privatization methods on firm performance, by estimating Equation (3) on the sample of all privatized firms. In the first two columns of Table 11 the interaction between *MBO* and the *Post* dummy is significantly positive for both measures of performance (at the 1% level). The coefficient on the *Post* dummy itself is not significant, suggesting privatization methods other than MBOs do not improve performance. In columns (3) and (4), we add firm fixed effects. The coefficient on *MBO*Post* remains positive and significant. The results are economically significant. The point estimate is -0.044 in column (3), implying that, all else equal, MBOs outperform non-MBOs by 4.4% in ROA and by close to 6000 RMB, or roughly 750 USD, in earnings per employee per year.

In columns (5) and (6) of Table 11, when we add an interaction between *Direct Sales to Outsiders* and *Post*, it is not significantly different from zero, suggesting direct sales to outsiders do not improve performance. This result is consistent with state control and a general lack of restructuring measures in this kind of privatization. Finally, the *Post* dummy itself is insignificant, suggesting that there is generally not any change in performance for non-MBOs.

5.3 Further analysis: The selection concern

A common concern about performance evaluation of privatized firms is the selection bias. For example, one may worry MBO firms have significantly better post-privatization performance because better firms are systematically chosen for MBOs; or managers may have incentives to buy out the firms if they have information about government implicit promises (e.g., in the form of protected entry) or future prospects of the firms; or managers may have

manipulated the earnings downward prior to MBOs so that they could buy out the firms more cheaply, causing a mechanical increase in earnings post privatization.

We should stress that compared with the previous literature, our data allow us to deal with the selection bias more seriously. In fact, the analyses so far have already addressed the selection issue in several ways. First, we do not simply make performance comparisons, but rather, we have identified the mechanism of performance improvement in MBOs, through transfer of control rights to private owners (Tables 4 and 5) and thus avoiding the negative impact of state control on performance (Table 6), through less government support and hardened budget constraint (Table 7), and through more enterprise restructuring (Table 8). Second, we explicitly examine the factors that affect the chances of firms being selected for MBOs. The fact that we find political and fiscal incentives, rather than the above-mentioned economic considerations, determine the choice of privatization method (Table 9) is reassuring. In the following analysis, we perform several additional tests to rule out the selection bias even further.

5.3.1 Preexisting trends in performance. If MBO firms were better firms or firms with greater growth potential, one should observe better performance prior to privatization. As Figure 3 shows, there is not any preexisting trend in performance.

5.3.2 Controlling for the impact of city-level economic aspects. One might worry that MBOs perform better because of city-level economic prospects. Specifically, if a greater share of SOEs and low fiscal resources symbolize a lack of future prospects for the privatized firms, there would be less managerial incentives to buy out the firms, resulting in a positive relationship between MBO and performance.

To address this concern, we use Columns (3) and (4) in Table 11 as the base estimation and add the interactions between city and year dummies, thus fully purging of all city-level time varying trends. We note that this is a strong test, as there are 205 cities and ten

years of data, resulting in 1,481 dummies being included in the estimation.[13] It is also worth pointing out that in our earlier estimation, we already have firm fixed effects and thus have controlled for time-invariant city-level economic prospects.

Panel A of Table 12 shows that, while adding 1,383 city-year dummies slightly weakens the significance level in one estimation (not surprisingly), it does not qualitatively change any of the earlier results. Further, the point estimates of *MBO*Post*, our main variables of interest, remain of similar magnitudes, implying that the time-variant component of city level influence does not drive the results.

5.3.3 Accounting for the role of product market competition. Section 3.2 shows that MBOs are rarely in monopolistic industries, which suggests that the better performance of MBOs is not likely driven by regulatory barrier to entry. We now extend performance analysis by explicitly including firms' self-reported competition.

This analysis is interesting and important in its own right. It helps understand the impact of product market competition on privatization outcomes. The answer is not ex ante clear: on the one hand, firms with monopoly power generally do better; on the other hand, firms facing competition has a stronger drive to improve efficiency because if they do not they may not even survive. Evidence from market economy has been mixed and identification is difficult due to endogenous market structure. Since trade liberalization often accompanies privatization, data from transition economies offer an opportunity to better deal with the identification challenge (Djankov and Murrell 2002). This advantage is even stronger in the Chinese setting, because at the time of privatization, there is already a variation in market structure across industries.

[13] We find that in the NSB data, the names of the cities where firms are located are sometimes missing, involving 149 firms and 1040 firm-years. We manually identify the cities based on company names or addresses. Sometimes only county information is available; we then manually match the county with the city to which it belongs to. In a few cases where even the addresses do not contain city or county information, we search the internet for information, assuming there is no change in company location.

Again using Columns (3) and (4) in Table 11 as the base estimation, we add variables on product market competition (Panel B of Table 12). We find that firms with monopoly power perform significantly worse in terms of return on assets (at the 5% level), suggesting that, when firms in monopolistic industries are privatized, they do not have a strong incentive to improve efficiency. This is consistent with results from transition economies that, while there are regional variations, the impact of product market competition on privatization performance is significantly positive overall (Djankov and Murrell 2002). Moreover, the triple interaction Monopoly*MBO*Post is insignificant, while our main variable of interest, *MBO*Post*, remains significantly positive. This means that better MBO performance is not driven by regulated entry. Finally, when we use a variable indicating market power, i.e., both monopoly firms and those reported to have few competitors, we obtain very similar results.

5.3.4 Controlling for the impact of government supports. We now compare MBOs with their private sector benchmark. If they have advantages arising from their government ties they would outperform de novo private firms. In Panel C1 of Table 12, we rerun Equation (3) by including only MBOs and de novo private firms. The insignificant coefficient of MBO*post suggests that MBOs have similar performance to the private sector benchmark. In Panel C2 of Table, we perform a diff-in-diffs analysis based on industry-and-size matching. The results are highly robust to alternative matching criteria and we do not find any evidence that MBOs outperform their private sector peers.

5.3.5 Instrumental variable estimation. We use city government's political incentives as instruments to estimate MBO choices on performance. The instruments include %SOE Employment, Fiscal Revenue/GDP, government allocation of land, and loan guarantees. The first-stage regression is the same as that in column (1) of Table 9B in Section 4. We employ the limited information maximum likelihood (LIML) estimation of the two-stage least square

(TSLS) regressions, which is more robust to weak IV problems.[14] Table 13 reports the results. The IV difference-in-differences estimates are quantitatively similar to our OLS estimates, further confirming that selection does not drive MBO performance.

6. Generality of the Chinese Experience

We now discuss the generality of the Chinese experience. At a high level, as pointed out by Frydman et al. (1999) and Estrin et al. (2009), reallocation of ownership and control to different types of owners have disparate effect on restructuring and performance; thus looking at aggregate results without knowing why could be misleading. The Chinese experience is perfectly consistent with this insight: when we pull all privatization methods together, we do not see any performance gain. In fact, our survey is designed to advance the literature by asking detailed questions on transfer of ownership and control, as well as restructuring.

At a more detailed level, the previous literature has pointed to a common set of economic factors governing the success of privatization, including type of owners, management turnover, product market competition, and hardening of budget constraints (Djankov and Murrell 2002). Our findings support the importance of all four factors.

The first factor, the types of owners, is worth a special note. There is a well-known result in the literature that privatization to insiders does not lead to efficiency gains in transition economies, which appears to be inconsistent with our findings that Chinese MBOs are the most effective privatization method. This, however, is a surface contrast. Our results do support findings in other countries that privatization to employees does not work, a quite intuitive result given that drawbacks of employee ownership are well recognized (e.g., Hansmann 1996).

The ineffectiveness of managerial ownership, however, is somewhat puzzling, as it has usually been found to be effective in market economies since Morck, Shelifer, and Vishny (1988). The difference lies in to what extent it is market-based. Frydman et al. (1999) point

[14] We report LIML results because they are more robust to weak IV. A simple IV estimation yields very similar results and is available upon request.

out two "special characteristics" of managerial ownership in transition economies. First, in CEE-CIS nations, managers are selected under the old regime and thus may not have the skill set needed in the market economy. The second characteristic is that managers are offered to buy the shares at preferential prices but with restrictive terms, designed to favor existing employees. The Chinese MBOs do not share these characteristics. While employment is also a concern at the time of privatization, once the firms are privatized via MBOs, they operate according to market practices. In this sense, the Chinese MBOs constitute a nice counterfactual analysis for the studies of other transition economies (and vice versa). They confirm the conjectures in the literature regarding why managerial ownership does not work in CEE-CIS nations.

In addition to supporting and extending the existing literature, our paper explores two important aspects of privatization not previously examined, both of which have general implications. Most notably, enabled by our detailed data on re-allocation of control rights, we show that withdrawal of state control in MBOs is the driving force behind restructuring and performance improvement. This has important implications for other privatization programs. So far, despite that most privatization around the world is partial, i.e., state transfers control incompletely, the role of retained state influence has not been thoroughly studied.[15] The second area is the role of political factors in shaping the design of privatization programs. Despite that theoretical work and anecdotes all suggest a significant influence of political factors (e.g., Biais and Perotti, 2002), there have been very few formal empirical studies and our paper joins a more recent effort (e.g., Dinc and Gupta 2011) on this important topic. In the Chinese setting, a lack of fiscal resources and political opposition to unemployment, prevent the commitment to withdrawal of state control and adoption of an effective privatization method.

[15] The exception is perhaps more recent studies finding that political connections in privatized firms hinder performance enhancement (Boubakri et al. 2008) and that state ownership is associated with less accounting transparency (Guedhami et al. 2009), both consistent with the Chinese experiences.

7. Conclusion

China's privatization is unique in that, instead of being designed by the national government, it is initiated, designed, and implemented by city governments. Consequently, privatization methods and outcomes vary substantially across cities within one country. This distinctive experience provides a rich laboratory for studying choice of privatization methods and outcomes, and the mechanisms behind the differences in outcomes.

We conduct a large-scale nationwide survey of over 3,000 firms from nearly one-third of China's cities, based on a random sampling stratified by size and industry. The survey collects detailed information on ownership structure, reallocation of five corporate decision rights among five parties, remaining government tie and support, and four measures of post-privatization restructuring. Thus, the data we collect are, to our knowledge, the most comprehensive data available to researchers in studying a single country's privatization.

We find that, while privatization in China has made substantial progress in reallocating control rights to private owners, the degree of remaining government influence in corporate decisions differs significantly across privatization methods. The MBO method, which accounts for about half of all privatization programs, represents the strongest commitment to withdrawing state both control and support. Our evidence further suggests the city governments' incentives and political constraints are the key determinants of their choices of privatization methods. In cities where political opposition to layoffs is weaker and where the city government has more fiscal resources to bear the cost of layoffs and to fill the gap in social welfare, the government is more likely to choose the MBO method. Finally, MBOs restructured more effectively and improved their performance significantly. In contrast, in direct sales to outsiders and other methods, the state retains substantial control, resulting in less restructuring and a lack of post-privatization performance improvement.

The dynamics of privatization provide an important perspective for understanding the Chinese economy. Political constraints and state intervention are the main reasons why some privatization programs fail to enhance performance. The same dynamics govern the Chinese

economy till today. During the period of rapid economic growth, the state has no urgency to push for further economic reforms, and political compromises result in greater state influence and thus economic inefficiencies in many sectors of the economy. Given the current economic slowdown, however, resolving these inefficiencies is important for future economic growth. Indeed, reforming the remaining often ultra-sized SOEs is back on the agenda and insights garnered from our study have important implications for SOE reforms in the future.

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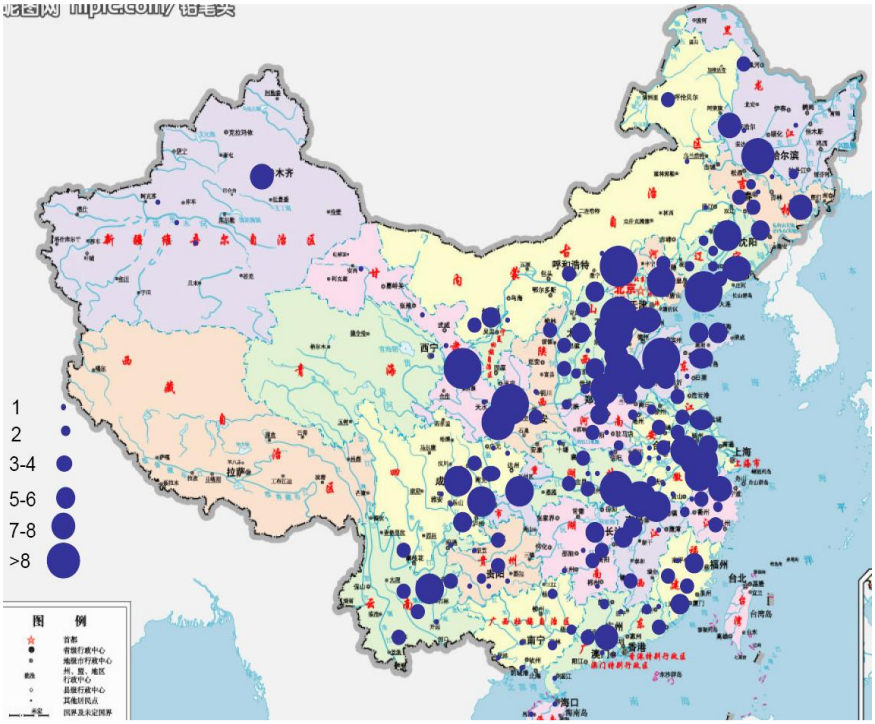
Figure 1. Regional distribution of privatized firms in the survey

(A) Geographical distribution of privatized firms in the survey



(B) Regional distribution of privatization over time

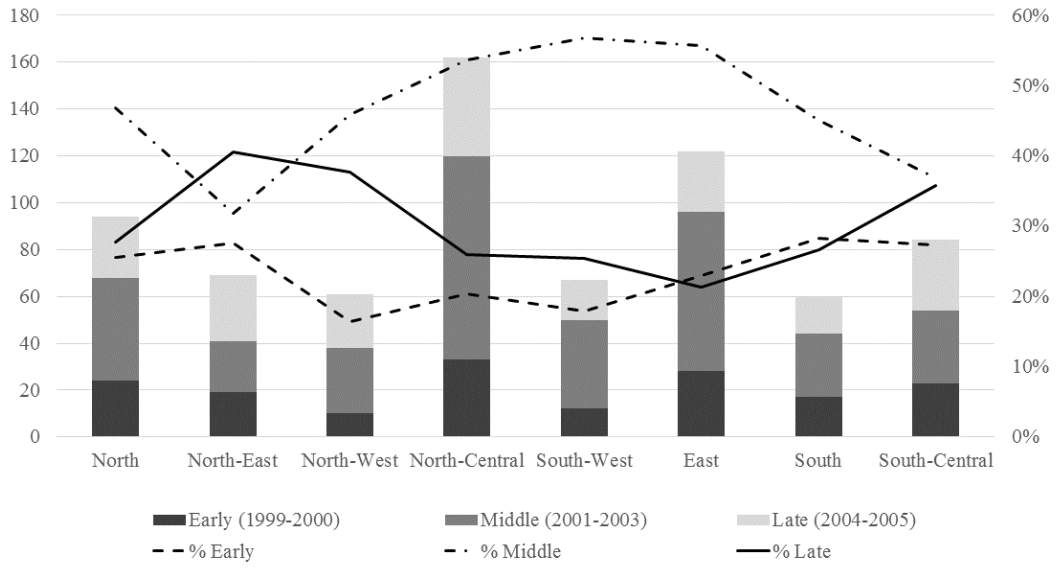


Figure 2. Reallocation of control rights before and after privatization

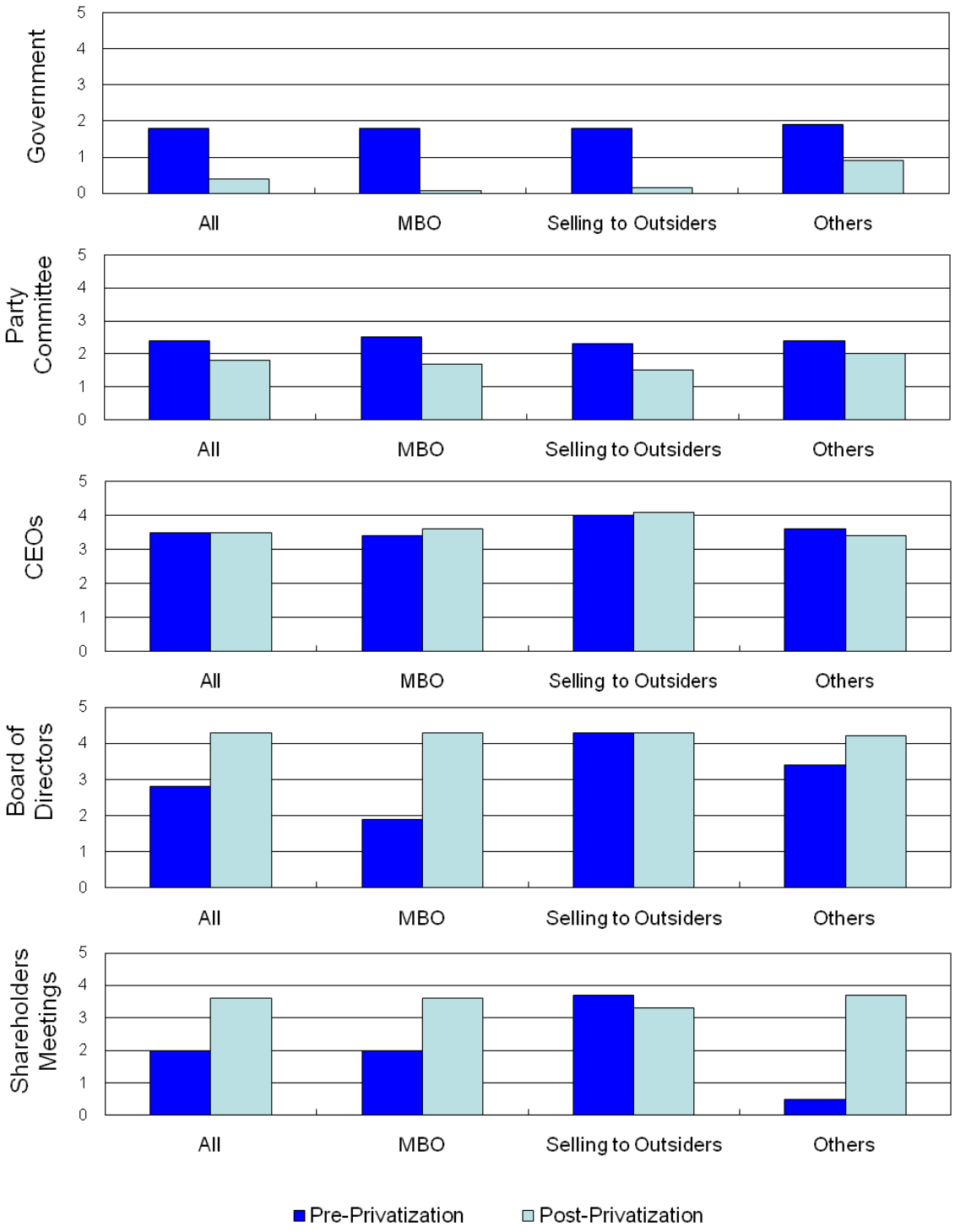
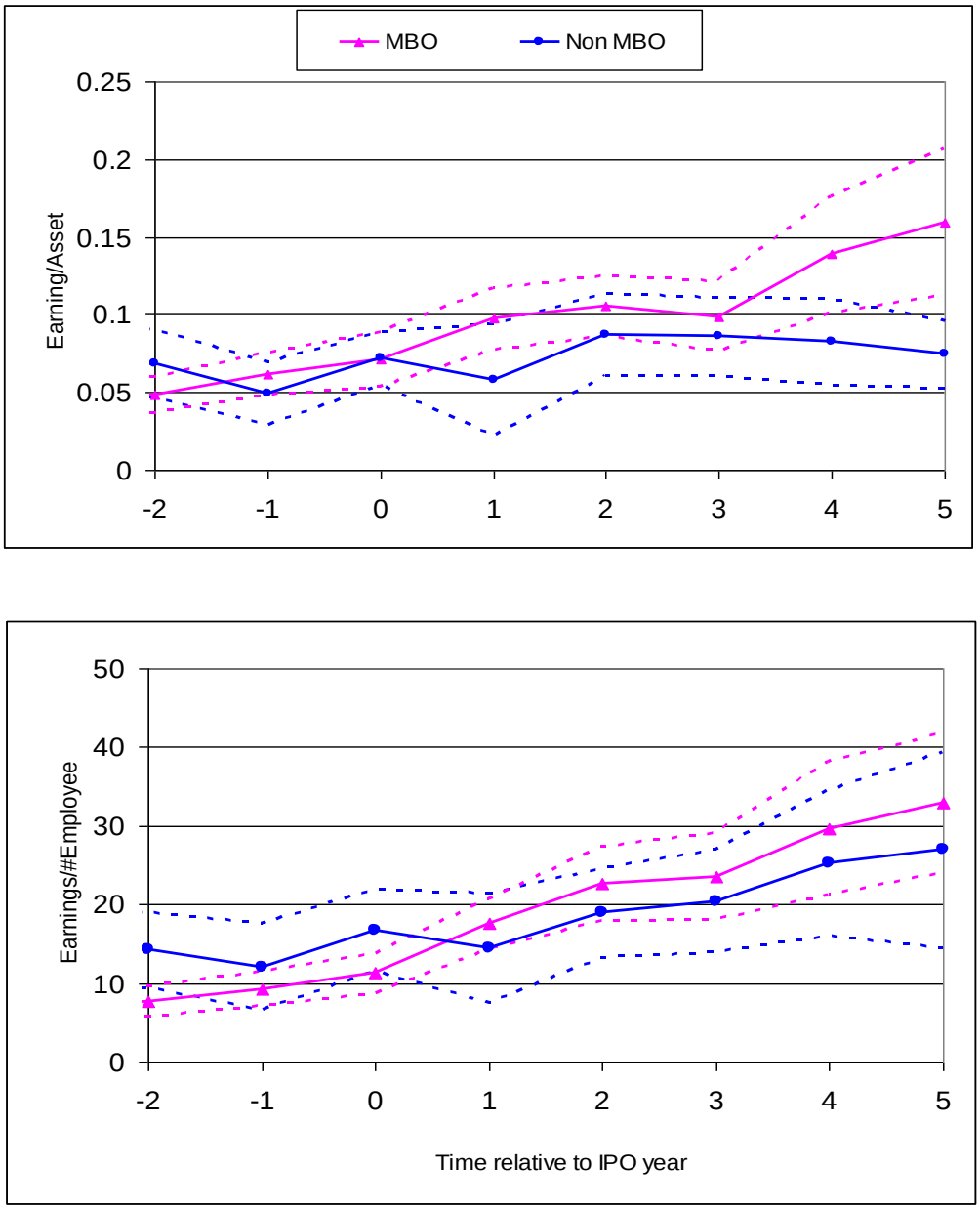


Figure 3. No preexisting trend in performance differences between MBOs and other privatization methods



Solid lines are the mean; dashed lines are 90% confidence intervals.

Table 1. Sample distribution of ownership, size, location, and industry

This table compares the distribution of our survey sample with that of the population by size, location, and industry. North China includes Beijing, Tianjin, Hebei; North-East: Heilongjiang, Jilin, Liaoning; North-West: Xinjiang, Qinghai, Ningxia, Gansu, Shaanxi, Innermongolia; North-Central: Shanxi, Henan, Shandong; South-West: Xizang, Yunnan, Guizhou, Sichuan, Chongqing; East: Shanghai, Jiangsu, Zhejiang; South: Guangxi, Guangdong, Fujian, Hainan; South-Central: Hubei, Hunan, Jiangxi, Anhui.

	Survey sample	Population
	(1)	(2)
A. Size distribution		
Large	3%	1%
Medium	17%	11%
Small	80%	88%
B. Regional distribution		
North	10%	8%
North-east	7%	7%
North-west	5%	4%
North-central	16%	15%
South-west	6%	5%
East	34%	35%
South	14%	18%
South-central	8%	8%
C. Industry distribution		
Mining	9%	12%
Food, beverage, and Tobacco	9%	9%
Textiles	12%	15%
Timber and paper products	9%	9%
Petroleum and chemical	17%	15%
Metals	21%	21%
Machine and electonics	17%	16%
Electricity, gas, and water	6%	3%

Table 2. Basic facts and summary statistics

Panel A presents basic facts of China's privatization during 1999-2005. In Panel A3, differences between the MBO firms and other methods and between Direct Sales to Outsiders and other methods are tested. Panel B reports the summary statistics of financial variables used in the empirical analysis during the sample period of 1998-2007. Profits are defined as earnings before interest, tax, and depreciation. Significance levels are all based on two-tailed tests of differences. Significance at the 1%, 5%, and 10% levels is indicated by ***, **, and *, respectively.

A. Basic facts of China's privatization

A1. Year of privatization

Year	# firms	Percentage
1999	60	8
2000	103	14
2001	102	14
2002	109	15
2003	129	18
2004	95	13
2005	119	17

A2. Methods

	# firms	Percentage
Direct sales		
To insiders (MBO)	338	47
To outsiders	157	22
Other methods		
Public offering	8	1
Joint venture	11	2
Leasing	56	8
Employee holding	70	10
Others	77	11
Total	717	100

A3. Ownership of privatized firms

		MBO	Direct sales to outsiders	Others	All
Ownership by the largest shareholder	Mean	37%***	64%	91%***	60%
	Median	30%***	70%	100%***	51%
Ownership by the second and third largest shareholder	Mean	27%**	20%***	30%*	26%
	Median	22%**	15%***	30%**	20%

Table 2. Basic facts and summary statistics (cont'd)

B.Financial information of Chinese firms

B1. Overview of financial information of Chinese firms

		Whole sample	State-owned enterprises (SOEs)			Non-SOEs	Difference
			Privatized	Nonprivatized	Difference		
		(1)	(2)	(3)	(2)-(3)	(4)	(2)-(4)
Assets (RMB '000)	Mean	181,801	354,285	252,388	101,897***	51,996	-302,289***
	Median	26,250	58,023	45,903	12,120***	15,926	42,097***
Sales (RMB '000)	Mean	135,102	239,621	155,860	83,761***	64,706	174,914***
	Median	23,911	31,060	23,311	7,749***	21,395	9,665***
Leverage	Mean	0.085	0.129	0.136	-0.006	0.040	0.090***
	Median	0.001	0.051	0.041	0.010	0.000	0.051***
Profits/Assets	Mean	0.132	0.091	0.069	0.022***	0.180	-0.088***
	Median	0.077	0.051	0.041	0.010***	0.109	-0.058***
Profits/# employee (RMB '000)	Mean	30.658	13.446	23.769	-10.323	43.393	-29.948***
	Median	11.876	8.387	5.837	2.550***	17.000	-8.613***
Number of firm-years		17,609	5,340	3,351		8,918	

B2. Financial variables before and after privatization

		All privatized SOEs			MBO		
		Before	After	Difference	Before	After	Difference
		(1)	(2)	(2)-(1)	(3)	(4)	(4)-(3)
Assets (RMB '000)	Mean	260,276	449,856	189,580***	117,114	195,703	78,589***
	Median	54,706	61,084	6,378***	44,237	43,215	-1,022
Sales (RMB '000)	Mean	155,549	325,057	169,509***	77,595	178,131	100,536***
	Median	24,685	40,235	15,551***	22,121	30,390	8,269***
Leverage	Mean	0.143	0.115	-0.028***	0.132	0.102	-0.030***
	Median	0.072	0.031	-0.041***	0.069	0.021	-0.047***
Profits/Assets	Mean	0.054	0.128	0.074***	0.047	0.153	0.106***
	Median	0.039	0.068	0.030***	0.036	0.078	0.043***
Profits/# employee (RMB '000)	Mean	10.963	15.898	4.934	7.901	2.659	-5.241
	Median	5.242	14.616	9.374***	4.449	14.743	10.293***

Table 3. Financial aspects of privatization

This table presents the financial aspects of China's privatization. In Panel A, significance levels are based on two-tailed tests of differences between a particular privatization method and other methods. Significance at the 1%, 5% and 10% levels is indicated by ***, ** and *, respectively. In Panel C, for each source of funds, firms are asked to specify the percentage of funding from this source. The possible answers are: 0, 1-20%, 21-40%, 41-70% and 71-100%. To estimate the monetary share of each of the financing source, we assume that the median of the range is the actual percentage.

A. Details of privatization payment schemes

	All privatized SOEs	MBO	Direct sales to outsiders	Leasing
% lump-sum cash payment	77	80**	74	55***
% first payment if by installment	33	34	28**	33
# years to pay if by installment	4.9	4.7	5.5	4.7

B. Sources of managers' funds

	Personal savings	Borrowings from friends and relatives	Bank loans	Future salaries
% Firms using this method	99	8	5	6
% as an above 20% source	99	2	2	3
% as an above 70% source	95	0	0	0.2

C. Estimated monetary share of each source of funds

Personal savings	96%
Borrowings from relatives	1%
Bank loans	1%
Future salaries	2%

Table 4. Privatization and change of control rights

This table reports allocation of control rights in Chinese firms. The importance of each decision maker is given a score from 0 to 5, where 0 means negligibly unimportant and 5 indispensably important. Average and median scores across firms are reported. Significance levels in columns (4), (6) and (8) are based on two-tailed tests of differences before- and after- privatization. Significance at the 1%, 5%, and 10% levels is indicated by ***, **, and *, respectively.

	Nonprivatized SOEs		De novo private firms		Privatization methods											
					All privatizatized SOEs				MBO				Direct sales to outsiders			
					Before		After		Before		After		Before		After	
	(1)		(2)		(3)		(4)		(5)		(6)		(7)		(8)	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median
A. Control rights of government																
Appointment of top management	3.0	4.0	0.0	0.0	2.4	2.0	0.6***	0.0***	2.4	3.0	0.1***	0.0***	2.6	2.0	0.4***	0.0***
Employment/Layoff	2.2	2.0	0.0	0.0	2.0	2.0	0.4***	0.0***	2.0	2.0	0.1***	0.0***	2.2	2.0	0.5***	0.0***
Wages/Compensations	1.9	2.0	0.0	0.0	1.6	0.0	0.4***	0.0***	1.6	0.0	0.1***	0.0***	1.8	1.0	0.4***	0.0***
Investment	2.6	3.0	0.0	0.0	2.0	2.0	0.4***	0.0***	2.0	2.0	0.1***	0.0***	1.9	2.0	0.4***	0.0***
Fund raising	2.4	2.0	0.0	0.0	1.9	0.0	0.4***	0.0***	1.9	0.0	0.1***	0.0***	1.8	1.0	0.4***	0.0***
Fund using	2.1	2.0	0.0	0.0	1.7	0.0	0.4***	0.0***	1.6	0.0	0.1***	0.0***	1.8	1.0	0.3***	0.0***
Distribution of profits	2.0	2.0	0.0	0.0	1.7	0.0	0.4***	0.0***	1.7	0.0	0.1***	0.0***	1.8	0.0	0.4***	0.0***
Production and marketing	1.8	1.0	0.0	0.0	1.6	0.0	0.3***	0.0***	1.5	0.0	0.0***	0.0***	1.7	0.0	0.3***	0.0***
Average	2.3	2.3	0.0	0.0	1.8	0.8	0.4	0.0	1.8	0.9	0.1	0.0	1.9	1.1	0.4	0.0
Number of firms	454		1550		717		714		338		337		89		88	
B. Control rights of party committee																
Appointment of top management	2.7	3.0	2.0	2.0	2.8	3.0	1.7***	2.0***	2.9	3.0	1.5***	2.0***	2.5	3.0	1.3***	1.0***
Employment/Layoff	2.7	3.0	2.2	2.0	2.8	3.0	1.7***	2.0***	3.0	3.0	1.6***	2.0***	2.4	3.0	1.3***	1.0***
Wages/Compensations	2.4	3.0	2.2	2.0	2.7	3.0	1.7***	2.0***	2.8	3.0	1.6***	2.0***	2.3	2.0	1.3***	1.0**
Investment	2.5	3.0	2.0	2.0	2.2	2.0	1.3***	1.0***	2.2	2.0	1.2***	0.0***	2.1	2.0	1.1***	1.0**
Fund raising	2.4	3.0	1.7	2.0	2.1	2.0	1.3***	1.0***	2.1	2.0	1.2***	1.0***	2.2	2.0	1.1***	1.0***
Fund using	2.3	2.0	1.6	2.0	1.9	2.0	1.2***	1.0***	1.9	2.0	1.1***	0.0***	2.1	2.0	1.0***	1.0***
Distribution of profits	2.4	3.0	1.8	2.0	2.5	2.0	1.6***	2.0***	2.6	3.0	1.4***	1.0***	2.3	2.0	1.2***	1.0**
Production and marketing	2.2	2.0	1.8	2.0	2.4	2.0	1.5***	1.0***	2.5	2.0	1.3***	1.0***	2.2	2.0	1.1***	1.0***
Average	2.5	2.8	1.9	2	2.4	2.4	1.5	1.5	2.5	2.5	1.3	1.1	2.2	2.3	1	1
Number of firms	320		181		611		611		285		285		67		67	

Table 4. Privatization and change of control rights (cont'd)

	Nonprivatized SOEs		De novo private firms		Privatization methods: All privatizatized SOEs, Before		All privatizatized SOEs, After		MBO, Before		MBO, After		Direct sales to outsiders, Before		Direct sales to outsiders, After	
	(1)		(2)		(3)		(4)		(5)		(6)		(7)		(8)	
	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median	Mean	Median
C. Control rights of CEOs																
Appointment of top management	3.9	4.0	4.3	5.0	3.6	4.0	3.6	4.0	3.4	3.0	3.5	4.0	4.1	4.0	4.3**	5.0*
Employment/Layoff	4.1	4.0	4.3	5.0	3.7	4.0	3.6**	4.0	3.6	4.0	3.5	4.0	4.1	4.0	4.3	5.0
Wages/Compensations	4.0	4.0	4.2	5.0	3.7	4.0	3.6**	4.0	3.6	4.0	3.6	4.0	4.2	4.0	4.3	5.0*
Investment	3.8	4.0	4.3	5.0	3.2	4.0	3.3*	4.0	2.9	3.0	3.3***	4.0**	4.1	4.0	4.3	5.0*
Fund raising	3.8	4.0	4.0	5.0	3.1	4.0	3.3**	4.0	2.9	3.0	3.2***	4.0**	3.9	4.0	4.2	5.0*
Fund using	3.8	4.0	4.2	5.0	3.1	4.0	3.2	4.0	2.9	3.0	3.2**	4.0**	4.0	4.0	4.2	5.0
Distribution of profits	3.9	4.0	4.2	4.0	3.6	4.0	3.6	4.0	3.4	3.0	3.5	4.0	4.2	4.0	4.4	5.0
Production and marketing	4.0	4.0	4.1	5.0	3.8	4.0	3.7	4.0	3.6	4.0	3.6	4.0	4.3	4.0	4.5	5.0
Average	3.9	4.0	4.2	4.9	3.5	4.0	3.5	4.0	3.3	3.4	3.4	4.0	4.1	5.0	4.3	5.0
Number of firms	466		1667		717		716		338		338		89		88	
D. Control rights of boards of directors																
Appointment of top management	4.5	5.0	4.5	5.0	n.a.	n.a.	4.4	5.0	n.a.	n.a.	4.3	5.0	n.a.	n.a.	4.6	5.0
Employment/Layoff	3.9	5.0	3.9	4.0	n.a.	n.a.	4.3	5.0	n.a.	n.a.	4.3	5.0	n.a.	n.a.	4.3	5.0
Wages/Compensations	3.9	5.0	3.6	4.0	n.a.	n.a.	4.0	4.0	n.a.	n.a.	3.9	4.0	n.a.	n.a.	4.0	4.0
Investment	4.3	5.0	4.5	5.0	n.a.	n.a.	4.6	5.0	n.a.	n.a.	4.7	5.0	n.a.	n.a.	4.7	5.0
Fund raising	4.3	5.0	4.4	5.0	n.a.	n.a.	4.5	5.0	n.a.	n.a.	4.6	5.0	n.a.	n.a.	4.7	5.0
Fund using	4.3	5.0	4.4	5.0	n.a.	n.a.	4.3	4.0	n.a.	n.a.	4.3	4.0	n.a.	n.a.	4.6	5.0
Distribution of profits	4.4	5.0	4.5	5.0	n.a.	n.a.	4.4	5.0	n.a.	n.a.	4.3	4.0	n.a.	n.a.	4.7	5.0
Production and marketing	3.9	4.5	3.6	4.0	n.a.	n.a.	4.0	4.0	n.a.	n.a.	4.0	4.0	n.a.	n.a.	4.2	4.0
Average	4.2	4.9	4.2	4.6	n.a.	n.a.	4.3	4.6	n.a.	n.a.	4.3	4.5	n.a.	n.a.	4.5	4.8
Number of firms	103		756		n.a.		545		n.a.		285		n.a.		42	
E. Control rights of shareholder meetings																
Appointment of top management	3.4	4.0	3.7	4.0	n.a.	n.a.	3.5	4.0	n.a.	n.a.	3.5	4.0	n.a.	n.a.	3.7	4.0
Employment/Layoff	2.5	3.5	3.1	4.0	n.a.	n.a.	3.4	4.0	n.a.	n.a.	3.4	4.0	n.a.	n.a.	3.6	4.0
Wages/Compensations	2.8	3.0	2.9	3.0	n.a.	n.a.	3.2	4.0	n.a.	n.a.	3.3	4.0	n.a.	n.a.	3.3	4.0
Investment	3.7	4.0	4.0	4.0	n.a.	n.a.	4.1	5.0	n.a.	n.a.	4.2	5.0	n.a.	n.a.	4.1	5.0
Fund raising	3.4	4.0	3.9	4.0	n.a.	n.a.	4.3	5.0	n.a.	n.a.	4.4	5.0	n.a.	n.a.	4.3	5.0
Fund using	3.5	4.0	3.9	4.0	n.a.	n.a.	3.7	4.0	n.a.	n.a.	3.7	4.0	n.a.	n.a.	3.8	4.0
Distribution of profits	3.4	4.0	3.8	4.0	n.a.	n.a.	3.6	4.0	n.a.	n.a.	3.6	4.0	n.a.	n.a.	3.6	4.0
Production and marketing	2.7	3.0	2.8	3.0	n.a.	n.a.	3.2	4.0	n.a.	n.a.	3.1	3.0	n.a.	n.a.	3.4	4.0
Average	3.2	3.8	3.5	3.9	n.a.	n.a.	3.7	3.9	n.a.	n.a.	3.6	3.9	n.a.	n.a.	3.8	4.0
Number of firms	48		376		n.a.		428		n.a.		286		n.a.		91	

Table 5. State control in privatized firms

This table reports the percentage of firms that are under strong state influence post-privatization by privatization method. State-Influence Score is defined as the max of the importance of local government and that of party committee in corporate decision making based on a 5-point scale (0=negligibly unimportant, 5=indispensably important). Panel B uses Principal Component Analysis (PCA) to form additional variables of state control. The source of state influence is from government or party communist. PCA State Control is defined as 1 if either the first component of government influence or the first component of party influence is above the mean. Significance levels are based on two-tailed tests of differences between a particular privatization method and other methods. Significance at the 1%, 5%, and 10% levels is indicated by ***, **, and *, respectively.

A. Ownership and state-influence score

	State ownership above mean	State-influence score above 2
Direct sales to insiders (MBO)	1%***	16%***
Direct sales to outsiders	15%	25%*
Other methods	50%	59%
All privatizatized SOEs	19%	31%

Panel B. Principal component analysis of state control

	First component of government influence	% first component of government influence above mean	First component of party influence	% first component of party influence above mean	PCA state control
Direct sales to insiders (MBO)	2.71***	21***	5.82***	44***	42%***
Direct sales to outsiders	3.54*	28*	6.18*	47*	49%
Other methods	3.61	32	6.03	50	59%
All privatizatized SOEs	3.40	26	5.96	47	49%

Table 6. State influence and performance

This table presents the effect of state control on post-privatization performance as in Equation (1). It is based on the sample of all privatized firms during 1998 to 2007. Variables related to state control are defined in Table 5. Performance measures are calculated as operating profits (earnings before interest, tax and depreciation) over assets and number of employees, respectively. Robust standard errors are in parentheses. Significance at the 1%, 5%, and 10% levels is indicated by ***, ** and *, respectively.

	Performance measures		Performance measures		Performance measures	
	Profits/assets	Profits/#employee	Profits/assets	Profits/#employee	Profits/assets	Profits/#employee
	(1)	(2)	(3)	(4)	(5)	(6)
Lag of performance						
Log (sales)	0.084***	18.290***	0.083***	18.256***	0.084***	18.100***
	(0.011)	(1.523)	(0.011)	(1.522)	-0.012	-1.525
Leverage	0.003	6.432*	0.007	6.877*	0.004	6.672*
	(0.018)	(3.881)	(0.018)	(3.891)	-0.018	-3.901
Post dummy	0.032***	1.781	0.018*	-0.258	0.031**	0.447
	(0.012)	(1.833)	(0.011)	(1.660)	-0.013	-1.935
State share above mean * Post	-0.074***	-9.655***				
	(0.014)	(2.669)				
State influence score above 2 * Post			-0.060***	-6.252*		
			(0.020)	(3.539)		
PCA state control * Post					-0.063***	-5.397**
					-0.014	-2.589
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Observations	5,245	5,167	5,245	5,167	5,214	5,136
R-squared	0.518	0.549	0.520	0.550	0.519	0.547

Table 7. Comparison of political connections, government subsidies, soft budget constraint, and protected entry between MBO and other privatized firms

This table presents the comparison of post-privatization political connections, government subsidies, soft budget constraint, and protected entry between MBO and other privatization methods. Panel E is based on answers to our survey question: "how many competitors does your firm have?" The possible answers are: no, few, some and many competitors. We categorize the firm as a monopoly if it reports no competitor. It is defined to have market power if it has no or few competitors. It is considered to be in a competitive market if it has some or many competitors. Significance levels are based on two-tailed tests of differences between MBO and other methods. Significance at the 1%, 5% and 10% levels is indicated by ***, ** and *, respectively.

	All privatizatized SOEs	MBO
	(1)	(2)
A. Political connections		
% with chairman or top manager appointed by government	23	3***
% with government officials on the board	4	0.3***
% with top manager being a former government official	2	1**
B. Government subsidies		
% with government land subsidy	67	59***
% with direct allocation of land by government	31	19***
% with purchases at below-market prices	36	40**
% with government-funded R&D projects	3	1***
C. Bank loans		
% with bank loans	82	84
% with loan rejection	22	26**
% rejected due to constraints on bank credit supply	3	4**
% rejected due to a lack of relations with the government	3	4*
% with government guarantee of loans	7	7
D. Soft budget constraints		
% expected tax reduction in case of financial distress	0.2	0
% expected government subsidies in case of financial distress	0.3	0
% expected capital injection in case of financial distress	0.4	0
% expected subsidized loans in case of financial distress	0.1	0.3
% with any of the above expectations	0.6	0.3

Table 7. Comparison of political connections, government subsidies, soft budget constraint, and protected entry between MBO and other privatized frims (cont'd)

E. Protected entry

E1. Reported competition by MBOs and other privatized firms

	All privatized SOEs	MBO
% monopoly	9	2***
% has Market Power	22	16***
% competitive market	78	84***

E2. Reported competition in industries perceived as protected industries

	All privatized SOEs				MBOs			
	# obs	% firms	% monopoly	% competitive market	# obs	% firms	% monopoly	% competitive market
Energy	35	4	23	69	10	2	10	80
Coal	34	4	21	71	10	2	10	80
Oil and natural gas	1	0.1	100	0	0	0	n.a.	n.a.
Utilities	83	9	67	13	10	2	60	20
Power supply	47	5	68	13	7	2	43	29
Fuel gas	9	1	44	33	0	0	n.a.	n.a.
Water	27	3	74	7	3	1	100	0
Car	54	6	11	74	18	4	6	78
Pharmacy	37	4	0	86	21	5	0	86

Table 8. Post-privatization restructuring and professionalization

Panel A presents, by privatization method, the percentage of firms that have undertaken restructuring. Significance levels are based on two-tailed tests of differences between a particular privatization method and other methods. Panel B presents the logit model (columns (1), (3)-(5)) or the Tobit model (column (2)) of restructuring measures after privatization. The financial variables are the three-year average after privatization. Robust standard errors are in parentheses. Significance at the 1%, 5%, and 10% levels is indicated by ***, **, and *, respectively.

A. Post-privatization restructuring measures

	Change of core management team	Performance-based compensation		International acccounting and independent auditing	Establishing board of directors
		Ratio of bonus in cash compensation	Shares		
Direct sales to insiders (MBO)	64%	54%***	8%	11%**	84%***
Direct sales to outsiders	61%	51%	15%***	7%	67%***
Other methods	60%	35%***	2%	5%	71%
All privatized SOEs	62%	47%	7%	8%	76%

Panel B. Logit and Tobit regression of post-privatization restructuring measures

	Change of core management team	Performance-based Compensation		International acccounting and independent auditing	Establishing board of directors
		Ratio of bonus in cash compensation	Shares		
	(1)	(2)	(3)	(4)	(5)
Lag of performance	-0.073**	0.274*	-0.264***	0.192	0.244***
	(0.036)	(0.140)	(0.080)	(0.065)	(0.046)
Log (sales)	-0.223	-0.020*	0.45	-3.570***	-0.069
	(0.343)	(0.011)	(0.773)	(0.992)	(0.408)
Leverage	-0.631**	0.057	0.422**	-0.522	-0.501***
	(0.302)	(0.099)	(0.187)	(0.575)	(0.182)
Direct sales to outsiders	-0.166	0.140***	1.793***	-0.094	-0.055
	(0.171)	(0.053)	(0.423)	(0.369)	(0.203)
MBO	0.388**	0.202***	-1.253***	0.991***	0.782***
	(0.151)	(0.044)	(0.272)	(0.318)	(0.189)
Industry fixed effects	Yes	Yes	Yes	Yes	Yes
Observations	606	553	606	606	606

Table 9. Government incentives and choices of MBO method

This table presents the effect of government incentives on MBO choices. Panel A reports the summary statistics of variables. Significance levels are based on two-tailed tests of differences between the MBO firms and other methods. Panel B presents the logit regression of MBO choices as in Equation (2). *Fiscal Resources* is defined as fiscal revenue over GDP; High share of SOE employment is a dummy variable indicating *Share of SOE Employment* above the median. Robust standard errors are in parentheses. In both panels, significance at the 1%, 5%, and 10% levels is indicated by ***, **, and *, respectively.

A. Summary statistics of government incentives and city-level variables

		All privatizatized SOEs	MBO
Government incentives			
Fiscal resources	Mean	0.67	0.70***
	Median	0.71	0.71
Share of SOE employment	Mean	0.25	0.24
	Median	0.17	0.16*
% with government land subsidy	Mean	69	62***
% with government guarantee of loans	Mean	7	7
City-level controls			
Log (GDP per capita)	Mean	9.72	9.77*
	Median	9.71	9.78*
Population growth	Mean	0.03	0.04*
	Median	0.01	0.01

Table 9. Government incentives and choices of MBO method

B. Logit regression of MBO choices

	Dependent variable: MBO	
	(1)	(2)
Government incentives		
Fiscal resources	-0.979	-1.173
	(0.230)	(0.159)
Share of SOE employment	-0.748**	-0.754**
	(0.024)	(0.026)
Fiscal resources * High share of SOE employment	2.660***	2.372***
	(0.002)	(0.008)
Government land subsidy	-0.142***	-0.142***
	(0.000)	(0.001)
Government guarantee of loans	0.053	0.078
	(0.464)	(0.314)
City-level controls		
Log (GDP per capita)	-0.021	-0.022
	(0.568)	(0.554)
Population growth	0.216	0.233
	(0.242)	(0.241)
Firm-level controls		
Log (sales)		-0.021*
		(0.054)
Performance		-0.023
		(0.874)
Leverage		-0.103
		(0.330)
Observations	708	678
R-squared	0.199	0.207

Table 10. A first look at performance of Chinese firms

This table presents the OLS estimates of the effect of privatization on firm performance as in Equation (3). It is based on the sample containing privatized SOEs, non-privatized SOEs, and de novo private firms during 1998 to 2007. Performance measures are calculated as operating profits (earnings before interest, tax and depreciation) over assets and number of employees, respectively. Robust standard errors are in parentheses. Significance at the 1%, 5%, and 10% levels is indicated by ***, ** and *, respectively.

	Performance measures		Performance measures	
	Profits/ assets	Profits/ #employee	Profits/ assets	Profits/ #employee
	(1)	(2)	(3)	(4)
Log (sales)	0.026***	16.629***	0.026***	16.621***
	(0.001)	(1.415)	(0.001)	(1.400)
Leverage	-0.071***	-3.511	-0.070***	-3.473
	(0.011)	(4.901)	(0.011)	(4.851)
Privatized firms	-0.088***	-31.925***	-0.094***	-32.494***
	(0.007)	(2.672)	(0.006)	(3.815)
SOE	-0.097***	-23.972***	-0.098***	-24.032***
	(0.006)	(2.482)	(0.006)	(2.561)
Post dummy			0.012	1.026
			(0.009)	(3.220)
Year dummies	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes	Yes
Observations	17,339	17,153	17,339	17,153
R-squared	0.072	0.057	0.072	0.057

Table 11. The Influence of privatization methods on post-privatization performance

This table presents the influence of privatization methods on firm performance as in Equation (3). It is based on the sample of all privatized firms during 1998 to 2007. Performance measures are calculated as operating profits (earnings before interest, tax and depreciation) over assets and number of employees, respectively. Robust standard errors are in parentheses. Significance at the 1%, 5%, and 10% levels is indicated by ***, ** and *, respectively.

	Performance measures		Performance measures		Performance measures	
	Profits/ assets	Profits/ #employee	Profits/ assets	Profits/ #employee	Profits/ assets	Profits/ #employee
	(1)	(2)	(3)	(4)	(5)	(6)
Log (sales)	0.021***	9.256***	0.084***	18.263***	0.084***	18.262***
	(0.002)	(0.401)	(0.011)	(1.521)	(0.011)	(1.521)
Leverage	-0.079***	0.207	0.006	6.756*	0.007	6.739*
	(0.020)	(3.545)	(0.018)	(3.881)	(0.018)	(3.857)
Post dummy	0.005	-1.178	-0.013	-4.169*	-0.009	-4.275
	(0.012)	(2.074)	(0.013)	(2.218)	(0.015)	(2.903)
MBO * Post	0.057***	7.467***	0.044***	5.950***	0.040***	6.047*
	(0.011)	(1.938)	(0.015)	(2.615)	(0.017)	(3.194)
Direct sales to outsiders * Post					-0.010	0.268
					(0.018)	(3.792)
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	No	No	No	No
Firm fixed effects	No	No	Yes	Yes	Yes	Yes
Observations	5,222	5,144	5,245	5,167	5,245	5,167
R-squared	0.083	0.206	0.518	0.549	0.518	0.549

Table 12. Further analysis of MBO performance improvement

This table provides further analysis of the influence of privatization methods on firm performance. Panel A and B estimate Equation (3) based on the sample of all privatized firms during 1998 to 2007. Panel C compares MBOs and de novo private firms. Panel C1 estimates Equation (3) based on the sample of MBO and de novo private firms during 1998 to 2007. Panel C2 reports the results by the method of matched sample. Matching is by industry and size, where the size is based on assets or sales within 20% range, or firms that are closest in size to the MBO firm. Performance measures are calculated as operating profits (earnings before interest, tax and depreciation) over assets and number of employees, respectively. Performance improvement is defined as the difference of average performance measures before and after privatization. Robust standard errors are in parentheses. Significance at the 1%, 5%, and 10% levels is indicated by ***, ** and *, respectively. Significance at the 1%, 5%, and 10% levels by one-sided tests is indicated by [a].

A. Impact of city-level economic prospects

	Performance measures		Performance measures	
	Profits/ assets	Profits/ #employee	Profits/ assets	Profits/ #employee
	(1)	(2)	(3)	(4)
Log (sales)	0.084***	16.863***	0.084***	16.848***
	(0.015)	(1.570)	(0.015)	(1.573)
Leverage	-0.002	0.092	-0.001	-0.109
	(0.024)	(5.208)	(0.025)	(5.219)
Post dummy	-0.026	-6.543*	-0.024	-8.423*
	(0.017)	(3.390)	(0.020)	(4.297)
MBO * Post	0.067***	8.187**	0.065**	9.971**
	(0.025)	(3.783)	(0.026)	(4.420)
Direct sales to outsiders * Post			-0.004	4.732
			(0.025)	(5.501)
City*Year fixed effects	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes
Observations	5,241	5,163	5,241	5,163
R-squared	0.647	0.724	0.647	0.724

Table 12. Further analysis of MBO performance improvement (cont'd)

B. Protected entry

	Performance measures		Performance measures		Performance measures		Performance measures	
	Profits/ assets	Profits/ #employee	Profits/ assets	Profits/ #employee	Profits/ assets	Profits/ #employee	Profits/ assets	Profits/ #employee
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Log (sales)	0.084***	18.192***	0.084***	18.192***	0.084***	18.197***	0.083***	18.203***
	(0.011)	(1.524)	(0.011)	(1.525)	(0.011)	(1.527)	(0.011)	(1.533)
Leverage	0.007	6.803*	0.007	6.803*	0.007	6.816*	0.008	6.805*
	(0.018)	(3.872)	(0.018)	(3.880)	(0.018)	(3.877)	(0.018)	(3.872)
Post dummy	-0.003	-3.995*	-0.002	-3.996*	-0.007	-4.019*	-0.002	-4.160*
	(0.012)	(2.210)	(0.012)	(2.253)	(0.015)	(2.102)	(0.013)	(2.215)
MBO * Post	0.036**	5.766**	0.035**	5.769**	0.041**	5.866**	0.031*	6.121**
	(0.015)	(2.589)	(0.016)	(2.703)	(0.016)	(2.492)	(0.016)	(2.825)
Monopoly * Post	-0.058**	-1.652	-0.061**	-1.642				
	(0.025)	(4.907)	(0.031)	(5.878)				
Monopoly * MBO *Post			0.016	-0.053				
			(0.037)	(8.656)				
Market power * Post					-0.020	-0.884	-0.038*	-0.403
					(0.022)	(3.266)	(0.023)	(4.808)
Market power * MBO * Post							0.049	-1.246
							(0.052)	(5.948)
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	5,241	5,163	5,241	5,163	5,241	5,163	5,241	5,163
R-squared	0.519	0.549	0.519	0.549	0.518	0.549	0.519	0.549

Table 12. Further analysis of MBO performance improvement (cont'd)

C. Comparison between MBO and de novo private firms

C1. The regression method

	Performance measures	
	Profits / assets	Profits / #employee
	(1)	(2)
Log (sales)	0.110***	23.402***
	(0.013)	(1.962)
Leverage	-0.005	8.037
	(0.023)	(11.316)
MBO * Post	0.023	4.425
	(0.014)	(2.703)
Year dummies	Yes	Yes
Firm fixed effects	Yes	Yes
Observations	7,468	7,385
R-squared	0.632	0.515

C2. The matched sample method

		Matched de novo firms based on industry and			
	MBO privatization	Assets within 20% range	Closest in assets	Sales within 20% range	Closest in sales
% Matched	n.a.	67	98	71	98
Performance measurement: Profits/assets					
Performance improvement	0.09***	0.06***	0.06***	0.09***	0.07***
Diff-in-diffs	n.a.	0.07	0.04	-0.04	-0.02
p -values	n.a.	(0.236)	(0.301)	(0.241)	(0.518)
Performance measurement: Profits/#employee					
Performance Improvement	16.70***	35.18**	30.08***	35.12***	37.38***
Diff-in-diffs	n.a.	-11.16	-8.51	-17.86	-15.27*
p -values	n.a.	(0.405)	(0.385)	(0.104)	(0.099)

Table 13. Instrumental variable estimates of the effect of MBO on performance

This table presents the instrumental variable (IV) estimates of the effect of MBO on performance as in Equation (3). It is based on the sample of all privatized firms during 1998 to 2007. The model is estimated using limited information maximum likelihood (LIML) estimation. Government Incentives, defined in Table 5, are used as instruments. Performance measures are calculated as operating profits (earnings before interest, tax, and depreciation) over assets, sales, and number of employees, respectively. The number of observations is less than that in Table 11 due to missing numbers in instruments including SOE shares and fiscal capacity. Robust standard errors are in parentheses. Significance at the 1%, 5%, and 10% levels is indicated by ***, **, and *, respectively.

	Performance measures	
	Profits/ assets	Profits/ #employee
	(1)	(2)
Log (sales)	0.081***	17.442***
	(0.011)	(1.307)
Leverage	-0.001	5.594
	(0.019)	(4.091)
Post dummy	-0.085**	-17.426**
	(0.039)	(6.941)
MBO * Post	0.186**	30.588**
	(0.080)	(13.070)
Year dummies	Yes	Yes
Firm fixed effects	Yes	Yes
Observations	4,869	4,805
R-squared	0.520	0.566

Internet Appendix 1. Survey Questions Relevant to the Analysis in the Paper

Part I Basic information

1. Has your firm experienced *Gaizhi (Privatization)*? A. Yes; B. No.
(If Yes, proceed with this questionnaire; Otherwise, proceed with Questionnaire B)

2. Method of Privatization:

Method	**Year**	
	First time	Last time
A. Going Public	_____	_____
B. Maintaining the ownership of existing assets	_____	_____
B.1 Maintaining the previous owernship but establishing Articles of Association and Board of Directors	_____	_____
B.2 Spinoffs: Separate the firm into smaller ones	_____	_____
B.3 Issuing new shares to parties with different types of owernship	_____	_____
B.4 Swapping debts into shares	_____	_____
B.5 Others (please be specific)	_____	_____
C. Bankruptcy and Reorganization	_____	_____
D. Transforming into shareholding companies	_____	_____
E. Direct sales:	_____	_____
E.1 Sales to managers	_____	_____
E.2 Sales to other individual insiders	_____	_____
E.3 Sales to another stated-owned firm	_____	_____
E.4 Sales to outsiders	_____	_____
E.5 Others (Please be specific)	_____	_____
F. Leasing, contracting or trusteeship	_____	_____
G. Forming a joint venture with a foreign firm	_____	_____

3. In which way do the majority of senior managers purchase most of their shares? (One choice only)

A. Paying in cash in full

B. Paying by installments within several years

C. Others (Please be specific)

If "Paying by installments within several years", the percentage of the initial payment is _____% in all; the payment lasts _____years.

4. How do most senior managers fund their share purchases? (Please choose the respective percentage)

	<20%	20%-40%	41%-70%	>70%
Personal savings				
Borrowings from friends and relatives				
Bank loans				
Future income (salaries or dividends)				
Others (Please be specific)				

5. How many competitors do you have for your products in the market?
A. No competitors; B. Few competitors; C. Some competitors; D. Many competitors

6. Does the firm have bank loans? A. YES; B. NO
6.1 Percentage of failed application for loans (%)
Before Reform_____; After Reform_____
6.2 If there are failures in application for loans, what is the reported reason?
Before Reform_____; After Reform_____
A. Lack of collateral or guarantees;
B. Lack of credit records;
C. Loan size too small;
D. Constraint on bank loan supply;
E. High-risk projects;
F. Others (Please to be specific)
6.3 The real reasons in your opinions:
Before Reform_____; After Reform_____
A. Agree with reasons presented in 6.2;
B. Lack of relationships with banks;
C. Lack of relationships with the government;
D. Failure to provide banks with required information;
E. Others (Please be specific)

Part II Corporate Governance

1. Ownership structure
after privatization (in %) (Please classify affiliation for state-owned shares)

	Percent
1. Central government	
2. Local government	
3. Executives	

4. Employees	
5. Other State- owned firm(s) or institution(s)	
6. Other collective firm(s)	
7. Domestic private firm(s)/ individual(s)	
8. Joint venture(s)	
9. Solely foreign owned firm(s)	
10. Other	
Total	
11. The percent of Major shareholder	
12. Total percent of the second and the third shareholder	

2. Was there any change in the core management team of the firm after privatization?
A. Yes; B. No

3. Is there a board of directors in your firm? A. Yes; B. No

3.1 The board chairman is:
A. A former manager/former CCP Secretary
B. Appointed by government
C. The largest shareholder
D. New CEO
E. Other (please specify: _____)

3.2 The Board Chairman was:
A. Chosen by the largest shareholder
B. Appointed by government
C. Elected by the Board of Directors
D. Elected by Shareholders' general committee
E. Chosen by the former general manager

3.3 The Board composition (fill in numbers):
__Representatives from the central government;
__Representatives from the local government;
__Executives;
__Employees;
__Representatives from other SOEs or governmental institutions
__Representatives from other collective firms;
__Representatives from foreign-funded company;
__Representatives from joint ventures;
__Other owners of domestic private firms or individual shareholders;
__Independent directors;
__Others;

4. CEO

4.1 Is CEO of your firm also the legal person?
Before privatization: A. Yes; B. No.
After privatization: A. Yes; B. No.
4.2 Is CEO of your firm also the Board Chairman?
Before privatization: A. Yes; B. No.
After privatization: A. Yes; B. No.
4.3 How many years has he/she served as CEO?
Before privatization: _____years;
After privatization: _____years.
4.4 Was CEO an employee of your firm before this appointment?
Before privatization: A. Yes; B. No.
After privatization: A. Yes; B. No.
4.5 CEO:
Before privatization:
A. Was elected by the general shareholders' meeting
B. Was appointed by the Board
C. Was held by the largest shareholder
D. Was appointed by the government
E. Others
After privatization:
A. Was elected by the general shareholders' meeting
B. Was appointed by the Board
C. Was held by the largest shareholder
D. Was appointed by the government
E. Others

5. CEO compensation
5.1 Percentage of shares owned by CEO:
Before privatization: _____%
After privatization: _____%
5.2 Is the stake owned by CEO related to operating performance?
Before privatization: A. Yes; B. No.
After privatization: A. Yes; B. No.
5.3 Is CEO's cash income related to operating performance?
Before privatization: A. Yes; B. No.
After privatization: A. Yes; B. No.
If YES, the percentage of his income related to operating performance in his/her total salary:
Before privatization: _____%
After privatization: _____%

6. The importance of the government and the major parties of the firm in the following decisions of the firm, before and after privatization (Rate the importance, with a 0-5 scale, in which 0 means Irrelevant and 5 means Indispensably Important):

Decision	Government	Board of	CEO	Party	Shareholde

			directors		committee	r meetings
Recruitment/ laying off	Before					
	After					
Investment	Before					
	After					
Compensation	Before					
	After					
Executive appointment	Before					
	After					
Profit allocation	Before					
	After					
Production and marketing	Before					
	After					
Finance	Before					
	After					
Use of Funds	Before					
	After					

Part III Government and Business

1. Government support of land or share contribution in the form of land: (Please fill in the respective percentage)

Before the reform (%) : _____;

After the reform (%) : _____.

2. Sources of R&D projects

	Self-choice	Projects from government	Projects from research institutions
Before the reform			
After the reform			

Internet Appendix 2. Details about Regional Distribution of Privatization over Time

Region	Province	Year of Privatization						
		1999	2000	2001	2002	2003	2004	2005
North								
	Beijing	2	3	1	4	3	3	2
	Tianjin	1	2	7	1	3	2	1
	Hebei	2	14	8	5	12	9	9
North-East								
	Heilongjiang	0	2	2	1	1	1	4
	Jilin	1	0	2	4	1	2	6
	Liaoning	5	11	3	5	3	8	7
North-West								
	Xinjiang	1	0	0	1	2	2	1
	Qinghai	0	0	1	0	0	0	1
	Ningxia	4	1	0	1	0	0	1
	Gansu	1	1	0	1	2	2	7
	Shanxi	0	1	4	9	4	4	2
	Innermongolia	1	0	2	0	1	2	1
North-Central								
	Shanxi	2	2	2	11	4	3	6
	Henan	1	7	2	6	12	3	4
	Shandong	7	14	18	11	21	14	12
South-West								
	Xizang							
	Yunnan	2	3	4	8	11	2	6
	Guizhou	1	1	1	5	0	1	1
	Sichuan	2	3	1	2	0	1	5
	Chongqing	0	0	1	3	2	1	0
East								
	Shanghai	4	1	2	5	4	4	4
	Jiangsu	9	7	9	10	18	11	4
	Zhejiang	2	5	9	4	7	1	2
South								
	Guangxi	1	2	0	1	2	1	2
	Guangdong	3	7	9	2	5	4	3
	Fujian	0	4	4	1	3	2	3
	Hainan	0	0	0	0	0	0	1
South-Central								
	Hubei	3	3	5	2	3	4	2
	Hunan	2	0	1	2	0	2	3
	Jiangxi	3	8	5	5	5	3	6
	Anhui	1	3	1	1	1	6	4

Internet Appendix 3. NSB Data

The National Statistical Bureau (NSB) is arguably the most important data source for studying industrial firms in the Chinese economy. However, some questions have arisen about the quality of this data set, as is the case with any Chinese data. In this study, we have examined the data in detail to understand how their weakness may affect our analysis. This appendix summarizes our findings.

1. Missing data

Critics have raised the issue of missing observations in the NSB data set. The most relevant concern for our analysis is that data might be missing for performance-related reasons, which biases our results. Table A1 reports the extent of missing data. To start, we focus on firm-year observations with valid sales *and* assets information. Column (1) of Panel A reports the NSB data sample size by year. It increases considerably over years, reflecting more firms meeting the 5-million-sales criterion, driven by the economic growth in China, and better coverage of the NSB census.

Columns (2) and (3) report the number and percentage of firms entering into and disappearing from the database. Column (4) is the number of firms reappearing. Each year, about 10%-26% (with an average of 18%) of the firms disappear from the database, whereas only a small proportion of these firms reappear in the database in later years. This finding suggests that once a firm enters the database, it reports data quite reliably every year until it disappears.

Panel B further confirms this pattern. It reports the number of missing years for firms with different data span, which is defined as the total number of years a firm appears in the

database. The vast majority of the firms—an average of 89% of firms across data spans between two and nine years—do not have any missing data. In the next few columns, we show, for those firms with missing observations, the number of years for which data are missing. In most of the cases, the data are missing for only one year. Combined with those in Panel A, the results suggest that although the database shows a substantial attrition of firms, during the firms' data span, missing data are not a big concern. In other words, firms permanently dropping out of the database are the primary drivers of the data attrition.

In what follows, we examine whether any pattern exists in the firms' (permanent) disappearance. Here, we focus on firms reporting data continuously until they disappear, because disappearance is the main source of missing data. Panel C of Table A2 is an entry and exit matrix. It reports the year in which firms entering the database in each year disappear—if they disappear. For example, the first row shows how many of the firms entering the database in 1998 disappear in each of the subsequent years from 1999-2006 (the last year of our data). The last two columns show the proportion of firms that never disappear.

Clearly, most firms that disappear do so during the first two years after they enter the database, accounting for around 60% of firm attrition on average, excluding firms entering in 2004, which has only two years of data. Several possible reasons can explain this pattern. First, after the Party's 15th Congress in 1997, large-scale privatization and restructuring of SOEs occurred, which disrupt company operations and thus responses to NSB survey. Private sector firms might also be involved in some kind of restructuring, to the extent that they are involved in mergers and acquisitions. Although the NSB database does not record such activities directly, it has a variable called "registration type." Under registration type, companies are classified into seven ownership categories, including SOEs, COEs (collectively owned enterprises), Hong

Kong, Macao, Taiwan-owned enterprises, foreign-owned enterprises, shareholding companies, private companies, and other domestic companies. A change in registration type reflects privatization or a significant M&A event. However, not all corporate restructurings would result in a change in registration type if such a restructuring does not involve a change in the ownership category as defined above. Nevertheless, this measure is the best one we have to gauge the extent of restructuring. Panel D1 of Table A2 supports the restructuring hypothesis and shows 65% of the firms that disappear in the first two years have changed their registration type, a much higher probability compared with firms disappearing in later years (7%) and those that never disappear (7%).[1]

Another possibility is that the firms are smaller, and yearly variations in sales make them fall below the 5-million-sales criterion necessary for inclusion in the NSB census. Panel D2 of Table A2 reports financial variables of firms in the first year they enter the database. Columns (1) and (2) indicate that compared with those that never disappear, firms that disappear in the first two years are indeed significantly smaller and are much more likely to have sales below 5 million (20% vs. 4%). Thus, the exogenous criterion of sales the NSB imposes appears to be an important reason firms disappear. One may argue that lower sales may be related to bad performance. This connection is not obvious, because in an SOE-dominated economy, refocusing and selling off redundant assets, which would reduce sales in the short run, is actually good news for efficiency and performance. When we compare firms disappearing in the first two years and those disappearing later, the former group is smaller, but the difference in the proportion of firms with sales below 5 million is not economically significant (21% vs.

[1] We also look at the proportion of firms that change registration type during all the years in the database for both firms that disappear in later years and those that never disappear. They are 23% and 47% respectively. Thus change in registration type does not necessarily cause firms to disappear. It just so happens that registration type changes in the first two years are associated with firms disappearing.

20%). Thus, although firm size is an important factor related to firms disappearing, it is not a direct reason for firms' disappearance in the first two years as opposed to later years.

Finally, we check whether data attrition results from firms that are not performing well and thus are reluctant to respond to the NSB census. Note that this explanation and the restructuring explanation may not be mutually exclusive. The proportion of negative-profit firms that have undergone a change in registration type is not significantly different from those that have not. In fact, among firms that disappear in the first two years, the proportion of negative profits is actually slightly smaller for those with a change in registration type than those without (25% vs. 27%). Thus, restructuring is not necessarily associated with poor performance.

In column (3) of Panel D2, we compare the two groups of firms disappearing (in the first two years and later) with those that never disappear. We find the former has a greater proportion of firms with negative profits in the first year in which they enter the database, which seems to suggest firms' poor performance may be associated with firms disappearing. To further understand the association between poor profits and data attrition, in Panel D3 of Table 1, we compare firms disappearing later with those that never disappear. We find the proportion of firms with at least one year of negative profits differs little between the two groups in terms of economic significance (37% vs. 32%). This finding is reassuring because it means firms with poor profits do not necessarily disappear, or the association between poor profits and firms' disappearance is fairly weak in the whole sample. Taken together, the evidence suggests restructuring and the sales criterion exogenously imposed by the NSB, rather than performance, are the main reasons firms disappear.

2. Privatization and NSB-reported Change of Registration Type

Given the NSB database records the registration type, a natural question may be "Can one identify privatization based on the changes of registration types?" This alternative approach may not be reliable, because, after partial privatization, the firm remains an SOE and thus would not report a change in registration type. In fact, our survey data provides a unique opportunity to check whether it is appropriate to use changes in registration type to identify privatization. Denoting privatization year as t, we classify privatization based on the change in registration type from t-1 or t+1. If registration type ever changes from SOE to non-SOE during this three-year window, we classify it as privatization.

Panel A of Table A3 suggests type II error is the main problem with using registration type to identify privatization (the null is no privatization). Among the 789 privatized firms, less than a quarter (23.2%) would have been classified as privatized. That is, the chance of type II error is 76.8%. If we extend the window to [t-2, t+2], things do not improve much and the chance of type II error is still as high as 67.3%. In comparison, type I error is a minor problem and is present in only 6.1% of the cases. Panel B of Table A3 further documents the reasons registration type fails to identify privatization. When we use a window of [t-1,t+1], 51% of the failure in identifying privatization is a results of firms not reporting any change in registration type after privatization. The second reason is that some SOE firms are never classified as SOEs (38% of the cases). Or sometimes the registration type is missing (7%). Finally, firms' reported registration types are, at times, inconsistent: they may be an SOE in one year, a non-SOE in another year, and then become an SOE again. Or they may turn from a non-SOE to an SOE. These inconsistent cases account for 3% of all failed identification. Taken together, the evidence suggests change of registration type is not a reliable indication of privatization, for two reasons.

One is that the firm still considers itself an SOE as long as the remaining state ownership is significant. The other is that registration type does not seem to be a reliable or accurate variable.

3. Privatization and NSB-Reported State Ownership

The NSB database contains information on state ownership. We check the reported state ownership of our sample of privatized firms. Again, we denote privatization year as t. Figure A1 plots NSB state ownership from t-7 to t+8. The finding that state ownership declines for the privatized firms in our survey is reassuring. Consistent with our earlier discussion that restructuring may happen in the years prior to the big push of direct sales, a mild decline in state ownership occurs before the reported privatization. Moreover, most of the decline in state ownership occurs between t-1 and t+1. All these findings suggest that although NSB state-ownership data are broadly consistent with privatization, they cannot identify the exact timing of privatization and thus should not be used for studies involving performance comparison.

Table A1. The Extent of Missing Data in the NSB Database

Panel A. Number of observations in NSB by year

Numbers in brackets in columns (2) and (3) are, respectively, new firms and disappearing firms as a percent of the number of observations in the previous year. (1) = (1)_last year + (2) – (3) + (4).

Year	# of firms	# of new firms	# of disappearing firms	# of reappearing firms
	(1)	(2)	(3)	(4)
1998	146,259	n.a.	n.a.	n.a.
1999	155,151	30,640 (21%)	21,748 (15%)	n.a.
2000	156,357	28,038 (18%)	28,429 (18%)	1,597
2001	163,968	46,162 (30%)	41,392 (26%)	2,841
2002	176,834	33,866 (21%)	25,422 (16%)	4,422
2003	193,122	43,376 (25%)	30,924 (17%)	3,836
2004	273,329	124,462 (64%)	50,783 (26%)	6,528
2005	269,751	36,209 (13%)	44,830 (16%)	5,043
2006	299,334	50,246 (19%)	26,963 (10%)	6,300
Total # of firms	1,834,105	392,999	270,491	30,567
Average of %	n.a.	26%	18%	n.a.

Panel B. Years of missing data by data span

Data span is defined as the number of years from the first year a firm enters database to the last year that the firm is in the database.

Data Span	Total	# firms w/o missing data	missing for			
			1 year	2 years	3 years	≥4 years
9 years	42,062 (100%)	35,148 (84%)	3,470 (8%)	1,373 (3%)	921 (2%)	1,150 (3%)
8 years	12,616 (100%)	9,889 (78%)	1,391 (11%)	557 (4%)	396 (3%)	383 (3%)
7 years	16,327 (100%)	13,033 (80%)	1,547 (9%)	808 (5%)	527 (3%)	412 (3%)
6 years	38,942 (100%)	34,106 (88%)	2,982 (8%)	1,230 (3%)	428 (1%)	196 (1%)
5 years	35,439 (100%)	31,701 (89%)	2,578 (7%)	846 (2%)	314 (1%)	n.a.
4 years	48,247 (100%)	45,126 (94%)	2,334 (5%)	787 (2%)	n.a.	n.a.
3 years	127,740 (100%)	122,776 (96%)	4,964 (4%)	n.a.	n.a.	n.a.
2 years	83,260 (100%)	83,260 (100%)	n.a.	n.a.	n.a.	n.a.
1 years	134,625 (100%)	n.a.	n.a.	n.a.	n.a.	n.a.
Total of # firms	539,258	375,039	19,266	5,601	2,586	2,141
Average of %	100%	89%	7%	3%	2%	2%

Panel C. Entry & exit matrix

Year the firm enters	Firms reporting data continuously until they disappear										Never disappear & % of the total
	Year the firm disappears								Subtotal	Disappear in the first two years	
	1999	2000	2001	2002	2003	2004	2005	2006			
1998	18,306 (19%)	18,083 (19%)	21,743 (22%)	9,860 (10%)	9,390 (10%)	13,055 (13%)	3,826 (4%)	3,422 (4%)	97,685 (100%)	36,389 (37%)	35,148 (24%)
1999	n.a.	6,418 (31%)	5,625 (27%)	2,393 (11%)	2,325 (11%)	2,759 (13%)	754 (4%)	679 (3%)	20,953 (100%)	12,043 (57%)	6,467 (21%)
2000	n.a.	n.a.	7,504 (44%)	2,362 (14%)	2,322 (14%)	3,203 (19%)	855 (5%)	774 (5%)	17,020 (100%)	9,866 (58%)	8,528 (30%)
2001	n.a.	n.a.	n.a.	6,040 (26%)	6,109 (26%)	7,407 (32%)	1,866 (8%)	1,716 (7%)	23,138 (100%)	12,149 (53%)	19,523 (42%)
2002	n.a.	n.a.	n.a.	n.a.	5,809 (39%)	6,024 (40%)	1,660 (11%)	1,541 (10%)	15,034 (100%)	11,833 (79%)	16,981 (50%)
2003	n.a.	n.a.	n.a.	n.a.	n.a.	10,314 (67%)	2,643 (17%)	2,550 (16%)	15,507 (100%)	12,957 (84%)	26,331 （61%）
2004	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	26,125 (72%)	10,068 (28%)	36,193 (100%)	36,193 (100%)	84,701 (68%)
2005	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	3,863 (100%)	3,863 (100%)	3,863 (100%)	32,346 (89%)
2006	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	50,246 (100%)
Total	18,306 (8%)	24,501 (11%)	34,872 (15%)	20,655 (9%)	25,955 (11%)	42,762 (19%)	37,729 (16%)	24,613 (11%)	229,393 (100%)	135,293 (59%)	280,271 (52%)

Panel D. Why do firms tend to disappear in the first two years?

Significance levels of 1%, 5%, and 10% are indicated as ***, **, and *, respectively.

Panel D1. Change of registration type

We test the statistical difference between (a) and (b), and between (a) and (c).

	Change in the first two years	Change during the lifetime
(a) Disappear in the first two years	65%	65%
(b) Disappear later	7%***	23%***
(c) Never disappear	7%***	47%***

Panel D2. Financial variables in the first year the firm enters

We test the statistical difference between (a) and (b), and between (a) and (c).

		# firms	Sales ('000)	Sales < 5 mil	Negative profit
			(1)	(2)	(3)
(a) Disappear in the first two years	mean	135,293	26,884	20%	26%
	med		7,518		
(b) Disappear later	mean	94,100	31,178**	21%***	27%***
	med		10,002***		
(c) Never disappear	mean	280,271	44,954***	4%***	19%***
	med		11,893***		

Panel D3. Financial variables of firms disappearing at some point and those that never disappear

		# firms	Avg Sales ('000)	Sales < 5 mil	Neg profit
			(1)	(2)	(3)
Disappear at some point	mean	229,393	35,040	30%	37%
	Med		9,807		
Never disappear	mean	280,271	91,905***	6%***	32%***
	med		19,813***		

Table A2. Change of Registration Types in NSB Data

Panel A. Type I & type II errors in using registration types to identify privatization

This table reports the success rate of using the change of registration type in the NSB database to identify privatization in our sample. For privatized firms in our survey, the privatization year is t. Then we check the registration type during [t-1, t+1] and [t-2, t+2]. If the registration type changes from state-owned and collectively owned firms to other types, we define it as privatization. For non-privatized firms, we use the same algorithm to check the registration change in NSB data over the whole sample period (1998-2006).

Panel A. Identification based on windows [t-1, t+1] and [t-2, t+2]

		Identified by the survey		
		Privatized window [t-1,t+1]	Privatized window [t-2,t+2]	Not privatized
Identified by NSB	Privatized	183 (23.2%)	258 (32.7%)	29 (6.1%)
	Not privatized	606 (76.8%)	531 (67.3%)	446 (93.9%)
	Total	789 (100%)	789 (100%)	475 (100%)

Panel B. Reasons why NSB fail to identify privatization

This table presents the reasons NSB data fail to identify privatization. “Others” means registration type goes from non-SOE to SOE at some point during the window.

	Window [t-1,t+1]	Window [t-2,t+2]
No registration-type change	310 (51%)	318 (60%)
Not SOE	233 (38%)	108 (20%)
Registration type missing	44 (7%)	72 (14%)
"Others"	19 (3%)	33 (6%)
Total	606 (100%)	531 (100%)

Table A3. Change in the Mean of State Ownership in NSB for Privatized Firms