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The Dynamics of Privatisation in China (1994-2008): An Empirical and Econometric Analysis

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Thesis submitted for the degree of PhD in Economics

2014

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Declaration for PhD thesis

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Abstract

At the heart of China's economic transition is the privatisation reform launched in the late 1990s. This thesis identifies the driving force behind the dynamics, characterising the privatisation story in China, in terms of the shrinkage of state sector. Nine hypotheses are established to test the influence of a variety of factors across macroeconomic environment, microeconomic condition and the context of political economy. Two panel datasets, generated from public data sources with respectively 450 and 3,300 observations during the period from 1994 to 2008, are analyzed by system general method of moments (system-GMM) in a dynamic specification. New empirical evidence adds to our understanding of privatisation in China by rejecting a uniformly consistent path, but highlighting its enormous complexity, captured in its evolutionary, regionally and sectorally diverse nature. The process of privatisation appears to be multi-dimensional, which not only reflected a centrally-determined national policy, but was played out as a drama in which the principal actors were the central reformers, local bureaucrats, enterprise managers, bank lenders and private investors.

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Abbreviation

| | |
|--------------|--|
| AR(1) | first order serial correlation test |
| AR(2) | second order serial correlation test |
| CEO | Chief Executive Officer |
| CPI | consumption price index |
| CRS | Contract Responsibility System |
| CSRC | China Securities Regulatory Commission |
| EBIT | earnings before interest and tax |
| EIT | enterprise income tax |
| FDI | foreign direct investment |
| FE | fixed effects |
| GDP | gross domestic product |
| GNP | gross national product |
| GMM | general method of moments |
| HRS | Household Responsibility System |
| IMF | International Monetary Fund |
| IOEs | individually-owned enterprises |
| IPOs | initial public offerings |
| IRS | interest rate spreads |
| LSDV | least squares dummy variables |
| MES | modern enterprise system |
| NBS | National Bureau of Statistics |
| NPLs | non-performing loans |
| OLS | ordinary least squares |
| POEs | private-owned enterprises |
| ROA | return on assets |
| ROS | return on sales |
| SEs | share-holding enterprises |
| SOEs | state-owned enterprises |
| SSCI | Social Science Citation Index |
| TFP | total factor productivity |
| TVEs | township and village enterprises |
| VAT | value-added tax |
| UCR | Union Civica Radical |
| WB | World Bank |
| WG | within group |

Chapter One

Introduction

Importance of research

When I was a youngster living in Taiwan in the 1970s, government propaganda always described Mainland China across the narrow Taiwan Strait as a place where people lived and worked in an abyss of deprivation and misery. The mission for every young patriot was to launch a military counter-invasion of the mainland, overthrow the communist regime, and liberate beloved compatriots from their endless suffering. This anti-communist education was so successful that it provided the first motivation to me – a young researcher – who felt the need to redeem his childhood dream of three decades ago. Yet, even allowing for the exaggeration of rhetoric, the reality has of course changed: the China of impoverishment and immiseration no longer exists, thanks to three decades of unprecedented growth brought about by post-1978 economic reform.

China's transition, launched in the late 1970s, is one of the most spectacular phenomena in recent world history. The importance of state sector continued to fall. (Huyghebaert and Quan, 2009). In terms of the industrial product, China's state share shrank from around 70 per cent in early 1980s to less than 10 per cent in the mid-2000s (See Figure 2.5). This almost unprecedented state contraction has attracted worldwide attention. Economists are eager to know how China has been able to transform itself from a central-command economy to a market-oriented system – and to have done so quite smoothly and peacefully, compared with the more painful

transition experiences of countries in Eastern Europe and the former Soviet Union.¹ At the heart of this economic ‘transfiguration’ (to adopt a religious analogy) has been privatisation reform.²

Yet, this ownership reform was not a priority task for Chinese leaders in the first two decades of the Reform Era (i.e., the 1980s and 1990s). Instead, this period witnessed a rapid *growth* in China’s state sector, which expanded by more than 50 per cent, creating 60.6 thousand enterprises and 25.6 million new jobs. The apparent inference is that in pursuit of growth, China adopted a strategy that fostered a strong state sector – a typical *socialist* strategy based on a firm belief in the superiority of public ownership. This boom approaches its peak in the mid-1990s, or precisely in 1996 in statistics. During the following decade, the state sector lost its dominant role to the private sector, with 97.3 thousand enterprises gone and a loss of 27.8 million employees. Only during these years did China follow the opposite strategy, embracing capitalism and promoting private ownership.

With respect to the topic of ‘privatisation in China’, there is no literature to be found that can date publication back to the last century in the Social Science Citation Index (SSCI). This research field emerges only after 2000, and, even today, the volume of SSCI literatures is still limited. Nevertheless, the topic is interesting for its *sui generis* character, with its own agenda, unique stresses and data that have different

¹ Quite rapid privatisation reform, also known as ‘voucher privatisation’ was carried out in Armenia, Azerbaijan, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, Moldova, Russia and Ukraine as the primary method of economic transition; whilst in Albania, Belarus, Bulgaria, Croatia, Estonia, Slovak and Slovenia it has been the secondary method; see EUROPEAN BANK FOR RECONSTRUCTION AND DEVELOPMENT (1998) *Transition report: Financial sector in transition*, London. Reformers in these countries seemed to believe that there would be a small window of opportunity in a rather short period in which they could take economic reforms; see FRIEBEL, G. (2000) Bureaucracies in the Russian voucher privatization. *Economics of Transition*, 8, 37-57.

² As Naughton says, the reason for studying the Chinese transition cannot be to provide a model for the next big socialist economy to follow, because, except for China itself, there no such economy (at least, none of any significance) any longer exists. Rather, an examination of transition in this huge country may provide invaluable information about the nature of economic change; see NAUGHTON, B. (1994b) What is distinctive about China economic transition - state enterprise reform and overall system transformation. *Journal of Comparative Economics*, 18, 470-490.

definition with (and so cannot be compared with) data deriving from research in other parts of the world. This would seem to point to a field of considerable individuality – what we might refer to as ‘privatisation research with Chinese characteristics’. Some theorists, especially Chinese theorists, may see China as the most effective development model, at least in terms of enterprise reform, not least because its size and unique character defied ‘mainstream’ theoretic explanations. This popular argument has often required the re-writing of theoretical textbooks in order to encompass the Chinese experience. This research does not follow this convention, but seeks to show to what extent privatisation reform in China is unique.

Research questions

The research that follows addresses following questions:

1. In China’s Reform Era, where are we to find the seeds that subsequently grew into a comprehensive privatisation reform process?
2. What are the main themes in the privatisation literature, and what light does it throw on China’s experience?
3. What has been the driving force behind the dynamics of privatisation, and how effective has it in fact in driving privatisation?
4. Can the privatisation, as it has occurred and evolved in China, be fitted into mainstream theories, or do we need alternative theories?
5. From a methodological perspective, can we construct a framework that will enable us to integrate the different privatisation reforms of China and other transitional economies, and make possible a comparative analysis?
6. (In short), what has been the ‘story’ of the privatisation in China? Does this story

suggest the existence of ‘privatisation with Chinese characteristics’?

Research methodology

This research is based on nine hypotheses, all of which are generated in a bottom-up approach. In what follows, I conduct a systematic review of privatisation theories and empirical studies, before summarising relevant arguments and propositions into nine groups of distinctive hypotheses. A new multi-level framework to study privatisation is developed, based on the work of Ramamurti (2000). Using the latest regression techniques, I use two unique datasets to rigorously generate empirical evidence, subject to various strict econometric criteria. Data sources are all in the public domain; there is detailed and thorough discussion of the selection of variables; and the econometric specification is mathematically justified. More details about methodological issues are set out in a later paragraph about Chapter 4.

The story from reform to privatisation in China

The structure of this research comprises seven chapters. After a general introduction in Chapter 1, Chapter 2 goes back to the beginning of the Reform Era to explore the story of China’s bumpy road toward privatisation. This story is told through a chronological framework defined by three rounds of enterprise reform.

Before 1986, the core thrust of reform was to increase enterprise autonomy by means of a new distribution system of profits between government and enterprise. In the event, however, misarrangement of incentives soon signalled the failure of these early reforms. With the government hard pressed to find out the true level of profits earned by enterprises, distribution was inevitably biased in their favour – a situation,

which if left unaddressed, would leave the decline in government revenue to continue unchecked. Thus, the next distribution system initiative – the introduction of the Contract Responsibility System during 1987-1992 – was designed to avoid this problem of information asymmetry by imposing on enterprises a fixed level of profit-deliveries. This policy change was successful in protecting government revenue, but the outcome had some consequences that were not anticipated. In particular, the banking sector became a new victim. Enterprises started to borrow money from state banks and hence the financial burden was effectively transferred to the state banks. This created a serious debt crisis, which then caused the Chinese government to shift the focus of its work to reforming the internal structure enterprises. In order to establish a modern enterprise system, a series of more deep-seated reforms was introduced. They included the diversification of ownership types, the establishment of auditing institutions, the upgrading of the statistical system, enhancement of the independent role of enterprise manager, and enlargement of enterprise autonomy. Yet these reforms were also ineffective, because they led to a continuing decline in profitability and an accelerated increase in the number of loss-making state enterprises. Finally, privatisation was implemented. One way of interpreting this chronological process is that the privatisation reform was an inevitable outcome, eventually embraced as a last resort for the Chinese government and a means of escaping from the two-decade-long vicious circle of failing reforms among state enterprises.

Inspired by some local experiments, the formal policy of privatisation – “grasp the large while letting go of the small” – was first implemented at the end of 1995. State enterprises were encouraged to approach ownership restructuring in a variety of ways, including bankruptcy, ownership diversification, shareholding cooperation, auctions, leases or merges. Several arguments in the literature tried to explain this event – what one may call the ‘Chinese variant of the Big Bang’ – in terms of changes

taking place in the surrounding environment, such as rising competition in the product market, the deterioration of central finance, the reform of local budget and bank credit systems, and, as I try to argue, the shrinking space for rent-seeking behaviour among state managers.

The origin of ownership diversification in China dates back to the mid-1980s, although the process continued during the next decade. It began with the first-ever acceptance that an enterprise could be registered as ‘cooperative’ or ‘individual’ (previously, enterprises could only be registered as state or collectively owned). Subsequent new legislation introduced even more profound initiatives in terms of new ownership types. Share-holding ownership, including limited liability and joint stock limited enterprises, dates from the mid-1990s. Finally – and most momentously – a few years later, private ownership was given legal backing and listed alongside state, collective and foreign ownerships. Meanwhile, the importance of the Chinese state sector within the national economy was in decline. In terms of total industrial output, the share of state-owned enterprises (SOEs) started to shrink in the early 1970s, a time when the township and village enterprises (under collective ownership) began a rapid expansion. This pace accelerated in the 1990s when the non-public enterprises started to boom.

The final section of this chapter consists of a detailed summary of the empirical evidences to be found in the existing literature of China. By various proxies of performance, most findings reach a similar conclusion that suggests a positive outcome and interpretation of privatisation reform among state enterprises.

Privatisation theories and evidence in the literature

The Chapter 3 provides a comprehensive and systematic review of the theoretical

and empirically-based privatisation literature. The literature discussed in this chapter is limited to that part of it that is concerned with the determinants of privatisation. In other words, the dependent variable in the theoretical or empirical model is the *likelihood* of privatisation, not the overall impact of privatisation.

The first section demonstrates the literature in a way that provides a better genealogy for understanding the creation and development of privatisation arguments. Empirical studies designed to identify the determinants of privatisation emerged in the early 1990s, and placed much emphasis on international comparisons among developing countries. Initially, analysis focused on various economic factors – for example, financial performance, deficit or debt. Only matters of political factors, such as ideological issue and soft budget constraint, were discussed. Institutional factor and microeconomic condition did not attract academic attention until even more recently.

As for the privatisation process in China, the first empirical studies emerged in the literature after 2000, with many of them offering viewpoints that deviated from the ‘mainstream’ thought. Most early research focused more on the micro-level conditions than on macro, let alone political conditions. When analysis extended to political influences, whereas on transitional countries other than China had focused mainly on shifts in ideology, in China it was the removal of the soft budget constraint in the wake of the 1994 fiscal reform had attracted the greatest attention. The role of *competition* was another factor that became a major theme in the literature on China, where various arguments were put forward in an attempt to examine the effect of rising competition in the product market on privatisation reform. Institutional factor has been a topic of less concern in the literature on China.

To model the dynamics of privatisation, early attention was given in the literature to bureaucratic behaviour and the way in which it can use privatisation as a tool to reduce risks and uncertainties in production. Budget constraint, the next factor

introduced into the model, draws attention to the relationship between privatisation and budgetary reform. Later analysis focused on election factors, such as the role of politicians, campaign strategies, or the stance of political parties. As for economic factors, the nature of the market – whether it is competitive or monopolistic – has most often been cited in order to justify the optimal scale of government ownership, as opposed to, private ownership. Transaction cost and institutional effect are two other factors that have been incorporated into the model in order to determine the best timing for a state enterprise to embark on privatisation reform. Research has shed light on other factors, such as firm size, economic efficiency or informational factors, and investigated how these factors affect privatisation decision-making.

The second section of Chapter 3 distils these arguments into nine categories of hypotheses, which embrace considerations relating to soft budget constraint, political ideology, decentralisation, market competition, financial pressure, institutional infrastructure, economic efficiency, firm size and human capital. Each category is followed by a systematic discussion of the development of relevant theories and empirical findings. A table summarising all the hypotheses, theories, arguments, models and evidence is presented in the final part of the chapter.

Hypotheses, econometrics, data and variables

The methodology of research is discussed in some detail in Chapter 4. The first section incorporates these theoretical hypotheses into the realities of Chinese privatisation. For each hypothesis group, I show relevant previous developments in China, defend the assumptions that are made, and finally detail the operational definition of each hypothesis prior to further quantitative examination.

These hypotheses are as follows:

- (1) The hardening process of SOEs' budget system will encourage local state enterprises to embark on privatisation.³
- (2) The greater the commitment by a local government to the ideology of private ownership, the more extensive will be the privatisation of its state sector.
- (3) The decentralisation process will lead to a greater incidence of privatisation in China's state sector.
- (4) Intensified competition in Chinese product markets will encourage more SOEs to implement privatisation reform.
- (5) Severe financial pressure facing SOEs will encourage privatisation in China's state sector.
- (6) The more the institutional infrastructure is strengthened and improved, the more likely it will be that privatisation will take place.
- (7) Less efficient SOEs are more likely to be privatised than more efficient SOEs in China's state sector.
- (8) In the early stage of privatisation reform in China, small-scale SOEs are more likely to be privatised.
- (9) The improvement of human capital among SOEs will lead to more privatisation in China's state sector.

To explain the privatisation dynamics, the next section establishes a multi-level framework, which modifies Ramamurti's pioneer work and re-categorises most of the privatisation arguments. Some of his arguments have been omitted on the grounds that

³ The reason why I define privatisation in operation as the shrinkage of state sector is justified in section 4.3.

they have no application to China; others are added for the opposite reason. The pros and cons are discussed.

Section 3 justifies the econometrics. Based on the current development of econometric techniques, I mathematically justify the appropriateness of using the system general method of moments (system-GMM) as the estimator for a dynamic specification. The primary reason for its use here is to avoid biases that would be introduced through the adoption of traditional and widely-used estimators, such as the pooled ordinary least squares (OLS), the fixed effect OLS, and the difference-GMM. Use of system-GMM can help avoid generating econometric problems, such as (1) the bias of endogeneity among correlated independent variables; (2) the upward or downward bias of coefficient in the fixed effect OLS or difference-GMM; (3) the inconsistency problem introduced by the lagged dependent variable as an independent variable in regressions; and (4) the high persistency problem associated with the difference-GMM estimator. All regression results are derived from the two-step GMM with Windmeijer corrections. The validity of the instruments is detected by Hansen test. The potential problem of over-identification caused by the proliferation of instruments (also known as the bias of “too many instruments”) is tackled by the latest regression technique developed by Roodman in 2009. Robustness checks are conducted by using a smaller dataset that excludes data that may contain relatively extreme values in the first or last few periods. In short, a strictly conservative manner is adopted in setting up the defaults of econometrics.

The reason for utilising two different datasets is to provide a better means of generalising and comparing the varied patterns of China’s privatisation experience. The provincial panel dataset includes 30 cross-sections from 31 provinces (Chongqing’s data are included in Sichuan’s) over 15 time-periods from 1994 to 2008,

and thus contains 450 observations.⁴ The industrial panel dataset includes 220 cross-sections from 37 major industries in six provinces (Guangdong, Jiangsu, Shandong, Jiangxi, Shanxi and Heilongjiang) over the same 15 periods and so contains 3,300 observations.⁵ Data are all public and were obtained from a wide variety of central and local statistics.⁶

Variable selection is based on the same or similar usage as that of the wider privatisation literature. Where variables are specially designed, a full explanation is given. The choice of the operational definition of privatisation, i.e. the dependent variable, is justified through a comprehensive discussion of the relevant literature with justification. All independent variables are chosen after considering their appropriateness, feasibility, authenticity and consistency.

It is noteworthy that all values of variables are transformed into a limited range between minus one and plus one before being placed into regression. This transformation provides an easy way to see through the correlation among variables by relatively moderate coefficients – a technique that can reduce the disturbance in coefficients brought about by different variable scale, such as money, people, cases, units, lengths, and so on.

Empirical findings, interpretations and implications

Chapter 5 reports the findings, analyses and implications derived from regression results, based on the provincial-level data. After descriptive statistics, the preliminary analysis of a non-parameter comparison shows the changes in political contexts,

⁴ The latest data available at the time of writing were released in official statistical yearbooks for 2009, and were not made public until end of 2009 or even mid-2010.

⁵ Why the cross-sections are not 222 (i.e., 37 times 6) but 220 is because the petroleum extraction industry does not exist in two provinces (Jiangsu and Shanxi).

⁶ More than one year was spent in the collection of data in generating these two unique datasets.

macroeconomic environment and microeconomic conditions in China. There is a discussion of each independent variable, followed by a simple regression analysis designed to confirm the appropriateness of hypothesis establishment.

In terms of the regression strategy, every hypothesis is tested one by one in order initially to highlight the individual impact of each, before being put together for a broader comparison in a principal component analysis. Checks are carried out of the results from baseline models and the models with a shorter time period. In order to maintain a high quality of econometrics, results are reported only if a number of strict testing requirements have been strictly fulfilled. Findings, analyses and implications are fully discussed for each hypothesis. Nevertheless, the number of observations is too small to make it possible to regress all variables together, since this would compromise some strict econometric requirements. The author therefore adopts a principal component analysis to generate a smaller number of hypothesis variables, thereby making a broader comparison possible.

Results derived from the industrial-level data are presented in Chapter 6 after setting out the descriptive statistics with a short preliminary analysis of the hypothesis variables. Hypotheses of political economy have had to be dropped for lack of relevant data, although these factors are still technically under control since they are included as control variables in regression. The remaining hypotheses are slightly adjusted in terms of their operational definition to fit this dataset. Thus, the hypotheses are as follows:

- (1) Intensified market competition within an industry will encourage more SOEs in that industry to undertake privatisation reform.
- (2) The degree of privatisation within an industry will increase when the financial pressure of its SOEs is mitigated.

- (3) The incidence of privatisation will increase in an industry when more capital for infrastructure construction is invested there.
- (4) The greater the concentration of inefficient SOEs in an industry, the more likely it will be for privatisation to take place in that industry.
- (5) Since small-size SOEs should be privatised first, the average size of SOEs within an industry will increase along with the progress of privatisation.
- (6) Improvements in human capital among SOEs in an industry will encourage a greater scale of privatisation within that industry.

Chapter 6 introduces a typology of sectors. The data are arranged into three major *sectoral* groups – light manufacturing, heavy manufacturing, and the mining and energy sector.⁷ Models for robustness check are presented and discussed. With its larger number of observations, this dataset makes it possible to construct a comprehensive model including all hypothesis variables. These results are compared with those derived from individual tests. The next concern is the *regional* dimension and the difference it generates. Data are again divided into two groups by regions – coastal and inland – each of which contains data for three provinces. The final concern relates to *time* dimension. This is explored by dividing the data into two sections; the first includes data during 1994-2001, the second, during 2002-2008.

Integrated analysis

The first section of Chapter 7 integrates the findings of the previous two chapters and generalises them into nine significant conclusions. Privatisation in China's

⁷ Mining and energy have to be combined into a single joint sector because the mining sector contains only five industries, while the energy sector contains only three. Only by combining them is it possible to make the number of cross-section items large enough to run GMM estimations.

industrial state sector after the mid-1990s is found to have been strongly policy-dominated. There is evidence of a strong and consistent cash cow effect, and a smaller ice-pop effect having made itself felt. Privatisation is found to have demonstrated many regional characteristics. It was also subject to a soft budget constraint, showed a strong influence from competition, and demonstrated a screening strategy in human capital. The entire process of privatisation is shown to have been evolutionary and dynamic.

The second section offers an overall narrative of privatisation in China. The series of failures in enterprise reform throughout the first two decades of the Reform Era precipitated a fundamental change to approach, which manifested itself as large-scale privatisation. Under the central guideline of “grasping the large while letting go of the small”, this process was driven by shrinking soft budgets, rising competitive pressures and improvements in infrastructure, although it was also to some extent constrained by the liability burden and/or enhanced capital and labour productivity.

The next section tries to investigate whether or not there is such a thing as ‘privatisation with Chinese characteristics’. In doing so, the author compares and contrasts his findings with those of other in the privatisation literature, and identifies a number of characteristics that have been unique to privatisation in China.

The final section discusses the contribution, as well as the limitation, of thesis, and identifies questions that require further exploration.

Chapter Two

From Enterprise Reform to Privatisation (1978-1997)

2.1 Bumpy road toward SOE reforms

The most serious legacy left by socialist China in the late 1970s was a huge shortage of consumer goods, brought by long-term, excessive emphasis on the development of heavy and military industries. Unfulfilled needs were to be found everywhere. Some reflected China's extreme poverty and underdevelopment, whilst some were caused by the waste associated with central command economy (Naughton, 2007:89). The socialist incentive inherent in the egalitarian wage system failed to raise productivity (Howe et al., 2003:12-13).

This central command system gradually began to be opened up at the end of 1978, when the China's reforms were launched in an attempt to stimulate production to meet consumer demands by giving individuals and groups the opportunity to act independently in an entrepreneurial capacity (Naughton, 2007:87). The previous emphasis on egalitarianism was loosened and gradually replaced by a development strategy that was reflected in growing inequalities across regions and sectors. The early success in rural reform through de-collectivisation encouraged and guided the subsequent reforms in other sectors. The prolonged process of institutional experimentation characterised the gradualist approach, allowing the transition to take place with a steady introduction of competition and market mechanisms (Hassard et al., 2007:41, Nolan, 2004:6). At the heart of this gradualism was a series of enterprise reforms.

First round of reform (1978-1986)

There were three rounds of enterprise reforms preceding the massive privatisation of the late 1990s. The first round of reform started immediately after 1978. Government's logic was to disarticulate the close tie between state and enterprises so as to improve efficiency (see Table 2.1). The priority mission was to shift enterprise responsibility away from mere plan fulfilment towards the inculcation of profitability as the main criterion of performance (Naughton, 2007:95). Reform leaders believed that to decentralise the control rights from the government to enterprise managers would encourage them to exercise self-stimulation, self-development, and self-restraint (Lin et al., 2000:51, Lin et al., 1997). Two key components in the reform package were the increase of enterprise autonomy and the introduction of profit distribution. For the first time, the enterprise was given a certain degree of decision flexibility in terms of production plans, product marketing, worker employment and technological innovation (Hassard et al., 2007:87). The role of enterprise manager was reintroduced to address these issues. The enterprise was also allowed to retain and spend profits above the planned amount negotiated in advance between the government and enterprises (Yusuf et al., 2006:53). The wage system was liberalised to a small extent and linked with workers' performance.⁸ In order to enhance their profit margin, enterprises were allowed to sell the excess products at the prices they set. Hence, market prices emerged and coexisted with the central determined prices. The prices of most inputs and outputs were liberalised through this dual-track pricing system (Brandt et al., 2007, Yang, 2004).⁹ By the early 1980s, it seems that China had

⁸ Material incentives were strictly forbidden in the last decade of the Mao period (i.e., during 1967-1976); see BYRD, W. (1983) Enterprise-level reforms in Chinese state-owned industry. *American Economic Review*, 73, 329-332.

⁹ Price liberalisation was accelerated after 1989 and by 1993 the dual-track pricing system had almost disappeared; see QIAN, Y. Y. (2000) The process of China's market transition (1978-1998): the

started the journey of improving the efficiency of its state sector (Byrd, 1983).

Table 2.1
Chronological table of enterprise reforms in China (1978-1999).

| Year | Enterprise reforms | Other related reforms |
|------|---|---|
| 1978 | Enterprise reform: <ul style="list-style-type: none"> ● Separate state and enterprise to increase enterprise autonomy ● Introduce profit delivery system to encourage efficiency | |
| 1979 | | Dual-track pricing system |
| 1981 | Replace government appropriation by repayable loan system | |
| 1983 | Expand the coverage of repayable loan system | |
| 1985 | Impose enterprise income tax on profits Extend scale of enterprise income tax Impose adjustment tax | Wage liberalisation |
| 1987 | Contract Responsibility System: <ul style="list-style-type: none"> ● Written contract between state and enterprise to guarantee performance, tax and delivered profits Performance evaluation system to link wages with enterprise bonuses | |
| 1988 | | Enactment of <i>Bankruptcy Law</i> |
| 1992 | Share-holding reform: <ul style="list-style-type: none"> ● Legislation to regulate the issue and trading of shares ● New typology of categories of ownership – including state ownership, corporate ownership, individual ownership and foreign ownership | First monitoring agency, the China Securities Regulatory Commission (CSRC), established |
| 1994 | Corporatisation: <ul style="list-style-type: none"> ● Clarify property rights of the government and enterprises ● Separate management from ownership ● Install corporate governance ● Introduce loss-making responsibility to enterprises | Enactment of <i>Company Law</i> |
| 1993 | | Application of national minimum wages |
| 1994 | | New external auditing and accounting systems |
| 1995 | Privatisation policy “grasping the large and let go of the small” | |
| 1997 | Authorisation of private ownership | |
| 1999 | Implementation of debt-equity swaps | |

Source: Author’s summaries

evolutionary, historical, and comparative perspectives. *Journal of Institutional and Theoretical Economics-Zeitschrift Fur Die Gesamte Staatswissenschaft*, 156, 151-171.

However, the profit-sharing arrangement between the government and enterprises did not work well. Government revenue collected from enterprise income was not raised to the extent that was expected but, on the contrary, dropped sharply after reform (Hay et al., 1994:6). Total revenue decreased from 57.2 billion yuan in 1978 to 27.7 billion yuan in 1984. The major cause lay in the ambiguity of the distribution rule of profits. Since profit-delivery was negotiated on a firm-by-firm basis, enterprises and supervisory agencies could effectively conspire to cut their remittance burden (Hay et al., 1994:23). The bargaining position of government was disadvantageous because it lacked detailed knowledge about the real operations of enterprise, making the haemorrhage of revenue inevitable and widespread. To a certain extent, what enterprise managers really negotiated with government agents was not profits, but “rents” (Otsuka et al., 1998:32). The minor cause was the incentive misarrangement in the profit-sharing system; whereas the yearly renewal of profit-delivery arrangement based on last year’s performance discouraged the improvement in efficiency. A good performance this year would result in even heavier demands being made next year. Consequently, this form of negotiation generated negative incentives, creating a ‘race to the bottom’. That is why Chinese government wished to abandon this profit-delivery system and replace it with an income taxation system, thereby eliminating the bargaining disadvantage inherent in the negotiation process and enhancing the stability of government revenue. After two waves of tax reforms, income tax was imposed on profits (i.e., the tax-for-profits policy, or *ligaishui* 利改稅). In the 1983 measure, the tax base was first limited to 50 per cent of the total profits; but in 1985 a new measure extended this to 100 per cent. A new kind of adjustment tax (*tiaojieshui* 調節稅) was also imposed (Zhang and Zhang, 2007:34), designed to reduce the rent opportunity for enterprises and to make profit

retention uniform among them. The government's apparent intention was to regulate profit distribution, as well as to make enterprise profits more transparent. In the event, during the next 22 months profits slumped, or concealed, highlighting the failure of these initiatives (Zhang and Zhang, 2007:49). The contradiction inherent in government loss of revenue at a time when enterprises were improving their efficiency merely highlighted the reality that resistance to transparency among enterprises was simply too strong to tackle. A fair judgement is that the government's capacity to use taxation tools to manage enterprise behaviour was not mature enough in the early 1980s.

Another separate effort that took place in parallel with those described in the previous paragraph was to normalise the relationship between the government and enterprises by transferring financial responsibility downward to the enterprises themselves in order to make them accountable for investment and performance (Yang, 2004). The new approach was captured in a repayable loan system, which replaced the free grants of government appropriation (i.e., the loan-for-grant policy, or *bogaidai* 撥改貸) (Hassard et al., 2007:89). In future, investment should no longer be given directly by the state; rather, enterprises should have to make their own investment plan and secure funding from banks by themselves. The first round of measures, released in 1981, covered fixed asset investment, but the second round, released in late 1983, expanded the coverage to cash flows (Zhang and Zhang, 2007:32-33). The aim was not only to reduce the heavy burden of government appropriation, but also to eliminate opportunist misuse of long-term investment and the short-term cash flows.¹⁰ However, these measures completely failed, too, because state banks could not effectively force unprofitable enterprises to repay loans (Hassard et al., 2007:90).

¹⁰ Yet the interest payment was still afforded by the state until 1998 when this payment was no longer included as a part of profit-delivery.

Superficially, government appropriation seemed to have been successfully replaced by bank loans, but, in reality, the government continued to shoulder financial responsibility. This was because state banks did not manage loans in a commercial manner, but made available loans by fiat. In this way, government was still the *de facto* sponsor of funding the various needs of enterprises. As a result, enterprises began to accumulate huge debts. Between 1980 and 1993, the share of loss-making state enterprises rose from 18.7 per cent to 67.5 per cent (Zhang and Zhang, 2007:36). In short, these reform initiatives generated a serious debt chain crisis, the so-called “triangular debt” (*sanjiaozhai* 三角債), which eventually, in the mid 1990s, led to far-reaching reform of the banking sector.¹¹

A fair assessment is that the first round of enterprise reforms was achieved in the absence of a coherent strategic blueprint (Hassard et al., 2007:88, Rawski, 1994). The overall efficiency of state enterprises was enhanced by new incentives. Control was transferred downward in an attempt to establish enterprise autonomy, but financial responsibility was still largely rooted in the government itself. The intended disarticulation failed to address enterprises’ opportunist behaviour and make them more accountable. Reforms were introduced into the banking sector and it assumed an uneasy position between government and enterprises. Profits were gradually eroded by the ‘ratchet effect’ in the wage and bonus system, and this effect was once more in evidence under the impact of the repayable loan reform.¹² Enterprises had various reasons and channels for obtaining loans, but had no way to pay them back to banks.

¹¹ It refers to the fact that the bank loans and trade credits were largely extended to the third enterprise and hence a great number of SOEs were in debts to one another; see SUN, Q., TONG, J. & TONG, W. H. S. (2002) How does government ownership affect firm performance? Evidence from China's privatization experience. *Journal of Business Finance & Accounting*, 29, 1-27. And SUN, Q. & TONG, W. H. S. (2003) China share issue privatization: the extent of its success. *Journal of Financial Economics*, 70, 183-222.

¹² Ratchet, according to the Oxford Dictionary, is a mechanical devise that allows motion in only one direction. Ratchet effect means that all decisions to increase wages or bonuses were welcomed, but punishment of poor performance by reducing wages or bonuses was simply not politically acceptable; see p.38 in CHEN, J. (2005) *Corporate Governance in China*, Oxford, U.K., RoutledgeCruzon.

Government did not benefit as much as was expected from the profit-sharing system, because lack of information weakened its bargaining power to the extent that the negotiation result was usually biased in favour of the enterprise. In addition, its attempt to make hidden profits visible through the implementation of an income taxation system proved to be a major failure. As a result, the Chinese government was compelled to compromise in the next round of enterprise reforms, in which it shelved the transparency agenda and made the profit-sharing system even more institutionalised.

Second round of enterprise reform (1987-1992)

The main goal of the second round of enterprise reforms remained unchanged: namely, to address the problem of unstable government revenue (Hay et al., 1994:23). Government should enhance its ability in securing its stake out of the profit-sharing system, which had appeared to be a game extremely unfair to the government. After the first round of reforms, it was evident that ambiguities in the profit-sharing arrangement were the root of problem, and that information asymmetry created uncertainties and led to a bias in distribution that favoured the enterprise. Thus, the government first tried to clarify these informational ambiguities by implementing a taxation system that responded to the operational details and thereby reconciled problems of informational asymmetry in such a way as to strengthen its bargaining power. Yet this experiment was a failure. The government was eventually forced to compromise with the enterprise, to align the interests of both parties, and to formulate a strategy to avoid the information gap in order to secure its share of profits.

This compromise was the Contract Responsibility System (CRS). By making a written contract with the enterprise, the government sought to reduce uncertainties

and guarantee a fixed amount of its profit share without having the information about operational details and the real amount of retained profits of enterprise. The idea of CRS was inspired by the successful trials of the Household Responsibility System (HRS) in rural areas in the late 1970s (Yang, 2004, Wu, 2003:139). It had previously been promoted for a few months in early 1983, but soon replaced by the taxation reform. In 1987, the CRS was revived in order to tackle the failure of taxation system by introducing the following changes. Enterprises would sign a negotiated three-year performance contract with the government, and managers would undertake to meet various performance targets, including sales, profitability and capital accumulation within a specific time frame (Garnaut et al., 2005:2). A new kind of performance evaluation system was simultaneously introduced (Naughton, 2007:94). The stereotype of the performance contract could be generalised as “two commitments and one hook-up” (*liangbao yigua* 兩包一掛). A contracted amount of tax and profit-delivery would be guaranteed by the enterprise, so that government revenue would be placed on a more stable basis. Technical renovation would be promised and funded through the use of retained profits, enabling the government to relinquish the burden of upgrading construction. Wages and bonuses would be hooked-up with, or linked to, the realised profits in order to stop prevalent misuse (Lin et al., 1997). This system was enthusiastically accepted by enterprise managers and its inherent stability led to it being widely adopted (Lin et al., 1997, Naughton, 2007:94). By the end of 1987, 80 per cent of state enterprises were covered by the CRS, and, in 1989, nearly all enterprises had signed contracts lasting through 1993 (Yusuf et al., 2006:59). However, numerous problems remained unsolved in the CRS (Hassard et al., 2007:92-94).

First, disparities among performance contracts were still significant. The negotiated profit quota fluctuated considerably between 5 and 20 per cent.

Discrepancies were considered necessary in order to establish a standardised target attainable for enterprise managers (Forrester and Porter, 1999). Enterprises therefore continued to complain about the unequal profit retention/margins that favoured some enterprises more than others. Second, property rights ambiguities facing enterprises were not clarified by the new system. Instead, the contract negotiation tended to institutionalise previous practices of direct government interference, thereby impeding efforts to separate enterprise management from state ownership (Hassard et al., 2007:91). Thirdly, opportunist behaviour was encouraged. The short-term nature of CRS encouraged enterprise managers to emphasise short-termism in performance to the detriment of maintaining fixed assets, undertaking technical upgrading and formulating long-term strategies (Forrester and Porter, 1999). Last but not least, the new system generated a serious conflict in incentive arrangements between the government and enterprises. This led to the accumulation of losses on a huge scale, and left the state a heavy burden of having to bail out loss-making enterprises.

The debt accumulation issue was the most serious problem to emerge from the second round. The intensified competition brought by the booming non-state sector was only a minor contributory factor. The huge losses were mainly generated by the institutional failure of the CRS. One outcome was reflected in the 'hostage effect', meaning that the enterprise viewed outstanding loans as the hostage of the bank, which was unable to stop funding enterprise operations even though it was unlikely to gain back anything except non-performing loans (NPLs). This effect was magnified by the fact that banks acted like state agencies in most lending businesses. Bank credit became a cheap commodity with the enterprise preferring to pay higher wages and bonuses to themselves, rather than repaying loans to the bank (Li and Li, 1997). As a result, the debt crisis became the most serious legacy of the CRS. In order to inflate wages and bonuses under the profit-sharing system, enterprises tended to over-report

profits and hide losses so as to maximise the retained share (Holz, 2003:78-82). Since hidden losses were not subsidised by the government, they were eventually transferred to the NPLs owed to the banks. Nearly a half of SOEs reported losses in 1994 and a third had losses unreported (Tung, 1996b). According to official surveys, hidden losses among all state enterprises accounted for 172-180 per cent of total reported losses, suggesting that about two-third of losses were hidden. Debt accumulation became extremely high. By 1993 NPLs accounted for around 20-30 per cent of state banks' total outstanding debts, or about 17-25 per cent of national gross domestic product (GDP) (Li and Li, 1997).

In summary, Chinese reformers instituted the second round of enterprise reform by making a compromise with the enterprise in the profit distribution arrangements, thereby making a strategic retreat for the purpose of securing government revenue. They fully understood that conditions, even after the first round of reform in the early 1980s, were still not mature enough to allow the implementation of a universal taxation system to replace various kinds of profit distribution arrangements among enterprises. That explains why the CRS was a second best option. As intended, it did stabilise government revenue. Control over investment was decentralised to enterprises, while funding responsibilities were transferred to banks. Since interests were better aligned between the government and enterprises, the CRS was soon widely accepted and retained until mid-1990s. However, the CRS was only partially successful while many problems remained unchanged or even got worse (Forrester and Porter, 1999). Huge differences in tax burdens were reflected in what continued to be an unfair environment facing enterprises. The attempt to separate the enterprise management from state ownership failed. Management decisions were guided by short-term considerations. In short, the huge accumulation of enterprise debts and bank NPLs caused by various incentive conflicts became the most serious legacy of

the CRS policy, paving the way for the next round of reform.

Third round of reform (1993-1997)

The second round of enterprise reform secured government revenue, but achieved very little in terms of enterprise management. The outcome of the short-termism associated with the CRS was a continuing deterioration in enterprises' long-term performance. A nationwide survey in 1991 revealed that 80 per cent of large and medium-scale state enterprises were facing difficulties, with 30 per cent of them on the edge of bankruptcy (Zhang and Zhang, 2007:67). After a decade of reform, enterprises were still not accountable for their performances. It was obvious that the CRS could be no more than an interim policy, and there was a growing consensus that the various incentive conflicts between the government and enterprises would not be removed unless a rearrangement of property rights was made. Thus, the spotlight of reform shifted from the autonomy issue to the ownership issue, with the goal of establishing a modern enterprise system (MES), based on corporatisation and share-holding reform. With hindsight, however, the institutional changes that were to take place did not touch an overall ownership reform, but offered a new hybrid ownership form that would eventually facilitate privatisation (Naughton, 2007:301).

Corporatisation was the core of the MES policy. It sought to achieve several goals: viz., to clarify property rights of the government and enterprises, to separate management from ownership, to install corporate governance and to introduce loss-making responsibility to enterprises (Green and Liu, 2005, Zhang, 2008:34). This process was framed by the first *Company Law* (1994) ever to be enacted in China, which provided detailed guidance for the transformation of a traditional enterprise into a modern legal corporation (Naughton, 2007:301).

There were four principal strands to the Law. First, the creation of corporate ownership out of the state ownership was to be the first step towards corporatisation. Ambiguities in property relation were clarified by granting to the corporate entity entitlement to a clear bundle of property rights. A government branch should not be entitled as a corporate shareholder. All state enterprises were to be transformed into wholly state-owned enterprises, limited-liability enterprises, or joint-stock enterprises (Leng, 2009:45). Second, separate the functions responsible for government and enterprises. Government would completely retreat from enterprise management (Hassard et al., 2007:94-95).¹³ The enterprise would not carry the burden of social welfare provision, nor would the government take the bailout responsibility of the poorly-performing enterprises. Thirdly, a sound system of auditing and monitoring would be established in order to reduce opportunist managerial behaviours (Hassard et al., 2007:94). Independent organisations – for example, boards of directors, general shareholder meetings and supervisory boards – were set up to separate decision-making, executive and supervisory powers in order to achieve a more effective system of checks and balances (Leng, 2009:45). External auditing and accounting systems were also introduced in an effort to reduce monitoring costs. Fourthly, inner conflicts of the overlapping bureaucratic and entrepreneurial responsibilities were to be resolved. Instead of being planned bureaucrats, enterprise managers should become market entrepreneurs, thereby removing the previous bureaucratic identity of managers. In accordance with labour contracts signed when they were recruited, state workers should be turned to be state “employees”, on longer in receipt of lifetime employment guarantees (Zhang and Zhang, 2007:101-102).

¹³ An official survey conducted between August and November 1994 by the central government over 9,000 heads of SOEs shows that 77.2 percent of respondents singled out changing the functions of the government as the most decisive step for establishing a modern enterprise system; on *Jingji Ribao* (Economic Daily) (Beijing), March 12, 1995, 2, quoted from TUNG, R. (1996b) Obstacles hindering the establishment of a modern state-owned enterprise system in mainland China. *Issues & Studies*, 32, 32-51.

Meanwhile, a national minimum wage was applied in the liberalised wage system.

Some breakthroughs in share-holding reform during the early 1990s eased the process of corporatisation. A typology of categories of ownership – including state ownership, corporate ownership, individual ownership and foreign ownership – was made explicit in a nationwide promotion of share-holding enterprises (SHEs) in 1992. In the same year, China's first ever monitoring agency, the China Securities Regulatory Commission (CSRC), was established to supervise the transactions in the security market. In 1994 the first national legislation designed to regulate the issue and trading of shares was promulgated. Therefore, the spread of the share-holding system brought to an end a decade of experimental reforms and signalled the diversification of the ownership categories on a national scale.

During 1993-96 the corporatisation reform initiative expanded rapidly among targeted enterprises with the total number of SHEs increasing from 2,580 to 7,760, and more than 10 million state workers caught up in the restructuring plans (Ma, 2010:32). By the end of 1996, 84.4 per cent of targeted enterprises had been restructured: of these 42 per cent were transformed into wholly state-owned enterprise, 29 per cent into join-stock enterprises, and 29 per cent into limited-liability enterprises. Among targeted enterprises, 71 per cent established boards of directors; 63 per cent, supervisory boards: and 33 per cent, introduced share-holder meetings (Zhang and Zhang, 2007:109). Even so, the results were not wholly satisfactory. In an official survey of managers of targeted enterprises in 1997, only 41.1 per cent took a positive view of the corporatisation reform. Even worse, there was an unexpected deterioration in the performance of SHEs. In 1996, their annual profits decreased by 11 per cent, whilst their profit-capital ratio fell from 6.1 per cent to 5.0 per cent. The increasing turnover time of working capital also pointed to a deterioration in efficiency in the use of capital (Zhang and Zhang, 2007:109-110).

To a large extent, the corporatisation made up for what had been lost in the second round of enterprise reform. Following a series of comprehensive rearrangements and clarification of property rights, a modern market-oriented enterprise system was established. Previous incentive conflicts between the government and enterprises in regard to welfare provision and overlapping responsibilities between bureaucrats and entrepreneurs were, to a large extent, removed. Monitoring costs were reduced through the introduction of external auditing and accounting systems. For the first time, the definition of state ownership was enshrined in legislation and further diversified through the sanctioning of other types of ownership. Nevertheless, less favourable outcomes were an unwelcome reminder that although enterprises had been granted unprecedented managerial autonomy and enjoyed full responsibility for performance, their overall profitability remained low or had even declined. The message was clear: Further ownership reform was urgently required.

2.2 From enterprise reform to ownership revolution

Launch of privatisation

It could not have been predicted that the central policy of comprehensive privatisation would be inspired by a local experiment. In an attempt to relieve the heavy burden of city finance, in 1994, Chongqing government launched an experimental privatisation initiative by retaining just 50 large SOEs – accounting for 0.7 per cent of total enterprises but 50 per cent of gross industrial output – and releasing the remaining small SOEs to the market (Zhang and Zhang, 2007:235). Inspired by Chongqing's success, in September 1995 the Chinese central government

decided to adopt this strategy as a national policy. As the document of the Fifth Plenum of the Fourteenth Congress of Communist Party put it, “The point is to grasp a number of large enterprises and enterprise groups and use capital leverage to encourage the restructuring and development of other enterprises to achieve the economy of scale ... to utilise ways of restructuring, joint venture, merging, share cooperation, leasing, contracts or sales in different situations in order to hasten the reform steps of small SOEs” (Zhang and Zhang, 2007:236). These sentences were the origin of the famous slogan of Chinese privatisation – “grasp the large and let go of the small” (*zhuada fangxiao* 抓大放小). A large-scale process of ownership diversification within China’s state sector was not only permitted and also actively promoted, and a legal position for private ownership was for the first time authorised by the Fifteenth Party Congress in 1997 (Yeh, 1998).¹⁴

There were two main elements to the initiative. The first – “grasp the large” – targeted the restructuring of the largest 1,000 SOEs, comprising 63 per cent of state assets, 69 per cent of value-output and 74 per cent of government revenue (Smyth, 1998). These enterprises were mainly in industries of strategic importance, such as electricity, automobiles, electronics, iron and steel, machinery, chemicals, construction materials, transport, aerospace and pharmaceuticals (Hassard et al., 2007:96). Through the restructuring programme the central government sought to fulfil three goals: to convert large SOEs into joint stock companies; to create large enterprise groups through mergers in pillar industries; and to encourage better-performing large SOEs to list on the stock exchange (Smyth, 1998).^{15,16} The

¹⁴ In the relevant plenary document, the term “private ownership” was not explicitly used, but was included among the “various types of ownerships” that would coexist with the “public ownership” without a dominant position.

¹⁵ In details, central government intended to establish 57 large enterprise groups in national heavy industries and some others in the local level, such as 70 groups in Guangdong, 54 groups in Shanghai, 31 groups in Zhejiang and 20 in Liaoning; see SMYTH, R. (1998) Toward "the modern corporation": recent developments in the institutional reform of state-owned enterprises in mainland China". *Issues &*

second element – “let go of the small” – enabled small and medium SOEs to take a greater scale of ownership reforms through various methods. They included:

- (1) **Bankruptcy.** The *Bankruptcy Law*, particularly for SOEs, was enacted in 1988, but was not widely applied until 1996 when bankruptcy cases jumped from 2,200 to 6,332 within a year (Smyth, 1998).
- (2) **Ownership diversification.** This could be done by inviting outside investors through initial public offerings, private replacements or private offerings while maintaining the state as majority owner (Garnaut et al., 2005:48).
- (3) **Shareholding cooperation.** This method – the equivalent of employee shareholding – was welcome by many state workers for a special design that allowed employees to take a decisive role to the initiative of privatisation (Garnaut et al., 2005:49). The successful story of shareholding reform in Zhucheng, Hebei, in 1993 enhanced the popularity of this method.
- (4) **Auctions.** This kind of open sale began in 1987. But it was soon halted in an ideological retreat, and only resumed in 1992. Ownership transactions had to be made in 25 exchanges of property rights across provinces. Private entrepreneurs were major buyers in auctions (Ma, 2010:22).
- (5) **Leases.** This method was often adopted when the lessee was incapable of buying out the firm (Garnaut et al., 2005:50).
- (6) **Mergers.** This included joint ventures and involved separating the assets from an existing enterprise and forming a new enterprise in conjunction

Studies, 34, 102-131.

¹⁶ Large SOEs with better performance were particularly encouraged to launch initial public offerings in any of Shenzhen, Shanghai, Hong Kong or New York Stock Exchange to promote ownership diversification and raise revenue from restructuring.

with a domestic or foreign firm (Garnaut et al., 2005:50).

In addition, four state asset management companies were established in 1999, as part of the implementation of a new policy of “debt-equity swaps (*zaihuangu* 債換股)” designed to alleviate the problem of huge NPLs accumulated in state banks during the privatisation reforms. This strategy had previously been implemented as part of privatisation processes in Argentina, Chile, Mexico and the Philippines, where it had been successful in attracting external capital and thereby helping rescue these highly indebted governments (Kikeri et al., 1994, Bortolotti et al., 2004). The outcome of China’s first-ever privatisation policy was significant (see Figure 2.1). The total number of SOEs reached its peak in 1996 at 127,600 but then decreased drastically in 1997 (by 13.79 per cent) and 1998 (by 41.18 per cent). In the space of two years, 62,900 SOEs were either transformed into other types of ownership or simply driven out of market. In short, this “Chinese Big Bang” was massive, rapid and profound.

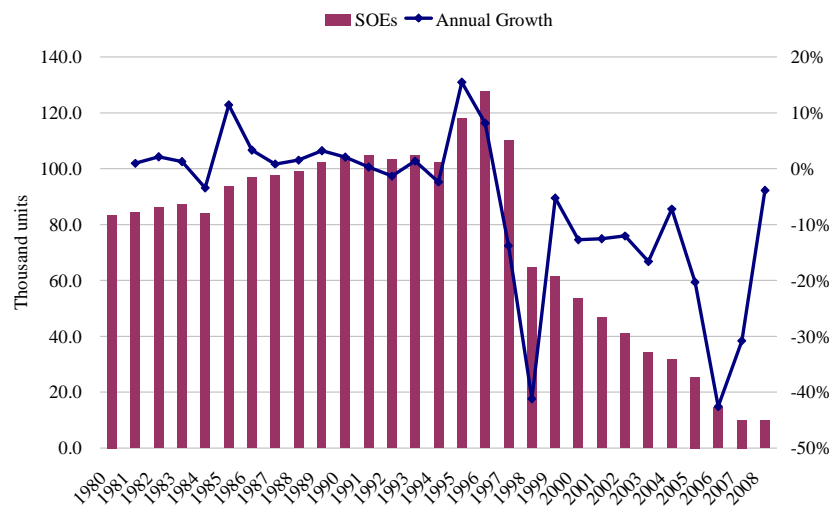


Figure 2.1: Total number and annual growth rate of SOEs (1980-2008).
Source: *China Statistical Yearbook* (various years).

Triggers of the massive privatisation

Several different arguments have been put forward to justify the massive privatisation in China of the late 1990s. The *market* perspective focuses on the induced process and attributes privatisation to the intensified competition generated by the boom of non-state sector production after the late 1980s (Jefferson and Su, 2006, Guo and Yao, 2005, Hassard et al., 2007:98, Naughton, 2007:105, Qian and Roland, 1998, Li et al., 2000, Cao et al., 1999, Garnaut et al., 2005:41). The *government* perspective highlights the motivations of central and local governments in the face of the roaring costs of maintaining a large but inefficient state industrial sector (Qian and Roland, 1998, Garnaut et al., 2005:3-4,40, Yusuf et al., 2006:77-81, Smyth, 1998, Guo and Yao, 2005, Li et al., 2000, Li, 2003, Cao et al., 1999). The *bank* perspective highlights the withdrawal of state support from a decade-long financial suppression and its harsh impact on the fundraising activities of public enterprises. Finally, the *manager* perspective shines the spotlight on the strategic behaviour of SOE managers under the impact of efforts to make transparent Chinese fiscal, taxation, statistical and legal systems in the mid-1990s.

Market perspective. The market-induced argument ascribes privatisation to the rapid expansion of the non-state sector in the product market emerging in and after the

late 1980s, particularly after Deng Xiaoping's "southern tour" (*nanxun* 南巡) in 1992, a tour intended to reaffirm the Open Door Policy. Various kinds of preferential treatment were offered to promote the development of non-state sectors, thereby significantly intensifying competition in product markets (Hassard et al., 2007:98).

There were three main sources of increased competition: township and village enterprises (TVEs), individually-owned enterprises (IOEs) (*getihu* 個體戶) and foreign-funded enterprises (*sanzi qiye* 三資企業) (Jefferson and Su, 2006, Naughton, 1994b). Thanks to the successful rural reforms of the late 1980s, accumulated capital and released labour force started to leave agriculture in favour of industrial work in rural areas. Over one million TVEs emerged in the 1980s.¹⁷ IOEs – enterprises that had fewer than eight employees – were for the first time permitted in 1981, and their total number thereafter increased rapidly to peak at more than 8 million in 1994.

Foreign direct investment (FDI) – mainly from overseas Chinese in Hong Kong, Macau and Taiwan – was greatly encouraged to form joint venture companies with Chinese capital in the early 1990s. Total FDI inflows increased from US\$ 4.4 billion in 1991 to US\$ 33.8 billion in 1994 (during which period when about 30,000 enterprises were established) (Cao et al., 1999). The proliferation of these new competitors gradually came to dominate the product market, leaving the output value

¹⁷ More discussion about the nature of TVEs are seen in NAUGHTON, B. (1994a) Chinese institutional innovation and privatization from below. *American Economic Review*, 84, 266-270.

of state enterprises to fall from a majority share of 78.5 per cent in 1980 to a minority share of 37.3 per cent in 1994. The profit space of SOEs was considerably squeezed by severe price competition. Facing growing pressure of having to compete with non-state products, SOE managers had no alternative but to seek more decision-making freedom decentralised from the state (Hassard et al., 2007:98). Hence, the ownership reform – equivalent to *de facto* privatisation – turned out to be a natural consequence. Privatisation was thus induced by the intensification of market competition.

Central government perspective. The poor performance of SOEs was a constant headache to the central government. Their declining profitability not only caused major fluctuations in the fiscal revenue of the government, but also seriously constrained its financial capacity. Thus, the efficiency argument regards ownership reform as a tool to improve SOE efficiency. In the final two decades of the last century, the performance of China's SOEs drew worldwide attention and was the source of heated debate in literature (Huang et al., 1999, Naughton, 1992, Ash and He, 1998, Jefferson and Rawski, 1994, Cheng and Lo, 2002, Fan and Woo, 1996, Holz, 2003:289, Zhang, 1998). Average SOE profitability dropped by 14 per cent between 1985 and 1993 (see Table 2.2) – a phenomenon that contradicted claims of continuing improvement in productivity (Groves et al., 1994). The loss-profit ratio increased

from 4.2 per cent in 1985 to 35.6 per cent in 1993, and rose further to 68.7 per cent in 1998. The spread of loss-making SOEs expanded by over 20 per cent within a single decade. In 1995, 72.5 per cent of local SOEs failed to show a profit, and huge debts were accumulated everywhere.¹⁸ During 1987-1991, the losses made by SOEs totalled about 5.1 billion yuan, of which only 1.9 billion yuan (37 per cent of the total) was repaid by the SOEs themselves (Wu, 2003:254), the balance being eventually absorbed by the state. Indeed, bailing out these losses crowded out a large part of government revenue. For reform leaders in Beijing, the message could not be clearer: unless they restored efficiency in local SOEs, the central government would never be assured of a stable and high-level income. Accordingly, ownership reform was regarded as a necessary measure to reduce agency costs and improve SOE performance. In so doing, the central government would also be relieved of a significant part of the subsidy burden. These were the motives that justified the privatisation initiative.

Table 2.2
SOE performance in selected years.

| | Profitability | Loss-Profit Ratio | Loss-Making SOEs |
|------|----------------------|--------------------------|-------------------------|
| 1985 | 25.4% | 4.2% | 9.7% |
| 1989 | 17.6% | 19.5% | 16.0% |
| 1993 | 11.4% | 35.6% | 30.3% |

¹⁸ For instance, in Zhucheng, Shandong, a pioneering city in the exploration of enterprise reform, 103 out of its 150 SOEs were financially in the red by the end of 1992, with the losses amounting to 147 million yuan, equivalent to 1.5 times its yearly city revenue; see p.3 in GARNAUT, R., SONG, L., TENEV, S. & YAO, Y. (2005) *China's Ownership Transformation: Process, Outcomes, Prospects*, Washington, U.S.A., The World Bank.

| | | | |
|------|-------|-------|-------|
| 1998 | 10.4% | 68.7% | 28.9% |
|------|-------|-------|-------|

Source: Holz (2003:60); *China Statistical Yearbook 2005*.

Note: Profitability is the ratio of the pre-tax profits to sales revenue.

Local government perspective. For the central government, poor performance was the major concern, but for local governments there were other preoccupations. The soft budget constraint argument suggests that the motivation for privatisation was the change in the calculation of costs and benefits made by local governments in the wake of the series of fiscal reforms in mid-1990s (Cao et al., 1999, Guo and Yao, 2005). The initial participating factor was the 1994 fiscal reform, which largely decentralised financial power down to local governments, but also transferred a huge amount of subsidies to them. Under the new system, local governments were allowed to keep enterprise income tax, but were compelled to assume the responsibility for subsidising loss-making SOEs. On balance, this was not a good deal for local governments. In the first year after this system was enforced (i.e., in 1995), over 36 billion yuan of enterprise income tax (EIT), accounting for 12.95 per cent of local revenue, was generated (see Table 2.3). However, almost three-quarters (72.86 per cent) of this was offset by the 28 billion yuan in subsidies, which were transferred to local governments. Total subsidies suddenly doubled (from 36.6 to 60.8 billion yuan) in 1995 (see Figure 2.2). Unlike central government, which also faced a major subsidy challenge, local governments had no capacity to print money for bailing themselves out (Yusuf et al., 2006:81). The logical inference seemed to be that if they could not turn SOEs profitable, local governments would have to dispose of the subsidies. Otherwise, budgets would not be balanced and the strict requirement of the new *Budget Law* (1995) would not be fulfilled (Cao et al., 1999). This hard budget pressure, together with intensified competition from the growing participation of non-state sectors in product market, formed the famous Chinese-style federalism

argument, which justifies the ownership reform by the joint impetus of market competition and hard budget constraint (Qian and Roland, 1996, Qian and Roland, 1998, Cao et al., 1999). This argument therefore sheds light on the local-driven and bottom-up nature of the massive privatisation in China.

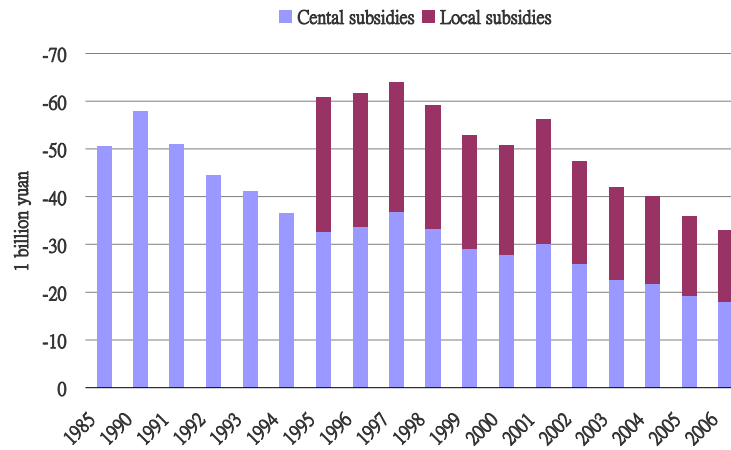


Figure 2.2: Subsidies to loss-making SOEs (1985-2006).
Source: *China Statistical Yearbooks 2007*.

Table 2.3

Subsidies to loss-making SOEs in central and local governments (1978-2006).

100 million yuan

| | Central revenue | | | | Local revenue | | | | | EIT% | Subsidy % |
|------|-----------------|----------|------------|---------------------------|---------------|------------|----------------------|-------------------------|---------------------------|--------|-----------|
| | Total | Taxes | Enterprise | | Total | Enterprise | | | Subsidies for loss-making | | |
| | | | Revenue | Subsidies for loss-making | | Income tax | Return of income tax | Profits of state assets | | | |
| A | B | C | D | E | (B+C+D)/A | E/(B+C+D) | | | | | |
| 1978 | 1132.26 | 519.28 | 571.99 | | | | | | | | |
| 1980 | 1159.93 | 571.70 | 435.24 | | | | | | | | |
| 1985 | 2004.82 | 2040.79 | 43.75 | -507.02 | | | | | | | |
| 1990 | 2937.10 | 2821.86 | 78.30 | -578.88 | | | | | | | |
| 1991 | 3149.48 | 2990.17 | 74.69 | -510.24 | | | | | | | |
| 1992 | 3483.37 | 3296.91 | 59.97 | -444.96 | | | | | | | |
| 1993 | 4348.95 | 4255.30 | 49.49 | -411.29 | | | | | | | |
| 1994 | 5218.10 | 5126.88 | | -366.22 | | | | | | | |
| 1995 | 6242.20 | 6038.04 | | -327.77 | 2985.58 | 366.62 | | 19.05 | -281.01 | 12.92% | -72.86% |
| 1996 | 7407.99 | 6909.82 | | -337.40 | 3746.92 | 421.99 | | 21.46 | -280.21 | 11.84% | -63.19% |
| 1997 | 8651.14 | 8234.04 | | -368.49 | 4263.20 | 534.94 | | 30.06 | -272.76 | 13.25% | -48.28% |
| 1998 | 9875.95 | 9262.80 | | -333.49 | 4983.95 | 515.14 | | - | -258.81 | 10.34% | -50.24% |
| 1999 | 11444.08 | 10682.58 | | -290.03 | 5594.87 | 781.29 | -28.28 | 45.91 | -238.38 | 14.28% | -29.84% |
| 2000 | 13395.23 | 12581.51 | | -278.78 | 6406.06 | 1005.50 | -13.85 | 60.17 | -230.15 | 16.42% | -21.88% |
| 2001 | 16386.04 | 15301.38 | | -300.04 | 7803.30 | 1636.13 | -7.76 | 57.21 | -261.76 | 21.60% | -15.53% |
| 2002 | 18903.64 | 17636.45 | | -259.60 | 8515.00 | 1118.17 | -2.71 | 85.12 | -214.01 | 14.10% | -17.83% |
| 2003 | 21715.25 | 20017.31 | | -226.38 | 9849.98 | 1043.50 | -0.14 | 135.44 | -194.04 | 11.97% | -16.46% |
| 2004 | 26396.47 | 24165.68 | | -217.93 | 11693.37 | 1373.34 | -0.07 | 222.73 | -181.98 | 13.65% | -11.40% |
| 2005 | 31649.29 | 28778.54 | | -193.26 | 14884.22 | 1745.90 | -0.76 | 394.75 | -166.57 | 14.38% | -7.78% |
| 2006 | 38760.20 | 34809.72 | | -180.22 | 18303.58 | 2182.50 | -1.82 | 500.47 | -149.07 | 14.65% | -5.56% |

Source: *China Statistical Yearbook* (various years).

Table 2.4

Ownership diversification and enterprise numbers (1980-2008).

| Unit: 10 thousand enterprises | 1980 | 1981 | 1982 | 1983 | 1984 | 1985 | 1986 | | | | | | |
|---|---------|--------|--------|--------|--------|--------|--------|--------|--------|---------|--------|--------|--------|
| National | 37.73 | 38.15 | 38.86 | 39.25 | 43.72 | 46.32 | 49.93 | | | | | | |
| Whole nation ownership industry | 8.34 | 8.42 | 8.60 | 8.71 | 8.41 | 9.37 | 9.68 | | | | | | |
| Collective ownership industry | 29.35 | 29.68 | 30.19 | 30.46 | 35.21 | 36.78 | 40.01 | | | | | | |
| # Township-run industry | 18.66 | 18.55 | 18.58 | 18.61 | 21.72 | 21.71 | 24.60 | | | | | | |
| Other types industry | 0.04 | 0.05 | 0.07 | 0.08 | 0.10 | 0.17 | 0.24 | | | | | | |
| | 1985 | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 | 1995 | 1996 | 1997 |
| National enterprises | 518.53 | 670.67 | 747.41 | 810.56 | 798.07 | 795.78 | 807.96 | 861.21 | 991.16 | 1001.71 | 734.15 | 798.65 | 792.29 |
| State-owned industry | 9.37 | 9.68 | 9.76 | 9.91 | 10.23 | 10.44 | 10.47 | 10.33 | 10.47 | 10.22 | 11.80 | 11.38 | 9.86 |
| Collective-owned industry | 174.21 | 182.30 | 181.93 | 185.30 | 174.70 | 166.85 | 157.72 | 164.06 | 180.36 | 186.30 | 147.50 | 159.18 | 177.23 |
| # Township-run industry | 21.71 | 24.60 | 23.79 | 23.77 | 23.43 | 22.87 | 22.96 | 22.95 | 20.98 | 21.77 | 22.88 | 20.23 | |
| Village-run industry | 63.26 | 62.91 | 70.80 | 73.38 | 72.16 | 68.08 | 67.52 | 70.97 | 77.73 | 78.87 | 68.99 | 67.84 | 63.14 |
| Cooperative industry | 74.17 | 79.38 | 71.92 | 72.38 | 62.95 | 59.66 | | 54.64 | 64.42 | 68.92 | 37.16 | 51.86 | 78.25 |
| Urban cooperative industry | | 3.33 | 3.63 | 3.72 | 3.54 | 3.09 | 2.95 | 3.96 | 6.81 | 6.73 | | | |
| Rural cooperative industry | 74.17 | 76.05 | 68.29 | 68.66 | 59.41 | 56.57 | 48.35 | 50.68 | 57.61 | 62.19 | | | |
| Individual industry | 334.78 | 478.45 | 555.33 | 614.81 | 612.42 | 617.60 | 638.67 | 685.40 | 797.12 | 800.74 | 568.82 | 621.07 | 597.47 |
| Urban individual industry | 33.01 | 36.74 | 49.15 | 45.28 | 42.49 | 43.25 | 45.06 | 50.70 | 68.17 | 88.18 | | | |
| Rural individual industry | 301.77 | 441.72 | 506.18 | 301.77 | 569.53 | 574.35 | 593.62 | 634.70 | 728.95 | 712.56 | | | |
| Other economic types industry | 0.17 | 0.24 | 0.39 | 0.54 | 0.72 | 0.88 | 1.08 | 1.42 | 3.21 | 4.45 | 6.03 | 7.02 | 7.73 |
| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | | | | | | | |
| National enterprises | 1001.71 | 734.15 | 798.65 | 792.29 | 797.46 | 792.99 | | | | | | | |
| State-owned and state-holding enterprises | 10.22 | 11.80 | 12.76 | 11.00 | 6.47 | 6.13 | | | | | | | |
| Collective-owned enterprises | 186.30 | 147.50 | 159.18 | 177.23 | 179.78 | 165.92 | | | | | | | |
| Individual enterprises | 800.74 | 568.82 | 621.07 | 597.47 | 603.38 | 612.68 | | | | | | | |
| Other economic types enterprises | 4.45 | 6.03 | 7.02 | 7.73 | 8.57 | 9.18 | | | | | | | |
| # Share-holding economy | 0.46 | 0.59 | 0.83 | 1.31 | 1.14 | 1.42 | | | | | | | |
| Enterprises with funds from Hong Kong, Macao and Taiwan | 3.00 | 5.40 | 4.43 | 4.38 | 6.25 | 6.23 | | | | | | | |

| Unit: One enterprise | 2000 | 2001 | 2002 | 2003 | 2004 | 2006 | 2007 | 2008 |
|---|--------|--------|--------|--------|--------|--------|--------|--------|
| National | 162885 | 171256 | 181557 | 196222 | 276474 | 301961 | 336768 | 426113 |
| Domestic funded | 134440 | 139833 | 147091 | 157641 | 219309 | 241089 | 269312 | 348266 |
| # State-owned and state-holding enterprises | 53489 | 46767 | 41125 | 34280 | 35597 | 24961 | 20680 | 21313 |
| State-owned enterprises | 42426 | 34530 | 29449 | 23228 | 23417 | 14555 | 10074 | 9682 |
| Collective-owned enterprises | 37841 | 31018 | 27477 | 22478 | 18095 | 14203 | 13032 | 11737 |
| Cooperative enterprises | 10852 | 10864 | 10193 | 9283 | 8215 | 6313 | 5880 | 5612 |
| Joint ownership enterprises | 2510 | 2234 | 1964 | 1689 | 1439 | 1075 | 999 | 833 |
| State joint ownership enterprises | 419 | 384 | 330 | 296 | 278 | 175 | 169 | 152 |
| Collective joint ownership enterprises | 736 | 639 | 546 | 486 | 395 | 320 | 299 | 277 |
| Joint state-collective enterprises | 954 | 829 | 733 | 549 | 427 | 294 | 262 | 206 |
| Other joint ownership enterprises | | | | | 339 | 286 | 269 | 198 |
| Limited liability corporations | 13215 | 18956 | 22486 | 26606 | 41234 | 47081 | 53326 | 62835 |
| State sole funded corporations | 1226 | 1372 | 1349 | 1330 | 1449 | 1343 | 1329 | 1398 |
| Other limited liability corporations | | | | | 39785 | 45738 | 51997 | 61437 |
| Share-holding corporations limited | 5086 | 5692 | 5998 | 6313 | 7171 | 7210 | 7782 | 9422 |
| Private enterprises | 22128 | 36218 | 49176 | 67607 | 119357 | 149736 | 177080 | 245850 |
| Private-funded enterprises | | | | | 26525 | 33976 | 39549 | 55784 |
| Private partnership enterprises | | | | | 6049 | 7316 | 8044 | 10223 |
| Private limited liability corporations | | | | | 82078 | 102199 | 122360 | 171150 |
| Private share-holding corporations ltd. | | | | | 4705 | 6245 | 7127 | 8693 |
| Other enterprises | 382 | 321 | 348 | 437 | 381 | 916 | 1139 | 2295 |
| Enterprises with funds from Hong Kong, Macao and Taiwan | 16490 | 18257 | 19546 | 21152 | 28399 | 29181 | 31949 | 35578 |
| Joint-ventures enterprises | | | | | 10694 | 10212 | 10927 | 11297 |
| Cooperative enterprises | | | | | 1863 | 1637 | 1673 | 1404 |
| Enterprises with sole investment | | | | | 15541 | 17038 | 19008 | 22288 |
| Share-holding corporations ltd. | | | | | 301 | 294 | 341 | 589 |
| Foreign funded enterprises | 11955 | 13166 | 14920 | 17429 | 28766 | 31691 | 35507 | 42269 |
| Joint-venture enterprises | | | | | 12930 | 13256 | 14485 | 16130 |
| Cooperation enterprises | | | | | 1711 | 1499 | 1537 | 1448 |
| Enterprises with sole funds | | | | | 13758 | 16552 | 18968 | 24028 |
| Share-holding corporations ltd. with foreign investment | | | | | 367 | 384 | 517 | 663 |

Source: *China Statistical Yearbook* (various years).

Bank perspective. Banking support became crucial to the daily operation of SOEs in the early 1980s, when unconditional loans from state banks to a considerable extent replaced the previous role played by government budgets. However, banking reforms subsequently launched in the mid-1990s ended this preferential support and increased financial stringency, thereby giving a further impetus to SOEs to adopt privatisation.¹⁹

The 1994 banking reform sought to fulfil three targets: (1) To turn People's Bank of China (PBOC) into a modern central bank fully in charge of monetary policy; (2) to build up a truly efficient banking system that would conduct business under modern methods of risk supervision and control; and (3) to marketise deposit and lending rates in order to enable the banking sector to help the economy attain optimal efficiency. The impact of the 1994 reform was profound and direct. The new risk control system required banks to withdraw unconditional support to the state sector. As Figure 2.3 shows, total industrial loans maintained a high rate of increase for a decade after 1985, growing on average, by 25.29 per cent p.a. However, in 1995, in the immediate aftermath of banking reform, growth fell sharply, and thereafter the average annual rate of increase declined to 10.04 per cent. Limited bank credits were largely crowded out. It became much more difficult to get loans from banks. As a result, the new stringent banking requirements squeezed profit margins, hardened budget constraints and encouraged eventual privatisation (Cao et al., 1999, Green and Liu, 2005:32).

¹⁹ In the 1979 reform, one of the priority tasks was to cut the economic dependence of SOEs on the state, and to replace it with a normal lending/borrowing relationship between commercial banks and state firms. Two waves of *bogaidai* (撥改貸; i.e., to replace allocations with loans) policy were announced in 1981 and 1983 in an effort to abolish the government budgetary allocation system and to replace it with commercial bank loans as the major source of SOE funding for purposes of construction and generating circulating cash flows.

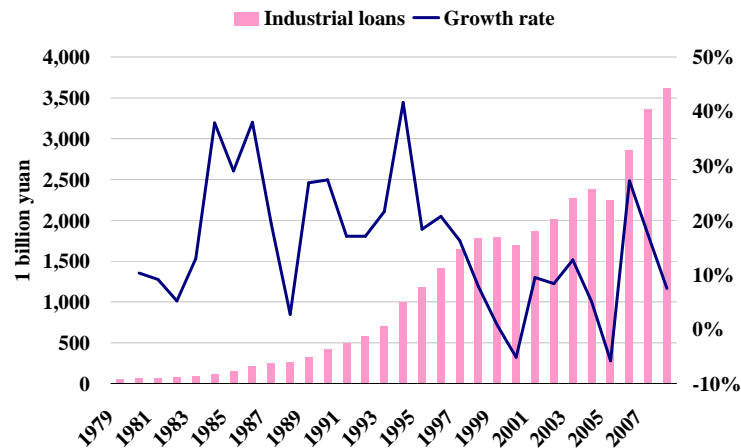


Figure 2.3: Industrial loans and growth changes (1979-2008).
Source: *China Statistical Yearbook* (various years).

However, there is another crucial effect brought about by the banking reform that has attracted little attention in literature – namely, the rent-shifting effect. From the perspective of the theory of financial deepening, the decade from 1985 to 1994 could be regarded as a period of financial repression: in other words, a period when under which policy that interest rate spreads (IRS) (i.e., the difference between nominal deposit and nominal lending rate) and the real lending rates (i.e., the difference between nominal lending rate and the inflation rate) were both highly controlled and repressed at a very low (sometimes at zero) level by the government as a part of industrial policy in order to create economic rents favouring specific industries (Suzuki et al., 2008). Theoretically, IRS is the rent opportunity that will drive banks automatically to allocate economic resource, because this gives banks incentives to seek more deposits and credits.²⁰ A chronology of changes in the IRS can be divided into three phases from 1955 to 2003 (see Figure 2.4). In the first phase (1955-1984), the average rate of IRS was 1.95 per cent. After the start of the first round enterprise reform in the mid-1980s, profit margins were clearly repressed and IRS rents were transferred from the banks to industrial (state) enterprises. During the second phase

²⁰ Although Marxist economics took exception to this financial surplus, it in fact never disappeared even after the Communist Party took over China in 1949.

(1985-1995), the average rate fell to 0.53 per cent. From 1984 to 1995, the number of SOEs increased by 40 per cent from 84,000 to 118,000 whilst the annual SOE industrial output increased fivefold from 517 to 3,122 billion yuan. Historical estimates of real lending rates reveal a similar but even more pronounced picture. During most of 1985-1995, the real lending rate remained at a negative level or a very low positive level, except for a very short period during 1990-1991 (see Figure 2.4). This policy of financial repression created a strong incentive for SOEs to try to borrow money from banks even for funding very poor investment projects (Wu, 2003:211). After the banking reform, the phase three shows, the interest rate ceased to be negative and after 1996 became positive. This change shifted the rents back to the banking sector and also hardened the budget constraint of SOEs. In summary, the rent-shifting policy resulting from financial repression successfully promoted a long-term expansion in the state industrial sector, although it also left banks with a huge amount of NPLs. Consequently, the end of this policy not only paved the way for a modern banking system, but also ended the soft budget policy favouring SOEs and further facilitated the subsequent privatisation.

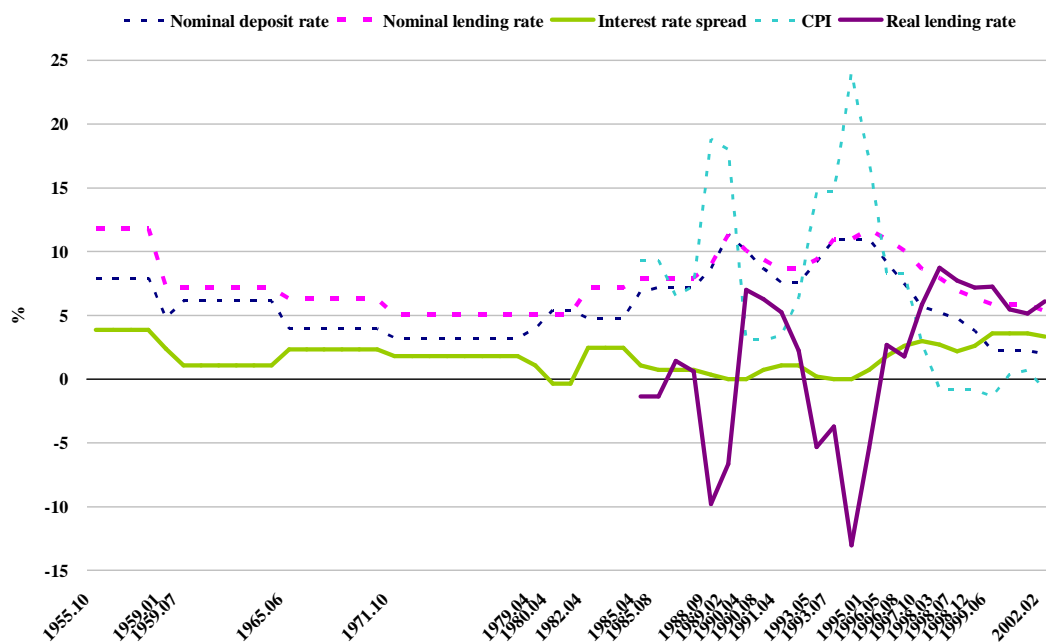


Figure 2.4: Interest rate spreads for one year period (1955-2002) and the real lending rate (1985-2002).

Source: Data of nominal deposit and lending rates from Li (2004); data of the consumption price index (CPI) from *China Statistical Yearbook* (various years).

Note: Interest rate spread = Nominal lending rate – nominal deposit rate. Real lending rate = CPI – nominal lending rate.

Managerial perspective. The ‘transparency argument’ shifts the analytical focus from the market, government and bank to the manager *per se*. It attributes privatisation to the strategic behaviour of SOE managers in response to the series of transparency reforms that took place in the mid-1990s. These reforms embraced three aspects – new accounting regulations, the introduction of the special invoices for value-added tax (VAT), and the revised *Criminal Law*.

First, in 1993, China launched an accounting and statistical revision that clarified various definitions of profits and costs and further facilitated the next round of tax reform in 1994. This measure first prevented SOE losses from being revealed before the presentation of the final accounts. Its effect was successfully to remove the incentive to manipulate losses in order to conceal profits, which had been a widespread problem during the profit-retention and the CRS periods. It generated four distinct cost concepts: (1) Product sales costs; (2) sales costs (roughly equivalent to

marketing costs); (3) management costs (equivalent to the expenditure on administrative overheads); and (4) financial expenses (mainly the repayment of interest on loans) (Ash and He, 1998).²¹ A more accurate measure of financial performance was therefore available, and, more importantly, information relating to profits, losses and costs were made much more transparent.

Second, the initiative of VAT special invoices in 1994 also made the production chain more transparent and reduced the rent-seeking opportunities available for SOE managers. One of the most crucial elements of the 1994 tax reform was to put the usage of VAT special invoices into the economic circulation process, allowing each purchase in the market to be doubly checked – from the buyer and seller sides – by accounting authorities.²² This double auditing system could effectively prevent the tax evasion (Zhou and Yang, 1994). Hence, for the first time, the industrial production chain was to a large extent made transparent to both public and, in particular, the state. All enterprise profits and costs were linked to the VAT revenue, which could be cross-checked in the production chain, so that the danger of manipulating was

²¹ There were two concepts of profits reported in the old statistical reporting system: Profits from product sales (equal to the revenue from product sales *less* costs of goods sold *less* product taxes *less* fees for technology transfer) needed to assess an enterprise's tax liability; and total profits (equal to the profits from product sales *less* profits on other sales *plus* non-operational income *less* non-operational expenses) needed to assess the profit remittance liability of an enterprise. There are three concepts of profits under the new statistical reporting system: Profits from product sales (equal to revenue from sales of goods *less* cost of good sold *less* selling expenses *less* tax on sales and other related taxes); sales profits (equal to profits from product sales *plus* profits on other sales *less* management expenses *less* financial expenses); and total profits (equal to sales profits *plus* net revenue from investment *plus* non-operational income *less* non-operational expenses); see ASH, R. & HE, L. (1998) Loss-making and the financial performance of China's industrial enterprises: data from the new accounting and statistical system. *Journal of Contemporary China*, 7, 5-20.

²² A nationwide VAT system was first formalised by the central government in 1984 when twelve machinery products were covered at various rates ranging from 6 to 16 per cent. The coverage was expanded again during 1986-1988 to over thirty-one products and services (70-80 per cent of total industrial products), at rates ranging from 8 to 45 per cent. However, problems emerged out of this new VAT system: The multiple rates were very difficult to administer. Various rates damaged the fairness of competition. The VAT liability was easily blurred because VAT was included in the product price, rather than being listed out of the sales price, so it was usually regarded as part of sale revenue, not independent cost. Further, the complicated method of VAT calculation not only made possible double taxation, but also left room for deliberate miscalculation. It finally led to the most serious problem – the auditing system often failed to detect miscalculation because of the lack of necessary information.

minimised. Meanwhile, the following form of strict legislation was also decisive.²³ Various forms of deliberate misuse of VAT special invoices were clearly defined, with associated severe punishments, in a *Specific Decision* released by the National Congress in 1995, and later written into the revised *Criminal Law* in 1997.²⁴ According to a survey, from January 1994 to May 2004, over ten thousand cases of VAT special invoice abuse were brought before the courts, and 195 people were sentenced to death (12 out of whom were state tax officials) (Wang, 2004a, Wang, 2004b). Through these rigorous efforts, a certain degree of transparency was finally achieved, leading to a major reduction in rent-seeking opportunities among SOE managers.

Third, a series of legal reforms aimed at combating corruption changed the incentive environment facing SOE managers and thereby encouraged eventual ownership reform. The slow development of a modern criminal legal system in China meant that legal initiatives that might have encouraged greater transparency in the state sector were absent until late 1980s.²⁵ Enactment of the first *Criminal Law* was delayed until 1979. Although this legislation sought to regulate and eliminate corruption and bribery, the definitions of these terms were left too simple and vague to tackle the complex and manifold nature of corruption and bribery in the rapid

²³ Since VAT invoices are designed to deduct taxes paid in the last stage of production chain, any forging or falsely making out invoice would effectively reduce the costs and guarantee a profit of 17 per cent of the transaction value. This explains why VAT invoices were widely recognised as more valuable than Renminbi notes. Within three weeks after the policy was announced, forged invoices were already circulating in the market; see WANG, Q. (2004b) A decade after the VAT special invoice (Zengzhi shuizhuan yong fapiao shinian huimou). *China Taxation (Zhongguo Shuiwu)*, 7, 4-10.

²⁴ For falsely issuing special invoices – the most popular type of abuse – criminal detention or imprisonment of up to three years with a fine between 20,000 and 200,000 yuan was the sentence. In “especially serious circumstances”, violators could be sentenced to life imprisonment or even sentenced to death, with a fine of between 50,000 and 500,000 yuan or the confiscation of property – a punishment even severe than for the crime of murder (murders could be sentenced to more than ten years’ imprisonment or receive the death penalty, but without any property confiscation).

²⁵ For nearly three decades after 1949, criminal charges and punishments were not based on parliamentary (i.e., NPC-authorized) laws, but on policies or bureaucratic decisions taken independently by the Party.

transition towards a market economy.²⁶ For this reason, a *Supplementary Provision* of the National People's Congress took effect in 1988, which provided a clearer operational definition of corruption and some types of bribery. An attempt was made to clarify the concept of corruption by redefining the agents of such crime, the associated types of criminal behaviour, as well as accessories and punishments.²⁷ This new regulation also highlighted practices of seeking, receiving and making a bribe, and included within the general meaning of bribery "accepting commissions and various service charges for own possession in economic activities". These changes were all written into the 1997 revised version of the *Criminal Law*. In addition to corruption and bribery, other forms of quasi-corrupt behaviours were for the first time banned.²⁸ The most important effect of these legal reforms was to treat the same behaviour of SOE managers and private managers *differently*. SOE managers were strictly prohibited from engaging to other similar business, to the benefit of relatives or friends through outsourcing or purchasing, or to show favouritism in recruitment – practices that were common among private enterprises. Falling prey to bankruptcy or making losses were basic risks facing both public and private enterprises. But an SOE manager who failed on either of these counts was likely to be jailed. Furthermore, the manager of a private enterprise had no responsibility to report foreign deposits or to justify his personal accumulation of

²⁶ The behaviour of corruption was simply defined as to "take advantages of one's office to embezzle public property", while bribery was defined as "taking advantage of one's office to accept bribes".

²⁷ The agent of corruption previously defined as "state functionary", was now defined as "state personnel, personnel of collective economic organizations or other personnel handling or administering public property", while corrupt behaviour was no longer simplistically defined as to "embezzle", but rather to "appropriate, steal, swindle, or otherwise illegally take possession of public property". Those who conspired with the agents of corruption were to be regarded as accessories and subject to the same punishment. Punishments were varied and the scale of punishment was linked to the amount of corruption proceeds.

²⁸ Crimes of "failing to justify large amount of properties", "hiding foreign deposits", and "accepting foreigners' gift without handing over to the state" were listed in 1988. Crimes of "abusing power", "privately distributing state assets", "privately distributing fines or confiscated goods", "committing irregularities for favouritism", "running similar business", "benefiting relatives and friends", "being defrauded in contracts", and "bankruptcy or losses for practicing favouritism" were listed in 1997.

wealth to the state, whereas an SOE manager who failed to justify assets in his possession or found to have concealed foreign deposits would receive a prison sentence of several years. In short, only managers and those working in the state sector were penalised for such crimes.

In summary, it is clear that the anti-corruption legislation made it more difficult for SOE managers to engage in rent-seeking behaviour. Thanks to such legislation, as well as the other “transparency reforms” affecting the taxation and accounting systems, the incentive arrangements of SOE managers were largely reshaped. Government ownership was much less beneficial than it had previously been, whilst the insider privatisation (i.e., the management buyout) became the means of continuing to engage in rent-seeking behaviour. Thus, this transparency argument offers a new explanation of the grass-root support for the massive privatisation in China in the late 1990s.

2.3 Privatisation process

Ownership diversification

Prior to eventual privatisation, China had experienced a long-term process of ownership diversification since the mid-1980s. The change in Chinese official statistics captures this process clearly. There were three phases. In the first phase of the early 1980s, the ownership types listed in the industrial chapter of the *China Statistical Yearbook* (*Zhongguo tongji nianjian* 中國統計年鑑) were confined to “whole nation ownership industry (*quanmin suoyouzhi gongye* 全民所有制工業)”, “collectively owned industry (*jiti suoyouzhi gongye* 集體所有制工業)”, and “other

types industry (*qita leixing gongye* 其他類型工業)” (see Table 2.4).²⁹ This simple categorisation, which disproportionately emphasised the importance of public ownership, reflected the conservative ideological attitude towards the non-public economy by that time. In the second phase, the enterprise reform of the mid-1980s allowed public enterprises to embark on a minor degree of ownership transformation in order to create performance-enhancing incentives. This was reflected in the emergence of a new sub-category of “cooperative industry (*lienying gongye* 聯營工業)”. Subsequently, small private businesses (*getihu* 個體戶) were promoted in an attempt to increase the provision of daily necessities, so giving rise to the sub-category of “individual industry (*geti gongye* 個體工業)” was created. These two new types of ownership were later formally authorised in the *State Enterprise Law* and the *Registration Regulation of Legal Corporations*, both promulgated in mid-1988, and related data were released in the next set of annual statistics.³⁰

This ownership classification lasted for over a decade until the third phase of diversification began in the mid-1990s. This phase started China’s first *Company Law* took effect in July 1994 and coincided with the national promotion of a modern enterprise system. In this law, more sophisticated company structures were created and defined, including “solely state-owned company” (*guoyou duzi gongsi* 國有獨資公司), “limited liability company” (*youxian zeren gongsi* 有限責任公司) and “joint

²⁹ Meanwhile, the “township-run industry (*xiangban gongye* 鄉辦工業)” was included in the category of “collectively owned industry”.

³⁰ In Article 34, *Law of the People’s Republic of China of Industrial Enterprises Owned by the Whole People*: “The enterprise shall have the right, in accordance with law and the provisions of the State Council, to engage in joint operations with other enterprises or institutions, to invest in other enterprises or institutions and to hold shares in other enterprises”. This article did not clarify the definition of “joint operation”, but this oversight was corrected by the registration regulation later announced by the State Council. In Article 2, *Administrative Regulations of the People’s Republic of China Governing the Registration of Legal Corporations*, “cooperative enterprise (*lienying qiye* 聯營企業)” and “private enterprise (*siying qiye* 私營企業)” were allowed for new registration, together with three new types of foreign funded enterprises: “Sino-foreign joint venture enterprise (*zhongwai hezi jinying qiye* 中外合資經營企業)”, “Sino-foreign cooperative enterprise (*zhongwai hezuo jinying qiye* 中外合作經營企業)” and “foreign funded enterprise (*waizi qiye* 外資企業)”.

stock limited company” (*gufen youxian gongsi* 股份有限公司).³¹ This legislation also made provision for the sub-category of “share-holding economy” (*gufenzi jinji* 股份制經濟) in the statistics during 1994-1999, when the growing importance of “foreign funded enterprises” (*waishang qiye* 外商企業) was also recognised through their inclusion.

The next dramatic change came with the statistical reforms of 1998. The total number of sub-categories increased from 6 to 16 in 2000, and from 16 to 30 in 2004. Distinctions were made between even more types of ownership, particularly in regard to various joint ownerships.³² The most momentous innovation was the explicit listing of “private enterprise” (*siying qiye* 私營企業), with added distinctions in later years. The inclusion of four major agents of ownership (state, collective, private and foreign sectors) alongside the six major ownership structures (solely funded, cooperative, joint venture, limited liability, partnership and limited share-holding) highlights the reality that Chinese ownership forms had finally diversified into a modern and complicated system.³³

Shrinkage of the state sector

In terms of the ownership composition in China, following the rapid nationalisation in the late 1950s, public ownership (including state and collective ownership) dominated the industrial production for the next four decades. Yet each

³¹ This first *Company Law* was momentous because it unprecedentedly established a modern corporate structure, including the shareholders’ meetings, boards of directors, and supervisory committees. It also sought strictly to regulate the company finance, accounting, mergers, separations, bankruptcies, dissolutions and liquidations.

³² Thus, “state joint ownership enterprise (*guoyou lienying qiye* 國有聯營企業)”, “collective joint ownership enterprise (*jiti lienying qiye* 集體聯營企業)” and “joint state-collective enterprise (*guoyou yu jiti lienying qiye* 國有與集體聯營企業)” were solely listed.

³³ For further consideration of the impact of China’s statistical reforms, see HOLZ, C. A. & LIN, Y. M. (2001) The 1997-1998 break in industrial statistics - facts and appraisal. *China Economic Review*, 12, 303-316.

decade witnessed its own distinctive changes. As Figure 2.5 shows, the 1970s saw a steady increase in the output of TVEs (collective ownership) under the impact of early rural reform. Driven by the Open Door Policy, non-public ownership, including the individual and foreign ownerships, began to emerge in the first half of the 1980s and subsequently expanded further in the latter half. The dramatic transition took place in the late 1990s, when rapid privatisation enabled non-public ownership to replace public ownership as the dominant ownership form. Indeed, according to the latest data in the figure, the public share has fallen to its lowest level – 11 per cent. In terms of the gross industrial output by ownership, Figure 2.6 tells a different story: the declining trend in state ownership during the 1980s and 1990s was not caused by falling output in the state-owned sector, but by the relatively faster increases in the output of the collective and non-public sectors. Figure 2.6 also highlights the accelerated pace of private ownership expansion in recent years.

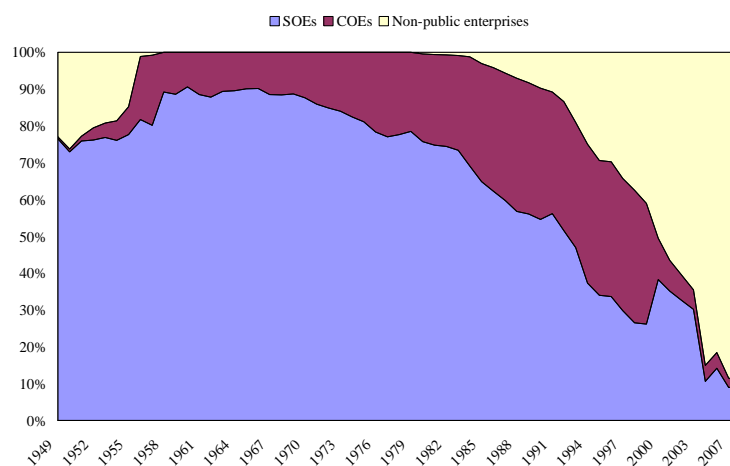


Figure 2.5: Composition of the industrial output by ownership types (1949-2008).

Source: *China Statistical Yearbook* (various years)

Note: Non-public ownership includes individual (private) and other forms of ownership.

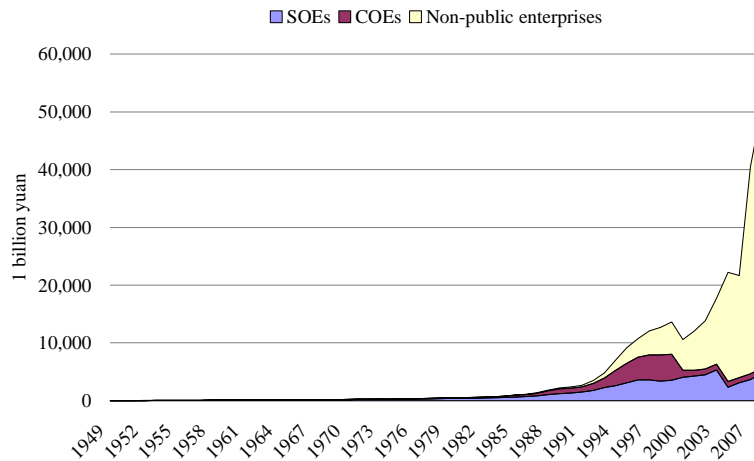


Figure 2.6: Total industrial output by ownership types (1949-2008).

Source: *China Statistical Yearbook* (various years).

Note: Non-public ownership includes individual (private) and other ownerships.

Since the shrinkage of the state sector is the principal theme of this section, in what follows we concentrate on the distribution of privatisation initiatives among provinces and industries.

In terms of units, the national number of SOEs (with independent accounting system) peaked at 87,905 in 1995, subsequently declining to 20,680 in 2007 whilst 76.5 per cent SOEs had disappeared from the statistics during that period (Appendix Table 2A.1).³⁴ In terms of employment, the national number of SOE employees also peaked in 1995 at 43.97 million, falling to 17.43 million in 2007 (implying that 60.4 per cent SOE employees had lost their jobs during this period) (Appendix Table 2A.2).

This dramatic transition was not, however, equally distributed among regions and industries. In regional terms, there was a heavy concentration of SOE restructuring in east China, particularly in coastal provinces (see Figure 2.7). Five coastal provinces –

³⁴ There are four kinds of definition of SOEs in Chinese statistics. The one defined in terms of possession of an independent accounting system is the most rigorous. For further discussions, see Section 4.4.

Liaoning, Hebei, Shandong, Jiangsu and Guangdong – each privatised over 3,500 SOEs during 1994-2008. The two inland provinces, with the highest concentration of SOE losses were Jiangxi and Sichuan (including Chongqing).³⁵ The second intensive privatisation was mainly concentrated in central provinces – including Henan, Hubei and Hunan – although there was also one province in the northeast – Heilongjiang. In most provinces in west China, the number of privatisation cases was less than 2,000 – a reflection of the relatively small size of their state sectors. The distribution in terms of employee reveals a slightly different pattern, biased particularly towards northeast China (see Figure 2.8). The combined total of laid-off state workers in Liaoning, Jilin and Heilongjiang was 5.44 million, accounting for one fifth of the national total during 1994-2008. Meanwhile, Shandong, Jiangsu and Sichuan still retained a large share of privatised state workers.

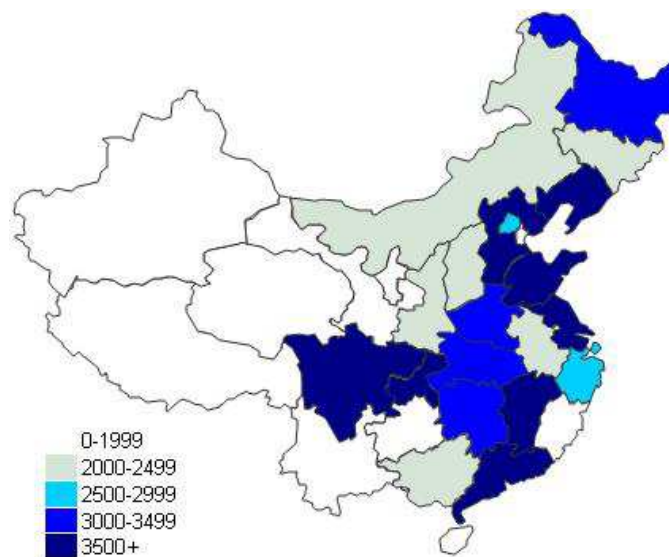


Figure 2.7: Decreases of SOEs by provinces (1994-2008).

Source: *China Statistical Yearbook* (various years).

Unit: An enterprise.

Note: Decrease is defined as the difference of the maximum and the minimum number during 1994 and 2008. Data of Chongqing and Sichuan are not distinguished.

³⁵ Chongqing is included in Sichuan's because its separation from Sichuan only took place in 1998, when it was granted provincial-level status. Combining their data avoids under-estimating this area's importance as well as facilitating the econometric analysis in later chapters.

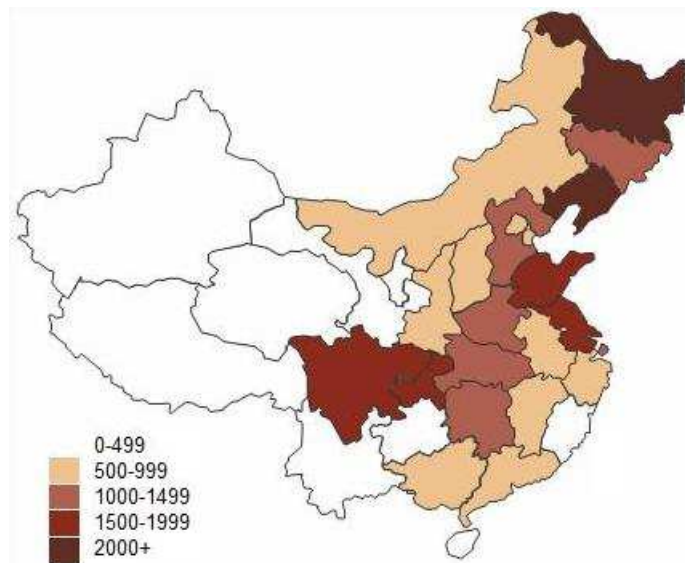


Figure 2.8: Decreases of SOE employees by provinces (1994-2008).

Source: *China Statistical Yearbook* (various years).

Unit: 1 thousand people.

Note: Decrease is defined as the difference of the maximum and the minimum number during 1994 and 2008. Data of Chongqing and Sichuan are not distinguished.

From an industrial (functional) perspective, privatisation was concentrated in ten industries: food processing, non-metallic minerals, food manufacture, chemical, textile, special and general machinery, beverages, printing and transport equipment (see Figure 2.9). During 1994-2008 66.23 per cent of all SOE closures occurred in these ten industries. It is striking that most of these were light manufacturing enterprises – and just two food industries accounted for the largest stake (20.76 per cent).³⁶ Fewer cases were found in petroleum extraction, petroleum processing, ferrous metal ores mining, tobacco, chemical fibbers, non-ferrous metals, and gas – i.e., in mining and heavy manufacturing (the single exception being the monopolistic tobacco industry). As for employment, nine industries – textiles, non-metallic minerals, chemicals, general and special machinery, coal, food processing, ferrous metals smelting and transport equipment – accounted for 64.62 per cent of the total

³⁶ All 37 major industries are divided into four categories of sectors in this research – light manufacture, heavy manufacture, mining and energy. More discussion are seen in Chapter Six.

number of laid-off SOE employees (see Figure 2.10). Very few state workers were dismissed in the ferrous metal ores mining, tobacco, furniture, culture articles, gas and water.

It is worth noting that the energy sector (including electricity, gas and water) occupied a special role in China's privatisation strategy. During 1994-2008, the state-owned electricity industry contracted by 27.19 per cent in terms of number of enterprises, but *expanded* by 28.28 per cent in terms of number of employees. The water industry closed 48.29 per cent of its SOEs, but dismissed only 18.38 per cent of its state employees. Yet while the gas industry shut down 23.32 per cent of its SOEs, it laid off 45.67 per cent of its state employees. The conclusion we draw from these statistics is that the energy sector underwent internal structural adjustment rather than an ownership reform. In short, the state-owned industry of electricity was still in a growing phase, while both the state-owned gas and water industries were adjusting each to their own problems, such as efficiency or redundancy.

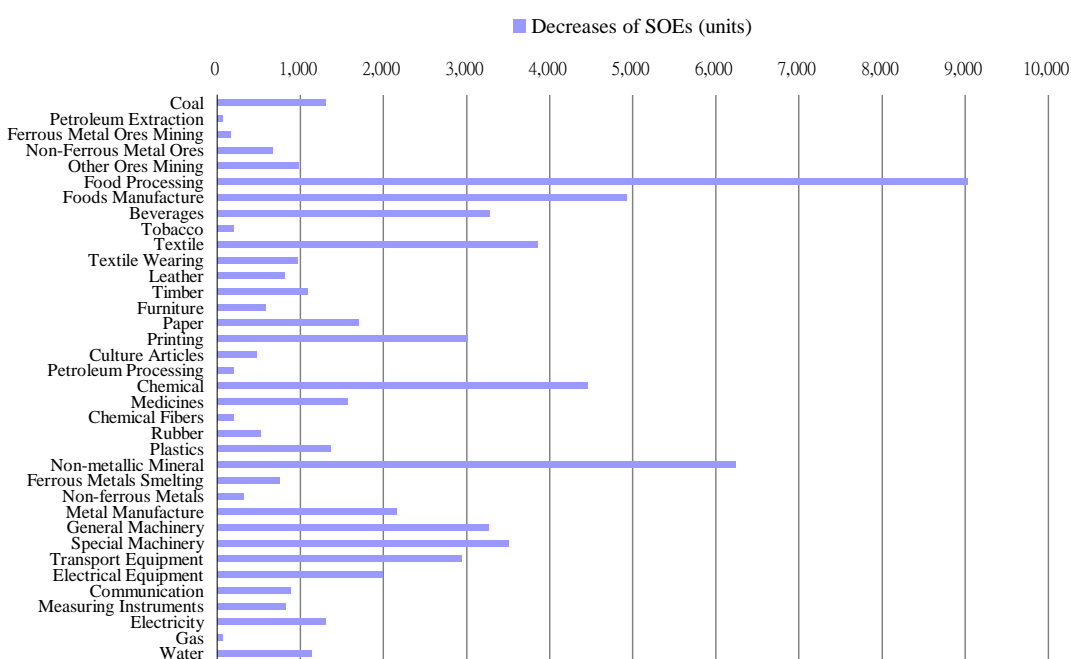


Figure 2.9: Decreases of SOEs by industries (1994-2008).

Source: *China Statistical Yearbook* (various years).

Note: Decrease is defined as the difference of the maximum and the minimum number during 1994 and 2008.

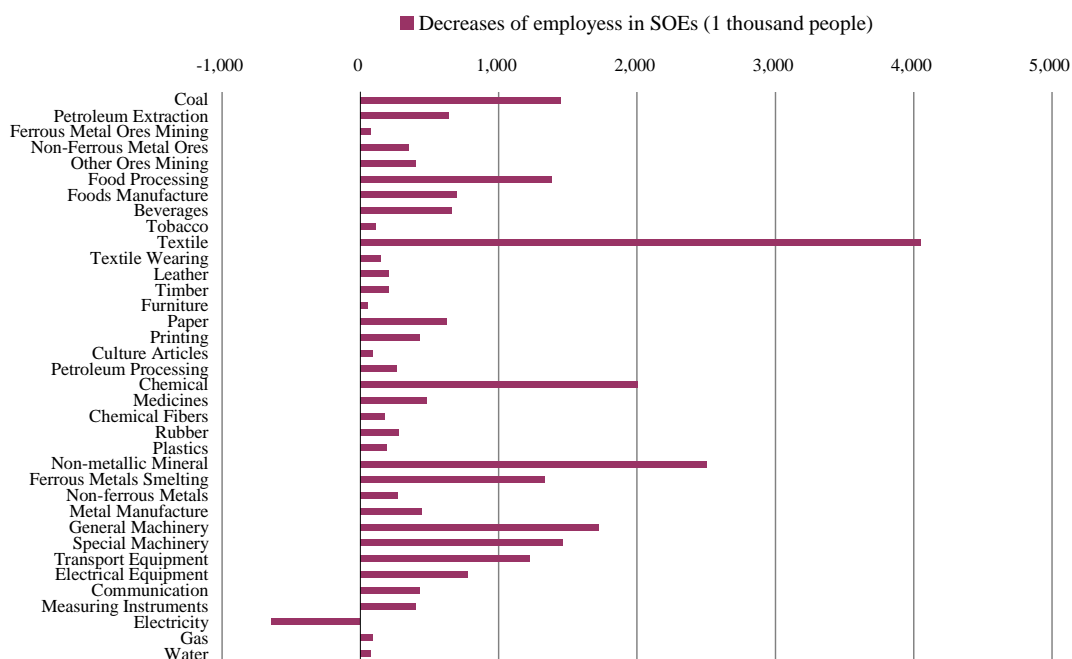


Figure 2.10: Decreases of SOE employees by industries (1994-2008).

Sources: *China Statistical Yearbook* (various years).

Note: Decrease is defined as the difference of the maximum and the minimum number during 1994 and 2008.

We have identified, so far, some specific regions and industries in which privatisation was more common than in others. However, it would be wrong to conclude from this that privatisation was a partial policy that was promoted in rather piecemeal fashion. On the contrary, it is clear that privatisation was a nationwide policy, pursued across all regions and most industries.

In some cases, for example, even the number of privatisation cases is small, but the percentage is high. The percentage comparison appears to show that Jiangxi, Heilongjiang, Jilin, Jiangsu, Hubei, Liaoning and Hunan have been among the most privatised provinces in China (see Table 2.5).³⁷ But it also tells us something different.

³⁷ This comparison is done by ranking the arithmetic mean of the overall privatisation degree in terms of enterprise and employee in a specific region or industry.

Hainan, Zhejiang, Neimenggu (Inner Mongolia), Guangxi and Fujian – where SOE concentration was relatively limited – nevertheless experienced privatisation on a considerable scale. By contrast, Shandong, Henan, Guangdong – provinces with major SOE contractions – experienced privatisation on a smaller scale than might have been expected. Counter-intuitively, Tianjin – an important coastal city – underwent the lowest level of privatisation of any province.

In addition, the comparison by industry first confirms the high degrees of privatisation in food processing, textile, foods manufacture, beverages and non-metallic mineral manufacture. Some industries – like leather, furniture, culture articles, paper, timber and printing – engaged intensive privatisation with less real cases due to a smaller scale. These data also demonstrate that privatisation may have favoured light industries more than heavy industries. Among the top 10 industries in the ranking of Table 2.5, there is only one industry – non-metallic mineral manufacture – that falls into the heavy industry category. By contrast, the incidence of privatisation in both (general and special) machinery manufacturing was relatively moderate, although the absolute level of contraction was much more significant (the maximum contraction for the general machinery is 3,267, and 3,511 for special machinery during 1994-2008; see Table 2A.1). The findings also suggest that both the energy and mining sectors may have been exceptions to privatisation policy trends. More specifically, these two sectors may have been pursuing a policy that gave a lower priority to privatisation *per se*.

In any case, there is no room for doubt that for the last decade and a half (or more), privatisation has been pursued as national policy on a widespread basis and with profound consequences. The process has taken place in all provinces, (albeit to differing degrees with the incidence of SOE privatisation falling within a range of between 55 and 80 per cent. From an industrial perspective, is the range of variation

was even bigger. The incidence of privatisation in 11 industries exceeded 80 per cent, while in 10 other industries it was less than 55 per cent. Such differences imply that the functional nature of industries may have been more important than regional locational characteristics in shaping the dynamics of privatisation. This point will be further elaborated in later chapters.

Table 2.5
Average decreasing share of state-owned enterprises and employees by provinces and industries (1994-2008).

| Rank | Region | Average | Enterprises | Employees |
|-------------|---------------|----------------|--------------------|------------------|
| 1 | Jiangxi | 78.80% | 87.45% | 70.15% |
| 2 | Heilongjiang | 78.56% | 86.94% | 70.19% |
| 3 | Jilin | 77.90% | 85.69% | 70.11% |
| 4 | Jiangsu | 77.88% | 81.92% | 73.84% |
| 5 | Hainan | 76.51% | 81.43% | 71.59% |
| 6 | Zhejiang | 75.39% | 78.78% | 72.00% |
| 7 | Neimenggu | 73.77% | 82.24% | 65.31% |
| 8 | Hubei | 73.60% | 80.28% | 66.93% |
| 9 | Liaoning | 73.36% | 80.82% | 65.90% |
| 10 | Hunan | 72.72% | 77.87% | 67.57% |
| 11 | Guangxi | 72.31% | 77.21% | 67.40% |
| 12 | Fujian | 71.76% | 78.05% | 65.46% |
| 13 | Hebei | 70.31% | 81.84% | 58.77% |
| 14 | Shanghai | 68.84% | 68.89% | 68.78% |
| 15 | Anhui | 68.41% | 80.84% | 55.98% |
| 16 | Sichuan | 68.16% | 75.00% | 61.32% |
| 17 | Guangdong | 67.75% | 74.52% | 60.98% |
| 18 | Xizhan | 67.53% | 84.48% | 50.59% |
| 19 | Xinjiang | 67.44% | 73.82% | 61.05% |
| 20 | Yunnan | 66.68% | 75.43% | 57.93% |
| 21 | Henan | 66.27% | 77.14% | 55.40% |
| 22 | Beijing | 65.48% | 72.57% | 58.39% |
| 23 | Qinghai | 65.37% | 76.30% | 54.44% |
| 24 | Ningxia | 64.59% | 80.23% | 48.95% |
| 25 | Gansu | 63.96% | 73.62% | 54.30% |
| 26 | Shandong | 62.67% | 73.10% | 52.24% |
| 27 | Shaanxi | 62.52% | 76.72% | 48.31% |
| 28 | Guizhou | 60.63% | 72.69% | 48.56% |
| 29 | Shanxi | 58.09% | 76.91% | 39.26% |
| 30 | Tianjin | 56.55% | 54.13% | 58.97% |

| Rank | Industry | Average | Enterprises | Employees |
|-------------|-------------------|----------------|--------------------|------------------|
| 1 | Leather | 95.09% | 95.87% | 94.31% |
| 2 | Food Processing | 90.18% | 91.81% | 88.55% |
| 3 | Textile | 89.89% | 88.81% | 90.96% |
| 4 | Furniture | 89.06% | 93.66% | 84.45% |
| 5 | Foods Manufacture | 88.33% | 92.89% | 83.77% |
| 6 | Culture Articles | 87.50% | 89.56% | 85.43% |

| | | | | |
|----|----------------------------------|--------|--------|---------|
| 7 | Paper | 87.36% | 89.68% | 85.04% |
| 8 | Beverages | 82.64% | 90.96% | 74.31% |
| 9 | Non-metallic Mineral Manufacture | 82.44% | 82.39% | 82.49% |
| 10 | Timber | 81.86% | 86.56% | 77.16% |
| 11 | Printing | 80.08% | 83.87% | 76.29% |
| 12 | Other Ores Mining | 79.91% | 82.35% | 77.46% |
| 13 | Metal Manufacture | 78.19% | 81.60% | 74.77% |
| 14 | Plastics | 77.24% | 81.82% | 72.66% |
| 15 | Rubber | 76.71% | 80.94% | 72.48% |
| 16 | Special Machinery | 73.31% | 78.30% | 68.31% |
| 17 | General Machinery | 73.08% | 74.40% | 71.76% |
| 18 | Textile Wearing | 72.52% | 82.50% | 62.55% |
| 19 | Measuring Instruments | 72.34% | 69.64% | 75.05% |
| 20 | Electrical Equipment | 72.29% | 74.15% | 70.43% |
| 21 | Chemical | 71.51% | 76.40% | 66.62% |
| 22 | Non-Ferrous Metal Ores Mining | 68.50% | 69.76% | 67.24% |
| 23 | Medicines | 68.42% | 74.89% | 61.94% |
| 24 | Chemical Fibers | 68.29% | 76.92% | 59.66% |
| 25 | Ferrous Metals Smelting | 60.05% | 69.48% | 50.61% |
| 26 | Transport Equipment | 56.89% | 68.44% | 45.34% |
| 27 | Petroleum Extraction | 53.51% | 53.57% | 53.46% |
| 28 | Communication Equipment | 52.02% | 54.91% | 49.14% |
| 29 | Ferrous Metal Ores Mining | 50.96% | 59.78% | 42.13% |
| 30 | Tobacco | 50.02% | 61.61% | 38.42% |
| 31 | Coal | 47.01% | 62.05% | 31.96% |
| 32 | Petroleum Processing | 44.36% | 47.15% | 41.58% |
| 33 | Non-ferrous Metals Smelting | 38.26% | 42.80% | 33.71% |
| 34 | Gas | 34.49% | 23.32% | 45.67% |
| 35 | Water | 33.34% | 48.29% | 18.38% |
| 36 | Electricity | -0.54% | 27.19% | -28.28% |

Source: Author's calculation.

Note: Average is the arithmetic mean of the share of enterprises and the share of employees.

Chongqing's data are included in Sichuan's.

2.4 Privatisation performance

“How does privatisation work in China?” This question has attracted worldwide attention and already generated a significant literature. It has also shifted the focus of research from a previous emphasis on comparing and contrasting performance indicators *among* publicly-owned and privately-owned enterprises to a more recent emphasis on comparing the performance record *before and after* the ownership transformation. The consensus view that has emerged from such research is that the net impact of privatisation has been a positive one, although there remain a few areas

in which findings are more ambiguous (see Table 2.5 for a summary of literature).

Table 2.6

Measuring the privatisation performance in privatisation literature.

| Authors | Data | Findings about privatisation performance |
|--|--|--|
| Xu and Wang (1999) | Utilises SHSE and SZSE data during 1993-1995 with 673 firm-year observations. | Finds that firm's profitability is negatively correlated with state's shares, but positively correlated with legal person's (private) shares. ^a |
| Li and Rozelle (2000) | Utilises a self-survey database collected in random counties in Jiangsu and Zhejiang in 1998 with 168 enterprises during 1994-1997. | Finds a significant increase in revenue within and after the year of privatisation. |
| Li and Rozelle (2003) | Utilises a self-survey database collected in random counties in Jiangsu and Zhejiang, covering 670 township enterprises during 1993-1999. | Among public firms, finds no significant difference in the performance between privatised and non-privatised SOEs. But, comparing to public firms, private firms are significantly correlated with better performance. |
| Sun and Tong (2003) | Utilises the China Stock Market and Accounting Research Database (CSMARD) and Taiwan Economic Journal Database to evaluate the performance changes of 634 SOEs issuing privatisation during 1994-1998. | The cross-section analysis documents that the majority share of government is only significantly correlated with sales, not with other performance indicators. The pooled analysis finds that the government ownership has negative impact only on to the market-to-book ratio, but not on the ROS and the earning before interest and tax payments. |
| Wei, Varela, D'Souza and Hassan (2003) | Utilises an investment bank database, covering 208 firms privatised in SHSE or SZSE during the period 1990-97. | Finds that the share of state ownership after privatisation has a significantly negative correlation with the changes in real sales, sales efficiency, and the employment, but has no significant correlation with the ROS and leverage. |
| Li and Rozelle (2004) | Utilises a self-survey database collected in Jiangsu and Zhejiang in 1998, covering 168 township or private enterprises on the period from 1994 to 1997. | Finds a significant increase in the value-added per worker in the post-privatisation period. |
| Chi and Padgett (2005) | Utilises a private Chinese stock market database, covering all 409 companies listed in SHSE or SZSE in 1996-97 to examine the short-run and long-run performance of IPOs. | Finds a significant return three years after the IPOs, but no significant response is found when more government ownership was engaged at the time of issuing. |
| Jia, Sun and Tong (2005) | Utilises the Hong Kong Exchange data, over the period 1993 to 2002 and examines the market-adjusted buy-and-hold changes five years after privatisation among 53 Chinese SOEs listed in Hong Kong | Finds a significant decrease in the return of market-adjusted buy-and-hold changes by increasing state ownership. |
| Lu and Liu (2005) | Utilises a Chinese Academy of Social | Finds a correlated 2.5 per cent increase |

| | | |
|---|---|--|
| | Science survey in five cities across four provinces, covering data of 451 enterprises from 1994 to 1995. | in return on asset after ownership transformation. |
| Wang (2005) | Utilises the CSMARD, covering all 747 firms in Shanghai or Shenzhen Stock Exchange during 1994-1999, and examines the changes in operating performance after initial public offerings. | Finds no significant correlation between the change of three-year return on assets and the percentage of government ownership at issuing. |
| Wei, Xie and Zhang (2005) | Utilises the CSMARD with 5,284 firm-year observations during 1991-2001 and examine the relationship between firm value and state ownership. | Finds the Tobin's Q to be negatively correlated with the state or institutional shares, but positively correlated with foreign shares. ^b |
| Dong, Putterman and Unel (2006) | Utilises a self-survey cooperated with the NBS over 168 manufacturing enterprises in summer 2002 in Nanjing during 1994-2001. | Finds significant and positive correlations between the reformed (i.e., privatised) share of SOE and the firm's value-added, revenues, total factor productivity and profits. |
| Hallward-Drimeier, Wallsten and Xu (2006) | Utilises an official survey, collaborated by the NBS and the World Bank, covering 1,500 firms in five major cities during 1994-2001. | Finds significant and positive correlations between the share of domestic private ownership and the sales growth and investment rate, but none with total factor productivity and employment growth. |
| Hu, Song and Zhang (2006) | Utilises a World Bank survey on 299 manufacturing SOEs in five major cities during 1996-2000. | Finds significant improvement in sales and revenue after increasing private ownership, but no improvement in value-added and employment. |
| Ito (2006) | Utilises a self-survey under government permission and estimates the privatisation effects on production function in over 100 TVEs in rural Jiangsu during 1995-2000. | Finds no correlation between privatisation and production function with time trend, but some significance without time trend. |
| Jefferson and Su (2006) | Utilises an official survey of the NBS over 22 thousand large and medium-size SOEs during 1996-2001. | Finds significant improvements in the capital ratio to labour and the profit ratio to capital after privatisation. |
| Fan, Wong and Zhang (2007b) | Utilises a self database, covering 617 firms, collected from IPO prospectuses published in SHSE and SZSE during 1993-2000. | Finds that firms with politically-connected CEO had poor performance in the three-year post-IPO stock return. |
| Park, Li and Tse (2006) | Utilises a dataset, collected from the Database of Industrial Firms in China and NBS statistics, covering 23,577 firms during 1992-1996. | Finds that private and collective enterprises outperformed state enterprises in terms of return on assets and earnings before interest and tax. |
| Chen, Firth, Xin and Xu (2008) | Utilises a self database collected from public information over 156 privatisation cases in SHSE and SZSE during 1995-2000 and examines the impact of control transfer toward the performance. | Finds that the control transfer to private entity has positive impact to performance, but the control transfer to other state institutions causes no meaningful change. |
| Rousseau and Xiao (2008) | Utilises a dataset, collected from the CSMARD and the Private Listed Companies Database (from SinoFin Information Service), covering 116 exchange-listed firms during | Finds that the change of control from the state to private owners has caused higher profitability and productivity. |

| | | |
|----------------------------|---|---|
| Bai, Lu and Tao (2009) | 1994-2002. Utilises annual surveys of the NBS with over 160 thousand firm-year data covering all SOEs during 1998-2005. | Finds that, in terms of performance, privatised SOEs experienced improvement in sales, higher profit margins and lower liability to asset ratio; but, in terms of social welfare, they paid lower wages, charged higher prices – though also made contributed more tax revenue. |
| Chen, Firth and Xu (2009) | Utilises the CSMARD with 6,113 firm-year data during 1999-2004. | Finds that private ownership is not necessarily superior to state ownership in performance. SOEs with the central government as the largest ownership performed best. |
| Jiang, Yue and Zhao (2009) | Utilises a dataset of the NBS with 149 manufacturing firms' data during 1998-2003. | Finds that share issue privatisation has improved firm's profitability by 2.5 per cent. |
| Li, Sun and Zou (2009) | Utilises a dataset, collected from the CSAMRD, CCER Corporate governance Database and a private source, covering 643 firms during 1994-2000. | Finds strong negative correlation between the state shareholding and the firms' performance among more profitable firms. |
| Ng, Yuce and Chen (2009) | Utilises a private database (from Guoyuan Securities Company) with 743 companies listed in Shanghai and Shenzhen Stock Exchange during 1996-2003. | Finds a negative correlation between the state share ownership and the performance (Tobin's Q). ^b Also documents a convex relation between the state ownership and the market value. |

Source: Author's summaries.

Note: All papers listed in this table are once published in academic journals included in the Social Science Citation Index (wokinfo.com), except two Chinese papers published in China's core journals. Only findings measuring the performance of different ownerships and the comparison between pre- and post-privatisation periods are listed in this table, while other findings of each author's interests are not included.

^a Legal personality is the characteristic of a non-living entity regarded by law to have the status of personhood.

^b The *Tobin's Q*, an indicator for measuring performance, is the ratio between the market value and replacement value of the same physical asset.

Some papers examine directly the influence of state ownership on SOE performance. Xu and Wang (1999) are among the earliest to measure the post-privatisation performance of state-owned firms using stock market data. They report a negative correlation between a firm's profitability and its state-owned status. Wei, Varela, D'souza and Hassan (2003) document a similar finding to the effect that holding a larger stake of state ownership in a firm had reduced both sales and sale efficiency and led to a smaller size of employment (i.e., an unsatisfactory result of job

creation). Jia, Sun and Tong's (2005) findings also attribute the decrease in market-adjusted buy-and-hold return to the shares held by the state, as do two recent papers (Ng et al., 2009, Li et al., 2009).

Some papers, examining the influence of *private* ownership, obtain similar results. Li and Rozelle's (2003) survey finds that private ownership is positively correlated with firm performance. Dong, Putterman and Unel's (2006) survey, undertaken in cooperation with the Chinese National Bureau of Statistics (NBS), identifies the positive influence of privatisation (represented by the proportion of shares privatised) in firm's value-added, revenues, profits and total factor productivity (TFP). From around the same time, two other reports, generated from the World Bank database, document a concrete improvement in sales, revenues and investment rates associated with increased participation in private ownership (Hu et al., 2006, Hallward-Driemeier et al., 2006).

Meanwhile, other papers have focused on a comparison of firm performance before and after privatisation. Li and Rozelle (2000, 2004) indicate that firms' revenue and value-added per worker increased significantly in the wake of privatisation. Lu and Liu's (2005) survey finds a 2.5 per cent increase in the return on assets (ROA) following privatisation. Similarly, another survey also finds a 2.5 per cent increase in post-privatisation productivity (see Jiang, Yue and Zhao (2009)). Again, Chi and Padgett (2005) find a positive (market-adjusted buy and hold) return three years after the initial public offering. Two large datasets also endorse the positive impact of ownership transformation. Jefferson and Su's (2006) data, covering over 22,000 SOEs during 1996-2001, regress out significant improvements in the capital-labour ratio as well as the profit-capital ratio following privatisation. Bai, Lu and Tao's (2009) mega dataset, which included 160,000 firm-year observations for 1998-2005, further confirms that privatised SOEs enjoyed more business sales, higher profit margins and

lower liability-asset ratio.

Some more recent papers have shifted the spotlight from ownership comparison to other relevant issues. Fan, Wong and Zhang (2007) focus on the relationship between political influence and privatisation, and find that privatised SOEs with politically-connected Chief Executive Officer (CEO) have had a poorer performance in terms of their three-year post-IPO return than SOEs whose CEOs had no political connection. This finding implies a negative impact arising out of the legacy of state ownership. Chen, Firth, Xin and Xu (2008) investigate the consequence of control transfer (i.e., the transfer of controlling share, usually the majority share) to different entities. Their evidence shows that the control transfer is beneficial only if the controlling share is transferred to private entities; in cases in which the controlling share is transferred to another state institution, no meaningful change in performance is likely. In another paper working on the control transfer, Rousseau and Xiao (2008) reach the same broad conclusion: in their case, that the change of controlling share from state to private owners is likely to generate higher profitability and productivity.

Nevertheless, a number of empirical investigations fail to find a positive impact of privatisation on specific performance indicators. Li and Rozelle (2003) find no significant difference between privatised and non-privatised SOEs in terms of profit rates and value-added per worker. Sun and Tong (2003) do not see positive influence of moving from state to private ownership on the firm's three-year return on sales (ROS) and the earnings before interest and tax (EBIT). Wang, Varela, D'Souza and Hassan (2003) do not obtain meaningful results in terms of ROS and leverage. One study finds no significant correlation between the production function and the privatisation proxy (Ito, 2006): another finds no correlation between the three-year post-IPO return and the extent of state ownership at the issuing (Chi and Padgett, 2005; Wang, 2005). Moreover, Chen, Firth and Xu (2009) argue that private

ownership is not necessarily superior to state ownership in performance, and they even find that SOEs with the greatest ownership involvement by the central performed best of all.

Even so, this review indicates that privatisation in China has been successful. Most researchers have concluded that private ownership participation has, to a greater or lesser degree, had an enhancing effect of performance within a short period of time. Only six out of 25 papers listed in Table 2.6 – fail to reject the superiority of state ownership, the findings of the remaining 19 lending support to the beneficial impact of private ownership. In the entire literature, there is only one paper that advocates SOEs' performance as being superior to others – and this inference holds only when the SOEs in question are under the direct control of the central government (Chen et al., 2009). In other words, except for a few large SOEs under the special protection of central government, evidence is lacking to support the argument that in the past decade or so medium and small SOEs have outperformed non-public enterprises. In short, a straight answer to the starting question “how has the privatisation worked in China?” is very simple: “well”.

Chapter Three

Literature Review: Why privatise?

3.1 Studies of the determinants of privatisation

This section briefly introduces theoretical and empirical studies of the determinants of privatisation in the existing literature. More detailed discussion is provided in the next section.

Theoretical studies in the literature on privatisation

How to model privatisation? Theorists first seek to find the answer through an examination of bureaucratic behaviour (see Table 3.1). Leyden and Link (1993) draw attention to the responsibility of production that rests on bureaucrats' shoulders. They argue that there are "political risks" that may reduce production if the production process is wholly controlled by bureaucrats (i.e., under government ownership). If the bureaucrat in charge of production is risk-averse and budget-maximising, he may try to use privatisation (i.e., sanctioning production by private enterprises) as a way to mitigate political risks and better fulfil his responsibility. Li, Ouyang and Zhou (2005) examine this risk factor, too. Their optimal timing model of privatisation demonstrates that a higher gain-to-risk ratio (for bureaucrats) will raise the likelihood of SOE privatisation.

Budget is another natural bureaucratic concern. A bureaucrat will be happy to maximise his budget and try to get rid of the heavy burden of running an inefficient state enterprise. Those enterprises with the least market power and/or in receipt of the

largest subsidies from government should privatise first (Chen, 1996). Yarrow (1999) sheds more light on the cost of government finance – a more serious source of budgetary concern. He argues that the privatisation of a country’s state sector may be preceded by a period of increased financial stringency. By the same token, the change in budget constraint will yield a similar impact. Regarding privatisation in China, Cao, Qian and Weingast (1999) indicate that the hardening process of soft budget constraint brought by the 1994 fiscal reform was crucial. In their Chinese-style federalism argument, it is decentralisation that removed soft budgets and further induced the privatisation of the late 1990s.

Likewise, a politician has his motives to privatise, too. A populist politician may advocate privatisation in an attempt to win votes by maximising social welfare (Chen, 1996). Bennett and Maw’s (2003) model also theorises this welfare impact. Biais and Perotti (2002) further combine this welfare concern with the ‘ideology factor’ and put forward their famous “Machiavellian argument” that strategic privatisation may be pursued by a right-wing government seeking to win votes from middle-class citizens by issuing state shares to please (or influence) them. Ramamurti’s theory (2000) also confirms this right-wing ideology by suggesting that SOEs in countries where the political leadership is ideologically committed to market forces are more likely to be privatised.

Macroeconomic pressure is the next concern in the theoretical literature on privatisation. Here, crisis is a major driver. According to the “Washington Consensus”,³⁸ privatisation is usually included in the bailout conditions imposed on a

³⁸ Details about the Washington Consensus are discussed in WILLIAMSON, J. (1993) Democracy and the Washington consensus. *World Development*, 21, 1329-1336. WILLIAMSON, J. (2004) The strange history of the Washington Consensus. *Journal of Post Keynesian Economics*, 27, 195-206. RODRIK, D. (2006) Goodbye Washington consensus? Hello Washington confusion? A review of the World Bank's economic growth in the 1990s: learning from a decade of reform. *Journal of Economic Literature*, 44, 973-987. ROLAND, G. (2001) Ten years after ... transition and economics. *IMF Staff Papers*, 48, 29-52.

country seeking financial support from the World Bank or the IMF (Ramamurti, 2000). Competition is another major trigger in privatisation models: rising competition will squeeze profit margins and, in turn, drive less efficient public enterprises out of the market (Bennett and Maw, 2003, Cao et al., 1999, Ramamurti, 2000). Monopoly is the other side of the same coin. Matsumura's (1998) duopoly model suggests that if a public firm is not monopolist, it should at least be partially privatised. In other words, the only justification for public ownership is the advantage of being a monopoly; otherwise, public ownership should be replaced by private ownership.³⁹ Then, there is the issue of transaction cost. Few would deny that competition will be enhanced by market development. But it is likely that the same process will also generate lower transaction costs, which will then hasten the speed of privatisation sales (Li et al., 2005). Market development may also reduce the cost of capital and thereby facilitate privatisation markets (Li et al., 2005). Finally, the institutional effect should be considered. Markets develop through the improvement of market-supporting institutions. Indeed, weak institutions – such as weak financial intermediaries, shallow stock markets, limited private savings, ambiguous property rights, and underdeveloped legal systems – may seriously undermine market development and, in turn, competition and privatisation (Ramamurti, 2000). Alexeev and Kaganovich (2001) generate the same conclusion that privatisation can be counterproductive unless market institutions actively work to favour private enterprises.

In privatisation theories, microeconomic conditions have attracted limited attention. The first factor discussed in the literature is firm size. Small SOEs are more easily privatised than large enterprises. This is not only because small size means

³⁹ There is only one source that argues in favour of privatisation of a monopoly: Ramamurti suggests that a monopolistic SOE may also opt for privatisation if it can benefit from the regulatory benefits privatisation reform; see RAMAMURTI, R. (2000) A multilevel model of privatization in emerging economies. *Academy of Management Review*, 25, 525-550.

fewer redundancies, and a less onerous managerial challenge, but, more importantly, also reflects the cheaper cost of purchasing the enterprise (Ramamurti, 2000). Alexeev and Kaganovich (2001) put forward the proposition that the productivity gains from privatisation are likely to differ dramatically among firms of different size. Li, Ouyang and Zhou's model (2005) also reveals a positive relationship between a firm's capability to adjust and the optimal timing of privatisation. In short, smallness of size offers greater flexibility, which facilitates the kind of adjustments entailed in privatisation. Next, efficiency. This factor embraces productivity and profitability, including future expectations (i.e., post-privatisation). Since efficiency improvements may be represented by the difference in income before and after privatisation, future income gains can be theorised in a model (Li et al., 2005). Expectations of future income gains is thus a strong incentive, since it promises to stimulate greater managerial effort and so lead to a better performance following privatisation (Debande and Friebel, 2004).

A unique model sheds light on the information factor in privatisation. At the heart of Glaeser and Sheinkman's (1996) theory is the impact of uncertainty on consumer demand and input cost in production. Central planners, they argue, are unable to acquire and use new information and hence are less responsive to market needs. This gives the "information advantage" to privately owned enterprises, and further encourages the "middlemen" (i.e., those whose upstream and/or downstream activities are already privatised) to adopt privatisation. Their theory explains how privatisation diffuses in the product chain. It also suggests that privatisation should begin with industries characterised by high uncertainties of demand and costs. These industries, with relatively higher elasticity in demands, are usually more competitive.

This theory, therefore, justifies competition as a driver of privatisation.⁴⁰ However, there exists a constraining factor according to the rent-seeking theory. Friebel (2000) argues that if the bureaucrat wants to maintain his current level of rents, he may try to avoid privatisation – even in the knowledge that doing so will reduce the risk of uncertainty he faces.

The following section offers a more detailed and systematic approach for further discussion of many of the issues discussed above.

⁴⁰ Li, Ouyang and Zhou (2005) follow this information argument and predict that the negative expectation of uncertainty after privatisation may delay its occurrence.

Table 3.1

Theoretical studies of privatisation dynamics in literature.

| Authors | Arguments or propositions |
|-------------------------------|---|
| Leyden and Link (1993) | <p>Examine the effect of bureaucratic risk aversion on the decision to privatise production.</p> <ul style="list-style-type: none"> ➤ If a bureaucrat is risk averse and budget-maximising, he will have an interest in mitigating the effects of risk through privatisation, because in which the production risks are reduced. |
| Chen (1996) | <p>Studies the choices of two types of maximising public servants over how far to implement industrial privatisation and in what order to privatise.</p> <ul style="list-style-type: none"> ➤ For budget maximising, bureaucrats will gain most by privatising from where the least market power and the largest subsidy are. ➤ For maximising social welfare, populists will begin the privatisation process by first focusing on firms with the least market power and the largest subsidies. |
| Glaser and Scheinkman (1996) | <p>Model the sequencing of privatisation within an industry and across industries.</p> <ul style="list-style-type: none"> ➤ Privatisation should be started from where the demand and cost are most uncertain in order to reap information advantages. ➤ Privatising middleman has particular value when neighbouring sectors are also private. ➤ Downstream privatisation should come first so that information about consumer demand can be generated. If the retail sector is private, then privatisation downstream usually dominates privatisation upstream. ➤ Sectors that benefit most from flexibility and sectors that will create the greatest benefits for other industries by providing improved information should be privatised first. In addition, industries with more inelastic demand should be privatised first. |
| Matsumura (1998) | <p>Considers how many shares the government should hold in the privatised firm in a quantity-setting duopoly involving a private firm and a privatised firm.</p> <ul style="list-style-type: none"> ➤ If a public firm is not a monopolist, the government should (at least partially) privatise the public firm. |
| Yarrow (1999) | <p>Argues that privatisation is a dynamic phenomenon and that the cost of government finance has played a role in triggering privatisation and related reforms.</p> <ul style="list-style-type: none"> ➤ Comprehensive ownership reform is preceded by a period of increased financial stringency for SOEs. ➤ Privatisation will tend to occur earlier, the less efficient is the SOE. |
| Cao, Qian and Weingast (1999) | <p>Investigate the profound reform of Chinese SOEs in the mid 1990s.</p> <ul style="list-style-type: none"> ➤ The decentralisation of governments (i.e. Chinese-style federalism), together with the harder budget constraints and increased competition from the non-state sector, created incentives for local government to undertake privatisation. |

- Friebel (2000) Models the relationship among privatisation volume, degree of uncertainty and the information of local conditions.
- The government may not use additional local information in favour of more privatization, and it may even slow down reforms in order to save on bureaucrats' rents. Concludes that the speed of reform implementation does not necessarily increase when a central reform-minded government receives additional information about the conditions facing its agents. The trade-off between rent extraction and efficiency may actually involve slower reforms at lower costs rather than an increase in speed.
- Ramamurti (2000) Proposes a dynamic multi-level model to answer "why are so many emerging economies privatizing SOEs?" and "how does that affect their performance?"
- Small SOEs are more likely to be privatised than large SOEs.
 - SOEs resulted from nationalisation or still partially privately owned are more likely to be privatised.
 - SOEs in competitive markets are more likely to be privatised than monopolies.
 - SOEs in countries facing a macro-economic crisis are more likely to be privatised.
 - SOEs in countries with weak market-supporting institutions are less likely to be privatised.
 - Monopolistic SOEs that can benefit from regulatory innovations are more likely to be privatised than those that cannot.
 - SOEs in countries where the political leadership is ideologically committed to private ownership and market forces are more likely to be privatised.
- Alexeev and Kaganovich (2001) Present a dynamic model of the transition and argues:
- The minimum wage constraint combined with low overall labour productivity impose an upper bound on the feasible speed of privatisation. Comprehensive privatisation occurs when the economy has accumulated a sufficient stock of capital so that the marginal product of labour rises above the subsistence constraint.
 - Early privatisation in an economy in which private enterprises are not likely to operate much more efficiently than SOEs may be counterproductive if it results in suboptimal investment and postpones complete privatisation.
 - Privatising small SOEs at an early stage is generally advisable, while privatising large SOEs should often be postponed, because productivity gains due to privatisation may differ dramatically for enterprises of different size.
- Biais and Perotti (2002) Offer a political economy theory of the design of privatisation sales to shift the political preferences of the middle class to ensure re-election.
- If inequality is low, the strategic privatisation may be the equilibrium where the right-wing government optimally sets the offer price, the middle-class citizens buy shares in the privatisation and then vote for the right-wing party, and the right-wing party wins the election.
- Bennett and Maw (2003) Determine whether or not the government should retain partial ownership after privatisation.

- The optimal amount of partial state ownership depends on both the degree of competition in the product market and the weights in the welfare function.

Debande and Friebe (2004)

Model a positive theory of privatisation.

- A government may want to privatise because privatisation can provide managers with stronger incentives to exert effort, and greater managerial effort may help to maintain jobs that otherwise would be destroyed.
- Further predict that potentially profitable firms are more likely to be privatised.

Li, Ouyang and Zhou (2005)

Determine the optimal timing of micro-level privatisation.

- The greater the speed of adjustment or the ability to adjust, the quicker the privatisation should occur.
- The greater the income gains after privatisation, the more quickly privatisation occurs.
- The higher the gain-risk ratio, the sooner privatisation occurs.
- The greater the uncertainty after privatisation, the more it will be delayed.
- The lower the cost of capital, the sooner the privatisation will take place.
- The higher the transaction costs, the longer it takes for privatisation.
- The faster the macro privatisation, the greater the pressure on an SOE, and the sooner it will privatise.

Note: Each arrow mark denotes an argument or proposition. For quality reason, researches are only selected from Social Science Citation Index (SSCI).

Empirical studies in the world

Empirical studies of the determinants of privatisation began to emerge in the early 1990s (see Table 3.2). Ramamurti (1992) was a pioneer in this field through his international comparative attempt to investigate the relationship between financial conditions and privatisation initiatives in 83 developing countries during 1965-1985. He assumes that privatisation is a policy tool available to governments seeking to address macroeconomic difficulty, and further establishes four hypotheses: countries that embark on privatisation, comparing to those who do not, are supposed to have (1) worse financial performance in their SOE sector, (2) higher budget deficits, domestic and/or external debts, (3) a bigger size of public sector, or (4) deeper reliance on the bailout programme of the World Bank or the International Monetary Fund (IMF). Plane's (1997) work, embracing 35 developing countries during 1988-1992, continues this topic.⁴¹ Lopez-de-Silanes, Shleifer and Vishny (1997) expand this macroeconomic concern to a broader field of political economy. Their research hypotheses, based on American data relating to the private provision of public services during 1987-1992, focus on the soft budget constraint of local finance and the political inclination among voters in democratic elections. They believe that the hardening process in budget system will encourage local governments to privatise public services to seek the improvement in efficiency. In addition, for ideological reasons, voting behaviour that supports parties that are committed to free-market doctrines (for instance, the Republican Party in the U.S.) will generate increased privatisation. Li and Xu (2002) too examine the telecommunication sector across 45 countries in the 1990s from the perspectives of the influences of ideology and fiscal

⁴¹ In this paper, Plane extends the analysis to show how a properly functioning capital market can facilitate the process of privatisation.

policy. They share Lopez-de-Silanes's ideological argument and indicate that a right-of-centre government (that embraces free-market economics) or one in receipt of World Bank loans is more likely to embark on privatisation. However, they take a different view of the fiscal impact, and argue that the deficit burden may reduce the likelihood of privatisation.⁴²

In addition to these macroeconomic and political-economic effects, Bortolotti, Fantini and Siniscalco (2003) shed light on the institutional impact from the perspectives of legal tradition and environment.⁴³ They point out that countries with a French/German system of civil law may offer less legal protection to private investors than the countries with a (English) common law system. Hence, privatisation is less likely to occur in French/German civil law countries. They also highlight the lubrication effect of a liquid stock market on the process of initial public offerings (IPOs). Clarke and Cull (2002) also focus on factors in addition to deficits and ruling ideology. They are more concerned about the microeconomic conditions of an SOE. By examining the privatisation plans of Argentinian provincial banks in the late 1990s, they argue that poor performance is the major cause of privatisation, while overstaffing is a constraining factor that tends to reduce its probability. Gupta, Ham and Svejnar (2008) focus particularly this indicator in Czech's privatisation in early 1990s.⁴⁴ They argue that the least profitable firms should be privatised first in order to secure higher Pareto efficiency. More importantly, Gupta and his colleagues draw special attention to the information factor. They argue that privatisation is a tool for reaping information gains: accordingly, privatisation should take priority in circumstances where demand uncertainty is greatest. This 'information argument'

⁴² They also shed light on other factors, such as the size of financial sector, the level of urbanization, and the degree of income inequality.

⁴³ They also assume that financial distress (or difficulty) and the existence of a right-wing (or conservative) government would account for the occurrence of privatisation.

⁴⁴ The Czech hereby and hereafter denotes the Czech Republic, dissolved from Czechoslovakia in 1993.

gives industrial character (i.e., the character of an industry's demand market) a role in privatisation dynamics. It also justifies a previous hypothesis, presented in Aussenegg and Jelic (2007), which argues that government's decision to privatise should be related to the characteristic of industry.

Empirical studies of China

It would seem that in the wider literature the focus of privatisation studies has gradually shifted from macroeconomic pressures, political economy considerations and institutional effects toward microeconomic conditions and information issues. The focus of privatisation studies of China, however, does not follow this route. Rather, it has concentrated more on microeconomic conditions. Li and Rozelle (2000) are among the earliest researchers to try to explain the massive privatisation in China in the late 1990s. They survey 168 TVEs in rural Jiangsu and Zhejiang during 1994-1997 and hypothesise three main determinants – manager traits (i.e., manager's personal characteristics), the choice of firms' inputs and the production environment. In addition to the factors of budget hardness and market competitiveness, they emphasize the impact of managers' personal characteristics (such as education, skilfulness, experience etc) and firms' factor endowments. Li's next two papers elaborate this idea and formalise it as a human capital argument, according to which the probability of privatisation increases with the manager's human capital but decrease with the official's (Li, 2003, Brandt et al., 2005). The firm's efficiency is another concern of microeconomic factor. Wang, Li and Lei (2001) argue that the expected improvement in efficiency after privatisation is the reason why a government seeks to abandon state ownership. A similar idea is implicit in Guo and Yao's (2005) suggestion that more profitable SOEs should be the first to be privatised.

A slightly different argument is that of Fang and Smith (2008), who interpret the decline of TVEs in terms of the negative effect on efficiency resulting from the 1994 banking reform. Huyghebaert and Quan (2009) also assume a positive correlation between profitability and privatisation.

In terms of political economy, as in other economies in transition, soft budget constraint is a constant concern. Most papers about China address this topic (e.g., see Guo and Yao, 2005, Li and Rozelle, 2000, Li, 2003, Brandt et al., 2005, Lin and Su, 2008). They all believe that the removal of soft budget constraint among SOEs is a necessary condition of privatisation. However, in contrast to the mainstream literature, in studies of China political ideology does not loom large as a major focus of concern. Instead, a greater preoccupation is the issue of job security. This is reflected in the China literature in one of two ways: On the one hand, as Wang, Li and Lei (2001) argue, privatisation will be pursued when it is expected to serve important political interests by facilitating expanded employment. On the other hand, as Guo and Yao (2005) argue, privatisation will be constrained if it is expected to damage the legitimacy of governments by leading to large-scale job losses among previous state employees. These approaches indicate the existence of a trade-off between public (government) ownership and the total level of employment. Kung and Lin (2007) incorporate this trade-off into their hypothesis and attribute the decline of public enterprises (TVEs in their article) to the job creation impact of the expansion of private enterprises. Another concern for government is the fiscal burden. China's fiscal challenge, unlike that facing many transitional economies, tends to have a local, or even individual, focus. In China, privatisation is regarded more as a policy tool to rebalance local finance than part of crisis therapy designed to rescue central finance. In other words, the essence of problem lies more in the performance of individual SOEs. The implication is that SOEs with heavier fiscal burdens should be privatised

earlier (Guo and Yao, 2005, Kung and Lin, 2007). Similarly, indebted SOEs are also thought to be willing to give more new shares to private investors in stock markets (Huyghebaert and Quan, 2009).

As for the macroeconomic environment, competition is also a major part of argument in the literature about China. Intense competition in product markets will squeeze profit margins and punish less efficient firms. That is why increased competition will drive inefficient public enterprises out of market (Li and Rozelle, 2000, Li, 2003). The same mechanism may also be hypothesised through analysis of the degree of market liberalisation, since a liberalising market in which entry barriers are being lowered will tend to encourage more providers (i.e., competitors) to participate in a given product market (Guo and Yao, 2005). Li, Vertinsky and Zhou (2004) extend the focus of analysis from product competition to regional competition among Chinese provinces. They examine a mega dataset, with data for 13,520 SOEs during 1993-1995, and argue that higher exposure to inter-provincial competition will result in more private firms emerging in any given province. Furthermore, this paper offers a number of new macroeconomic insights. It is also the first to argue that the development of legal and physical infrastructure (for example, telephone density, power supply, transportation, legal expenditures or patent transaction) will facilitate privatisation. It is also the first to highlight the information factor and illustrate the diffusion of privatisation across regions and industries.

Empirical strategy

The following discussion, based on the final column in Table 3.2, focuses on the basic empirical strategy in aforementioned papers, particularly in dealing with the

potential issue of endogeneity.⁴⁵

Most authors adopt probit (Aussenegg and Jelic, 2007; Bortolotti et al., 2003; Guo and Yao, 2005; Gupta et al., 2008; Li, 2003; Li et al., 2004; Liu et al., 2006; Lopez-de-Silanes et al., 1997; Plane, 1997; Wang et al., 2001) or logit (Brandt et al., 2005; Ramamurti, 1992) models for their use of qualitative and binary dependent variables to proxy for the choice of privatisation. Tobit models are sometimes used for better comparison with results from probit models (Guo and Yao, 2005; Plane, 1997).

Yet, the decision of privatisation is treated as being able to make every year in the assumption of a probit model, which fails to account for the irreversibility of privatisation (Guo and Yao, 2005). Some authors thus prefer time hazard or duration models, setting the timing of privatisation as a (Cox proportional) function of variables (Clarke and Cull, 2002; Guo and Yao, 2005; Li, 2003), which allow the probability of privatisation to change over time. Though discrete and continuous time hazard models will reach similar results, discrete models may be more preferable for better efficacy in controlling endogeneity (Clarke and Cull, 2002).

Fixed effects model is particularly used in panel data to control historical and regional fixed effects (Kung and Lin, 2007). However, when the panel is less time-variant – such as of short time period or of time-invariant nature – a fixed effects model may throw out a certain number of observations and exacerbate measurement error problems. Some authors, instead, choose random effects models in this regard (Li and Xu, 2002; Lin and Su, 2008).⁴⁶ In addition, only one paper in the relevant literature adopts a statistical comparison over efficiency performance between public and private enterprises as the justification for privatisation (Fang and Smith, 2008).

⁴⁵ Please see Section 4.3 for more mathematical discussion about endogeneity and the bias it may introduce to regression.

⁴⁶ Lopez-de-Silnes et al. (1997) use random effects models controlling two levels of regional effects (state and county) in order to make comparison with results derived from probit models.

Most papers devote, to a greater or lesser extent, efforts addressing the potential problem of endogeneity, except Kung and Lin (2007), who acknowledge the difficulty in tackling this issue for limited range of information in their aggregate data, and Ramamurti (1992), who addresses nothing about empirical problems.

The most popular method of dealing with endogeneity in literature is re-estimation by instrument models (Brandt et al., 2005; Clarke and Cull, 2002; Gupta et al., 2008; Li, 2003), which can correct potential biases of simultaneity and omitted variables. Privatisation, as discussed earlier, can be driven by increasing hardness of government budget, but there is also the possibility that a local government may privatise as a way of removing soft budgets. This reverse causality will introduce endogeneity leading to biased coefficients in regressions. Li (2003) and Brandt et al. (2005), accordingly, choose the tightness of budget variable in *neighbouring* townships as an instrument – a variable supposed to be exogenous to the privatisation in a specific township – and conduct a Hausman test to examine the validity of instrument. Another similar causal relationship is between fiscal pressure and privatisation, while, in conventional arguments, fiscal pressure will encourage privatisation. However, based on cases of the banking sector in Argentina, provinces that spend more and thus have larger deficits in order to provide more bank services may be less likely to privatise, argued Clarke and Cull (2002). They find variables from the Argentine Constitution – the number of deputies and senators per capita and the deputies from the province as a percentage of total deputies – as instruments to capture the relative power of smaller provinces. Since these variables are predetermined in time, they should be regarded as exogenous to the privatisation reform. Gupta et al. (2008) also use predetermined variables as instruments to purge potential endogeneity among explanatory variables, by replacing each of the annual 1992 firm-specific variables by all of the 1992 *first quarter values* of that endogenous

variable as instruments.

The problem of simultaneity can also be mitigated by using lagged variables. Bortolotti et al. (2003) use lagged debt-to-GDP ratio, the stock market capitalisation to GDP, and the turnover ratio as explanatory variables to tackle potential simultaneity between privatisation with public finances and with financial market development. By the same token, Guo and Yao (2005) take the values of lagged three-year moving averages for all explanatory variables in order to avoid potential endogeneity.

To avoid a specific variable that could be endogenous is feasible, too. Regarding the proxy of hard budget constraint, the conventional wisdom may prefer the measurement of government cash-flow; however, Lopez-de-Silanes and his colleagues (1997) believe that the ability to run a deficit may have deterred the reform of privatisation in American counties. Instead of finding a proper instrument, they use a qualitative variable – based on the state laws limiting a county's ability to tax and to spend – that is surely predetermined, and hence exogenous, to privatisation.

Setting a simultaneous equations model can also identify the simultaneity between potential endogenous variables. Huyghebaert and Quan (2009) assume a simultaneous nature between public share allocation and the under-pricing in the reform of share issue privatisation, although the result of this model disproves their assumption of endogeneity.

It is noteworthy that some papers try to address the potential bias in the sample selection (Aussenegg and Jelic, 2007; Li and Rozelle, 2000; Lin and Su, 2008; Plane, 1997), an econometric problem of inconsistent results caused by dependent variables collected in a non-random sample. However, this issue of selectivity is only dealt with when the paper tries to find out determinants of firm performance (in which privatisation variable is one of the explanatory variables in the right-hand side of equation). Apparently, this is not an issue for papers identifying determinants for

privatisation, because these papers do not tend to make a fair comparison in terms of performance between privatised and non-privatised firms – a comparison meaningful only if the sample selection is unbiased.

In addition to finding determinants for privatisation programme, Plane (1997) sheds light on the privatisation effect to the GDP growth among developing countries. Yet he argues that privatisation may not be a random choice because the opportunity for privatisation may be enhanced by the expectation of improving economic growth. That is, privatisation could be an endogenous explanatory variable to the annual rate of GDP growth. To tackle the endogeneity of privatisation, Plane uses Hausman test (1978) to decide whether to use the actual privatisation variable or, instead, its instrument – estimated from the maximum likelihood probit and tobit equations – in the specification.

The Heckman two-step estimation (1979) is preferable in later years in tackling selectivity and, furthermore, controlling missing and unobservable variables (Aussenegg and Jelic, 2007; Li and Rozelle, 2000; Lin and Su, 2008). Privatisation variable is assumed to be endogenous to various dependent variables of firm performance, such as the *revenue* in Li and Rozelle (2000), the *firm value* in Lin and Su (2008), and the *real sales, capital expenditure, net income, debt-asset ratio* and *dividends* in Aussenegg and Jelic (2007).

Causality versus correlation

Another topic in privatisation literature that deserves attention relates to the relationship between causality and correlation.

As the conventional wisdom states that “correlation does not imply causation”, most of the above papers focus on the discussion of correlation and simply mention

nothing about causality (Clarke and Cull, 2002; Gupta et al., 2008; Huyghebaert and Quan, 2009; Li, 2003; Li et al., 2004; Li and Xu, 2002; Lopez-de-Silanes, 1997; Plane, 1997; Ramamurti, 1992). Some papers take a clearer stance against causality. Examining the privatisation reform in Russia, Debande and Friebe (2004) warn readers to be careful in assuming causality, because many of other things also changed in Russia simultaneously. Similarly, Bortolotti et al. (2003) cannot rule out effects from unobserved variables. They encourage readers to be cautious in the causal interpretation of their results, which they admit to be only “conditional expectations”.

By contrast, a handful of papers are more open to the issue of causality. The title of Guo and Yao’s paper (2005) is “Causes of the privatisation in China”, suggesting that they are testing hypotheses based on an assumption of causality. Liu et al. (2006) admit that they try to identify motives that make local governments privatise, implying causality between privatisation and external factors. Kung and Lin (2007) state that their model is intended to capture the causal relationship “implied” in the hypotheses. In short, these papers are happy to embrace causality in an implicit way; however, there are no doubts that their empirical findings are all interpreted on a correlation basis.

Table 3.2
Empirical studies of determinants of privatisation.

| Authors | Data | Hypothesis | Variable | | Empirical strategy |
|--|---|--|---|--|---|
| | | | Dependent | Independent | |
| Ramamurti (1992) | 83 developing countries for 1965-1985 | <ul style="list-style-type: none"> ➤ The financial performance of the SOE sector in privatising countries is likely to be worse than that in nonprivatising countries ➤ Privatising countries will have higher budget deficits, public debt, or external debt as a share of GDP than nonprivatising countries ➤ The share of SOEs in gross investment (public sector) will be higher in privatising countries than in nonprivatising countries ➤ Privatising countries will have higher levels of financial dependence on the World Bank (W.B.) or IMF as a share of GDP | Probability that a country is an active privatiser (23 countries out of 83, according to author's definition) | <p>Overall surplus/deficit of SOE divided by value added in 1970s</p> <p>(1) Budget deficit to GNP in 1983/84, (2) domestic debt to GDP for 1981-84, and (3) public debt to GNP in 1984</p> <p>SOE share in gross fixed capital formation in the late 1970s</p> <p>(1) Outstanding W.B. loans to GDP in 1985 and (2) IMF fund resources to GDP in 1984</p> | Logit models |
| Lopez-de-Silanes, Shleifer and Vishny (1997) | 3,042 counties in U.S. in 1987 and 1992 | <ul style="list-style-type: none"> ➤ The harder the budget constraints, the more likely that privatisation will occur ➤ The ambiguous effects of labour-market conditions on | Share of services provision by private contractor in 1987 | <p>(1) Dummy if the state does not allow to engage in short-term borrowing, (2) dummy if to impose debt limits on counties, (3) dummy if to mandate a balanced budget, (4) dummy if not to allow state takeover of county finances, and (5) ratio of rainy-day funds to state total expenditure</p> <p>(1) Dummy if state law allows employees to strike, (2) civilian</p> | Probit and random-effects models; avoiding cash-flow variable for endogeneity |

| Authors | Data | Hypothesis | Variable | | Empirical strategy |
|------------------------|--|--|---|---|---|
| | | | Dependent | Independent | |
| | | privatisation | | unemployment rate in 1986, (3) public-employee wage premium, and (4) union participation | |
| | | <ul style="list-style-type: none"> ➤ When more people vote for the US Republican Party, the more likely is it that local government will privatise ➤ The more difficult it is to pursue in-house provision of public services, the more likely to privatise | | Share of county votes for Republican governor (1) Dummy if state law requires to use a merit system in hiring, (2) dummy if it sets local purchasing standards, and (3) dummy if it forbids political activity by government employees | |
| Plane (1997) | 35 developing countries during 1988-1992 | <ul style="list-style-type: none"> ➤ The larger the public sector, the higher the probability of implementing a privatisation programme ➤ Privatisation may be a specific response to over-indebtedness ➤ Openness will promote private entrepreneurship and show a greater the willingness to trust foreign investors ➤ Privatisation will be facilitated by the presence of properly functioning capital markets | Dummy if implemented any privatisation during 1988-1992 | GNP per capita External public debt stock to GDP FDI inflows to income ratio Ratio of market capitalization to GDP | Probit-ML and tobit-ML models as privatisation itself as endogenous variable (Ps. Hausman test for selectivity bias as finding determinants for GDP growth) |
| Clarke and Cull (2002) | 23 provincial banks in Argentina in the late 1990s | <ul style="list-style-type: none"> ➤ Over-staffing tends to reduce the probability of privatisation | Whether the bank was privatised in a certain year | (1) Bank assets per employee and (2) government employees to population | Discrete time hazard models with IVs for potential |

| Authors | Data | Hypothesis | Variable | | Empirical strategy |
|---|--|---|--|---|--|
| | | | Dependent | Independent | |
| | | <ul style="list-style-type: none"> ➤ Banks that perform poorly are more likely to be privatised ➤ Provincial governments with large fiscal deficits may be more willing to privatise ➤ Provinces controlled by the ruling party (Partido Justicialista) may be more likely to privatise than those in which the opposition (Union Civica Radical) has the power to block legislation | | <ul style="list-style-type: none"> (1) Share of normal loans and (2) net worse to total liabilities (1) Government deficit to local GDP and (2) federal transfers to province to local GDP Dummy if the UCR could block privatisation by controlling either the executive or the legislature | <ul style="list-style-type: none"> endogenous variables <i>fiscal pressure</i> and <i>public employment</i> |
| Li and Xu (2002) | Telecommunications in 45 countries for 1990-1998 | <ul style="list-style-type: none"> ➤ A higher government budget deficit makes privatization less likely ➤ Countries with a larger financial sector, a higher urban population, and a lower income inequality are more likely to privatize ➤ Countries with a right-of-center government and countries that receive World Bank assistance in the telecommunications sector are more likely to privatize | Non-state ownership share | <ul style="list-style-type: none"> Ration of budget deficit to GDP, lagged one year (1) A component index of financial depth, (2) urban share of population, and (3) Gini coefficient (1) A component index of the ideological inclination of legislature, lagged one year and (2) dummy if the World Bank has a telecommunications project with the country | Random-effects models |
| Bortolotti, Fantini and Siniscalco (2003) | 49 countries for 1977-1999 | <ul style="list-style-type: none"> ➤ Ceteris paribus, a financially distressed government is more likely to privatise ➤ Ceteris paribus, as opposed to common law countries, French/German civil law countries | Scale of the total gross revenue from privatisation sales to its GDP | <ul style="list-style-type: none"> Total debt as percentage of GDP (1) Dummy for German civil law countries (2) that for French and (3) that for | Probit models using lagged variables to address endogeneity |

| Authors | Data | Hypothesis | Variable | | Empirical strategy |
|-------------------------------|--|---|--|---|--|
| | | | Dependent | Independent | |
| | | <ul style="list-style-type: none"> ➤ are less likely to privatise ➤ Ceteris paribus, the higher the liquidity of stock markets in a given country, the more likely it is that such countries will privatise ➤ Ceteris paribus, a right-wing government is more likely to privatise | | <p>Scandinavian</p> <p>Weighted average percentage of capital privatised by public offer and private sale</p> <p>Dummy if the incumbent executive was supported by democratic-conservative parties</p> | |
| Aussenegg and Jelic (2007) | 327 privatised firms in Czech, Hungary and Poland during 1990-1998 | <ul style="list-style-type: none"> ➤ Hypothesise that the governments' choice of timing and order of privatisation sales are associated with (1) the industry classification, (2) the choice between private and public sales, (3) foreign participation, (4) percentage of shares sold, and (5) firm size. | Early dummy, if privatised during 1990-1994 | (1) Industry dummy, for easy privatisation, (2) private dummy, if private sale, (3) foreign dummy, if foreign investors were participating (4) share sold, and (5) size, natural logarithm of firms' market value. | Probit MLE models (Ps. Heckman two-step estimations to correct selection bias as finding determinants for performance) |
| Gupta, Ham and Svejnar (2008) | 1121 firms in 1992 Czech privatisation | <ul style="list-style-type: none"> ➤ The least profitable firms should be privatised first in the interests of higher Pareto efficiency ➤ The more profitable firms should be privatised first for maximising the public goodwill, political cost and revenue ➤ The greater the uncertainty that surrounds demand, the more likely it is that early privatisation will take place in order to reap the informational gains | Dummy if the firm was privatised in the first wave | <p>(1) Difference between the total output and wage, (2) accounting profits, and (3) market share in the industry</p> <p>(1) Difference between the total output and wage, (2) accounting profits, (3) market share in the industry</p> <p>(1) Dummy of demand shock from the breaking-up of Soviet trading in 1990 and (2) dummy if in downstream industries</p> | Probit models with IVs for endogenous variables |

| Authors | Data | Hypothesis | Variable | | Empirical strategy | |
|-------------------------|--|------------|---|---|--|--|
| | | | Dependent | Independent | | |
| About China | | | | | | |
| Li and Rozelle (2000) | 168 TVEs in Chinese Jiangsu and Zhejiang for 1994-1997 | ➤ | The firm's manger traits have effects on ownership decisions. | Dummy if any share shifted to private individuals in 1994 | Manager's (1) firm experience, (2) age, (3) hometown, (4) education, (5) management experience, and (6) government experience Firm's (1) fixed capital, (2) working capital, (3) high-skilled labour, (4) low-skilled labour, and (5) loan asset ratio (1) Bank budget hardness and (2) Product market competitiveness | N/A (Ps. Heckman's two-step method to address selection problem as finding determinants for performance) |
| | | ➤ | The firm's financial inputs have effects on ownership decisions. | | | |
| | | ➤ | The improvements in the product market environment and capital markets affect firm ownership decisions. | | | |
| Wang, Li and Lei (2001) | 657 Chinese SOEs over 1980-97 | ➤ | The greater the improvement in efficiency following privatisation, the more likely it is that state ownership will be abandoned | Dummy if the SOE is privatised or liquidated | (1) Difference of ROA between privatised and non-privatised SOEs and (2) Improvement of labour-productivity after entrenchment (1) total employment, (2) output, and (3) fixed assets before the privatisation | Probit models |
| | | ➤ | The more political interests (in job creation, revenue, capital), the sooner the government to abandon state ownership | | | |
| Li (2003) | 134 Chinese rural firms for 1994-97 | ➤ | The probability of privatisation increases with the manager's human capital, but decrease with the official's | Dummy if the firm is controlling-interest shifted | Official's (1) education, and (2) age; manager's (3) education, and (4) age (1) employment, (2) export, and | Probit and hazard models with IV to control over potential endogeneity of |
| | | ➤ | The quality and size of a firm could | | | |

| Authors | Data | Hypothesis | Variable | | Empirical strategy |
|-------------------------------|--------------------------------------|--|--|--|--|
| | | | Dependent | Independent | |
| | | <ul style="list-style-type: none"> ➤ affect the probability of privatisation ➤ When the product market is more competitive, privatisation is more likely to occur ➤ The probability of privatisation increases with the hardness of the government's budget constraint ➤ The probability of privatisation increases with the existence of upper-government (i.e., higher level government) policy and its intensity | | <ul style="list-style-type: none"> (3) profit Competitive index of product market in 40 industries in China for 1988-93 A binary qualitative variable by asking township officials "how difficult is it to ask for an extension when a loan is overdue?" (1) Dummy if the presence of an upper-government policy and (2) the number of months the township is given to finish privatisation | <i>hardness of budget</i> |
| Li, Vertinsky and Zhou (2004) | 13,520 Chinese SOEs during 1993-1995 | <ul style="list-style-type: none"> ➤ The higher level of exposure to inter-regional competition, the higher the frequency of privatisation ➤ The higher the degree of government intervention and rent-seeking, the lower the frequency of privatisation ➤ The higher development of legal and physical infrastructure, the higher the frequency of privatisation ➤ The more privatisation in the neighbouring regions or industrial sector, the higher the frequency of | Dummy of the ownership choice of new firms in 1995 | <ul style="list-style-type: none"> Number of industries in a province (1) Ratio of government subsidies to retail sales in a province, (2) share of controlled revenue in a county, and (3) tax rate variation in a county Infrastructure factor (including telephone density, power supply, transportation, legal expenditures and patent transaction) (1) Privatisation factor and (2) industry privatisation level (i.e. The private share of output in a | Probit models with a theoretical assumption of endogenous change |

| Authors | Data | Hypothesis | Variable | | Empirical strategy |
|-------------------------------|---|--|---|---|--|
| | | | Dependent | Independent | |
| | | privatisation | | region/ neighbouring region/ industry) | |
| | | ➤ The lower level of government supervision for the approval of new establishment, the higher frequency of privatisation | | The level of government to which the firm reports | |
| Brandt, Li and Roberts (2005) | 338 TVEs in Chinese Jiangsu or Zhejiang for 1993-99 | ➤ The likelihood of privatisation increases with both the firm and bank manager's human capital, but decreases with that of the leader | Dummy if 100% of the firm was sold | Manager's (1) age, (2) years of education, and (3) origin dummy if from the same township; and leader's (1) age, (2) years of education, and (3) origin dummy | Logit models with IV models to check potential endogeneity from <i>hardness of budget</i> variable |
| | | ➤ Privatisation is more likely when the firm is more profitable | | Profits divided by firm sales in 1994 | |
| | | ➤ Privatisation is more likely when a TE faces tighter budget constraints or when the leader derives smaller perks (rent) from a TE | | Budget tightness: by the relationships between local governments and banks by asking the difficulty to extend an overdue loan in 1994 | |
| | | | | Firm attribute (rent): the size of (1) employment and (2) profit rate | |
| | | ➤ Privatisation is more likely to occur when banks have incentives to do so and without a constraint of too many bad loans | | (1) The profitability relative to nonprofit duties by upper-level banks, (2) manager's bonus ratio to the base wage, (3) percentage of nonperforming loans | |
| Guo and Yao (2005) | 683 Chinese SOEs for 1995-2001 | ➤ When an SOE becomes a financial burden to the city budget, the more | (1) Dummy if any private shares and (2) | (1) Tax arrears to the total assets and (2) social security | Comparison among OLS, tobit, probit |

| Authors | Data | Hypothesis | Variable | | Empirical strategy |
|-------------------------|--|---|--|--|--|
| | | | Dependent | Independent | |
| | | likely it is that privatisation will take place | dummy if more than 50% of private shares | arrears to the total assets | and duration models with all explanatory variables taking values of their lagged three-year moving averages to avoid endogeneity |
| | | ➤ The greater the profit potential, the more likely it is that the SOE will be privatised | | (1) Return to assets and (2) gap of profitability between an SOE and the average of the private firms in its industry | |
| | | ➤ Public ownership will diminish as the market becomes more liberalized | | Private share of employment to the total in that province | |
| | | ➤ The existence of a soft budget constraint will make privatisation less possible | | Dummy if the SOE is losing money and getting bank loans | |
| | | ➤ Excessive SOE debt and redundant workers are serious constraints for local government to privatise | | (1) Debt-asset ratio, (2) ratio between redundant and on-duty workers, and (3) city budget | |
| Liu, Sun and Woo (2006) | 847 Chinese SOEs for 1997-2003 | ➤ The success of privatisation depends on the meeting of the managerial cooperation, workers compensation, and the bank-debt-serving constraints | Dummy if the largest shareholder has been changed to private investors | (1) Lagged compensation cost per worker and (2) lagged debt-asset ratio for each firm | Probit model with sub-sample comparison |
| | | ➤ Local governments will be motivated to privatise if higher sales, faster growth and sustained official benefits are expected to be forthcoming | | (1) Lagged sale revenues in logarithm, and (2) lagged profit margin | |
| Kung and Lin (2007) | 27 provincial TVE sectors during 1987-1998 | ➤ Fiscal pressure: the weaker TVEs' fiscal and financial performance, the stronger will be the pressure on them to privatise | (1) sales share: share of TVEs in total sales revenue of rural enterprises, and (2) workforce share: share of TVEs in total workforce of rural enterprises | Sum of taxes and net profits divided by fixed assets of TVEs | Fixed effects models |
| | | ➤ Job creation pressure: the faster the growth rate of new entrants to the rural workforce the stronger the pressure to rely on private enterprises | | Growth rate of non-continuing junior and senior high school graduates in rural areas divided by growth rate of newly added | |

| Authors | Data | Hypothesis | Variable | | Empirical strategy |
|-----------------------------|--|---|--|--|---|
| | | | Dependent | Independent | |
| | | | | | |
| | | for job creation | | rural workforce | |
| Lin and Su (2008) | 816 firms listed during 2000-2002 | <ul style="list-style-type: none"> ➤ State ownership is negatively related to firm value due to agency problem and soft budget constraint ➤ Legal ownership status is tied to better firm performance for more expert knowledge and better monitor management ➤ Firms in growth industries are more likely to engage in value-enhancing diversification | Dummy if a firm engages in diversification | Government share Legal share (1) Dummy in growth, (2) consolidating, (3) technical change and (4) declining industry among all industries | Random effects models. (Ps. IV and Heckman models as finding determinants for firm value) |
| Fang and Smith (2008) | 57 Chinese TVEs and PEs for 1988-99 | <ul style="list-style-type: none"> ➤ After 1994 bank reform, TVEs should have encountered institutional disadvantage that is worse than PEs in terms of efficiency | Comparison of revenue between TVEs and PEs | (1) Revenue, (2) net income, (3) total payments for intermediate inputs, (4) total payments to labour, and (5) value of physical capital | Conduct statistical comparison by average data |
| Huyghebaert and Quan (2009) | 521 SOEs listed in SHSE during 1994-2005, in Shenyin & Wanguo Securities Company Ltd. Database | <ul style="list-style-type: none"> ➤ More highly indebted SOEs will issue a higher portion of new shares at share-issued privatisation (SIP) ➤ Profitability will negatively influence public share allocation (i.e. leverage has a positive impact on public share allocation) ➤ Poor financial performance will lead to larger public share allocation | Public allocation, the fraction of A shares sold at SIP relative to the total number of shares outstanding | Debt ratio, the ratio of short-term and long-term (1) (1) bank loans to total debt, (2) subsidies, and (3) ratio of subsidies to sales Leverage, the book value of debt and current liabilities divided by total assets Ratio of administrative expenses to sales Asset turnover, ratio of sales to | Establish a simultaneous equations model to account for the potential endogenous nature of <i>public share allocation</i> and <i>underpricing</i> . |

| Authors | Data | Hypothesis | Variable | | Empirical strategy |
|---------|------|---|-----------|--|--------------------|
| | | | Dependent | Independent | |
| | | <ul style="list-style-type: none"> ➤ Historical stock market returns and the clustering of prior listings will still not be significantly related to public share allocation ➤ Under-pricing costs are negatively associated with public share allocation | | total assets (1) Market return on the Shanghai stock exchange in the year before SIP, (2) number of new firm, listed in the year preceding the SIP scaled by the raw data, and (3) sample size Underpricing, first-day stock return minus the market return between share offering and listing | |

Note: Each arrow mark denotes a hypothesis. For quality reason, researches are only selected from the papers published on journals listed on Social Science Citation Index.

Source: Author's summaries.

3.2 Theoretical discussion and establishing hypotheses

The above arguments and statements about the determinants of privatisation can be generalised into the following hypotheses.

Soft budget constraint hypothesis

The soft budget constraint is among the earliest factors discussed in the privatisation literature. In Kornai's (1979) classic argument that the socialist mechanism reproduces economic shortage, he builds a bridge between public ownership and the soft budget constraint. He shows how production is constrained by limited resources, limited demand and limited budgets. He argues that the budget constraint is hard when the firm's spending is effectively delimited by its financial ability.⁴⁷ By contrast, the budget constraint is soft when the firm's losses are almost automatically compensated for by the state – a situation that tended to make the firm's demand almost insatiable. Under the soft budget constraint, the state will protect the firm from bankruptcy, so that the growth of its demand does not depend on its own financial position. Qian's (1994) incentive model supplements Kornai's shortage theory by demonstrating that soft budget constraint generates shortage because household consumption is crowded out by too many bad (inefficient) projects.

The existence of a soft budget constraint is correlated with the occurrence of privatisation because, as Lopez-de-Silanes, Shleifer and Vishny (1997) argue, a hardening budget constraint will make it more difficult for politicians to spend public

⁴⁷ In Kornai's own words: "A budget constraint is hard if it is asserted with iron discipline: the firm can spend only as much money as it has. It has to cover its expenses from its incomes from sales. It is entitled to take out credit, but the bank is prepared to grant credit only under 'conservative' and 'orthodox' conditions. This can be, therefore, only an advance for subsequent proceeds from sales. The budget constraint is soft, if the above-mentioned principles do not get asserted consistently."

money for political gain. Chen's (1996) game model seeking to investigate the optimal privatisation explores this dynamics. He distinguishes two kinds of public servants – bureaucrat and populist – and assumes that, first, the goal of the *bureaucrat* is to maximise the surplus budget, summed up as revenue, subsidies and sales from the public sector plus taxes from the private sector. What the bureaucrat must decide is how to choose a sector to privatise and how to determine the level of consumer compensation (subject to the constraint imposed by voters' wishes) so as to maximise his utility (that is the surplus budget). Second, the goal of the *populist* is to maximise popularity or consumer welfare (subject to a balanced budget) in making his privatisation decision. Chen's model illustrates that the optimal behaviour for the bureaucrat, or the optimal policy for the populist, will be to begin the privatisation process in the sector which has the largest subsidies or faces the most intense competition. This game model of privatisation therefore explains how, by reducing state subsidies, the hardening budget constraint will encourage the bureaucrat or the politician to embark on privatisation. This theory is applied to China for the first time by Cao, Qian and Weingast (1999), who argue that the Chinese privatisation of the late 1990s was induced by a series of reforms that removed soft budget constraint. Tax reform made it more difficult for local governments to evade national taxes. Fiscal reform meanwhile required that as government borrowing became more restricted local finances should be balanced. Local governments could no longer expect to be bailed out as easy as they had been in the past. Hence, their political influence to local banks over loan decisions was diminished.⁴⁸

Empirical studies offer unqualifiedly positive evidence in support of this hypothesis. There are two kinds of variable definition for soft budget constraint – *objective* and *subjective*. In terms of the objective variable, Lopez-de-Silanes, Shleifer

⁴⁸ Details of these reforms are discussed in Chapter Two.

and Vishny (1997) find that the service provision by private contractors (the privatisation proxy) among 3,042 American counties during 1987-1992 increased in countries where state regulation did not allow county government to engage in short-term borrowing. They also find that the scale of private provision was smaller in counties whose ratio of the state's "rainy-day funds" (which are reserves that can be made available for unforeseen circumstances) to total expenditure was larger.⁴⁹ Guo and Yao's (2005) regression on 683 Chinese SOEs during 1995-2001 presents a similar result – viz., that if an SOE was losing money and meanwhile getting bank loans (meaning that this SOE faced a soft budget constraint), its likelihood to be privatised was reduced. By examining 521 listed SOEs in the Chinese stock market during 1994-2005, Huyghebaert and Quan (2009) also confirm that Chinese government was determined to replace subsidies with public allocation (by issuing more A shares to the private market).⁵⁰ In terms of the subjective variable, questionnaires have been designed to measure the real softness of the budget constraint. In Li and Rozelle's (2000) survey of more than 168 TVEs in rural Jiangsu and Zhejiang during 1994-1997, they measure the hardness of bank budget constraint by asking whether bank managers "are allowed to make their own decisions". The authors assume that banks managers will act more commercially and grant less money to inefficient projects if they are given more freedom in making loan decision. Their finding is as expected. Based on the same survey, Li (2003) subsequently designs another question for township officials: "How difficult is it to ask for an extension when a loan is overdue?" He finds that the firm's controlling-interest was more likely to have been shifted to private hands, the more difficult it was for township officials

⁴⁹ They find no significance in the following kinds of soft budget dummies: (1) if the state imposes debt limits on counties; (2) if the state mandates a balanced budget on counties; and (3) if the state is allowed to take over a country's finance.

⁵⁰ "A share" is traded in Renminbi and cannot be invested directly by foreign individuals, according to Chinese law.

to seek a loan extension. Brandt, Li and Roberts (2005) continue this work, retaining the same measurement. Their result is the same.

Political ideology hypothesis

The influence of political ideology toward privatisation has been extensively examined in literature, just next to the factor of soft budget constraint. In reality, privatisation is better viewed as a political decision than an economic calculation, and it will not occur in the absence of political will and support. Ramamurti (2000) argues that, in some transitional countries such as the Czech, Hungary and Russia, many new political leaders privatised as fast as they could in an attempt to ensure that the political and economic changes following the collapse of *Berlin Wall* (i.e., the symbol of the democratisation movement in Eastern Europe and former Soviet Bloc) would be irreversible.⁵¹ Li and Xu (2002) attribute the origin of ideological dimension to the Washington Consensus, which made privatisation one of its most important prescriptions. They argue that the involvement of international organisations – for example, the World Bank or the IMF – often entails the advocacy of privatisation for which financial incentives are provided.

What bridges the political strategy with the economic policy? Chen's (1996) optimal model of privatisation, as discussed, is among the earliest to describe how a populist politician will use privatisation as a tool to increase social welfare and thereby win votes in elections. Biais and Perotti's (2002) Machiavellian model successfully lends political economy theory to privatisation. Their model illustrates the dynamic of a situation in which, without privatisation, the middle-class citizens

⁵¹ Ramamurti also argues thereby that the reason why privatisation has not been pursued in Cuba and North Korea where macroeconomic performance has also been poor, lies in the lack of the same ideological commitment.

will always vote for a left-wing opposition party, but in which a right-wing ruling party can utilise privatisation to shift political allegiances to its own benefit and so win a majority of the electorate's votes (subject to the condition that the citizens' stakes in privatised firms are large enough and the problem of social inequality is not too serious).⁵² Since the larger the size of the privatisation programme the easier it is to shift the political preferences of the middle-class citizens, the prevalence of free share distribution and voucher privatisation in some transitional economies is therefore justified.

This hypothesis is well supported by empirical evidences. By comparing the telecommunication sectors of 45 countries during 1990-1998, Li and Xu (2002) report a significant and positive correlation between the market-oriented ideological inclination of legislatures (by a component index) and the share of non-state ownership in a country.⁵³ They also document that those countries engaging with the World Bank's telecommunication project were more likely to have a larger non-state sector. In American localities, it is also found that the higher the share of votes of the Republican Party (which is traditionally perceived as being more committed to the free-market doctrine than the Democrat Party) during 1987-1992, the greater the

⁵² The two-period dynamics is as follows: In the first period, the citizens receive their first-period income; the party in power chooses an economic policy, which involves determining the tax rate for the period and possibly setting up a privatisation scheme; the market consumption takes place; elections take place. In the second period, citizens receive their second-period income; the party in power chooses the second-period economic policy, which involves setting the tax rate and deciding whether to expropriate shareholders through re-nationalisation; the manager of the privatised firm decides whether to exert effort under given conditions; the profit of the firm is realised while the politicians in power can target transfers to their preferred constituency if the firm is under state ownership; consumption takes place.

⁵³ This component index is a formula constructed by three variables indicating the ideological inclination of the legislature: i.e., the right, the centrist and the left inclination of government. Li and Xu borrow the definition, developed by Beck et al., in which the ideological inclination is defined by party names. A party is defined as 'Right' if it is defined as conservative, Christian democratic, or right-wing; 'Left' if it is defined as communist, socialist, social democratic, or left-wing; and 'Centre' if it is defined as centrist or can best be described as centrist, such as a party advocating strengthening private enterprise in a social-liberal context. See BECK, T., CLARK, G., GROFF, A., KEEFFE, P., and WALSH, P. (2001) New tools in comparative political economy: the database of political institutions. *World Bank Economy Review*, 15, 165-176.

number of social services contracted by private providers (LopezdeSilanes et al., 1997). Argentina in the late 1990s (under the rule of then President Menem's party, the Partido Justicialista (PJ)), was seen as fiscally conservative and PJ politicians were widely believed to be strongly committed strengthening the banking system by privatisation in order to prevent this system collapsed and to secure the party's credibility. By contrast, the left-wing opposition party, Union Civica Radical (UCR), was opposed to this policy logic. The finding of Clarke and Cull (2002) confirm that the UCR tended to block bank privatisation in areas where this party controlled the executive or legislature in a locality. Similarly, as Bortolotti, Fantini and Siniscalco (2003) argue, credibility is another ideologically-related concern of right-wing governments, since it impinges on private investors' willingness to pay.⁵⁴ Their research, across 49 countries from 1977 to 1999, indicates that in countries in which the incumbent executive was supported by democratic-conservative parties privatisation sales continued a larger share of their national gross revenues.

Decentralisation hypothesis

According to the literature, decentralisation may trigger privatisation for three reasons: information, budget constraint and market competition.

Hayek advocates decentralisation because this policy can solve central government's problem of lacking knowledge of local circumstances of time and space. This 'information issue' makes privatisation crucial to decentralisation because privatisation allows a better platform in terms of price mechanism for local economic sectors to communicate information of production with each other (See Glaeser and

⁵⁴ Also, enhanced credibility will improve the credit rating for government bonds and then generate lower interest payments; see BORTOLOTTI, B., FANTINI, M. & SINISCALCO, D. (2003) Privatisation around the world: evidence from panel data. *Journal of Public Economics*, 88, 305-332.

Scheinkman, 1996). This ‘information argument’ is further developed by Dewatripont and Maskin (1995) in a game model that focuses on the transferability of information which, they argue, is an important criterion on the basis of which to distinguish between centralisation and decentralisation. They model the funding decision of good (profitable) and bad (unprofitable) projects under a centralised or decentralised credit market. The result (i.e., this model’s equilibrium solution) shows that, under centralisation, bad projects will continue to be funded. By contrast, only good projects will be funded under decentralisation thanks to greater financial discipline being brought to bear to reduce soft budgets.

Then, Qian and Weingast (1997) establish a federalism hypothesis that argues that – through decentralised information and the state power – federalism will provide positive incentives to limit state predation problems, as well as to minimise soft budget problems. Meanwhile, the competition intensified by the federalisation among localities will also endogenously harden the budget constraint and change the incentives of local politicians. Qian and Roland (1998) make this argument clearer by generalising two effects – the competition effect, and the check and balance effect. The first effect suggests that fiscal competition among local governments under the limitation of factor mobility will increase the opportunity costs of bailout. The second effect suggests that the policy of fiscal decentralisation, together with the policy of monetary centralisation, will induce a conflict of interests between central and local governments, and reduce inflation and harden budget constraints. Based on same theories, Cao, Qian and Weingast (1999) generate a Chinese-style federalism argument to suggest that the massive privatisation in late 1990s was attributable to previous decentralisation reforms. They argue that the newly established federal structure – formed by decentralised fiscal power – in China provided local governments with strong incentives to privatise. Intensified competition generated by

an expanding and booming of private sector made it more difficult for local governments to maintain inefficient SOEs. Further, the hardening budget constraint changed the calculation of costs and benefits among local governments. All these factors helped trigger privatisation. Its prevalence also benefited from the information advantage that local governments acquired from localised privatisation programmes.

In the end, however, a fair assessment is that the decentralisation hypothesis is relatively ignored by the literature. Empirical evidence is largely lacking; nor has anyone designed a subjective or objective variable of decentralisation. In most cases, the influence of this factor is embodied within the competition factor and the soft budget constraint. In short, finding a variable that can effectively represent this hypothesis remains a challenge.

Market competition hypothesis

Market competition, also referred to as market development or market liberalisation, is a major hypothesis in privatisation literature. As Ramamurti (2000) says, “Nowhere in the literature is there any theoretical argument in favor of state ownership of firms in competitive markets.” Under conditions of increased market competition, the problem of agency failure will be magnified and the organisational weakness of SOEs will be even more clearly exposed. Privatisation is thus seen as a means of improving the competitiveness of inefficient SOEs. In David Li’s (1996) theory of ambiguous property rights, the justification of government ownership lies in market imperfections. His argument is that since government can help overcome transaction obstacles caused by market imperfections, in situations in which property rights are poorly defined government-owned enterprises are able to achieve greater efficiency than their private counterparts. This theory further suggests that as markets

become more efficient and/or more market imperfections are corrected, the necessity of government ownership is reduced. In this way, privatisation is justified and encouraged.

Some papers explore the interaction between competition and privatisation through an investigation of the optimal scale of state ownership (“optimal” in terms of maximising the social welfare). Matsumura (1998) seeks to show how much state ownership should be retained after privatisation by modelling a quantity-setting duopoly involving a private firm and a privatised firm with a mixture of public and private ownership. His model demonstrates that in the absence of private participation (equivalent to privatisation), social welfare will be optimal only if the firm is a monopolist; if the firm is not a monopolist (implying the existence of a competitive market), social welfare will not be optimal without private participation (privatisation).⁵⁵ Bennett and Maw (2003) explore the same question and reach a clearer conclusion. They demonstrate that in a two-firm differentiated-product oligopoly, the optimal amount of retained state ownership will depend on the competitiveness of the product market. As discussed above, Chen’s (1996) model reaches the same conclusion: that for the bureaucrat, defined here as someone who seeks to maximise incremental budget, his maximal budget will only increase with the decrease in the market power of a specific sector. That is to say, the bureaucrat will gain most by privatising the most competitive public sector. By the same token, for a populist politician, defined as someone who seeks to maximise welfare and popularity, the optimal strategy is exactly the same as that of the bureaucrat.

Among empirically-driven studies, Plane (1997) focuses on the openness and the

⁵⁵ In Matsumura’s two-firm optimal model, he derives the following proposition: If firm 1 is fully privatised, then full privatisation is optimal if the market share of firm 1 is smaller than 1/3. If firm 1 is a public firm, then full privatisation is optimal if the market share of firm 1 is smaller than 3/4. In other words, if market is highly competitive (meaning firm 1’s market share is always small), no matter firm 1 is a public or fully privatised firm, full privatisation will be optimal for maximising social welfare.

capital function of the market. He argues that the degree of market openness will reveal the authority's willingness to trust foreign investors, as well as its determination to promote private entrepreneurship. In addition, the development of the capital market will enhance the transparency of the production system and engender more political support to the commitment of developing a market economy. His measures of the ratio of FDI inflows to total income and of market capitalisation to national GDP are all positively correlated with the number of privatisation sales among 35 countries during 1988-1992. Li and Xu's findings (2002) from their international comparison of the telecommunications sector are similar. They show that the share of non-state ownership in a country's telecommunications sector increases along with the progress of financial deepening, defined in terms of a component index of financial depth.⁵⁶ Bortolotti, Fantini and Siniscalco (2003) hold the same assumptions and argue that the liquidity of stock market will facilitate ownership diversification, information aggregation, monitoring of managers and the regulation of firms. Their large-scale dataset, covering 49 countries over two decades, confirms the positive correlation between government's privatisation revenue and market's privatised capital. Guo and Yao's (2005) liberalisation argument also suggests that the removal of entry barriers (equivalent to raising market competition) together with price liberalisation will correct market imperfections and encourage SOEs to embrace more private shares, or even full-scale privatisation. They document a strong positive correlation between the private share of employment in a province (the proxy of market liberalisation) and the likelihood of provincial SOE privatisation. Li, Vertinsky and Zhou (2004) measure the degree of competition directly by the number of industries in a province and conclude that it will increase (with significance level at

⁵⁶ This composition includes three factors – the M2/GDP, stock market capitalisation/GDP and bank assets/GDP.

15 per cent) the probability that a new enterprise will register as being privately owned. Li and Rozelle's (2000) survey of the rural Jiangsu and Zhejiang of the mid-1990s also demonstrates this competition effect. They borrow Yang's (1998) competitive index of the product market in 40 industries as the proxy for competition and regress out a strong correlation between competition and privatisation.⁵⁷ Li's subsequent work (2003) confirms this result. Without empirical testing, Cao, Qian and Weingast's (1999) observation concludes that intensified competition resulted from the rapid increase of foreign direct investment and the boom in non-state enterprises was the major trigger of the massive privatisation that took place in China in the late 1990s.

Financial pressure hypothesis

The financial pressure, or fiscal stringency, hypothesis is described as the most common trigger in Yarrow's (1999) privatisation theory. He argues that demands for increased public expenditure across a wide variety of activities and across a wide range of countries have raised the opportunity costs of public finance. This results in tightened SOE budgets, curtailed investment programmes, and the eventual divestiture of SOEs. Due to the soaring costs of financial stringency, privatisation can be expected to occur where the marginal costs of government revenue are high and rising. However, privatisation is a painful therapy as many governments recognise. Hence, most governments' preference to solve macroeconomic crises by raising taxes, or borrowing from home or abroad, rather than pursuing painful privatisation reforms

⁵⁷ Yang's competitive index estimates the barriers to entry of 40 major industries in China by modelling entry as a *function* of various incentives to enter. These incentives include the degree of firm concentration, capital requirement for the establish a new firm, scale of economies, possible intervention of local government, regulation of central government and risks in market. He identifies 16 industries as "lowest barriers to entry" and 9 industries as "highest barriers to entry".

(Ramamurti, 2000). Yet the reality may not always allow them to follow these less painful paths. When the limits of taxing and borrowing are reached, privatisation may become inevitable. This perhaps explains the privatisation wave following the oil crises of the 1970s and the debt crises of the 1980s. Many governments by then found it difficult to squeeze more money out of taxpayers and savers at home or from lenders abroad, and instead they resorted to privatisation to increase short-term cash flows (Ramamurti, 1992). This crisis argument places considerable emphasis on pressures of structural adjustment required the international institutions, such as the World Bank or the IMF, as sources of last-resort loans. “Stabilise, privatise and liberalise” became the mantra of many advocates of the so-called Washington Consensus. In addition, the design of “debt-equity swap” has also facilitated the use of privatisation as a tool for solving debt problems. In this initiative, loans are allowed to be paid by issuing new shares to private investors. It therefore makes privatisation therapy particularly attractive in heavily indebted countries (Bortolotti et al., 2003).

All these arguments suggest a positive correlation between increasing financial pressures and the occurrence of privatisation, although there are some who have argued in favour of a reverse causation. Even if privatisation solves the fiscal problem, it may not benefit the politician, if privatisation reform weakens his political and regulatory control capacity – and hence damages his ability to extract rents. Profitable sectors or SOEs may be seen as a politician’s “cash cow”, leading him to weigh the benefit of a one-time receipt from the privatisation against the loss of control over future cash flows. This ‘cash cow argument’, also known as the patronage argument (put forward in Li and Xu (2002)), predicts that, in the absence of severe macroeconomic crisis, financial stringency may not stimulate privatisation but, instead, constrain it. This negative correlation is also implicit in Guo and Yao’s (2005) debt evasion argument. They agree that fiscal liability should be a strong driver of

privatisation, but they argue that this driver is subject to the constraint of debt evasion. If considering the role of bank, a privatisation sale may be vetoed or taken to court by the bank if it fears repayment of any loans may be evaded following the takeover.

Ramamurti's (1992) examination indicates that in the early 1980s, countries with higher budget deficits, domestic or public debts were more likely to have experienced five or more privatisation transactions before 1988 (such countries being defined in the study as active privatisers).⁵⁸ The same phenomenon is found to have characterised countries with larger ratio of loans to national GDP from the World Bank in 1985.⁵⁹ In two large-scale and long-term cross-country surveys, Plane (1997) and Bortolotti, Fantini and Siniscalco (2003) report the same result – namely, that during the period between the 1970s and 1990s, countries with higher debt/GDP ratios had completed more privatisation transactions. Clarke and Cull's (2002) finding in regard to the local deficit/GDP ratio in Argentina during the 1990s is also close to above results (with significance at 15 per cent level). Local governments in receipt of more federal transfers (to enable them to write off deficits) were more likely to engage in state bank privatisation. Evidence from China is also consistent. The loan share and debt-asset ratio are repeatedly reported to be positively correlated with the incidence of local privatisation in Li and Rozelle (2000), Brandt, Li and Roberts (2005), Liu, Sun and Woo (2006), and Huyghebaert and Quan (2009) (these studies being based on individual surveys across rural TVEs, traditional SOEs and some SOEs listed in stock markets). Kung and Lin's (2007) provincial survey reports a similar result to the effect that rising fiscal pressure (as shown by the sum of taxes and

⁵⁸ Ramamurti divides 83 countries into three groups – 28 countries designated as active privatisers, 21 countries as cautious privatisers, and 35 as nonprivatisers – the categorisation being based on whether, as of December 1987, countries had completed five or more transactions, between one and four transactions, or zero transactions, respectively.

⁵⁹ A finding against hypothesis is noted in the ratio of IMF fund resources divided by national GDP in 1984. The author attributes this exception to the possible econometric problem of multicollinearity and regards it not a piece of counterevidence.

net profits divided by the fixed assets of TVEs) may have accounted for the shrinkage in the number of local TVEs. There is one exception, however: Guo and Yao (2005) use the tax arrears to total assets and the social security arrears to total assets as the proxy of fiscal liability, but their results show no findings at any level of significance.

As to counter-arguments, there is also some evidence that supports a negative correlation between financial pressure and privatisation. Li and Xu (2002) test the 'cash cow argument' by measuring the deficit/GDP ratio in the telecommunications sector in 45 countries. They do find that, in less democratic countries, the telecommunications sector had been frequently treated as the politician's cash cow, and that financial pressures had constrained rather than not stimulated privatisation. The strength of this argument is enhanced by the finding that this constraint was not observable in democratic countries during the 1990s. Moreover, Guo and Yao's (2005) debt evasion argument is also supported as correlating the debt-asset ratio with the emergence of private share among 683 SOEs in the late 1990s.

Institutional infrastructure hypothesis

Inherent in transaction cost theory is the assumption that institutional infrastructure will facilitate privatisation.⁶⁰ The quality or degree of sophistication of market-supporting institutions determines privatisation because deficient institutional environment will raise transaction costs and deter potential private sector investors. Reducing transaction costs will require institutional changes in areas such as property right protection, business laws, competent regulatory agencies (to ensure fair

⁶⁰ Coase and Williamson define the firm as a non-market institution evolving to economise on transaction costs; however, the objective function of an SOE is much more complex and does not necessarily reflect prioritisation of this goal (see Plane, 1997). This implies that various policy burdens placed upon public enterprises would increase rather than decrease transaction costs in the market. Yet this explanation is closer to the cash cow argument. The transaction cost argument discussed here focuses on the costs raised in privatisation transactions.

competition or to protect minority shareholder rights), independent courts (to enforce laws), financial institutions (that can mobilise and loan out private savings), and so on (Ramamurti, 2000). Improvement in the legal system is a crucial element, particularly for former communist countries during the market-oriented transition. This is because in these transitional economies, the legal system that protects private property had long disappeared in the wake of rapid nationalisation. Needless to say, without a sound legal system that favours private ownership, privatisation may involve substantial political and economic risk, and hence suffer from high transaction costs (Li et al., 2004).

Li, Ouyang and Zhou (2005) include the factor of transaction cost and set up an optimal timing model of privatisation strategy. They define the total costs of privatisation in this model as consisting of a function of time, the speed of adjustment, and the level of transaction costs; whereas transaction costs often reflect, *inter alia*, non-monetary costs, such as the time spent on cultivating connections or combating political resistance to privatisation. The optimal timing of firm privatisation will depend on a number of factors including transaction costs, capital costs, speed of adjustment, risk aversion, current income, performance and the level of uncertainty. They further argue that the higher are transaction costs, the longer it will take for the privatisation to take place. A similar argument is provided in Alexeev and Kaganovich (2001), whose game model shows that under an adverse institutional environment, early privatisation will result in sub-optimal (rather than optimal) investment – which will in turn postpone the completion of privatisation. Therefore, early privatisation is advisable only in the economies capable of providing a favourable environment that can enhance the efficiency of private enterprises; otherwise, if economies fail to provide sufficient protection to the private sector, early privatisation may be counter-productive and even make things worse. The implication cannot be clearer:

institutional improvement in the macro context should precede ownership reform. More importantly, the postponement of individual privatisation may not justify the delay of more comprehensive liberalisation in macroeconomic environment.

It is unfortunate that there is scarce empirical evidence to lend support to this hypothesis. The reason may be simple: the change in institutional environment is not easily quantified and measured before being correlated with any privatisation proxy. That is why Bortolotti, Fantini and Siniscalco's (2003) effort to link a country's legal origin with its current privatisation policy is unique. They argue a country's choice of legal system – i.e., whether it follows French/German-style civil law or English common law – will affect its government's willingness to adopt privatisation. This reflects the likelihood that a government of civil law countries is typically an influential stakeholder, as well as an active interventionist, and therefore tends to keep a larger SOE sector (even if it performs poorly). Just as predicted in the cash cow argument, a politician may prefer to enjoy the 'control rents' (i.e. the rents due to holding control rights) over SOEs and be unwilling to let the powerful instrument of redistribution fall into private hands. Therefore, the transaction costs – such as combating for political resistance – in the civil law countries are likely to be high. By contrast, common law countries often have a smaller SOE sector, being less likely to encounter political resistance. Legal protection of property rights is usually extended to private shareholders and creditors, which in turn leads to a better result in terms of corporate governance and a higher market value for enterprises. Accordingly, institutional advantages should make more popular in common law countries. The empirical evidence supports this. By categorising countries into (on the one hand) French-, German-, or Scandinavian-like civil laws countries and (on the other) English-type common law countries, Bortolotti and his colleagues report a negatively significant result in "Germanic law" countries, including Austria, Germany, Japan,

South Korea, Switzerland and Taiwan. They explain that it is these countries' relatively strong banking sector that has reduced the feasibility of privatisation. As for China, Li, Vertinsky and Zhou's (2004) research is the only study that focuses on its legal system. Their research points to the uneven development across provinces in terms of legal protection of intellectual property markets, including patent applications, registrations, and technology transactions. Their remit also includes physical infrastructure, and they argue that a more developed physical infrastructure – roads, transportation, power supply and communication networks – will facilitate business operation, enhance businesses' ability to compete, expand profit-making opportunities – and so lead to more privatisation. Their infrastructure factor – composed of telephone density, power supply, transportation, legal expenditure and patent transaction – is found to be highly correlated with the prosperity of private enterprises.

Economic efficiency hypothesis

The economic efficiency hypothesis is another major element in the privatisation literature. How to improve the *Pareto efficiency* among loss-making SOEs is the most common question facing a government considering whether or not to embark on privatisation reform.⁶¹ This Pareto argument predicts that a government should start the privatisation at the point of minimum efficiency in order to maximise the efficiency improvement (see Gupta et al., 2008). Thus, less efficient SOEs should be the first to be targeted for reform because their privatisation is likely to maximise potential interests. This privatisation strategy is demonstrated in Li, Ouyang and

⁶¹ “Pareto efficiency” is a basic economic concept that captures the optimal allocation of economic resource. In this allocation, no one can be better off without making someone else worse off (otherwise, there is still space for “Pareto improvement”).

Zhou's (2005) model, which shows that only if expected post-privatisation gains are sufficiently large will privatisation take place. Some models explore the inner mechanism of this hypothesis.

Leyden and Link (1993) shed light on political and production risks that may reduce an SOE's (the "bureaucrat's" in their model) ability to produce goods or provide services. They first distinguish two different time-lines of the decision-making process in production: one with the bureaucrat in charge of production, and the other with the private firm replacing the bureaucrat and assuming the responsibility of production.⁶² They argue that the constraint of budget and self-selection effect (which captures the likelihood that the more-risk-averse bureaucrat will be offered a government job) will make a bureaucrat try his best to avoid risks. This risk-averse bureaucrat, hence, will tend to mitigate the uncertainties in production by contracting with private firms in order to deliver a guaranteed, specified level of goods or services that he is asked for. Through this "risk-shifting" argument, Leyden and Link (1993) justify the bureaucrat's motivation to opt for privatisation. Their argument also implies that less efficient SOEs should be privatised first since they should bear higher uncertain political or production risks.

Debande and Friebe (2004), however, suggest that the result may be otherwise, using a model that focuses on managerial incentives. Two cases are initially distinguished: *Case A* – in which the government seeks to maximise employment, while the manager seeks to maximise profit. In these circumstances, the government will find that privatisation is the cheapest way to encourage a private manager to exert efforts; and, as a result, more jobs will be preserved and/or created. Thus, efficiency

⁶² The former time line without privatisation includes four periods: (1) Legislature provides budget contingent on output; (2) bureaucrat chooses level of effort; (3) political or production risk is realised; (4) output is produced. The latter time-line associated with privatisation includes five periods: (1) Legislature provides budget contingent on output; (2) *bureaucrat contracts with firm*; (3) *firm begins production*; (4) political or production risk is realised; (5) firm finishes production.

has nothing to do with privatisation. However, in *Case B* – where the government tries to stabilise current budget level, while the manager tries to seek rents – privatisation will favour more profitable firms, which will provide more incentives for the manager (who is the residual claimancy) to exert more efforts.⁶³ By contrast, privatisation of unprofitable firms will de-incentivise the manager, since his expected interests after privatisation is reduced. This model, therefore, suggests a positive correlation between efficiency and privatisation, meaning that privatisation will begin with relatively more profitable/efficient firms.

Following the same rent-seeking argument, Brandt, Li and Robert (2005) establish a game model bringing in the crucial role of bank. This model assumes that the bureaucrat (i.e., the leader in this paper) may prefer not to privatise a firm in order to retain his large perks. However, this attempt may be frustrated by the bank. This is because as it contemplates the future return, the bank will prefer to lend to a more profitable private firm, instead of a less profitable government-owned firm. Privatisation, therefore, will be triggered by bank's loan decision, and will favour more profitable/efficient firms.

Profitability may also encourage privatisation through the “ice-pop effect”, firstly coined by Garnaut, Song, Tenev and Yao in their 2003 paper (quoted from Guo and Yao, 2005). This effect gives an explanation of goodwill to privatisation – to protect valuable/productive state assets from melting down (like popping ice) by

⁶³ It is worth noting that, for simplicity, Debande and Friebe do not model the case where the transfer is characterised by separate control rights and cash flow rights. They are, however, aware of this difference, which is the subject of a brief discussion in their paper. There are two types of separated transfer – regulation and corporatisation. Under regulation, the government retains the control rights and the manager receives cash flow rights; while in corporatisation, the manager receives control rights and the government retains cash flow rights. They argue that the ownership form of corporatisation combines the *worst* elements of privatisation and state ownership because the manager will never internalise the consequences of his actions and can even divert controlled restructuring funds to unproductive uses. But regulation yields a different result. It may incite the manager to exert the same level efforts as in privatisation, while the government can also set a higher level of employment target to induce the manager to work harder.

frequently seen mismanagement and corruption. So, privatisation will be with the most valuable asset (i.e., the most efficient SOE) suggesting a positive correlation between efficiency and privatisation. Guo and Yao (2005) describe this effect through the use of an old Cantonese idiom “prettier-daughter-marries-first” (靚女先嫁). In other words, relatively better-performing SOEs have a better chance to raise efficiency after privatisation, so they should be privatised first.

Gupta, Ham and Svejnar (2008) reach the same conclusion. Their model shows that in a normal case in which the government is Pareto-efficiency-maximising privatisation will begin with loss-making or less profitable firms. By contrast, however, if the government is public-will-maximising or political-cost-minimising, privatisation will then begin with most profitable firms in order to maximise voters’ goodwill and/or to minimise the scale of layoffs.

Empirical evidence reflects a variety of efficiency variables. In terms of overall financial performance, Ramamurti (1992) finds that a country with a higher operating deficit as a share of value added is more likely to become a proponent of privatisation (“active” here defined in terms of five or more privatisation transactions having taken place in a country before 1988). Clarke and Cull (2002) find that Argentinian banks with more overdue loans or less net worth to liabilities were more likely to have been privatised earlier. Lin and Su’s (2008) examination of 816 listed SOEs in China also argues that SOEs with better growth opportunities (in growing or consolidating industries or those undergoing technical change) were more likely to diversify their ownership (i.e., privatisation) than SOEs lacking such opportunities (because of their status as part of a declining industrial sector).⁶⁴ In terms of

⁶⁴ Authors follow the industry classification, given by Maksimovic and Phillips in 2008, where industries are divided into four groups based on the change in industries sales and the change in the number of firms to show the attractiveness of the industry: (1) Growth industries – both the change in industry sales and the change in the number of firms during the sample period are above the median for all industries; (2) consolidating industries – the change in industry sales is above the median for all

profitability, Wang, Li and Lei's long-run survey (2001) of 657 Chinese SOEs offers evidence of the existence of a positive correlation between the improvement of output and fixed assets. Brandt, Li and Roberts (2005) use data for 1994 and predictably find a negative correlation between SOE profits/sales and the incidence of privatisation in rural Jiangsu and Zhejiang. Guo and Yao (2005) find supportive evidence from the variable – return to assets (ROA), as well as the variable – gap of profitability between an SOE and the average of private firms of an industry. Liu, Sun and Woo (2006) document an expected result in the correlation between the control-shifting privatisation (i.e., privatisation is defined as the control/majority share is shifted to private investors) and the lagged sale revenues, as well as the profit margin. Kung and Lin (2007) get the same evidence from the scale of local TVE sector and the sum of taxes and net profits divided by fixed assets. Further, one of Li and Rozelle's (2000) regressions shows that the amount of low-skilled labour will positively affect the increase of private share in SOEs. Wang, Li and Lei's (2001) data also show a positive link between the employment gap and the privatisation chance: A bigger improvement in total employment is expected, the greater the incidence of privatisation.

Nevertheless, there is also evidence that supports a different argument: Privatisation may start with more efficient or profitable SOEs. Gupta, Ham and Svejnar (2008) test their “least-profitable argument” (i.e., the least-profitable SOEs should privatise first) and “most-profitable argument” at the same time. They find that profitability variables – including the difference between total output and wage, accounting profits and industrial market share – were all positively, not negatively, correlated with the likelihood of privatisation in the first wave of Czech privatisation

industries and the change in the number of firms is below the median for all industries; (3) technological change industries – the change in industry sales is below the median for all industries and the change in the number of firms is above the median for all industries; (4) declining industries – both the change in industry sales and the change in the number of firms are below the median for all industries.

programme in 1992. That is to say, early privatisation may favour profitable SOEs – and the “ice-pop argument” thereby holds true.

Firm size hypothesis

For various reasons, it is commonly argued that firm size is a constraint on privatisation. Ramamurti (2000) was an early advocate of this view, using agency theory to argue in favour of the advantage of small firm size. Any kind of ownership reform, including the comprehensive privatisation, is likely to be accompanied by the separation of ownership and management. As this takes place, a large SOE will inevitably suffer more pain and encounter greater difficulties because of the higher agency costs it bears. Similarly, institutional theory is used by Ramamurti (2000) to reach the same conclusion in a context in which the lack of market-supporting institutions generates a weak institutional environment, where small SOEs should be more flexible to avoid various institutional obstacles. In addition, a small privatisation project may reduce the negative consequences of an underdeveloped capital market, since private buyers will face a less severe cash constraint. A smaller-scale transaction is also more easily financed by internal members (of a privatising SOE), which makes the management buy-out an easy way for privatisation (Li, 2003).

Alexeev and Kaganovich’s (2001) dynamic model finds that the productivity gains of privatisation will be distributed unevenly among enterprises of different size. They therefore suggest that in the early stages of ownership reform in any transitional economy, “small privatisation” (i.e., the privatisation of small-scale SOEs) is generally more advisable. Arguing from the perspective of the bureaucrat’s interests, Li (2003) justifies the size advantage in terms of the patronage (cash cow) argument. Since large SOEs may provide more political capital and economic rents for the

bureaucrat in charge, he will prefer to let go of small SOEs, whilst retaining the large ones. In their optimal strategy model, Li, Ouyang and Zhou (2005) examine the size factor in terms of total privatisation costs, which they define as a function of time and speed of adjustment. Given that smaller size usually facilitates adjustment within a shorter time period and at a faster pace, it will generate fewer privatisation costs and hence reduce the transaction time. Political attitude is another privatisation cost that may differ according to firm size. A large SOE may spawn a rigid and complex bureaucracy, which generates strong political resistance to privatisation among insiders. Finally, small SOEs may have their own preference in favour of privatisation (Li et al., 2005): for example, their small size may have limited their development, through their disadvantageous market position, poor resource endowments or inability to access support from government and banks. Privatisation may therefore offer significant support to them in their efforts to expand current size, attract extra investment and thereby enhance their market position.

Empirical evidence overwhelmingly supports this size hypothesis. In their examination of 327 privatised firms in Czech, Hungary and Poland in the early 1990s, Aussenegg and Jelic (2007) find that firms with a smaller market value were very likely to be privatised in the early wave of privatisation programme (1990-1994). Argentinian banks with higher bank assets per employee (meaning smaller banks), as reported by Clarke and Cull (2002), were more likely to be privatised in the late 1990s.⁶⁵ Similarly, in China, Li (2003) measures the employment scale in rural SOEs and reaches the same conclusion. Huyghebaert and Quan (2009) obtain the same result by measuring the total assets in listed SOEs.

⁶⁵ In this calculation, banks with fewer employees (equivalent to small banks) are more likely to have a higher asset-employee ratio.

Human capital hypothesis

In the existing literature, there are only three papers, based on the same survey, that examine the influence of human capital changes in economic efficiency and the incidence of privatisation. Human capital hardly features as a hypothesis to explain privatisation in the paper by Li and Rozelle (2000), where the human capital characteristics of the manager – such as the manager’s age, education, place of birth, former managerial experience, status as a government cadre, and the length of time over which the manager has held a managerial position in the sample firm – are tested only in attempts to see if they have raised the efficiency of rural firms. The human impact on privatisation is for the first time hypothesised in Li (2003), who consider both the manager’s and the bureaucrat’s human capital conditions. Li assumes that firms will be more profitable when the manager acquires better human capital (enabling the manager to execute better internal and/or external management functions, such as education and experience) and become more specialised in doing business than the bureaucrat. The probability of an SOE being privatised will increase as a manager’s human capital endowment improves, because expected post-privatisation profits will also be enhanced. In other words, if the bureaucrat acquires better human capital, the probability of privatisation of the SOE over which he has charged will decrease as a result of the expected reduction in post-privatisation profits. In short, this human capital theory points to a positive correlation between privatisation and managerial human capital, but a negative relationship in the case of “bureaucratic” human capital. Brandt, Li and Roberts (2005) take this argument a step further by placing a human capital factor in a game model with three players – government leader, firm manager and bank manager – where privatisation determined by the comparison of the total value between public and private enterprises. It is

assumed that, like the firm manager, a skilled bank manager (i.e., one with better human capital) should be more capable of delivering profitable projects for the bank. Also, a government leader may reduce monitoring costs if his human capital endowment is enhanced. Then the model shows that the likelihood of privatisation will increase as the human capital of both the firm and the bank manager is enhanced because their costs of efforts are both reduced and the value of relevant private enterprise is raised. The reverse is also shown to hold true.

Although Li and Rozelle (2000) do not seek to correlate human capital characteristics with the privatisation proxy, one of their selected *probit* models does, as it happens, reveal this correlation – the manager’s government experience is found to be a negative factor. This means that if the firm’s manager once served as a government cadre (which, in turn, implies possession of stronger social network links, or the so-called *guanxi* (relationship) in mobilising economic resources), the firm will be less susceptible to privatisation. No significant results are found in other human capital characteristics, including age, education, hometown living experience or similar previous management experience. This finding is derived from a broad definition of privatisation dummy coded by whether or not “any” state share is shifted to private investors. This definition is later limited to the control-interest shifting (equivalent to a shifting share over 50 per cent) in Li (2003), who compares the bureaucrat’s human capital characteristics with those of manager in terms of their respective impact on privatisation. Li’s finding gives the first piece of supportive evidence that the manager’s age and education level have encouraged the occurrence of privatisation as might be expected. However, against the assumption, the bureaucrat’s age and education level have not significantly reduced the occurrence of privatisation. With the most strict definition in the privatisation dummy (i.e., one that regards a privatisation case only if 100 per cent state shares are sold to private

investors), Brandt, Li and Roberts (2005) test this hypothesis, again, on the same survey. This is the first time they are able to identify the expected constraint impact of human capital: privatisation is less likely when the firm's leader is more educated (denoted by education level) or more experienced (denoted by age). This therefore confirms the monitoring cost argument. Likewise, their findings over the manager's education level and age also, as expected, suggest a positive influence on the incidence of privatisation.

All theories, arguments, models and evidence discussed above are re-categorised by hypothesis in Table 3.3. It should be noted that most arguments in papers and propositions derived in models are, more or less, related to several sub-fields of economics. The category of theories in this table should not be regarded as a category under strict definition. It is mainly based on the author's personal interpretation and it only serves the purpose no more than giving a broad feeling about the possible sub-field accommodating relevant arguments and propositions. After all, except a few cases, most researchers appear to have prevented from categorising themselves into a specific group of discipline. Readers are reminded to be as cautious as they are.

Table 3.3

Theories, arguments, models and evidence for hypotheses

| Hypothesis | Theories | Arguments | Models | Evidence |
|--|--|---|---|---|
| Soft budget constraint hypothesis | Economics of shortage (Qian, 1994, Kornai, 1979) | <ul style="list-style-type: none"> ➤ The hardening budget constraint will make it more difficult for politicians to spend public money to procure political benefits (Lopez-de-Silanes et al., 1997). ➤ The harder budget constraints will create a part of incentives for local governments to undertake privatisation.(Cao et al., 1999). | | Supportive (Li, 2003, Guo and Yao, 2005, Huyghebaert and Quan, 2009, Li and Rozelle, 2000, Brandt et al., 2005, Lopez-de-Silanes et al., 1997). |
| | Behaviour theory | | For a budget-maximising bureaucrat or popularity-maximising populist, the optimal behaviour is to privatise from where the largest subsidy exist (Chen, 1996). | |
| Political ideology hypothesis | Economics of Washington Consensus | <ul style="list-style-type: none"> ➤ SOEs in countries where the political leadership is ideologically committed to private ownership and market forces are more likely to be privatised (Ramamurti, 2000). ➤ A right-of-centre government or a receiver of the World Bank's loans is more likely to privatise (Li and Xu, 2002). | | Supportive (Li and Xu, 2002, Lopez-de-Silanes et al., 1997). |
| | Governance or election theory | A right-wing government is more likely to privatise in order to maintain the credibility of government to private investors (Bortolotti et al., 2003). | <ul style="list-style-type: none"> ➤ A populist politician will use privatisation as a tool to increase social welfare so as to win votes in elections (Chen, 1996). ➤ A right-wing government can utilise privatisation to shift political allegiance, reverse inferior position, and win the election at the end (Biais and Perotti, 2002). | |
| Decentralisation hypothesis | Information economics | Hayek's information argument that only privatisation will allow a better way for the price mechanism to | Dewatripont and Maskin's (1995) game model proves that under the circumstance of | |

| Hypothesis | Theories | Arguments | Models | Evidence |
|--------------------------------------|--|---|---|---|
| Market competition hypothesis | | communicate information among local economic sectors (See Glaeser and Scheinkman, 1996). | centralisation, bad (unprofitable) projects will continue to be funded because of adverse selection; however, only good (profitable) projects will be funded under the circumstance of decentralisation because by which financial discipline will be implemented to harden the budget constraint. | |
| | Federalism theory (Qian and Weingast, 1997, Qian and Roland, 1998) | The Chinese federalism argument that the newly established federal structure in China in the mid-1990s provided local governments with strong incentives to privatise (Cao et al., 1999). | | |
| | Agency theory | Under intensified market competition, the problem of agency failure will be magnified and more organisational weakness of SOEs will be exposed (Ramamurti, 2000). | | |
| | Property right theory | Since government can effectively help overcome transaction obstacles caused by various market imperfections, government-owned enterprises are able to gain more efficiency than private enterprises under the environment with poorly-defined property rights (Li, 1996). | | |
| | Competition theory | Cao, Qian and Weingast (1999) argue that the intensified competition resulted from the rapid increase of foreign direct investment and the boom of non-state enterprises was the driver of the privatisation in China in the late 1990s. | <ul style="list-style-type: none"> ➤ Matsumura's (1998) optimal model demonstrates that social welfare will be optimal without private participation (equivalent to privatisation) only if the firm is a monopolist; otherwise, if the firm is not a monopolist (meaning a competitive market) the social welfare will not be optimal without private participation (privatisation). ➤ In a two-firm differentiated-product | Supportive (Li et al., 2004, Li and Rozelle, 2000, Li, 2003). |

| Hypothesis | Theories | Arguments | Models | Evidence |
|---------------------------|---------------------------|--|--|---|
| | Behaviour theory | | oligopoly, the optimal amount of retained state ownership will depend on the competitiveness of product market (Bennett and Maw, 2003). For a budget-maximising bureaucrat or popularity-maximising populist, the optimal behaviour is to privatise from most competitive public sector (Chen, 1996). | |
| | Market development theory | <ul style="list-style-type: none"> ➤ Plane (1997) argues that the market openness will reveal the authority's willingness in trusting foreign investors as well as its determination in promoting private entrepreneurship. Also, the development of capital market will contribute more transparency to the production system and offer more political supports to the commitment of market economy. ➤ The non-state ownership in a country's telecommunication sector will increase along with the progress of financial deepening (Li and Xu, 2002). ➤ The liquidity of stock market will facilitate ownership diversification, information aggregation, monitoring of managers and the regulation of firms (Bortolotti et al., 2003). ➤ Guo and Yao's (2005) liberalisation argument suggests that the removal of entry barriers (equivalent to raise market competition) together with the price liberalisation will correct market failures and then encourage SOEs to embrace more private shares or even full privatisation. | | Supportive (Plane, 1997, Li and Xu, 2002, Bortolotti et al., 2003, Guo and Yao, 2005) |
| Financial pressure | Fiscal stringency theory | <ul style="list-style-type: none"> ➤ The rising opportunity costs of public finance will result in tightened budgets, curtailed | | Supportive (Ramamurti, 1992, Plane, 1997, Bortolotti et al., |

| Hypothesis | Theories | Arguments | Models | Evidence |
|--|---|--|--|--|
| hypothesis | | investment programmes, and the eventual privatisation of SOEs (Yarrow, 1999). | | 2003, Clarke and Cull, 2002, Li and Rozelle, 2000, Brandt et al., 2005, Liu et al., 2006, Huyghebaert and Quan, 2009, Kung and Lin, 2007). |
| | | ➤ Privatisation is sought to increase short-term cash flow during financial stringency (Ramamurti, 1992). | | |
| | | ➤ The new design of “debt-equity swap” will facilitate privatisation to be a tool to solve debt problem in heavily indebted countries (Bortolotti et al., 2003). | | |
| | Rent-seeking theory (cash cow argument) | Li and Xu’s (2002) cash cow argument suggests that fiscal stringency may constrain privatisation for the politician fears to damage his ability to extract personal interests. | | Supportive (Li and Xu, 2002). |
| | Debt evasion argument | Guo and Yao (2005) argue that a privatisation sale may be vetoed or taken to court by the bank if it fears the loans to be evaded after privatisation. | | Supportive (Guo and Yao, 2005). |
| Institutional infrastructure hypothesis | Transaction cost theory | ➤ The quality of market-supporting institutions determines privatisation because poor institutional environment will raise transaction costs and deter the potential investors in private sector (Ramamurti, 2000). ➤ Without a sound legal system in favour of private ownership, privatisation may involve substantial political and economic risks and hence suffer from high transaction costs (Li et al., 2004). | ➤ Li, Ouyang and Zhou’s (2005) optimal timing model of privatisation proves that higher transition costs will deter the occurrence of privatisation. ➤ Alexeev and Kaganovich’s (2001) game model says that, under an unfriendly institutional environment, early privatisation will result in suboptimal investment and in turn postpone the complete privatisation. | Supportive (Li et al., 2004). |
| | Legal origin argument | Whether a country has a French/German-style civil law or an English common law tradition will affect its government’s willingness to adopt privatisation (Bortolotti et al., 2003). | | Supportive (Bortolotti et al., 2003). |
| Economic | Efficiency | The Pareto argument suggests that less efficient SOEs | ➤ Li, Ouyang and Zhou’s (2005) strategy | Supportive (Ramamurti, 1992, |

| Hypothesis | Theories | Arguments | Models | Evidence |
|------------------------------|-------------------------------------|---|---|--|
| efficiency hypothesis | theory | should be first targeted for reform because their privatisation may realise the maximum of potential interests (Gupta et al., 2008). | model demonstrates that privatisation will take place only if the gain in the profitability after privatisation is expected to be large enough. ➤ Less efficient SOEs should be privatised first because they should bear higher uncertain political or production risks (Leyden and Link, 1993). | Clarke and Cull, 2002, Lin and Su, 2008, Wang et al., 2001, Brandt et al., 2005, Guo and Yao, 2005, Liu et al., 2006, Kung and Lin, 2007, Li and Rozelle, 2000). |
| | Incentive theory (ice-pop argument) | Guo and Yao's (2005) "prettier-daughter-marries-first" argument states that if a local government cares about raising efficiency it will privatise better performing SOEs as fast as it can in order to protect productive assets from melting down. | When the government is budget-stabilising and the manager is rent-seeking, privatisation will be more desirable for profitable SOEs because the positive incentives associated with residual claimancy will be enhanced and managers will be more incited to exert efforts (Debande and Friebel, 2004). | Supportive (Guo and Yao, 2005). |
| | Governance argument | For a public-will-maximising or a political-cost-minimising government, privatisation should begin with the most profitable firms in order to maximise the goodwill for voters or to minimise the scale of layoff employment (Gupta et al., 2008). | | Supportive (Gupta et al., 2008). |
| | Bank argument | Privatisation will occur when the bank is willing to lend to a more profitable private firm in expectation of a better future return (Brandt et al., 2005). | | |
| Firm size hypothesis | Agency theory | During the separation of ownership, a large SOE will suffer more difficulties because of the higher agency costs it bears (Ramamurti, 2000). | | |
| | Transaction cost theory | ➤ In a weak institutional environment without enough market-supporting institutions, small SOEs should be more flexible to avoid various institutional obstacles (Ramamurti, 2000). ➤ Small transaction is easier to be financed by internal members, which makes the management | ➤ Alexeev and Kaganovich's (2001) dynamic model derives that the productivity gains of privatisation will distribute unevenly among enterprises of different size and hence small privatisation is more advisable. | Supportive (Aussenegg and Jelic, 2007, Clarke and Cull, 2002, Li, 2003, Huyghebaert and Quan, 2009). |

| Hypothesis | Theories | Arguments | Models | Evidence |
|---------------------------------|--------------------|---|--|---|
| | | buyout as a way of privatisation mush easier (Li, 2003). | <ul style="list-style-type: none"> ➤ Given that smaller size usually means shorter time and quicker speed for adjustment, it will generate fewer privatisation costs and hence reduce the transaction time (Li et al., 2005). ➤ A large SOE may have grown into a rigid and complex bureaucracy, in which the political resistance against privatisation among insiders could be too strong to overcome (Li et al., 2005). | |
| | Patronage argument | Since large SOEs may provide more political capital and economic rents for the bureaucrat in charge, he will prefer to let go of small SOEs and keep large ones (Li, 2003). | | |
| | Strategy argument | | Small SOEs are more willingly to utilise privatisation as a way to overcome problems like disadvantageous market position, poor resource endowments or less supports from the government and banks (Li et al., 2005). | |
| Human capital hypothesis | Agency theory | When the human capital of the manager improves, the probability of privatisation will be raised for expecting profits increased after privatisation (Li, 2003). | Brandt, Li and Roberts's (2005) model derives that the probability of privatisation will increase with the manager's human capital because the costs of efforts are reduced and hence the value of private enterprises after privatisation will be raised. | Supportive (Li, 2003, Li and Rozelle, 2000, Brandt et al., 2005). |

Source: Author's summaries

Chapter Four

Research Hypotheses and Methodology

4.1 Research hypotheses

After discussing various arguments and propositions in literature, this research sets out nine hypotheses, based on Chinese realities, in order to explain the privatisation dynamics in that country.

The soft budget system is one of the most significant economic features in socialist China. Subsidising loss-making SOEs were a heavy burden to the Chinese government from the mid-1980s, when, according to official statistics, a quarter of annual revenue was directly consumed by SOE subsidies (see Table 2.3). A series of reforms in early 1990s (see Chapter Two) saw the beginning of the hardening process in the budget and credit systems (especially those of local state sectors). From 1990, central government began to reduce annual SOE subsidies. In the 1994 fiscal reform, it further transferred a significant part of subsidy responsibilities to local governments, whilst also requiring local finance to be rebalanced in accordance with the new *Budget Law*. Meanwhile, the banking reform played a significant role in helping diminish the political influence that local bureaucrats had long enjoyed over loan decisions of local financial bodies. It also ended the long period of financial repression and deprived the state industrial sector of preferential rents which it had previously enjoyed.

In effect and taken together, these reforms reduced soft budget constraint and brought strong fiscal pressure to bear on local governments. The new regime of hard budget constraint was likely to encourage privatisation for the following reasons:

(1) The *bureaucrat* will adopt privatisation in order to achieve his goal to maximise the surplus budget (subject to the constraint of staying in office) (Chen, 1996).

(2) The *populist politician* will adopt privatisation in order to maximise popularity/consumer welfare (subject to the constraint of a balanced budget) (Chen, 1996); or in expectation to generate more political benefits from a larger private sector (Lopez De Silanes et al., 1997).

For these factors derives the first hypothesis, as follows:

Hypothesis 1. *The hardening process of SOE's budget system will encourage local state enterprises to embark on privatisation.*

Privatisation in transitional economies reflects not only economic calculation but also political considerations. The ideology of reform leaders is particularly crucial to initiating a nationwide structural adjustment. China is no exception to this. Under the impact of privatisation, China's transformation from a socialist to capitalist ideology was characterised by two distinctive features. The first is that the ideological change towards market economy in China was endogenously induced by a series of gradual reforms rather than being exogenously stimulated by a foreign economic doctrine, such as the "Washington Consensus". From this perspective, it may be said that China underwent a transition with Chinese characteristics. The second feature is that this Chinese-style transition avoided simultaneously embracing democratisation. As a result, the Machiavellian assumption was inapplicable to China.⁶⁶ The lack of civil democracy leaves China with no median-class voters to please, and Chinese leaders

⁶⁶ This argument suggests that privatisation will be utilised as a campaign tool for a ruling government to please voters during the simultaneous democratisation; see BIAIS, B. & PEROTTI, E. (2002) Machiavellian privatization. *American Economic Review*, 92, 240-258.

therefore have no need to pursue popularity through a voucher privatisation programme, as happened in Czech, Hungary and Poland in the early 1990s. Moreover, the party's specific preference over ideology (Lopez De Silanes et al., 1997) may also not explain Chinese privatisation, for there exists not a substantial opposition party confronting the ruling communists. In circumstances, the ideological change in China often relied on the power transfer among leader generations within the Communist Party *per se*.

Nevertheless, political ideology has undoubtedly contributed to the trend towards the prevalence of privatisation in China, especially since the historical turning point in 1992, when during his southern tour Deng Xiaoping referred to the "ideological innovation" of socialism.⁶⁷ However, looked at from a more bottom-up perspective, the ideological change at the local level had its origins in enhanced local autonomy and decentralised enterprise control rights. Once they were endorsed, both increased inter-regional competition to achieve the fastest economic growth. To uphold the protection of foreign and private ownership became a priority task. In short, privatisation was used by local leaders as a symbolic way of demonstrating their determination to promote the development of the private economy.

Meanwhile, a local leader's personal career expectation may bridge inter-regional competition and privatisation ideology for seeking a better evaluation on his performance. Since the performance of local economic growth is included as a chief indicator in cadre evaluation system, the decision whether or not to privatise

⁶⁷ By then, Deng went to Shenzhen, the pioneering special economic zone to experimentally practice market economy, to comfort the hot debates between the socialism and capitalism in society. He justified the market-oriented reform by redefining the market role in the socialism; the most famous quote he said is "Planning and market forces are not the essential difference between socialism and capitalism. A planned economy is not the definition of socialism, because there is planning under capitalism; the market economy happens under socialism, too. Planning and market forces are both ways of controlling economic activity (quoted from the *News of the Communist Party of China*, <http://cpc.people.com.cn/BIG5/64162/82819/143371/8818527.html>, downloaded on 28th September 2010)." In this way, disputes were calmed and the direction toward the so-called socialist market economy was therefore determined.

became an important political choice that was likely significantly to shape local leaders' future careers (Liu et al., 2007). Accordingly, the confidence to government also became a growing concern. Confidence in a local government's pro-private-ownership ideology will largely affect private investors' willingness to invest (Bortolotti et al., 2003). From an examination of the interactions between inter-regional competition, local economic growth, the cadre evaluation system and confidence in local governments' commitment to market-oriented development, is derived the political ideology hypothesis, as follows:

Hypothesis 2. *The greater the commitment by a local government to the ideology of private ownership, the more extensive will be the privatisation of its state sector.*

Decentralisation is another significant feature of socialism with Chinese characteristics. After the end of the Cultural Revolution, the 1980s and 1990s saw the implementation by the central government of policies designed to decentralise fiscal autonomy, budgetary discretion and enterprise control. As discussed earlier, conflicts of interest between the central government, local governments and SOEs became a major problem in the early years of the reform, not least because of the core issue of asymmetric information. According to Hayek's theory, lack of local information was likely to be a significant challenge for a centralised government, implying that decentralisation would overcome such informational deficiencies. China is probably the best exemplar of the practice of this information theory. As a result of the decentralisation reforms, interests among governments and enterprises were realigned in a new distribution system. Meanwhile, the information gaps between them were bridged through the introduction of a new decentralised taxation system. Through such decentralisation initiatives, by the mid-1990s China had finally achieved more

effective control over its state industrial sector.

Information theory further suggests that decentralisation will stimulate a hardening process in the soft budget system. Since the adverse selection effect under centralisation is what makes it possible to secure funding for bad (i.e., inefficient, unprofitable) projects, decentralisation with more information transferable between central and local levels is able to negate this effect and prevent the funding of “bad” projects through the introduction of stronger financial discipline (Dewatripont and Maskin, 1995). That explains why, after decentralisation, Chinese local governments obtained stronger incentives to identify good (efficient or profitable) projects. In other words, the opportunity costs of bailing out bad projects were hugely increased. The year-on-year reduction in subsidies to loss-making SOEs is strong evidence of this process (see Figure 2.2 and Table 2.3). In addition, intensified regional competition was another major propelling factor. The pressure of competition consolidated the growth-oriented ethos of the cadre evaluation system and made the maximisation of investment in their areas a major policy goal of local cadres.

For all these reasons, the author follows Hayek’s information theory and the Chinese-style federalism argument (Qian and Roland, 1998, Cao et al., 1999, Qian and Weingast, 1997) in formulating the decentralisation hypothesis as follows:

Hypothesis 3. *The decentralisation process will lead to a greater incidence of privatisation in China’s state sector.*

In the past three decades, a highly competitive product market has been one of the most successful outcomes of China’s Open Door Policy. Over 70 per cent of its industrial output was produced by SOEs in the late 1970s, but thereafter the industrial share of SOEs declined rapidly (see Figure 2.5 and 2.6). Today, over 90 per cent of

products are generated by private and foreign companies. Increasing output competition accords well with mainstream economic theory. This may be illustrated through reference to arguments about liberalisation, agency and property rights.

The *liberalisation argument* (Guo and Yao, 2005). Entry barriers in China's major industries were gradually lowered. The change started from the light manufacture sector in early 1990s and later expanded to the heavy manufacture, and the mining and energy sector. Since market imperfections are supposedly corrected by liberalisation, more private providers should be encouraged to join the competition.

The *agency argument* (Ramamurti, 2000). Since the SOE manager is not the residual claimant and therefore has no incentives to maximise performance, he may seek instead to maximise self-interest at the expense of the interests of the enterprise. In the Chinese state sector, these agency costs often include opportunistic behaviours in the process of decision-making, short-termism in production investment decisions, and the misuse of wage and bonus systems (Hassard et al., 2007:91, 94, Holz, 2003:78-82). By minimising these agency problems, competition will drive out SOEs with higher agency costs.

The *argument over ambiguous property rights* (Li, 1996). In China, there was no separation of government and enterprise responsibilities before the early 1990s, whilst enterprise ownership was not legally separated from government property. After corporatisation reform, state assets – as the institutional form of state ownership – were for the first time legally defined, officially registered, and statistically counted. However, a management system in charge of state assets was absent before the late 1990s. The term “private ownership” was not written into China's constitution until 1999. According to some theories, poor definition of property rights will give a comparative advantage to government ownership in allocating economic resources. However, as markets develop and property rights ambiguities are clarified by new

institutions, government ownership will lose its comparative advantage to private ownership. As a result, government ownership will be replaced by private ownership; in other words, privatisation will occur. These theoretical dynamics seem generally applicable to the current thrust of developments in China's legal system.

Hence, my approach bases the market competition hypothesis on a number of economic theories (Matsumura, 1998, Bennett and Maw, 2003, Chen, 1996) and privatisation arguments (Ramamurti, 2000, Li, 1996, Li and Xu, 2002, Bortolotti et al., 2003, Guo and Yao, 2005, Li and Rozelle, 2000, Cao et al., 1999, Li, 2003) and it goes as follows:

Hypothesis 4. *Intensified competition in Chinese product markets will encourage more SOEs to implement privatisation reform.*

Fiscal stringency, as Yarrow (1999) argues, is the factor that has most commonly triggered structural adjustment in most countries. However, this may not apply to the same extent in China. Before the massive privatisation of the late 1990s, unlike some countries in Latin America, Eastern Europe or the former Soviet bloc, China did not confront hyperinflation, internal deficit or external debt crisis.⁶⁸ At that time, most of China's neighbours were suffering harshly from the Asian financial/monetary crisis, whereas China had emerged largely unscathed thanks to its huge trade surpluses, strong economic growth and sizable domestic savings and foreign reserves (Bergsten, 1997). Indeed, China has never been on the waiting list of countries seeking last-resort loans from the World Bank or IMF. In short, the "crisis argument" (Ramamurti, 2000) seems not to be applicable to China.

⁶⁸ This is not to say that China faced no problems of price inflation or government deficits. It is to suggest that the scale of such problems in China was much less than that in countries facing severe macroeconomic crises.

However, this does not mean that privatisation in China has been immune from rising financial pressure. Rather, China faced its own severe financial problem, highlighted in the existence of numerous loss-making SOEs. This problem had become increasingly serious, thanks to the huge losses accumulated from late 1980s, when the incentive deficiencies of the Contract Responsibility System (CRS) enabled SOE managers to manipulate profits (Holz, 2003:78-82). In 1993, about 36 per cent SOEs were loss-making, and by 1998 this figure had nearly doubled to reach 69 per cent. Meanwhile, the non-performing loans (NPLs) of state banks soared. For instance, data for 1993 show that NPLs accounted for 20-30 per cent of the total outstanding debts of state banks, or the equivalent of 17-25 per cent of national GDP (Li and Li, 1997). Four state asset management banks were set up in 1999 in order to absorb these huge NPLs. Had they not been established, the whole banking sector might have collapsed, preventing the creation of China's first modern banking system. Subsequently, the special design of debt-equity swap in this recapitalisation reform played a key role in promoting ownership diversification and thereby led to a partial or complete ownership transformation plan. Through the support of banking reform, it was possible to use the burden of huge SOE losses as a positive force whereby more large or medium SOEs were encouraged or forced to adopt privatisation. More local bureaucrats could take this therapy to overcome financial problems. In short, the financial pressure facing SOEs should display a positive correlation with Chinese privatisation.⁶⁹

By contrast, the cash cow argument (Li and Xu, 2002), or the patronage argument, assumes a negative correlation between financial pressure and privatisation.⁷⁰ The selfish bureaucrat who prioritises short-term cash flows, or perks,

⁶⁹ In operational definition, it is equivalent to a negative correlation between the shrinkage of state sector and the growth of financial pressure.

⁷⁰ For the same reason, the negative correlation here will assume a positive correlation in operations.

ahead of long-term returns after privatisation will seek to maintain the existing scale of state ownership as long as any financial pressures can be accommodated. This argument once more addresses the serious agency problem associated with Chinese SOE management, in which a rent-seeking bureaucrat is the root of problem. This correlation may also be assumed under a committed bank manager (i.e., one who is risk-averse and acting commercially as granting loans), unlike a typical state agent (i.e., one who is usually risk-ignorant and follows orders from above in making loan decisions). This committed bank manager would probably veto a privatisation plan for a highly indebted SOE out of concern that debt repayment would be avoided in the aftermath of privatisation. In China, this debt evasion argument (Guo and Yao, 2005) seems highly plausible. In the banking reform in mid-1990s, the primary goal was to establish a modern commercial banking system, and bank managers were therefore given increased authority and encouraged to act independently in their efforts to control risk while reducing soft credits. They were also expected to guarantee the return of loan funds in a more efficient way. In principle, these managers would prefer privatisation because private ownership is supposed to yield better chance than public ownership in future success. At the same time, however, they would not hesitate to stop a privatisation sale if it threatened to damage a creditor's rights by (for example) under-pricing state assets before the sale. In fact, devaluation of state assets has been a prevalent phenomenon in China: sometimes arising through collusion among the seller, buyer and inter-mediator; at other times, arising out of the simple fact that the real values of many tangible or intangible state assets (for example, land use rights and business reputation) were simply unknown.⁷¹

Hence, there are two directions of hypothesis – financial pressure can be

⁷¹ More discussion about the losses of state assets and the causes is seen in TUNG, R. (1996a) The depletion of state assets in mainland China. *Issues & Studies*, 32, 1-17.

positively or negatively associated with privatisation. My approach has been to follow mainstream arguments and formulate a positive hypothesis, while keeping an open mind to the alternative choice:

Hypothesis 5. *Severe financial pressure facing SOEs will encourage privatisation in China's state sector.*

In terms of reforming its institutional infrastructure, no doubt China has still a long way to go. But its achievements in the past three decades have also been impressive. Market-supporting institutions were seriously lacking in the 1980s and the 1990s, but in the 2000s the situation improved greatly. Among the most important institutional changes were the following:

The revival of private ownership was perhaps the most striking legislative institutional initiative. Nationalisation and collectivisation during the 1950s led to the elimination of private ownership, except for the retention by farmers of tiny private plots. In the first half of the 1980s it was reintroduced in the form of small individual business (*getihu* 個體戶), which were initially officially tolerated, but in the late 1990s formally legalised (after which they were vigorously promoted). New regulations for civil businesses were also announced, and the legal statuses of state-owned and non-state-owned enterprises were also defined and clarified for the first time. A modern judicial system for the arbitration of business disputes was eventually founded. In terms of developing a market system, the institution of a price mechanism was the first priority, albeit one fraught with danger. Thanks to the adoption of a dual price system within which market prices were extended at a steady and safe pace, the former centrally-planned price system was gradually transformed

into a market-dominated system without from the attendant danger of hyperinflation.⁷² More capital markets were established to issue and manage the shares of enterprises, while other institutional initiatives were implemented to create and protect intellectual property rights, as well as its transactions. A newly-reformed commercially-based banking system also started to provide a better market function in allocating limited economic resources in such a way as to enhance efficiency. There were improvements too in the physical infrastructure. Factor mobility was considerably enhanced, thanks to on-going investment in large infrastructure projects (e.g., highways, railways, airports, sea ports, power supply, telecommunications, internet systems, etc.).

In effect, all these reforms and construction initiatives served to reduce institutional barriers and cut transaction costs in all markets. More importantly, these changes largely reshaped the market environment to which all enterprises were increasingly exposed. The institutional advantage from which public enterprises had formerly benefited was reduced, enabling private to enjoy an increasing comparative advantage. Such evidence attests to the positive impact of institutional enhancement on the occurrence of privatisation. Accordingly, I follow the transaction cost argument (Ramamurti, 2000, Li et al., 2005, Alexeev and Kaganovich, 2001) in formulating the institutional infrastructure hypothesis as follows:

Hypothesis 6. *The more the institutional infrastructure is strengthened and improved, the more likely it will be that privatisation will take place.*

Much scepticism surrounded claims of enhanced efficiency in China's state industrial sector during the first decade of reform. Doubts were fuelled by the

⁷² A certain degree of economic heating was inevitable during the price transition. Price reform triggered two significant waves of inflation in 1988 and 1992. See pp.357-361 in WU, J. (2003) *China Economic Reform (Dandai Zhongguo Jingji Gaige)*, Shanghai, China, Shanghai Far East Publishers.

apparent inconsistency between claims of significant improvements in productivity and evidence that pointed to a continuing decline in profitability. This paradox generated fierce debate among researchers (Huang et al., 1999, Jefferson and Rawski, 1994, Cheng and Lo, 2002, Fan and Woo, 1996, Holz, 2003:289, Zhang, 1998, Ash and He, 1998, Naughton, 1992). How to improve SOE profitability became a pressing question. Reform leaders initially sought to address the issue in a variety of ways, such as allowing enterprises to retain a greater share of profits or decentralising more enterprise control rights and management autonomy to local governments. The outcome of these efforts less than favourable, however, proved unable to halt the declining trend in profitability. It was against this background that in the mid-1990s ownership reform – an early stage of privatisation – began to be considered.

Economic theories link efficiency improvements with private ownership through consideration of production risks. A risk-averse bureaucrat may prefer private provision (through privatising SOEs or contracting with private providers) because of a belief that he will thereby avoid the various production and political risks attached to public provision (Leyden and Link, 1993). The bureaucrat seeks to guarantee that his obligated amount of products or services will be provided under the lowest level of uncertainty. This traditional argument fits the motive of Chinese central government. It implies the best strategy that privatisation should be started from wherever the production or political risk is high – i.e., where the inefficiency is high.

Nevertheless, there are players other than the central government. There are also situations in which privatisation may focus on efficiency, rather than inefficiency. First, as some theory suggests, if the local bureaucrat is a benevolent value protector (i.e., one who privatises for it as the best way to prevent valuable state assets from being melt-down under frequent mismanagement or corruption by SOE managers) he will start by seeking to protect the most valuable state assets and therefore seek to

privatise the most profitable SOEs as quickly as possible (Guo and Yao, 2005). Or, second, if the local bureaucrat is someone who endeavours to minimise political costs, then he will also start privatisation with the most profitable SOEs, since these can most readily be sold at a favourable price in the face of minimal political resistance from employees (Gupta et al., 2008). Thirdly, if the SOE manager is rent-seeking, he will also have a stronger incentive to focus his efforts on the privatisation of the more profitable SOEs (Debande and Friebel, 2004). Finally, if the bank manager, too, is risk-averse and acts commercially, he will wish to fund efficient, not inefficient private enterprises in the expectation of higher future returns (Brandt et al., 2005).

Thus, hypotheses pointing in different directions are suggested by this analysis. While keeping open-minded to the alternative, my approach is to base the hypothesis on the original motive of the central government and assume that the privatisation will start from the point of greatest inefficiency:

Hypothesis 7. *Less efficient SOEs are more likely to be privatised than more efficient SOEs in China's state sector.*

'Firm size' is a variable that can represent and generalise many of the privatisation arguments discussed above. The large size of a firm may result in exacerbating agency problems that arise during the separation of ownership and management (Ramamurti, 2000). It also reduces the flexibility with which a firm can operate in a weak institutional environment full of market imperfections. A small-scale privatisation sale will be less affected by the underdeveloped state of the capital market and will encounter fewer cash constraints by private buyers (Li, 2003). In addition, we may assume that a rent-seeking local bureaucrat will be able to retain a bigger stake of political patronage by holding large SOEs and only to privatise small

ones as a response to the order of central government (Li, 2003). That is why privatisation proceeds may differ by firm size (Li et al., 2005). Privatisation will almost certainly disadvantage a large firm because of the high transaction costs entailed by ownership reform.

Such size considerations are a justification of China's privatisation policy of "grasping the large and letting go of the small", launched in the late 1990s. As discussed earlier, this policy comprised two elements. The idea of "grasping the large" was aimed at about 1,000 large SOEs, which were regarded as strategically important and which the central government had already targeted with a moderate programme of ownership diversification (albeit on a scale much less than privatisation) in order to improve their poor performance (Yeh, 1998, Zhang and Zhang, 2007:235-239). "Letting go of the small" focused on the remaining medium and small SOEs, the privatisation of which was to be encouraged by local governments through such mechanisms as bankruptcy, ownership diversification, shareholding cooperation, auctions, leases and mergers (Ma, 2010:22, Garnaut et al., 2005:48-50, Smyth, 1998). It would appear that this policy was an attempt to accommodate ownership reform whilst avoiding the orthodoxy of the 'Big Bang' approach espoused by mainstream transitional economics. For Chinese reform leaders, privatisation has never been regarded as taking precedence over fundamental policy goals such as the preservation of economic stability, high employment and social harmony. Accordingly, my next hypothesis is as follows:

Hypothesis 8. *In the early stage of privatisation reform in China, small-scale SOEs are more likely to be privatised.*

Only a handful of studies in the privatisation literature have addressed issues

relating to human capital (Li and Rozelle, 2000, Li, 2003, Brandt et al., 2005). One reason for this is the lack of human capital data available to SOE staffs and government bureaucrats. Yet this research field is full of potential. In some theoretical writing, it is argued that human capital characteristics are correlated with privatisation for several reasons.

First, if the SOE manager acquires better human capital, compared with the quality of the bureaucrat in charge of this firm, the likelihood of privatisation will increase, because the manager's greater specialisation will give the enterprise a better chance of future success (Li, 2003). Second, if the bank manager's human capital endowment is strengthened, he will be better qualified to identify good projects and fund them (Brandt et al., 2005). More privatisation programmes will be granted loans because they are regarded as "good projects". Thirdly, if the bureaucrat's human capital endowment is strengthened, his monitoring costs will decrease, so do the expected proceeds after privatisation. Hence, the likelihood of privatisation will also be reduced (Li, 2003).

In general, managers are assumed to possess better endowments of human capital (such as greater specialisation, higher education, longer experience in relevant works, better relationship in social network, etc.) than bureaucrats. However, a large-sampling survey in 1994 comparing the human capital characteristics between local bureaucrats and SOE managers suggests that this does not hold true in China. To date the only instance in which data relating to the basic conditions in human capital of civil servants in local governments and administrative personnel in local enterprises have been recorded is in the publication of just two tables in *China Statistical Yearbook 1996* (see Table 4.1). Although the information provided here is of quite a general nature, it is sufficient to show that local bureaucrats in chief levels are generally speaking more educated, older and having more senior positions. SOE

managers possessed less endowments of human capital than local bureaucrats, whilst the former only out-perform in one item – staying longer in current positions. That is to say, statistically, Chinese SOE managers do not enjoy comparative advantage in running enterprises, compared with their upper bureaucrats (from whom the managers take their instructions). Local bureaucrats actually possess better endowments in human capital than SOE managers. Unfortunately, these data cannot afford any further analysis because they have not been updated in a consistent manner. Moreover, during a series of far-reaching reforms in the mid-1990s, most SOE personnel structures were restructured. Many SOE managers were re-appointed through a competitive process, or newly-recruited from domestic or foreign labour markets. The expectation would have been that their style of doing business would become more commercial, aggressive and market-oriented, and in addition that their endowments of human capital would be strengthened. However, the same problem remains – data are not available and may not even exist.

For these reasons, I will simply assume a positive correlation between human capital characteristics and privatisation. The improvement in the average level of human capital should reduce production risks, enhance opportunities of future success, and facilitate the eventual privatisation.⁷³ Accordingly, the hypothesis is set as follows:

Hypothesis 9. *The improvement of human capital among SOEs will lead to more privatisation in China's state sector.*

Table 4.1
Basic conditions of Chinese civil servants and administrative personnel in enterprises (1994).

| Interviewees | Average | | |
|--------------|----------|-----|-----------------------|
| | Educated | Age | Seniority Postholding |

⁷³ The justifications and details of the design of human capital variables are discussed in Section 4.4.

| | | (person) | | (year) | | |
|---|----------------|----------|------|--------|------|-----|
| Civil servants | National | 55,509 | 11.8 | 42.0 | 19.7 | 4.9 |
| | Division Chief | 3,374 | 12.7 | 50.8 | 32.0 | 4.9 |
| | Section Chief | 15,239 | 11.8 | 48.5 | 26.8 | 4.8 |
| | Office Staff | 36,895 | 11.8 | 35.0 | 14.3 | 5.9 |
| Administrative personnel in enterprises | National | 65,912 | 11.2 | 44.2 | 21.7 | 7.0 |
| | Division Chief | 4,676 | 12.1 | 49.2 | 29.1 | 5.5 |
| | Section Chief | 18,105 | 11.2 | 48.2 | 26.4 | 5.7 |
| | Office Staff | 43,131 | 11.0 | 42.2 | 19.4 | 7.8 |

Source: *China Statistical Yearbook 1996*, pp.127-128.

Note: Samples are collected from 14 provinces including Beijing, Tianjin, Shanxi, Liaoning, Heilongjiang, Jiangsu, Zhejiang, Jiangxi, Shandong, Hubei, Guangdong, Sichuan and Shaanxi.

4.2 Multi-level framework

In this section, the author establishes a multi-level analytical framework, modified from the pioneering work in Ramamurti (2000), to accommodate the above nine hypotheses and further illustrate the privatisation dynamics in China under transition.

The prevalence of privatisation among emerging economies in the 1980s and 1990s attracted academic attention in many disciplines. Political scientists, according to Ramamurti, mainly emphasise the country-specific factors that interact with privatisation. Economists tend to extend their analysis to include the industry-specific factors, while management theorists usually focus on the firm-specific factors. Ramamurti argues that privatisation is not a “one-shot event”, but is a dynamic process in which *all* these factors should be examined all together *ex ante* and *ex post* in privatisation. Reforms should be implemented bit by bit in every aspect and should not be implemented wholesale in a short time. Furthermore, there is a feedback loop: one round of privatisation is likely to generate changes in the firm-, industrial- and country-level factors, which in turn affect the dynamics in subsequent rounds of reform (see Figure 4.1).

In terms of firm-level factors, Ramamurti first points to the agency argument, which refers to the failures of agency and property rights.⁷⁴ SOE property rights are usually poorly defined in socialist economies, often leading to the agency problem of “an agent without a principal” in which the principal (namely, the whole of society) cannot make the agent (the SOE manager) accountable. This gives rise to inevitable abuse of government budgets, a problem which Kornai (2003) called the “soft budget” problem. The second firm-level factor is firm size. Small SOEs should supposedly be privatised earlier than large ones. The price of transacting small-scale SOEs should be easier for private buyers. Managerial challenges should be less demanding for the new private owners. The potential for political resistance by laid-off state workers should be much smaller for local governments. Besides, the origin of the firm is also relevant. Wholesale privatisation is more likely to take place in the case of an SOE that had in the past been privately (or co-privately) owned. For instance, the reform of so-called “restitution” took place in the Czech and Estonia in the early 1990s, when some SOEs were returned to the people who had owned these enterprises prior to nationalisation. If an SOE is already partly shared by private ownership, its inner legal structure should have been left with the space (for diversified ownerships) that can facilitate the future privatisation in a full scale.

Two factors in framework are relevant at an industrial-level – viz., competition and regulatory innovation (i.e., the change of regulation). The competition facing SOEs in all countries mainly derives from three sources: the global scale of economic liberation in most industries, the nature of technological change in some industries (especially in telecommunications), and the international trend towards deregulation in industries such as airlines, transport, etc. More organisational weaknesses of SOEs

⁷⁴ Please note that most arguments Ramamurti makes have been systemically discussed in Chapter Three. The introduction here will be kept brief and it serves the only purpose that to draw an overall picture of his privatisation framework.

are exposed under intensified competition, so that privatisation is seen as a popular means of improving the competitiveness of such enterprises.

Regulatory innovation expands the potential role of private firms in the provision of public goods and services. Traditional theory sees the establishment of natural monopolies in some industries as lying within the purview of the state; however, recent theories suggest that a certain part of this “natural monopoly” is artificial, and can be broken up. For example, if production is vertically or horizontally separated, collaboration can be achieved among providers characterised by different kinds of ownership status. This offers private firms the opportunities to participate in the establishment of such natural monopolies. New regulations in respect to natural monopolies may also be encouraging for private providers; for example, the introduction of a price-cap, which only allows price increases to take place if they are lower than actual inflation. This means that higher production costs cannot be automatically transferred to consumers. Accordingly, all providers will have stronger incentives to reduce cost-raising inefficiencies and thus to increase consumer welfare. In consequence, this regulatory change will not only facilitate the competitive involvement of private providers, but will also encourage more SOEs to enhance their efficiency through privatisation.

Last but not least important are country-specific factors. Ideology change is the first such factor. Ramamurti argues that many new leaders in former communist countries tended to privatise as early as possible simply in order to guarantee the irreversibility of the economic and political changes that occurred after the collapse of Berlin Wall. This ideological fervour for free market doctrines led to a rapid and massive privatisation movement throughout Eastern Europe and the former Soviet bloc in the early 1990s. The second country-specific factor relates to the onset of macroeconomic crises, such as hyperinflation or balance-and-payment problems.

States confronting such crises may first seek to solve their problems by raising domestic taxes or borrowing from overseas; however, there are limits to the extent to which domestic savers and foreign lenders can undertake such actions. If these limits are reached, the state may have no choice but to take the painful alternative of selling off state assets – *de facto* privatisation – to secure hard currency it needs to write off huge deficits or debts. As discussed, this is the remedy advocated by the Washington Consensus, and also required by the World Bank and IMF when they grant last-resort loans. The final country-specific factor cited by Ramamurti is the degree of sophistication of institutions underpinning a market economy. The quality of market-supporting institutions will affect the private investor’s willingness to make funds available so that a weak institutional environment will slow down the speed of any ownership transaction (and so also privatisation). Figure 4.1 offers a diagrammatical representation of Ramamurti’s framework of privatisation dynamics.

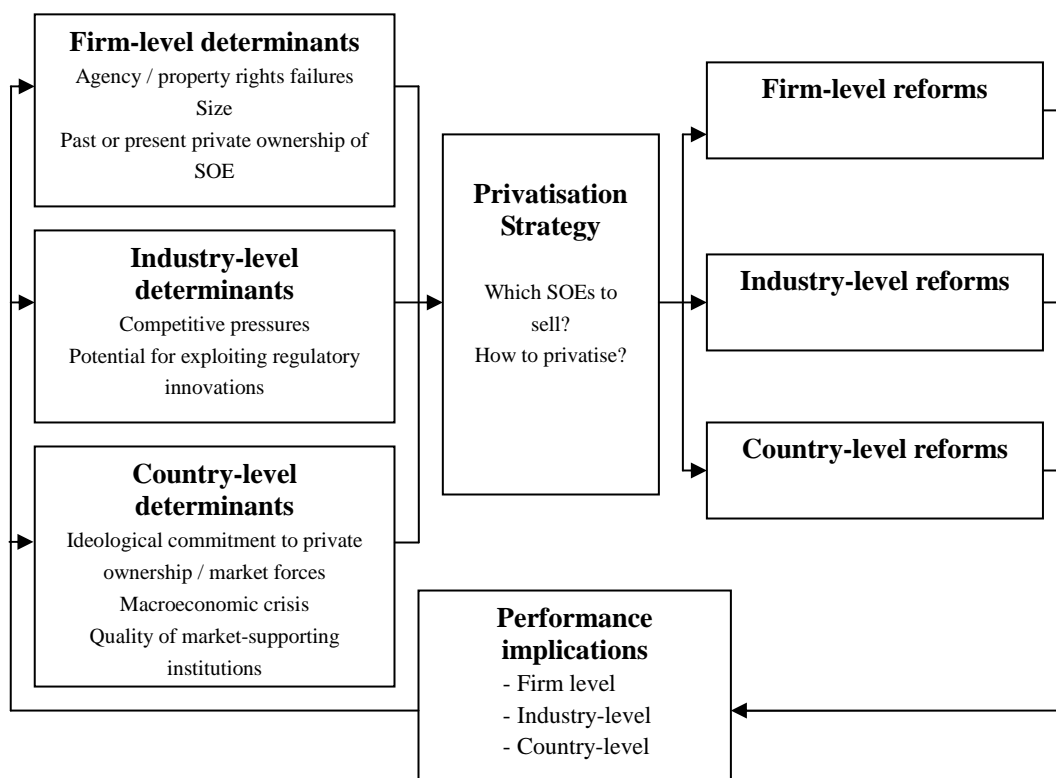


Figure 4.1: Ramamurti’s multi-level model for privatisation studies.

Source: Ramamurti (2000)

This framework has two shortcomings. First, its classification wholly relies on the difference in organisation levels, which are classified by firm-, industry- or country-specific factors. However, the scale of influence is actually not a concept based on economic theories. That makes this framework impossible to explore the economic nature of privatisation dynamics. Second, this framework makes no distinction between relevant actors. Different actors are involved in any privatisation. They include government bureaucrats, enterprise managers, private investors and bank lenders, each of whom will respond to a privatisation programme on the basis of his self-interest-maximising calculation of costs and benefits. Such considerations help explain why Ramamurti's framework is too simplified to address the complexities of privatisation, as well as to identify the economic nature of privatisation dynamics.

Therefore, in what follows, I propose a modified framework that can be more effectively address this nature. All privatisation-related factors can be fitted into three categories – those that operate at the microeconomic, macroeconomic and political economy levels. Microeconomic determinants place the micro conditions of an SOE at the centre of the analysis. They include (see literature review) factors such as economic efficiency, firm size and human capital characteristics of SOEs. These micro conditions determine the starting point of each privatisation sale. Secondly, macroeconomic level determinants relate to macroeconomic changes in the market environment and their subsequent impact on privatisation. They include considerations of market competition, financial pressure and institutional infrastructure. Under my categorisation, this group is larger than Ramamurti's industry-level group because of its inclusion of two extra country-level factors.

Thirdly, the group of political economy determinants focuses on the strategic behaviours of individual actors during privatisation. Relevant factors include the soft budget constraint, political ideology and decentralisation. Through consideration of these it is possible to address various interactions between government and enterprise, bureaucrat and manager, and/or enterprise and bank in the privatisation process. Thus, my revised group here differs greatly from Ramamurti's country-level group, in which there is only one factor – ideological commitment – which overlaps with my modified version.

In nature, there are three economic dimensions of privatisation:

- (1) *Microeconomic dimension*: that concerns SOEs' conditions of individual/micro endowments at the beginning stage of privatisation.
- (2) *Macroeconomic dimension*: that concerns SOEs' conditions of surrounding/macro environment during privatisation.
- (3) *Political economy dimension*: that concerns strategic interactions between SOEs and other actors in privatisation.

Figure 4.2 shows the author's modified framework of privatisation dynamics.

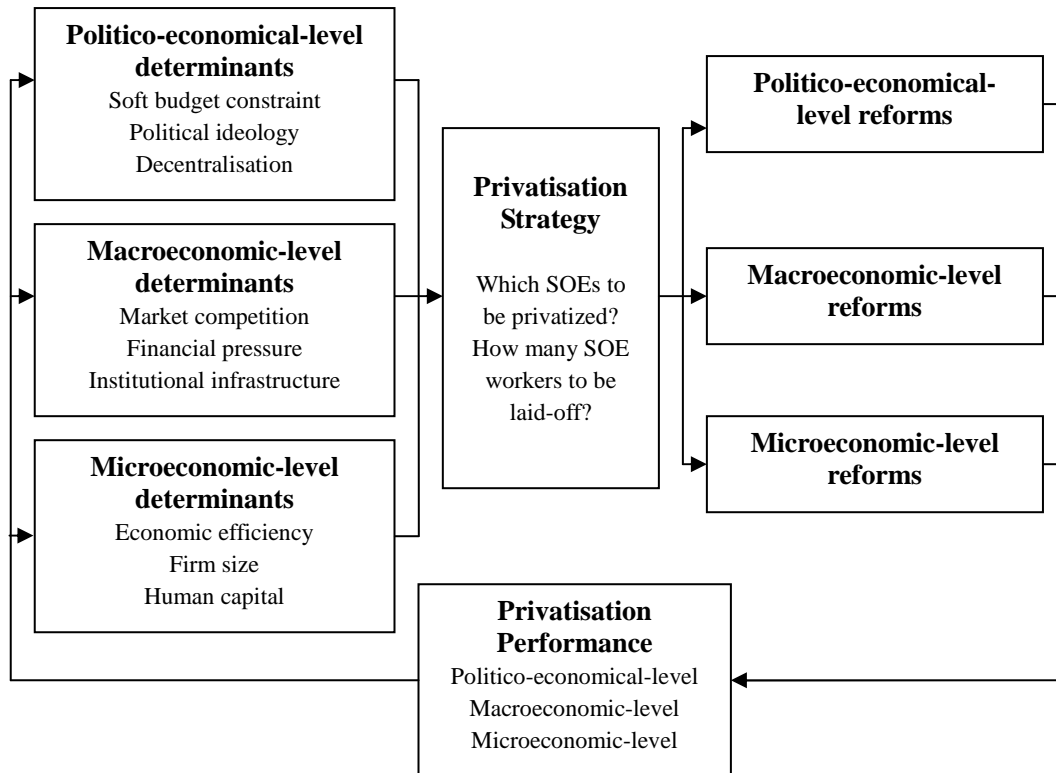


Figure 4.2: Multi-level framework in this research.
Source: Author's summary

The two frameworks have their own distinctive characteristics

Firstly, the *soft budget constraint*. In Ramamurti's framework, the soft budget issue is included as a part of agency problem and regarded as a firm-level factor. In my framework, it is viewed not as a microeconomic level, but rather as an issue of political economy. The reason lies in the nature of hardening soft budgets – which is a process never solely controlled by the SOE itself. The bureaucrat's role should not be neglected because he is the one who is most strongly motivated to harden the soft budget system. SOEs are actually the beneficiaries of soft budgets, and they do not have the motivation to reform themselves. In this regard, the issue of soft budget is better seen as part of the interaction between the bureaucrat and manager, rather than a firm-level condition under the SOE's own control. In China, the soft budget issue is even more complicated than this suggests. Three levels of interaction are involved:

- The first is between central and local governments. Through a series of budgetary, banking and monetary reforms in the mid-1990s, the Chinese central government successfully shifted the major part of the SOE subsidy burden downwards to local governments. Soft budgets which local governments had long enjoyed were significantly reduced. In effect, local governments became more vulnerable than the central government in bearing this heavy burden because of the absence of fiscal and monetary tools at their disposal.
- At the second level, local governments also reduced the subsidies to local SOEs in attempts to transfer the hardening pressure.
- At the third level, banking reforms began to require state banks to reduce soft credits for SOEs because these loans carried higher risks.

As a result, SOEs suffered most from the hardening process because they were hit three times over.

For these reasons, the soft budget constraint should not be seen as solely a firm-level determinant. This is particularly the case in China, where the soft budget issue is best understood as a set of strategic interactions between central and local governments, as well as between SOE managers and bank lenders.

Secondly, the *past experience* of an SOE. This factor is regarded by Ramamurti as a firm-level determinant for future privatisation because the SOE's past (pre-nationalisation) experience as a private firm act as a facilitator of its re-embrace of private ownership. However, this variable is not applicable to China, since this assumption does not wholly accord with the historical development of China's state industrial sector. In 1995, the total number of Chinese SOEs peaked over 120,000: two thirds of these had been established during the pre-1979 socialist industrialisation

period, while one third had been newly created under the impact of reform. In short, the vast majority had no origin as a private enterprise. Thus, restitution has not been a characteristic feature of Chinese privatisation. In addition, China's transitional model is not based on the Big-Bang approach where voucher privatisation is widely taken to achieve a rapid reform of ownership transformation. Its gradualist model of transition has also avoided the necessity of making a sudden and immediate privatisation decision.

Thirdly, the benefits of *regulatory innovation*. By assumption here, under the impact of the development of regulatory innovation, more private providers will start to be permitted to participate in some traditional monopolistic industries. This assumption, however, may not accord with the reality of Chinese conditions. Chinese privatisation mainly took place in the second half of the 1990s, a period when the institutional environment was still poorly developed and inimical to private property rights. Most privatisation transactions took place without supporting regulations. Indeed, many entry barriers of industries were lowered whilst more private providers were allowed to enter a number of traditional monopolies, such as electricity, water, gas, coal or petroleum (see Table 2.6). However, it would be difficult to conclude that the evolving process of privatisation in these Chinese industries was the result of sophisticated regulation innovation (meaning that private competitors were encouraged to participate by the regulatory rents relieved by the state). Most merits should be claimed by the success of liberalisation towards China's markets.

Fourthly, *competition*. The two frameworks offer two distinctive hypotheses in relation to competition. In Ramamurti's framework, rising competition in each country's state sector is assumed to have derived from three sources – global economic liberalisation, overall technological improvement and the international trend towards deregulation. These sources are all external. However, the increase in

competition facing Chinese SOEs has mainly come from *internal* sources, including more intensified regional/provincial competition following decentralisation, increases in private competitors resulting from a booming local private sector, and the increasing accessibility of local markets to products made available through international and inter-regional trade. Hence the difference in the competition hypothesis in my modified framework.

Fifthly, there are two necessary shifts between categories. The macroeconomic crisis and institution hypotheses are both moved from the country-level group of determinants. This does not suggest that these influences on privatisation do not operate at the country-level; indeed, they do. But it is to argue that these factors mainly relate to the response by an SOE to changes in external conditions in the market and institutional environment. They are much less related to the strategic interaction between the bureaucrat and manager in the process of privatisation; unlike the ideology factor – which captures the manager’s strategic response to the bureaucrat’s ideological commitment. It also explains why these two factors do not belong among political economy determinants.

Finally, there are some important factors neglected in Ramamurti’s framework.⁷⁵ The first is that of decentralisation. This factor has many distinctive Chinese characteristics, and it lies at the heart of differences between privatisation in China and in other transitional economies. Chinese privatisation occurred after the implementation of major, far-reaching and comprehensive reforms; by contrast, privatisation in other transitional economies often took place in advance of market-oriented reform (or sometimes within it, or sometimes to be used as a tool to achieve it). Chinese practice provided an exception to this mainstream assumption – something of which Ramamurti was not aware.

⁷⁵ Please see the details of each hypothesis in the literature review in Chapter Three.

Nor, in terms of firm-level determinants, is the factor of economic efficiency included. This is generally understood as part of agency/property rights problem in Ramamurti's framework. However, economic efficiency is not a problem that solely exists between principal and agent, or merely relates to unclear definition of property rights. Efficiency is a more general factor reflecting and affecting many aspects of a firm's business capability. A more economically efficient SOE is likely to be privatised sooner or later depending on circumstances. The outcome will depend on the assumptions of personal motivation and future expectation of the bureaucrat and manager. This is another crucial point, but one that is often ignored.

Lastly, the human capital characteristics of an SOE are not considered. Although this factor has attracted little attention in the existing literature, human capital capacity is undoubtedly one of the most important facets of any enterprise's factor endowment. Possession of strong human capital may make an SOE more attractive to potential private buyers and thereby increase the likelihood that privatisation will take place. Strong human capital may also help an SOE reduce monitoring costs and production risks. It may further decrease the willingness of the bureaucrat to privatise it. One way or the other, it is a variable not to be underestimated in the privatisation process.

Connection between hypotheses

There is potential connection between hypotheses – an issue that should be considered before discussing econometrics that can deal with this endogenous problem. From a broad perspective, all external factors could be to some extent connected to each other, particularly in this multilevel framework of privatisation in

which nine hypotheses are placed into three major groups.⁷⁶ Every hypothesis of each group is assumed to be sharing the remaining two hypotheses with similar economic essence, either of microeconomics, macroeconomics, or political economy. By nature, accordingly, there should be potential connection among hypotheses in the same group, and the question is how to deal with this in a more efficient way (see the discussion in Section 4.3). However, from another angle, this problem can be mitigated by concentrating on the influence of hypotheses as a group. That is, the potential connection among three groups should be much smaller than that among hypotheses within a group. By doing so in interpretation, we can highlight the driving force in a higher level (which is one of main purposes of this thesis) while also not downplaying any single factor, whose influence could be affected by other factors having potential connection.

Before the discussion proceeds, it is useful for readers to know that this issue has so far drawn little attention in the literature of privatisation studies. The handful of papers addressing the potential connection between privatisation and output variables attempt to rule out the sample selection bias as comparing performance between privatised and non-privatised (including public or private) firms or in *ex ante* and *ex post* period of privatisation (Aussenegg and Jelic, 2007; Li and Rozelle, 2000; Lin and Su, 2008; Plane, 1997). What worries these authors is the potential reverse causality in which the privatisation decision is made on the basis of external factors, particularly of the variety of firm performances. However, interestingly, this “reverse causality” is exactly the causality I intend to examine, and, hence, this concern should

⁷⁶ For this reason, it is impossible to single out an independent factor entirely free from influence of other factors in the context. Even though one can declare of doing so, it will hardly match the reality. The problem in operation is therefore how to better control other effects in terms of ‘feasible’ econometrics. All findings should be interpreted in a conservative manner, while a careful researcher will have to admit that the limitation of, even the most advanced, econometric technique may neglect potential causal relationship not being hypothesised. This is also the stance taken in my following interpretation.

not be a worry to this thesis.

Even without any reference in literature, some concerns over the potential connection among hypotheses, based on my own conjectures, are still plausible.

For instance, firstly, the potential relationship between soft budgets (H1) and financial pressure (H5). The decrease of soft budgets is supposed to increase the financial pressure facing SOEs; however, this causality is not so direct. Since soft budgets are mainly granted for loss-making SOEs, the reduction of soft budgets may also represent the decrease in the number of SOEs that make losses. This means, on the contrary, less financial pressure has fallen on SOEs, against the causality imagined.

Next, in former Soviet and Eastern European countries, rising market competition (H4) can be seen to be a result of the ideological shift from a central-command to a market-oriented economy (H2) in a rather short period of time in the early 1990s. Yet, this ideological change in China has been much slower than the “big bang” approach in the West. Private ownership was not even ‘legally’ protected in China until the late 1990s – a time when the degree of market competition was already very high, thanks to the boom of township and village (also public) enterprises, as well as the participation of FDI pouring into China from overseas. So the potential causal relationship between ideology and competition in China is actually rather weak.

Thirdly, decentralisation (H3) is once defined in literature as the combination of the hardness of budget (H1) and market development (similar to H5) (Guo and Yao, 2005). This potential connection comes only from the special definition; however, decentralisation is not necessarily to be defined as being connected with soft budgets, market competition, or even other factors. In my definition, detailed in Section 4.4, decentralisation is better represented by the increasing autonomy in local fiscal

capability – a factor that could matter nothing about budget constraint or market situation.

Furthermore, as one can imagine, competition (H5) is a strong factor that could affect everything. Competition may encourage politicians to undertake political changes (relevant to H1, H2 and H3) or push managers to adjust enterprise conditions (relevant to H7, H8 and H9). However, this wide range of potential influence of competition also reveals that the causality between competition and other factors is not sufficient. More importantly, it will take ‘time’ to diffuse competition effect, which therefore may not be simultaneous with the effects from other factors.

The final concern is with the potential link between efficiency (H7) and human capital (H9).⁷⁷ There is no doubt that the endowment of human capital may relate, more or less, to the degree of efficiency of a firm. But these two factors may differ from each other by placing emphasis on different part of efficiency. The quality of labour is at the centre of the human capital factor, while it also can be totally ignored in a normal efficiency factor. This strategy may help avoid direct causality between them, and will be taken in the variable design in Section 4.4.

In short, although it is theoretically impossible to reject potential causality among hypotheses, there is no substantial causality that can be recognised among the hypotheses set out in this thesis. There is no literature to suggest, or even to provide evidence of, any potential connection among privatisation determinants. Hence, the concern of results being biased by potential problem of endogeneity should be small. In addition, by contrast, if there is still concern that this analysis remains unconvincing, the issue of endogeneity among hypotheses/variables can also be better controlled by using system-GMM estimation technique. The mathematical justification is followed in the next section.

⁷⁷ I would like to thank the examiner for pointing out this potential issue ignored in the previous draft.

4.3 Econometrics

Econometric specification and strategies

The shrinkage of Chinese state sector, representing the dependent variable, is specified in a dynamic model as

$$y_{it} = f(y_{i,t-1}, x_{1it}^*, x_{2it}^*, \dots, x_{kit}^*), \text{ for } i = 1, \dots, N, t = 1, \dots, T, \quad (1)$$

where the degree of contraction, in the i -th province at the t -th period, y_{it} is assumed to be determined by its lagged term for one period $y_{i,t-1}$, also known as the dynamic variable, with other explanatory variables $x_{1it}^*, x_{2it}^*, \dots, x_{kit}^*$ in the same period. This dynamic autoregressive-distributed linear model is expressed as

$$y_{it} = \alpha y_{i,t-1} + \sum_{l=1}^k \beta_l' x_{lit}^* + u_{it}, \text{ for } i = 1, \dots, N, t = 1, \dots, T, \quad (2)$$

$$u_{it} = \eta_i + \lambda_t + v_{it},$$

where the disturbance u_{it} is decomposed by unobservable individual-specific effects $\eta_i : \text{IID}(0, \sigma_\eta^2)$, year-specific effects λ_t , and the remainder stochastic disturbances $v_{it} : \text{IID}(0, \sigma_v^2)$.

The reason for setting up a dynamic model is twofold. Firstly, a dynamic process of privatisation induced by multilevel factors is the chief argument of this thesis, while a traditional static setting in specification is completely contrary to my theoretical assumption. My aim is to show that privatisation should not be regarded as

a “one-shot event” (Ramamurti, 2000), especially in China where privatisation reform took place over a period much longer than that during which the “big bang” approach took place in the former Soviet Union and Eastern European countries. Only by a dynamic setting in specification can one examine external effects to privatisation as well as the feedback/internal effect from privatisation itself. In other words, a static model will inevitably omit the lagged adjustment phenomenon in which privatisation as a policy may adjust itself according to previous policy outcome, especially in the short-run, such as of the last period. Secondly, a multilevel model of privatisation will surely raise the worry of engaging with the issue of endogeneity among explanatory variables, a kind of econometric bias that can be largely controlled by a newly developed estimator that also requires a dynamic specification as necessity. There is more discussion about endogeneity and estimator below.

There are econometric reasons to apply the estimator of system general method of moments (system-GMM) (Blundell and Bond, 1998, Blundell et al., 2000, Arellano and Bover, 1995) in the following analysis.⁷⁸ First, the dynamic nature is only captured by the GMM estimator without bias and inconsistency – problems that are inevitable in traditional pooled or fixed effects, also known as the within group (WG), ordinary least squares (OLS) estimations (Nickell, 1981, Baltagi, 2009, Blundell et al., 2000).⁷⁹ ⁸⁰ Second, with the help of GMM estimator, researchers may consider more explanatory variables in a regression without worries of the problem of endogeneity.⁸¹ Thirdly, the bias caused by the decrease of data variation in the first differences in the

⁷⁸ These reasons are discussed mathematically in the next section.

⁷⁹ The correlations between explanatory variables and errors brought by the dynamic specification would prevent the probability limits of pooled-OLS and WG estimators from approaching to the true value. So this problem of endogeneity would make results inconsistent when the sample size increases.

⁸⁰ This dynamic nature would also lead to an asymptotic upward bias in the pooled-OLS estimator as well as downward bias in the WG estimator.

⁸¹ The problem of endogeneity refers to problem of inconsistency caused by the correlation between regressors and errors. The mathematical discussion of this problem is listed after the Equation (4) in Section 4.3.

difference-GMM (a problem to which particularly for highly persistent series are especially susceptible) is corrected by getting the level values of variables back to the regressions in the system-GMM.⁸² Hence, the precision of coefficients will be improved through the removal of the bias caused by weakened instruments.

Robustness checks are conducted by using a smaller dataset excluding data that may contain relatively extreme values in the first or last few periods of time, in order to see if results can resist changes. Finite sample bias in the difference-GMM should be corrected by the system-GMM estimator through its re-introduction of the level equations into estimations (Blundell and Bond, 1998). All results are derived by two-step estimation with Windmeijer corrections. Validity of instruments is detected by Hansen test.⁸³ Hansen test can also check the fitness of structural specification (Roodman, 2009b).⁸⁴ Difference-in-Hansen test detects the validity of the subsets of instruments using in level equations (Roodman, 2009a).⁸⁵ The potential problem of the instrument proliferation, also known as too-many-instruments bias, is considered. Some Monte Carlo simulation tests showed that the over-identification caused by too many instruments in GMM estimators would lead to the failure of expunging endogenous components (Roodman, 2009b). Two theoretical solutions are accordingly adopted: first, the instrument count will be severely reduced by the matrix technique of collapsing the instruments using in the first differenced equations, and,

⁸² This problem will supposedly lead to a downward bias among coefficients – an effect clearly seen in following results.

⁸³ The validity of instruments can be detected by Sargan or Hansen test. Theoretically speaking, the Sargan test is not robust because of its assumption of homogeneity, but this test will not be affected by too-many-instrument problem. On the contrary, the Hansen test is robust for assuming heterogeneity, but its effectiveness may be weakened by instrument proliferation.

⁸⁴ As Roodman (2009) states “omitting important explanatory variables, for instance, could move components of variation into the error term and make them correlated with the instruments”, a large *p*-value in Hansen test also means that there is little evidence of omitted variables. See also in He and Sun (2013).

⁸⁵ If the subset instruments introducing by the system-GMM is valid, this statistic should be asymptotical to Chi-squared, with degree of freedom equal to the number of suspect instruments.

second, the time depth of instrument lags will be severely limited.⁸⁶ In short, a conservative strategy of econometrics will be strictly committed in what follows.

More about endogeneity

Since endogeneity is one of the most common problems that worry researchers in empirical studies, I would like to address this topic in more detail and provide the rationale of my strategy.

First of all, it should be noted that most discussions of endogeneity in privatisation literature are concerned with the endogenous effect of privatisation variable (in the right-hand side of equation) to firm performance as dependent variable – a case completely different from this thesis in which privatisation is treated as dependent variable (in the left-hand side of equation).

In fact, there are only two variables discussed in current literature that could be endogenous to privatisation. A potential reverse causality may happen to the variable *hardness of budget* (Brandt et al., 2005; Li, 2003; Lopez-de-Silanes et al., 1997). Though most privatisation should be driven by hardening budgets, it cannot be rejected that a local government may choose privatisation as a means to harden the budget. A similar case also happens to the variable *fiscal pressure*. A local government keen to provide more services by spending more budgetary funds may be happy with larger deficits and thus less likely to privatise (Clarke and Cull, 2002).

Nevertheless, as Plane (1997) states, privatisation is not a policy of random choice, but endogenous to economic policy targets. That is to say, more, or even all, explanatory variables could be endogenous to privatisation. Or, in other words,

⁸⁶ Yet, it is well accepted in relevant discussion that there is no clear guidance from the literature on a proper number of instruments.

privatisation is also inevitably an endogenous result of all economic policy variables. This assumption will make it almost impossible to solve endogeneity by traditional econometric techniques, such as replacing endogenous variables by valid (or, more precisely, orthogonal) instruments, or setting up a simultaneous equations model to examine the real degree of endogeneity. Yet the current development in econometrics helps greatly in tackling this problem.

With the help of system-GMM estimator, whose merits in dealing with endogeneity have just been discussed, more empirical researchers are encouraged to extend their researches to the field that most explanatory variables could be endogenous (Colombo et al., 2013; He, 2012; He and Sun, 2013; Pathan and Faff, 2013). For instance, Colombo et al. (2013) focus on the treatment effect of public subsidies on a firm's investment rate and investment–cash flow sensitivity, but all public support variables could be endogenous for a reverse causation in which firms having more investment opportunities may be more likely to seek public support in finance. He and Sun (2013) identify the determinants of China's economic growth in the reform period and assume that all explanatory variables of output growth may be endogenous to the growth process due to the feedback effect. Pathan and Faff (2013) examine the causal effect of board structure on firm performance while regarding major explanatory variables such as *board size*, *independent directors* and *gender diversity* endogenous. He (2012) establishes a causal relationship between financial deregulation and export expansion in China while controlling the potential endogeneity of financial deregulation to other explanatory variables such as *real GDP*, *human capital investment*, *labour force growth*, *fiscal expenditure* and *FDI*. Although endogeneity may come from different sources, all these papers fully rely on the system-GMM estimator to tackle this econometric problem.

Following this academic trend, the strategy of this thesis is also to take a

conservative stance in econometrics, regarding all explanatory variables as potentially endogenous, and use system-GMM estimator to deal with this issue. The mathematical process of how system-GMM estimator can purge endogeneity via lagged terms of predetermined variables as instruments is detailed in the following section. Since these variables are *internal* instruments, there is no need any longer to find *external* instruments – a job not only time consuming but sometimes unfeasible because of limited information for constructing new variables. This estimator is thus preferred over reduced-form and instrument models. Another major advantage is that it can address endogeneity from different sources including unobserved heterogeneity, simultaneity and reverse causality (Pathan and Faff, 2013).

Additionally, it is noteworthy that the special data form of this research also helps to reduce the chance of engaging with endogeneity among variables. Since all my data are of aggregate form, either of a province or of an industry of a province, the nature of potential reverse causality among variables of a specific firm will inevitably be blurred. My assumption corresponds to that of Li (2003), who argues that his industrial-level measure is able to avoid the endogeneity issue of a firm-level measure.

Causality in hypotheses

In terms of the potential issue of causality versus correlation, the conclusion drawn from the literature discussion in Section 3.1 may suggest a conservative approach avoiding the use of causality in order to accommodate potential problems caused by simultaneity, reverse causality, or unobserved factors.

However, the current trend in empirical studies seems to be generating greater confidence, by which researchers are more encouraged to declare causal relationship

among variables examined. Using system-GMM technique, Pathan and Faff (2013) examine the causal effect of board structure of firm performance. Vandenberghe et al. (2013) use firm-level panel data with system-GMM estimation to produce robust evidence (in their words) on the causal effect of ageing on productivity and labour costs. He (2012) declares that the dynamic panel data specification allows him to use system-GMM to establish a causal relationship between financial development and firm exports. Regarding to the production function, He and Sun (2013) use system-GMM to isolate the contributions of human capital and technological change to output growth, so that they are allowed to establish a causal relationship between growth and its determinants. Since the specific (unobserved) characteristics can be controlled in system-GMM, Krieger and Ruhose (2013) state that they are “able to draw conclusions on a causality basis, rather than just interpreting correlations.”

Returning to this thesis, which aims to explore the determinants of the privatisation reform in China, it is impossible to reject causality. To the contrary, the multilevel framework, established in the last section, modelling the dynamic process by examining both simultaneous and feedback effects, is by nature assuming causality between privatisation and external factors. This theoretical assumption will inevitably raise concerns of engaging with endogeneity, introducing biases into regression results. However, with the help of system-GMM estimation, these endogenous problems can be largely, if not entirely, reduced. It is beneficial to recall that, in literature, only two variables – *hardness of budget* (Brandt et al., 2005; Li, 2003; Lopez-de-Silanes et al., 1997) and *fiscal pressure* (Clarke and Cull, 2002) – are once discussed for having potential reverse causality to privatisation. It means that endogeneity is not a serious concern in privatisation studies when privatisation is treated as a development variable, rather than one of the explanatory variables that, in most cases, explain firm performance. In addition, the great merit of the system-GMM in controlling

unobserved effects by introducing differenced equations into models also allows us to interpret findings in a more causal sense.⁸⁷

Nevertheless, there is no doubt that all empirical findings, not only in this thesis but in all empirical papers, are derived from a correlation basis. Causality is only assumed behind hypotheses, while any declaration of it should be rigorously subject to specific conditions in econometrics. Therefore, I feel obliged to admit that all my findings are based on correlations with statistical significance, while the causality can only be interpreted in a rather conservative manner.

Econometric justification

This section justifies the application of system-GMM by demonstrating mathematically how the potential econometric problems – including bias, inconsistency and endogeneity – will be solved by the system-GMM estimator. It starts with the basic regression model, the pooled OLS estimation.

Pooled OLS estimation. This estimation begins with the basic form of Eq.(2):

$$\mathbf{y}_i = \mathbf{X}_i \boldsymbol{\beta}_{pool} + \mathbf{u}_i, \quad (3)$$

where $\mathbf{y}_i = (y_{i1}, \dots, y_{it})'$, $\mathbf{X}_i = (y_{i,t-1}, x_{1it}^*, \dots, x_{kit}^*)$, $\boldsymbol{\beta}_{pool} = (\alpha, \beta_1', \dots, \beta_k')$, and $\mathbf{u}_i = (u_{i1}, \dots, u_{it})'$. The coefficient vector $\boldsymbol{\beta}_{pool}$ can be obtained by assuming orthogonality conditions $E(\mathbf{X}_i' \mathbf{u}_i) = 0$, which yield the following calculation

⁸⁷ It is for this reason that the term “ceteris paribus” will not be used in wording my hypotheses. This conditional assumption will help improve the accuracy in interpreting findings when unobserved or simultaneous factors cannot be ruled out. However, since the system-GMM is supposed to be able to efficiently control both effects, I feel no needs to make this statement. In addition, this term is rarely seen in the privatisation literature. There is only one paper using this term in hypotheses, while Bortolotti et al. (2003) downplay their findings as conditional expectations for the possibility to contain effects unobserved.

$$E[\mathbf{X}'_i(\mathbf{y}_i - \mathbf{X}_i\boldsymbol{\beta}_{pool})] = 0,$$

$$E(\mathbf{X}'_i\mathbf{X}_i)\boldsymbol{\beta}_{pool} = E(\mathbf{X}'_i\mathbf{y}_i),$$

$$\boldsymbol{\beta}_{pool} = [E(\mathbf{X}'_i\mathbf{X}_i)]^{-1} E(\mathbf{X}'_i\mathbf{y}_i).$$

So, the pooled OLS estimator is obtained as

$$\hat{\boldsymbol{\beta}}_{pool} = \left(N^{-1} \sum_{i=1}^N \mathbf{X}'_i\mathbf{X}_i \right)^{-1} \left(N^{-1} \sum_{i=1}^N \mathbf{X}'_i\mathbf{y}_i \right). \quad (4)$$

However, there are two problems. First, applying the pooled OLS estimator in a dynamic model will cause a problem of inconsistency because of the existence of a correlation between regressors and errors:

$$\text{plim}\hat{\boldsymbol{\beta}}_{pool} = \boldsymbol{\beta}_{pool} + \text{cov}(\mathbf{X}_i\mathbf{u}_i) / \text{var}(\mathbf{X}_i),$$

if $\text{cov}(\mathbf{X}_i\mathbf{u}_i) \neq 0$, then the probability limits will not approach to the true value, that is $\text{plim}\hat{\boldsymbol{\beta}}_{pool} - \boldsymbol{\beta}_{pool} \not\rightarrow 0$. This is called the problem of endogeneity and these explanatory variables are called endogenous variables. Second, this estimator also leads to the problem of asymptotic bias (Blundell et al., 2000, Baltagi, 2009):

$$\text{plim}(\hat{\boldsymbol{\beta}}_{pool} - \boldsymbol{\beta}_{pool}) = (1 - \beta) \frac{\sigma_\eta^2 / \sigma_v^2}{\sigma_\eta^2 / \sigma_v^2 + k}, \text{ with } k = \frac{1 - \beta}{1 + \beta}, \sigma_\eta^2 = E(\eta_i^2),$$

this estimator is biased upwards, with $\beta < \text{plim}(\hat{\boldsymbol{\beta}}_{pool}) < 1$.

Fixed effects estimation. The fixed effects (FE) estimator highlights the unobserved heterogeneity among individual-specific and time-specific impacts, so the

Eq.(2) is re-written as

$$\mathbf{y}_i = \alpha \mathbf{1}_{nt} + \mathbf{X}_i \beta_{FE} + \mathbf{Z}_\eta \eta_i + \mathbf{Z}_\lambda \lambda_t + \mathbf{v}_i = \mathbf{Z} \delta_{FE} + \mathbf{Z}_\eta \eta_i + \mathbf{Z}_\lambda \lambda_t + \mathbf{v}_i, \quad (5)$$

where $\mathbf{1}_{nt}$ is a $n \times t$ matrix of ones, $\beta_{FE} = (\beta'_1, \dots, \beta'_k)'$, \mathbf{Z}_η and \mathbf{Z}_λ are respectively the matrix of individual and time dummies, $\mathbf{Z} = (\mathbf{1}_{nt}, \mathbf{X}_i)$, $\delta_{FE} = (\alpha, \beta_{FE})'$, and the stochastic disturbance vector $\mathbf{v}_i = (v_{i1}, \dots, v_{iT})'$. The individual-specific heterogeneity η_i and time-specific heterogeneity λ_t can be captured by including dummies in regressions, and the fixed effects estimator $\hat{\delta}_{FE}$ can be obtained by performing the method of least squares dummy variables (LSDV) on Eq.(5) with a transformation matrix, given by Wallace and Hussain (1969), that sweeps away η_i and λ_t effects.⁸⁸ So, the estimator is as

$$\hat{\delta}_{FE} = (\mathbf{X}'_i \mathbf{Q} \mathbf{X}_i)^{-1} (\mathbf{X}'_i \mathbf{Q} \mathbf{y}_i). \quad (6)$$

However, this encounters the same problem as the pooled OLS estimator. The lagged term of dependent variable in the dynamic model will cause inconsistency due to the endogeneity problem (Arellano and Bond, 1991). Additionally, this estimator is also asymptotic biased (Nickell, 1981, Blundell et al., 2000), which is given by

⁸⁸ This transformation matrix is $\mathbf{Q} = E_N \otimes E_T = I_N \otimes I_T - I_N \otimes \bar{J}_T - \bar{J}_N \otimes I_T + \bar{J}_N \otimes \bar{J}_T$, where I_x denotes identity matrix of dimension x , J_y denotes a matrix of ones of dimension y , $\bar{J}_y = J_y / y$, and \otimes denotes Kronecker product, whose application is if, for example, two matrices

$$A_{m \times n} \text{ and } B_{p \times q} \text{ then } A_{m \times n} \otimes B_{p \times q} = \begin{bmatrix} a_{11} B & L & a_{1n} B \\ M & & M \\ a_{m1} B & L & a_{mn} B \end{bmatrix}_{mp \times nq}.$$

$$\text{plim}(\hat{\delta}_{FE} - \delta_{FE}) = -\frac{\frac{1 + \delta_{FE}}{T-1} \left(1 - \frac{1}{T} \frac{1 - \delta_{FE}^T}{1 - \delta_{FE}}\right)}{1 - \frac{2\delta_{FE}}{(1 - \delta_{FE})(T-1)} \left(1 - \frac{1}{T} \frac{1 - \delta_{FE}^T}{1 - \delta_{FE}}\right)},$$

and hence when $\delta_{FE} > 0$, $\text{plim}(\hat{\delta}_{FE}) < \delta_{FE}$.

Difference-GMM estimation. This estimator has lagged terms of predetermined variables, which are determined prior to the current period, as the instruments for the equations in first differences (Arellano and Bond, 1991). The logic is that all the explanatory variables are potentially correlated with individual-specific effects and therefore only the estimator based on the deviations of original observations can avoid inconsistency (Arellano and Bover, 1995). The general form of GMM estimator for Eq.(2) is expressed as

$$\mathbf{y}_i = \mathbf{W}_i \boldsymbol{\delta}_{GMM} + \mathbf{v}_i \eta_i + \mathbf{v}_i, \quad (7)$$

where the variable matrix $\mathbf{W}_i = (y_{i,t-1}, x_{1,it}^*, \dots, x_{l,it}^*, \mathbf{v}_t)$, the GMM parameter vector $\boldsymbol{\delta}_{GMM} = (\alpha, \beta'_1, \dots, \beta'_l, \lambda_t)'$, and the vector of ones \mathbf{v}_i and \mathbf{v}_t with dimension of i and t , respectively.⁸⁹ The method of difference-GMM utilizes the first differences of Eq.(7) to eliminate individual-specific effects η_i , which may not be simply purged by instrumental transformation:

$$\begin{aligned} \Delta \mathbf{y}_i &= \Delta \mathbf{W}_i \boldsymbol{\delta}_{GMM} + (\mathbf{v}_i \eta_i - \mathbf{v}_i \eta_i) + \Delta \mathbf{v}_i, \\ \Delta \mathbf{y}_i &= \Delta \mathbf{W}_i \boldsymbol{\delta}_{GMM} + \Delta \mathbf{v}_i, \end{aligned} \quad (8)$$

⁸⁹ An essential assumption to GMM estimation is that there is no serial correlation in v_{it} , or the estimators may not be consistent. This requirement can be detected by the AR(1) and AR(2) tests.

where $\Delta \mathbf{y}_i = (\Delta y_{i2}, \dots, \Delta y_{iT})'$ for $\Delta y_{it} = y_{it} - y_{i,t-1}$, $\Delta \mathbf{W}_i = (\Delta y_{i,t-1}, \Delta x_{1,i1}^*, \dots, \Delta x_{l,iT}^*, \Delta \mathbf{t}_t)$ for $\Delta y_{i,t-1} = y_{i,t-1} - y_{i,t-2}$, $\Delta x_{it}^* = x_{it}^* - x_{i,t-1}^*$, $\Delta t_t = t - t_{-1}$, and $\Delta \mathbf{v}_i = (\Delta v_{i2}, \dots, \Delta v_{iT})'$ for $\Delta v_{it} = v_{it} - v_{i,t-1}$. Let \mathbf{W}_i^* and \mathbf{y}_i^* denote this first-differenced transformation (that is $\Delta \mathbf{W}_i$ and $\Delta \mathbf{y}_i$), and the suitable instruments for each equation are

| First differenced equations | Instruments available |
|---|--|
| $\Delta y_{i3} = \Delta W_{i2} \delta_{GMM} + \Delta v_{i3}$ | y_{i1}, x_{i1}, x_{i2} |
| $\Delta y_{i4} = \Delta W_{i3} \delta_{GMM} + \Delta v_{i4}$ | $y_{i1}, y_{i2}, x_{i1}, x_{i2}, x_{i3}$ |
| \mathbf{N} | \mathbf{N} |
| $\Delta y_{iT} = \Delta W_{i,T-1} \delta_{GMM} + \Delta v_{iT}$ | $y_{i1}, \dots, y_{i,T-2}, x_{i1}, \dots, x_{i,T-1}$ |

where $x_{it} = (x_{1,it}^*, \dots, x_{k,it}^*)$, and $E(x_{it} v_{is}) = 0$ for $s \geq t$, otherwise $E(x_{it} v_{is}) \neq 0$, and $E(x_{it} \eta_i) \neq 0$. So the optimal instrumental matrix is given by

$$\mathbf{Z}_i = \mathbf{Z}_i^{\text{DIF}} = \begin{bmatrix} y_{i1} & x_{i1} & x_{i2} & & & & & & & 0 \\ & & & y_{i1} & y_{i2} & x_{i1} & x_{i2} & x_{i3} & & \\ & & & & & & & & \mathbf{O} & \\ 0 & & & & & & & & & y_{i1} \quad \mathbf{L} \quad y_{i,T-2} \quad x_{i1} \quad \mathbf{L} \quad x_{i,T-1} \end{bmatrix},$$

which can be pre-multiplied on Eq.(8) in order to get the orthogonality conditions for further calculating the GMM estimator:

$$\mathbf{Z}_i' \mathbf{y}_i^* = \mathbf{Z}_i' \mathbf{W}_i^* \delta_{DIF} + \mathbf{Z}_i' \Delta \mathbf{v}_i, \quad (9)$$

which yields following moment restrictions $E(\mathbf{Z}_i' \Delta \mathbf{v}_i) = 0$.⁹⁰ Then the one-step

⁹⁰ The validity of instruments depends on Sargan test of over-identifying restrictions

difference-GMM estimator is computed in the general form as (Arellano and Bond, 1991)

$$\hat{\delta}_{DIF} = \left[\left(\sum_i \mathbf{W}_i^{*'} \mathbf{Z}_i \right) \mathbf{A}_N \left(\sum_i \mathbf{Z}_i' \mathbf{W}_i^* \right) \right]^{-1} \left(\sum_i \mathbf{W}_i^{*'} \mathbf{Z}_i \right) \mathbf{A}_N \left(\sum_i \mathbf{Z}_i' \mathbf{y}_i^* \right), \quad (10)$$

where

$$\mathbf{A}_N = \left(\frac{1}{N} \sum_i \mathbf{Z}_i' \mathbf{H}_i \mathbf{Z}_i \right)^{-1},$$

and \mathbf{H}_i is a possibly individual-specific weighting matrix as:

$$\mathbf{H}_i = \mathbf{H}_i^{\text{DIF}} = \frac{1}{2} \begin{bmatrix} 2 & -1 & 0 \\ -1 & 2 & 0 \\ 0 & 0 & -1 \\ 0 & -1 & 2 \end{bmatrix}.$$

If the number of columns of \mathbf{Z}_i equals that of \mathbf{W}_i^* , \mathbf{A}_N becomes irrelevant and

$\hat{\delta}_{DIF}$ reduces to

$$\hat{\delta}_{DIF} = \left(\sum_i \mathbf{Z}_i' \mathbf{W}_i^* \right)^{-1} \left(\sum_i \mathbf{Z}_i' \mathbf{y}_i^* \right). \quad (11)$$

There are reasons that difference-GMM may yield large bias and poor precision in simulation and empirical experience. The explanation is that those lagged levels of variable series have provided weak instruments for those first-differenced variables (Blundell and Bond, 1998), particularly under two conditions:

$$S = \left(\sum_i \hat{v}_i^{*'} \mathbf{Z}_i \right) \mathbf{A}_N \left(\sum_i \mathbf{Z}_i' \hat{v}_i^* \right),$$

where \hat{v}_i^* are one-step residuals. This Sargan statistic with the null of the validity of instruments is asymptotically distributed as a χ^2 with as many degrees of freedom as over-identifying restrictions; see SARGAN, J. D. (1958) The estimation of economic relationships using instrumental variables. *Econometrica*, 26, 393-415.

(1) as the value of autoregressive parameter α increases towards one, meaning a highly persistent series; and

(2) as the variances of individual effects η_i increase relative to the variances v_{it} (Blundell et al., 2000, Bond, 2002).⁹¹

But this efficiency loss will be largely compensated for by introducing more informative instruments in the following system-GMM estimator.

System-GMM estimation. The basic logic of difference-GMM is to utilise lagged regressors as instruments because they are not correlated with individual effects. This logic can be applied again to the levels of same variables as instruments to the first differences of individual-specific effects, and it forms the basic logic of the system-GMM estimator. The Monte Carlo simulation in Arellano and Bover (1995) reveals that the absence of this information about the levels of variables may lead to the substantial loss of the total variation in the data. Arellano and Bover further introduce a more efficient estimator, the system-GMM, which exploits more *moment conditions* as the orthogonality restrictions in level equations in the combination with those moment conditions already in first-differenced equations.

In case the AR(1) (i.e., the first order serial correlation) model of the level Eq.(7) is mean-stationary, the first differences Δy_{it} will not correlate with individual-specific effects η_i . This condition is sufficient to justify that $\Delta y_{i,T-1}$ can be used as suitable instruments to level equations (Blundell and Bond, 1998, Bond,

⁹¹ The reason is that when y_{it} is highly persistent (i.e. the autoregressive parameter α is close to one) and variances of v_{it} and η_i are correlated, consider the case with $T = 2$

$\Delta y_{i2} = \pi y_{i1} + \eta_i + v_{i2}$, for $i = 1, \dots, N$, the probability limitation of $\hat{\pi}$ is given by

$$\text{plim} \hat{\pi} = (\alpha - 1) \frac{k}{\frac{\sigma_\eta^2}{\sigma_v^2} + k}, \text{ with } k = \frac{1 - \alpha}{1 + \alpha}. \text{ Clearly, we find that } \text{plim} \hat{\pi} \rightarrow 0 \text{ as } \alpha \rightarrow 1 \text{ or}$$

as $\sigma_\eta^2 / \sigma_v^2 \rightarrow \infty$, which means the instrument y_{i1} is only weakly correlated with Δy_{i2} .

2002):

| Level equations | Instruments available |
|---|-----------------------|
| $y_{i3} = W_{i,2} \delta_{GMM} + \iota_i \eta_i + v_{i3}$ | Δy_{i2} |
| $y_{i4} = W_{i,3} \delta_{GMM} + \iota_i \eta_i + v_{i4}$ | Δy_{i3} |
| \mathbf{N} | \mathbf{N} |
| $y_{iT} = W_{i,T-1} \delta_{GMM} + \iota_i \eta_i + v_{iT}$ | $\Delta y_{i,T-1}$ |

Then the system of two equations is

$$\begin{bmatrix} \Delta \mathbf{y}_i \\ \mathbf{y}_i \end{bmatrix} = \delta_{SYS} \begin{bmatrix} \Delta \mathbf{W}_i \\ \mathbf{W}_i \end{bmatrix} + \begin{bmatrix} \Delta \mathbf{v}_i \\ \mathbf{v}_i \end{bmatrix}, \quad (12)$$

and the combined instrument matrix is

$$\mathbf{Z}_i = \mathbf{Z}_i^{SYS} = \begin{bmatrix} \mathbf{Z}_i^{DIF} & & 0 \\ & \Delta y_{i2} & \\ & & \mathbf{O} \\ 0 & & & \Delta y_{i,T-1} \end{bmatrix},$$

and the one-step weighting matrix becomes

$$\mathbf{H}_i^{SYS} = \begin{bmatrix} \mathbf{H}_i^{DIF} & 0 \\ 0 & \frac{1}{2} \iota_i \end{bmatrix}.$$

Then the system-GMM estimator $\hat{\delta}_{SYS}$ can be obtained through the same calculation in Eq.(10) and Eq.(11). The final estimator becomes

$$\hat{\delta}_{SYS} = \left(\sum_i \mathbf{z}_i' \mathbf{w}_i^* \right)^{-1} \left(\sum_i \mathbf{z}_i' \mathbf{y}_i^* \right).$$

4.4 Data and variables

Basic information

Two panel datasets are utilised in this research to address differences between provinces and between industries. The basic assumption is that only through comparing, contrasting and generalising these differences can the researcher explore and assess the varied nature of privatisation in China. The provincial dataset, embracing 31 Chinese provinces from 1994 to 2008 by 450 observations, has six data sources.⁹² The majority of data is collected from the *China Statistical Yearbook* (*Zhongguo tongji nianjian* 中國統計年鑑) from various years, while the remaining data are taken from a number of Chinese provincial statistical yearbooks, *China Industrial Economic Statistical Yearbooks* (*Zhongguo gongye jingji tongji nianjian* 中國工業經濟統計年鑑), *The Third National Industrial Census of the People's Republic of China in 1995* (*Zhonghua jenmin gonghejuo 1995 nian disanci quanguo gongye pucha ziliao huibian* 中華人民共和國 1995 年第三次全國工業普查資料匯編), *China Economic Census Yearbook 2004* (*Zhongguo jingji pucha nianjian 2004* 中國經濟普查年鑑 2004) and a small part of data are calculated by the author.⁹³

The industrial dataset covers all 37 major industries across mining, manufacturing and energy sectors in six chosen Chinese provinces – namely Guangdong, Jiangsu, Shandong, Jiangxi, Shanxi and Heilongjiang – for the period

⁹² Chongqing was not separated from Sichuan until 1998 in official statistics, so its data are included in Sichuan's throughout this analysis and hence the number of cross-sections in estimations is 30.

⁹³ The data calculated by the author are all based on the public data from above sources.

1994-2008.⁹⁴ The major source of information is the relevant collection of provincial statistics contained in the *Guangdong Statistical Yearbook* (*Guangdong tongji nianjian* 廣東統計年鑑), *Jiangsu Statistical Yearbook* (*Jiangsu tongji nianjian* 江蘇統計年鑑), *Shandong Statistical Yearbook* (*Shandong tongji nianjian* 山東統計年鑑), *Jiangxi Statistical Yearbook* (*Jiangxi tongji nianjian* 江西統計年鑑), *Shanxi Statistical Yearbook* (*Shanxi tongji nianjian* 山西統計年鑑), and *Heilongjiang Statistical Yearbook* (*Heilongjiang tongji nianjian* 黑龍江統計年鑑).

The provincial selection was made on the basis of the following criteria:

- (1) The search for provinces which had experienced a relatively high degree of privatisation.
- (2) The need for an appropriate balance between coastal and inland areas, as well as between southern, central and northern areas.
- (3) The feasibility of variable data.⁹⁵

This panel dataset, with 3,300 observations equivalent to 220 cross-sections times 15 time periods,⁹⁶ accounts for a quarter of the total privatisation cases in Chinese state sector after 1994.

The next two subsections provide details of the variable selection in each dataset.

⁹⁴ This dataset has updated to the latest data from 2009 provincial statistics that were published at that yearend. However, a considerable part of the latest data was not accessible in online databases until mid-2010.

⁹⁵ Some provinces might have been preferred to the six that have been chosen. But they were omitted because of serious lack of necessary data. For example, Sichuan would have been the best representative of inland provinces, but there are no sector data of its serial numbers of state-owned employees in the available provincial statistics. The same applies to Liaoning. In the case of Henan, statistics were lacking for some years, especially, before 2001. These deficiencies also help explain why an all-embracing investigation of data for every province has not been possible.

⁹⁶ Two cross-sections are dropped from the data because there are no petroleum extraction industries in the state sector of Jiangxi and Shanxi.

Selection of variable in the provincial dataset

The selection of variables in this study is justified by the literature. With regard to the dependent variable, all privatisation variables in literature fall into four categories, according to different levels and types of data (see Table 4.2). In country- or regional-level data, most privatisation variables are scale variables, as represented, for example, by the private share of total ownership (Li and Xu, 2002), service provision (Lopez De Silanes et al., 1997), government revenue (Bortolotti et al., 2003), sales or workforce (Kung and Lin, 2007); while two cases in most studies are dummy variables – such as “whether a country has taken a certain number of privatisation transactions before or in a certain period” (Ramamurti, 1992, Plane, 1997). By contrast, in firm-level data, the dummy variable – e.g., whether a firm is privatised before or in a certain period – is the majority as the privatisation variable in literature (Aussenegg and Jelic, 2007, Clarke and Cull, 2002, Gupta et al., 2008, Wang et al., 2001, Li and Rozelle, 2000, Guo and Yao, 2005, Lin and Su, 2008, Liu et al., 2006, Brandt et al., 2005). The minor distinction among them is over the quantitative definition of privatisation: whether it is defined as “any share” to be privatised or as “a certain share”, – which can be, for example, the complete share of 100 per cent; or the controlling-interest share of usually 50 per cent; or the largest share of any per cent. There is only one case which chose a scale variable as the ownership proxy in firm-level data (Huyghebaert and Quan, 2009).

There are two significant generalisations in the table: Either the data are country-level while the privatisation is a scale variable, or the data are firm-level while the privatisation is a dummy variable. There are two possible reasons. First, a cross-country or cross-region dataset is large scale, so using a dummy variable as a dependent variable may reduce too many variations and lead to more insignificant

results. Second, in a firm level dataset, a researcher usually has to take a dummy variable for privatisation because the scale variable is often not feasible. Otherwise, it will require the dataset to cover all information about all ownership changes in all years for all firms recorded in the data. Only stock market data may fulfil this strict requirement. However, if a privatisation study is only based on stock market data, it will lead to another fundamental question: namely, do the ownership transactions in a relatively poorly-functioning stock market comprehensively represent the reality of privatisation in a transitional economy with fewer market-supporting institutions? Especially, privatisation viewed through the prism of stock market data would only occupy a small part of total privatisation. This potential fundamental flaw has applicability to conditions in China and it may largely damage the credibility of research carried out in this way.

Table 4.2
Privatisation variable in empirical literature.

| Data level | Scale variable | Dummy variable |
|--------------------------------------|---|---|
| Country-level or regional-level Data | <ul style="list-style-type: none"> ➤ Share of services provision by private contractor in 1987 (Lopez De Silanes et al., 1997) ➤ Non-state ownership share (Li and Xu, 2002) ➤ Scale of the total gross revenue from privatisation sales to its GDP (Bortolotti et al., 2003) ➤ (1) Sales share: share of TVEs in total sales revenue of rural enterprises, and (2) workforce share: share of TVEs in total workforce of rural enterprises (Kung and Lin, 2007) | <ul style="list-style-type: none"> ➤ Probability that a country is an active privatiser (Ramamurti, 1992) ➤ Dummy if implemented any privatisation during 1988-1992 (Plane, 1997) |
| Firm-level data | <ul style="list-style-type: none"> ➤ Public allocation, the fraction of A shares sold at SIP relative to the total number of shares outstanding (Huyghebaert and Quan, 2009) | <ul style="list-style-type: none"> ➤ Dummy if the firm is privatized (for any share) in a certain year/period (Aussenegg and Jelic, 2007, Clarke and Cull, 2002, Gupta et al., 2008, Wang et al., 2001, Li and Rozelle, 2000, Guo and Yao, 2005, Lin and Su, 2008) ➤ Dummy if the largest shareholder has been changed to private investors (Liu et al., 2006) ➤ Dummy if the firm is controlling-interest (50%) shifted (Li, 2003, Guo and Yao, 2005) ➤ Dummy if 100% of the firm was sold (Brandt et al., 2005) ➤ Dummy of the ownership choice of new firms in 1995 (Li et al., 2004) |

Source: Author's summaries.

Accordingly, given that this empirical study is based on a provincial-level and an industrial-level dataset, a scale variable is more suitable to be used as the privatisation variable. Yet more concerns should be paid as thinking of the speciality of China, or the so-called "Chinese characteristics". All country-level studies have placed the change of "private ownership" at the heart of the analysis to represent the process of privatisation, but this methodology may not be applied to China for two reasons.

First, public ownership and private ownership are not the only two sides of the

coin in the Chinese ownership system. There is a significant element of “collective ownership” that falls between state ownership and various types of private ownership (including joint venture, cooperative, or foreign ownership) (see Table 2.4). In the first two decades of the reform era, the collective economy remained significant, accounting for around 20-40 per cent of the national economy (see Figure 2.5). The problem lies in its ownership nature: i.e., is it essentially to be regarded as embodying public or private ownership? Of course, literally and legally defined, collective ownership in China is undoubtedly a variant of public ownership, because it refers to assets that are owned collectively under the name of a group of people, such as a township or village. However, in practice, quite a few collective-owned enterprises were in fact founded by private investors during the 1980s, when private ownership was not yet formally permitted. Many private owners chose to register their enterprises under a “collective name” in order to avoid the risk of it being confiscated by the state for ideological reasons. This “red hat” phenomenon was widespread and led to unreliable statistics about private economy.⁹⁷ No consensus has been reached so far on the precise number of red-hat enterprises that existed before the late 1990s when private ownership was finally permitted and protected by new laws. That is why the inclusion or exclusion of collective enterprises or from private enterprises is bound to damage the basis of any study.

Second, the red-hat phenomenon generates another problem, which is that the true number of private enterprises was severely suppressed in the late 1980s and throughout the 1990s. The formal statistics of registered private enterprises were for the first time released only in mid-2002, in the *China Statistical Yearbook 2001*, and

⁹⁷ See more discussion in PUTTERMAN, L. (1997) On the past and future of China's township and village-owned enterprises. *World Development*, 25, 1639-1655. DONG, X. Y., BOWLES, P. & HO, S. P. S. (2002) The determinants of employee ownership in China's privatized rural industry: evidence from Jiangsu and Shandong. *Journal of Comparative Economics*, 30, 415-437.

times series data went back only to 1999. The situation is the same for provincial statistics. Due to the lack of publicly accessible data, in the absence of a dataset derived from private surveys, it is impossible to undertake research on private enterprises earlier than 1999.

Accordingly, I have used the shrinkage of the state sector, rather than the boom of the private sector, as the privatisation variable what follows. This has two merits. First, it helps avoid the risk of including unreliable statistics about the private sector in the 1990s. Second, it makes it possible truly to focus on China's core transformation.

Two dependent variables to represent privatisation are chosen to measure the degree of contraction of the state sector. *SOEUnit* denotes the total number of state-owned and state-holding industrial enterprises, while *SOEEmployee* denotes the total number of staff and workers employed in state-owned enterprises. They respectively represent state contraction in terms of enterprise and employee. In addition, there are several SOE numbers with different definitions listed in statistics; they include (1) SOEs without specific limitation; (2) SOEs above a certain scale (usually annual sales of over 5 million yuan); (3) SOEs controlled by local governments above a certain level (village or township); and (4) SOEs with independent accounting systems. It must be acknowledged that any choice of these four kinds of SOE definitions may result in different measure of performance, particularly from the perspective of "efficiency". SOEs having larger size, higher level of supervisor, or independent accounting systems are probably more efficient (or not) than those SOEs that do not have these conditions. However, it is only in the final category that SOE numbers are accompanied by other economic and financial data in statistics, making this the only definition that it is operationally feasible to use. Additionally, SOEs having no independent accounting systems are usually very small ones within or even under township and village level, and inevitably of less

importance comparing to others.

In terms of independent variables, most variables utilised in the general literature cannot be applied to China. For practical reasons, variable selection must be based on the feasibility of data, as well as the reality of Chinese characteristics. I have endeavoured to follow this principle and illustrate the selection process for each as follows. However, an inevitable problem should be noted here that all variables will be, more or less, loosely related to the factors in hypotheses. Although I provide justification for the appropriateness of each variable in use, it should still be open to academic discussion. All results should hence be interpreted in a cautious manner.

Soft budget variable. The first soft budget variable utilised in the privatisation literature is a set of dummy variables relating to the budgetary regulations among county governments in the U.S. (Lopez De Silanes et al., 1997). This variable does not fit China's case because there are actually no provincial variations among its local budgetary regulations.⁹⁸ The subjective dummy variable of asking how difficult it is to extend a bank loan in some researches (Li, 2003, Brandt et al., 2005, Li and Rozelle, 2000) is feasible for a firm-level dataset, but is not applicable to a provincial-level dataset and an industrial dataset. Meanwhile, Guo and Yao's (2005) variable design is helpful. Their dummy variable includes two simultaneous conditions that must be met – whether an SOE is losing money, as well as whether it has got loans from the bank. This definition highlights two important elements of the Chinese soft budget system – viz., the SOE losses and subsequent soft bank credits. With this in mind, I have formulated the first scale variable of soft budget as the subsidies for loss-making SOEs. This variable is able to show the *loco parentis* attitude of a local government towards its loss-making SOEs. When subsidies are reduced, the budget system is

⁹⁸ China's first *Budget Law* was announced in 1995 and it was applied to the whole country without local variations (at least in theory).

hardened. The second scale variable is designed as the share of industrial loans in total loans in local state banks. The industrial loan is another major source for bailout money, and about 90 per cent of such funds are usually granted to SOEs. So the decrease in industrial loans will immediately crowd out the soft credits that can fund SOEs.

Political ideology variable. The most popular political ideology variable utilised in literature is the “right-wing government” dummy (Clarke and Cull, 2002, Bortolotti et al., 2003, Lopez De Silanes et al., 1997), which assumes that a ruling central/local government inclined to a right-wing ideology will be keen to privatise. This simply has no applicability to Chinese conditions. This is because of the absence of democratic governance and of any alternative party representation to that of the CCP in China, where the single ruling communist party is, by assumption, ideologically left-wing. By inference, this variable yields no variations in Chinese data. Another choice is to see if there is a pro-market legal system (Li and Xu, 2002), but this dummy variable is more suitable to a cross-country comparison than to within-country research. This is because differences between legal systems in different regions within a given country are supposedly minor, unless the context is that of a federalist country, like the U.S., with a long tradition of diversified legal systems. China is not a federalist country in this sense. In terms of legal system, China is a unitary state, in which local legislatures cannot demonstrate any ideological difference with national laws.

Nevertheless, we should never underestimate the influence of political ideology in China. Even if there is neither a so-called right-wing government at the central or local level, nor any significant legal variations to be found in local legislatures, a local government’s determination and commitment to market-oriented reform and the promotion of private economy can still make huge differences to outcomes. In order

to address this local-level ideological dimension, two variables about the development of private sector are selected – the ratio of registered private-owned enterprises (POEs) to total registered enterprises, and the ratio of POE’s employees to the total. For experienced researchers, it may not be a surprise to learn that in most provinces these data never exceeded 10 per cent in the late 1990s. This statistical fact, however, is hardly consonant with the well-known reality of a booming private sector at this time. The true data were suppressed for two political reasons. Thanks to lack of confidence in central leaders’ supports for private enterprises, local leaders might automatically suppress such data for fear of stepping across the invisible red line of socialist ideology. Similarly, the true owners of “private enterprises” also feared their possible confiscation due to an unexpected ideological retreat, leading them to falsely but purposely register their enterprises as being publicly owned. This so called ‘red-hat’ phenomenon blurring the boundary between collective (public) and private ownership was prevalent in rural China in the 1990s, making official statistics unreliable (Dong et al., 2002). These ideological concerns are likely to have led both local leaders and private owners to manipulate statistics purporting to show the real scale of the private sector. However, these inauthentic data may just represent the ideological commitment that local leaders have demonstrated to their private entrepreneurs – i.e., the commitment to privatisation reform is loose when the statistics of private enterprises is severely suppressed; by contrast, the commitment is firm when the number of POEs is high and supposedly close to the reality. These data may also represent the growing confidence among private investors of not being intervened by local government. This explains why this variable with inauthentic data turns out to be a good candidate to represent the change of ideology in China. However, readers should be reminded that this ideological proxy is for the first time used in literature. There may be lack of consensus among academics on the validity of the use of this

variable, even though it could be even more difficult to find other replacements in Chinese statistics.

Decentralisation variable. Since this hypothesis has never been empirically tested, there is no such variable in the literature. Yet, in theoretical discussion, there are some clues that help in the design of an appropriate decentralisation variable. In terms of the impact of decentralisation, two elements are considered to be crucial to ultimate privatisation – viz., local autonomy and fiscal competition. Rising local autonomy is a determinant because it helps to better utilise local information to make economic decision-making more efficient (e.g., by using funds efficiently by screening out poor projects) (Dewatripont and Maskin, 1995, Glaeser and Scheinkman, 1996). Fiscal competition among localities will also help increase the opportunity costs of bailing out losses and hence drive out relatively inefficient SOEs (Qian and Weingast, 1997, Qian and Roland, 1998, Cao et al., 1999). Accordingly, I have designed two variables to represent decentralisation – self-funding capacity in local capital investment, and fiscal self-sufficiency in local expenditure. In China, a local government has five sources from which to raise money needed for capital construction – planned budget, domestic loans, foreign investment, self-funding, or “other”.⁹⁹ Since self-funding usually occupies over half of local investment, it can be used to represent the ability of a local government to fund itself. It therefore represents financial autonomy.¹⁰⁰ Then, the ability of self-sufficiency in local finance

⁹⁹ These five sources are formal categories in official statistics.

¹⁰⁰ There is a reasonable doubt that local government may embrace decentralisation by making full use of the FDI as a means of funding itself. If this is the case, the variable of “self-funding capability” may not well represent the rising autonomy in local finance during decentralisation. However, this theoretical assumption does not match the reality. The reason is twofold. (1) There are only four provinces (Beijing, Shanghai, Hainan and Tibet) seeing a moderate decline in the data of self-funding capability from 1994 to 2008. What most provinces actually experienced was a steady growth (or with slight fluctuation), suggesting an overall rising ability among them in funding their own needs in finance (see Table 5A.3a). This matches the assumption in hypothesis. (2) If going into statistics to examine this assumption, data just show an opposite story. The percentage of FDI used as the source of self-funding sees a clearly decline in all provinces. The average share dropped from about 13% to less than 3% from 1995 to 2008. This is against the original hypothesis that local provinces have gained

may represent the fiscal autonomy. A high deficit will undoubtedly make a local government more dependent on subsidies or transfers from the central government. Conversely, if local revenue is self-sufficient to meet its expenditure, the local government will clearly enjoy stronger fiscal autonomy. In short, both variables are able to measure the rising local autonomy in China in recent years.

Market competition variable. Market development is a broad concept that can be measured in many ways, such as openness to the outside world (Plane, 1997, Cao et al., 1999), intensified competition (Li, 2003, Li and Rozelle, 2000, Li et al., 2004), ownership diversification (Guo and Yao, 2005, Cao et al., 1999) and/or financial deepening (Li and Xu, 2002, Bortolotti et al., 2003) in emerging economies. The appropriate choice of a market variable depends on which aspect of market development a researcher is focusing on. Some variables are not suitable for provincial-level research in China, such as capital market development, which embraces only two stock markets in Shanghai and Shenzhen. Most large and medium SOEs, even in remote provinces, will adopt initial public offerings in these two places or Hong Kong Stock Exchange. The underdevelopment of local capital markets has not unduly constrained large SOEs from undertaking privatisation. Also, the absence of relevant data makes it impossible to use the level of entry barrier as the competition variable among Chinese provinces. The first overall index of China's marketisation progress was published in 2007, with provincial data dating back only to 2000 (Fan et al., 2007a). Subject to these conditions, I will utilise the non-state share of the gross value of industrial output as the first competition variable, similar to that used in Guo and Yao (2005). This variable may reflect the real degree of competition facing SOE

more autonomy in finance during decentralisation. Additionally, if to check data of the four provinces with declining self-funding capability, in the last few years before 2008, except a small jump in Hainan's data of 2006, the rest of the data are all very low. Data of Shanghai and Hainan are around 5%, Beijing less than 2%, and Tibet nearly 0%. In short, the FDI share may not be a good proxy to measure local capability in the matter of self-funding.

products in product market. Next, like in Plane (1997) and Cao *et al.* (1999), the second competition variable is set as an “outward openness” variable, represented by the ratio of the combined value of exports plus imports to the total GDP of a province. This may also reflect rising product competition associated with the greater involvement of foreign producers and consumers.

Financial pressure variable. Two mutually contradictory arguments in financial pressure hypothesis. The most common argument considers financial pressure as a stimulant to privatisation, whereas the alternative considers it to be more of a constraint. No matter whether it is a stimulant or constraint, however, the variable selection in the wider literature focuses heavily on the government burden of deficits or debts. Research based on cross-regional data may prefer to use the deficit or debt ratio to GDP as representative of financial pressure in a region (Ramamurti, 1992, Plane, 1997, Bortolotti *et al.*, 2003, Clarke and Cull, 2002, Li and Xu, 2002); while a firm-level research may use loan- or debt-asset ratio (Liu *et al.*, 2006, Li and Rozelle, 2000, Brandt *et al.*, 2005, Huyghebaert and Quan, 2009). Variables other than these, such as the taxability (namely the tax bases) (Kung and Lin, 2007) or tax arrears (Guo and Yao, 2005) are rarely used. This research establishes two variables to represent the financial pressure facing Chinese SOEs – the asset-liability ratio and the share of budget deficit in a province. Both variables are sufficient to measure the changing pressure in local finances.

Institutional infrastructure variable. There are only two pieces of research that offer insights to the institutional impact towards privatisation in literature. Both of them focus on the legal protection to development in a private economy. The dummy variable of legal origin assumes that if a country’s legal system is rooted in the French/German civil law tradition, the country in question will have less legal protection for private ownership than in a country with a common law tradition

(Bortolotti et al., 2003). This variable is not suitable for China because, on the one hand, there is no difference in terms of legal tradition among provinces; and, on the other, no western legal traditions has any applicability to communist China. A scale variable is, therefore, designed by Li, Ouyang and Zhou (2004), in which the legal protection of intellectual property rights is the major concern. Li *et al.* also shed light on the improvement of physical infrastructure, through which transaction costs for private businesses will be considerably reduced and so will privatisation be facilitated. Making use of the same assumptions, this research utilises two scale variables to represent the change of institutional infrastructure. The first is a legal infrastructure index, comprising of the arithmetic mean of a patent index (indexing the number of patent granted in a province) and a technical market index (indexing the amount of transaction value in a local technical market). This variable promises to reveal the improvement that a local government has achieved in the protection of intellectual property rights. The second variable, is a physical infrastructure index, comprising the arithmetic mean of a highway index (indexing the length of highways per kilometre-squared in a province) and a telephone index (indexing the number of subscribers of fixed telephone in a certain population). This variable serves to represent the efforts made by a local government to reduce transaction costs.¹⁰¹

Economic efficiency variable. Economic efficiency, like market competition, is a variable with various definitions. Profitability is the most common variable, which also can be measured, at least, by profits, return on assets, sales revenue or the output of production (Brandt et al., 2005, Guo and Yao, 2005, Liu et al., 2006, Kung and Lin, 2007, Gupta et al., 2008, Wang et al., 2001). Financial performance, such as the deficits or loans, is sometimes a choice, too (Ramamurti, 1992, Clarke and Cull, 2002). Most above variables are applicable, but the best candidate in Chinese data

¹⁰¹ The method of indexation is considered in the later section about data transformation.

should be the “asset contribution”, which is defined as the sum of profits, tax and interests divided by the total assets. Given this variable being a listed item in both central and local statistics, its credibility is relatively stronger than other potential candidates for efficiency. I also utilise the industrial output ratio to the total assets as the second efficiency variable. Since this variable differs from the first one by covering the production and management costs, it can be more accurate in the way considering the possible misuse of wages and bonuses.

Firm size variable. “People” is the first key element in measuring the size of a firm, so that a firm’s total employment should be a good proxy for size, as in Li (2003). “Money” is the second key element, so that a firm’s total assets or market value should be good candidates, too, as in Huyghebaert and Quan (2009), and Aussenegg and Jelic (2007). Two elements may also be combined together, such as the average assets per worker (equivalent to the “money” divided by the “people”) in Clarke and Cull (2002). However, this combination may overstate the importance of money, while neglecting people; for example, a firm with small assets and many workers could be regarded as a smaller unit than one that has larger assets but fewer workers. For research on the banking or financial sector, this mixed variable is able to highlight the effect of money on the basis of people, but, for research in other sectors, this variable may blur the distinction of size and, even worse, be sufficiently misleading to generate a false interpretation and results. Accordingly, this research seeks to avoid mixing up “people” and “money” by establishing the following two size variables – first, the average scale of SOE employment (calculated by the year-end number of annual average employed persons divided by the number of SOEs in a province); and, second, the average scale of SOE assets (calculated by the amount of fixed assets divided by the number of SOEs in a province). Both variables may represent the change in size of a local state sector.

Human capital variable. In the limited amount of research that addresses the impact of human capital on privatisation, the manager's human capital characteristics – including age, education, place of birth, former managerial experience, experience as a government cadre, and the time for which that the manager has held a managerial position in the firm – are the major concerns (Li, 2003, Li and Rozelle, 2000). These variables, according to different assumptions, are also used to measure the human capital characteristics of a bureaucrat (Li, 2003) and/or a banker (Brandt et al., 2005). For a simple reason, however, these variable designs are not applicable to my research: because no such comprehensive information on human capital information for SOE managers and local bureaucrats is available in any public statistics.¹⁰² Subject to data limitation, I have therefore had to design new, feasible variables. Based on human capital theory, two concepts are highlighted in the variable design. The first is the monitoring costs – better human capital means enhanced managing skills, which in turn facilitate a reduction in monitoring costs. The second is the production risk – better human capital also means improved labour efficiency, which should lead to a reduction in production risks. Thus, the first human capital variable is set up as the scientific and technical personnel ratio (equivalent to the number of scientific and technical personnel in state-owned enterprises or institutions divided by the number of total staff and workers in all state-owned units in a province), which is a variable that can trace the increase of 'advanced labour' in a locality's state sector. It is assumed that if more skilled positions are generated, the overall level of human capital level will also be improved. The second human capital variable is formulated as labour productivity (equivalent to industrial value-added divided by the number of SOE employees in a province). This variable seeks to track

¹⁰² As discussed earlier, there are only two tables, based on a sampling survey in 1994, in national statistics that have ever released basic information about civil servants and enterprises' administrative personnel (see Table 4.1).

the improvement in production efficiency in each worker, and hence to reflect the reduction in production risks.

Besides, in order to control influence from other factors, this research introduces three control variables to absorb variations caused by people's education (literacy rate), degree of industrialisation (industrial output share to regional GDP) and development level (income per capita). Variable definitions are listed in Table 4.3.

Table 4.3

Variable definitions and summary statistics in the provincial dataset.

| Variables | Definition |
|--------------------------------|--|
| <i>SOEUnitX</i> | Index of the number of SOE units with independent accounting system in each province |
| <i>SOEEmploymentX</i> | Index of the number of employees in SOEs with independent accounting system in each province |
| <i>SubsidyX</i> | Index of the amount of provincial subsidies to loss-making SOEs in fiscal revenue in provinces |
| <i>IndustrialLoan%</i> | Share of the industrial loans to total loans granted by local financial institutes in provinces |
| <i>POE%</i> | Share of registered private-owned enterprises to total enterprises with all types of ownership in provinces |
| <i>POEEmployment%</i> | Share of POE employment to total employment in both urban and rural areas in provinces |
| <i>SelfFunding%</i> | Share of the self-funding part in total investment of capital construction in provinces |
| <i>FiscalAutonomy%</i> | Ratio of local revenue to its expenditure in fiscal balance of payments in provinces |
| <i>NonSOEOutput%</i> | The rest share of SOE industrial output in provinces |
| <i>Openness%</i> | Rate of the total amount of import and export trade to regional GDP in provinces |
| <i>AssetLiability%</i> | Ratio of the total amount of SOE liabilities to total assets in provinces |
| <i>DeficitBudget%</i> | Share of the deficit (that is local revenue minus expenditure) in local expenditure in provinces |
| <i>PhysicalInfrastructureX</i> | Arithmetic mean of road (that is the highway length per square kilometres) and telephone (that is the density of fixed line subscribers to the population) indexes in all provinces |
| <i>LegalInfrastructureX</i> | Arithmetic mean of patent (that is three kinds of patents granted by local governments) and technical market (that is the business volume in local technical markets) index in all provinces |
| <i>AssetContribution%</i> | Rate of the asset contribution (that is the ratio of total amount of profits, tax and interests to that of capital) in provinces |
| <i>AssetOutput%</i> | Ratio of the gross value of industrial output to the total assets in provinces |
| <i>AveEmployeeX</i> | Index of the average number of SOE employees in each province |
| <i>AveAssetX</i> | Index of the average amount of total assets (including fixed and mobile assets) in SOEs in each province |
| <i>ScientificPersonnel%</i> | Share of the number of scientific and technical personnel in SOEs to the number of total employees in each province |
| <i>LabourProductivityX</i> | Index of the labour productivity (that is SOEs' value-added per worker) in each provinces |
| <i>Literacy%</i> | Share of the population of literacy to the total, over 15 years old, in a province |
| <i>Industrialisation%</i> | Rate of the output by industrial sector to the total GDP in a province |
| <i>IncomePer capitaX</i> | Index of the disposable income per capita among all provinces |

Variable selection in the industrial dataset

The criteria of variable selection in the industrial dataset remain the same. Two dependent variables are selected – *IndSOEUnit*, denoting the number of SOEs with independent accounting system in one of the major industries in a province; and

IndSOEEmployee, denoting the average number of year-end SOE employees. However, there is a major problem in local industrial data. Very limited information is provided so that this dataset can only afford a handful of variable candidates. The following adjustments have therefore been necessary.

In the first place, virtually no industry-specific variables are available for political-economic hypotheses. Data needed for the soft budget or decentralisation variable – e.g., subsidies, loans, self-funding or government revenue – are only available at the provincial level, but not the industrial level. The data needed for the ideology variable, the number of enterprises or employees of private ownership, are also seriously deficient for some provinces. Although I am reluctant to drop any hypothesis simply because of lack of data, this data issue may remind us that the basic assumption behind political-economic hypotheses lies in the interaction between local bureaucrats and SOE managers. That is to say, there is no reason to assume that their interaction pattern may differ across industries. In other words, political impacts are assumed to be equally distributed across industries so that any statistical variations if any could be regarded as meaningless. Thus, due to lack of data and the absence of theoretical justification, this research only uses the political-economic variables of the provincial level as the control variables in order to absorb possible variations.

Second, also subject to data limitation, most independent variables remain the same but all alternative variables have to be dropped. The market competition variable is still denoted by the non-state share of industrial output. Financial pressure is represented by the asset-liability ratio. Economic efficiency is revealed by output divided by assets. Size variable is the average number of workers per enterprise, while the human capital variable is still labour productivity. Meanwhile, however, a change in the institutional infrastructure variable is necessary.

In terms of legal infrastructure, there are no data showing the change of legal

protection in a specific industry. As for physical infrastructure, estimates of construction investment may all that can be used here. However, such data are not available for local industry, although they *are* available, in two instances, among national level data, covering total investment in each of 31 provinces, or each of 37 major industries. Accordingly, I have been compelled once again to design a new variable that combines information for provinces and industries. Accordingly, this variable is established as the product of provincial value and industrial value. Only by this means is it possible to formulate a variable that can simultaneously address both provincial and industrial features.

Table 4.4
Variable definitions, summary statistics and correlations.

| Variable | Definition / Operational Definition |
|-------------------------------|--|
| <i>IndSOEUnitX</i> | Index of the number of SOEs with independent accounting system in each major industrial sector in a province |
| <i>IndSOEEmployeeX</i> | Index of the number of the year-end average employees in SOEs with independent accounting system in each major industrial sector in a province |
| <i>IndNonSOEOutput%</i> | The rest share of SOE industrial output in each major industrial sector in a province |
| <i>IndAssetLiability%</i> | Ratio of the total amount of SOE liabilities to total assets in each industrial sector in a province |
| <i>IndConstructInvestX</i> | Product of two indexes: (1) index of the total amount of construction investment in all years in each major industrial sector in national data, and (2) index of the same item in each province. |
| <i>IndAssetOutput%</i> | Ratio of the gross value of industrial output to the total assets in each major industrial sector in a province |
| <i>IndAveSOEEmployX</i> | Index of the average number of the year-end average employees in SOEs in each major industrial sector in a province |
| <i>IndLabourProductivityX</i> | Index of the labour productivity in each major industrial sector in a province |

Data transformation

It is worth noting that all variables will be transformed in such a way that data value are strictly limited and fall in the range between minus and plus one. This data transformation will help highlight the relationship among variables by excluding the scale dimension of row data. Therefore, there is no need for transformation if the variable is already presented in percentage form, (e.g., literacy rate, asset-contribution ratio, non-SOE share of industrial output, etc.). Yet, if the variable is of scale data (e.g., the SOE number (units), SOE employee number (person), labour productivity (yuan/person), etc.) its value will be transformed into indexes before being regressed.

Two kinds of indexation are used to serve different purposes. Control variables with scale data will be indexed by a whole panel comparison, in which each datum will be compared with all data in all provinces in all years. Hence, this index will not only show the change in each province over time, but also its relative status to the rest

of the panel data. Consequently, the information of other regional characters will be included in this index. This kind of information, however, should be excluded when the variable is not being used for control purposes; otherwise, the impact from other provincial data will also be introduced into the hypothesis testing. For this fear, those explanatory variables with scale data will be indexed only by their own serial comparison.¹⁰³ Below are shown two ways of transformation in mathematics:

(1) Indexation with the whole panel comparison:

$$I_{ij} = \frac{V_{ij} - V_{\min}}{V_{\max} - V_{\min}},$$

while I_{ij} denotes the index in the i -th province in the j -th year, V_{ij} the original value of variable, V_{\max} the maximum value in all provinces in all years, and V_{\min} the minimum value in the same scale.

(2) Indexation with the individual serial comparison: It is done by the same formula but with different definition in V_{\max} and V_{\min} , where they are respectively the maximum or minimum value in that specific province in all years.

After transformation, the maximum datum in a panel or series will be transformed into 1 or -1, while the minimum datum into 0, and the remaining data between maximum and minimum will be proportionally distributed in the interval between ± 1 and 0.

Reliability of Chinese data

¹⁰³ Only two explanatory variables of infrastructure are indexed by a national panel comparison due to their institutional nature.

Readers should always be reminded that there is an issue of data reliability among empirical studies based on Chinese statistics. There has been a growing concern about potential data exaggeration, particularly over the real GDP growth rate since late 1990s. This suspicion has triggered much debate among academics ever since. Some authors identify discrepancies in statistics and tend to regard them as “biases” caused by the lack of integrity among statistical agents (Rawski, 2001; Young, 2003), while others tend to see these discrepancies as “errors” due to misunderstanding statistical methods (Chow, 2006; Holz, 2003, 2005; He and Sun, 2013). Two procedures are usually seen in showing the falsification of output data: (1) to compare output growth to the growth in other variables highly correlated, or (2) to contrast different approaches from which are derived nationwide GDP data (Holz, 2003). The motive for state agents to falsify growth data mainly stems from the cadre evaluation system. Local officials may intentionally overstate output growth in order to get rewards for superior performance or to avoid punishment for failing to meet policy targets (He, 2010; Holz, 2003, 2005; Young, 2003).

Based on his independent nationwide income calculation, Rawski (2001) points out major exaggerations of real output growth during 1997/2001, which he argues should be no more than one-third of official claims. He lists some quantitative inconsistencies in the trends between China’s GDP and other variables, such as energy use and retail sales. Young (2003) also argues that the real GDP growth rate during 1978/1998 should be 2 percentage points too high due to the systematic understatement of inflation that would falsely push up the data of physical capital investment. Consumption data based on retail sales and reported in the national income account also exceeds that obtained from sample surveys of urban and rural households (Chow, 2006). He (2010) attributes the data falsification to the issue of methodology in which it is the difference in GDP accounting approaches that makes

discrepancies in results. In addition, the sum of provincial GDP routinely exceeds nationwide GDP, so the National Bureau of Statistics (NBS) needs to adjust provincial data as summing up the national total (Holz, 2003, 2005).

These criticisms are, however, also criticised as being unconvincing. From his experience of doing econometric researches based on Chinese statistics over two decades with dozens of papers widely published, Chow (2006) admits that “errors or statistical discrepancies do exist”, but “it is difficult to falsify national output and other statistics for a long period”. After examining Young’s evidence (2003), he argues that errors are “unavoidable” but “the official data are by and large reliable”. Take an example, consumption: relevant data reported in sample surveys include only goods and services paid for by the households themselves – figures bound to be smaller than the data in national income accounts that also include goods and services provided by the units in which the consumers work (like medical expenses and schooling for the children), home production by the consumers, implicit rent of their housing units, and etc. (Chow, 2006). Holz (2003) also casts no doubt on the integrity of Chinese statistical agents, while his research finds the evidence on falsification of growth data “invalid, or at least highly problematic”. Most criticisms, he argues, are “unfounded” and “based on misunderstandings about the meaning and coverage of particular data” (Holz, 2003). The divergent trend between output growth and energy use in the late 1990s, for instance, is caused by the inconsistency of data coverage that shows a tendency “to cover only a subset of the economy, the directly reporting enterprises” (Holz, 2005). Otherwise, if the NBS request provinces to change the data they report, more unexplainable inconsistencies are likely to emerge (Holz, 2003).

Furthermore, some empirical evidence also supports the reliability of Chinese data. Klein and Ozmcür (2002/2003) regress 15 related time series in the period 1980-2000 and identify a close relationship between these series and the trend of GDP

growth. He and Sun (2013) test a provincial panel data (1978-2002) against the augmented Solow model and a technological diffusion model and reach a conclusion that these data are reliable for growth regressions. Mehrotra and Paakkone (2011) produce coincident indicators from a factor analysis summarising various macroeconomic information and compare the estimated factors with GDP growth (1997-2009). They find discrepancies between them very small and their factors match the GDP dynamics closely.

In sum, all these papers discuss the reliability of Chinese statistical data in a prudent manner. They all agree on the existence of discrepancies in statistics, but differ on how these should be interpreted. Intentional biases or unintended errors? Over this question, there has so far been no consensus of an answer among academics and, very likely, will never be. However, even if Chinese data are not purposely falsified, as Chow (2006) suggests, a serious scholar will still need to exercise caution as using them. I will follow his advice and try to control this potential data problem.

There are, hence, two kinds of data falsification if any – one is ‘data bias’ with purposeful exaggeration, while the other is ‘data error’ without systematic manipulation. Both data problems will be dealt with by the system GMM estimation technique, discussed in Section 4.3. Firstly, in terms of potential data biases in my panel, I assume these biases to be part of “unobserved specific effect”, which should be invariant over time and can be eliminated by first differencing. This technique has been widely applied as a means to control unobserved specific country characteristics, particularly in the cross-country comparison of GDP growth (Hoeffler, 2002; Krieger and Ruhose, 2013). I wonder if, perhaps, some researchers are happy to see data exaggeration as a kind of country characteristic in China. Secondly, in terms of inevitable data errors, I assume these to be “measurement errors”, which should be randomly distributed (stationary) in the panel and can be largely corrected by

introducing instrumental variables with orthogonal conditions in the system GMM estimation (Bond et al., 2001). In practice, He and Sun (2013) use this approach and treat the understatement of inflation reported in Young (2003) as a problem of measurement error in their cross province comparison over GDP growth.

Other than econometric solution, there are other reasons that also help reduce the worry concern about data falsification. The time period of my panel is from 1994 to 2008, relatively new to those data criticised in the literature mentioned above. Most of them were reported after 1998 when a series of statistical reforms was applied. The opportunities of falsification should have been largely reduced (Holz, 2003) Last but not least, in fact, there are only three variables (two hypothesised variables and one control variable) in my panel containing output data that may be criticised. The data reliability of the two dependent variables and most explanatory variables should therefore be free from above questions.

Chapter Five

Provincial Analysis

5.1 Data and summary statistics

Summary statistics of all variables are listed in Table 5.1. This panel of provincial data is balanced. In the correlation table, there are only two coefficients higher than the standard value (traditionally 0.9), which could point to the existence of a statistical problem of multi-collinearity. The first is the correlation between two dependent variables (*SOEUnitX* [pdv1] and *SOEEmployeeX* [pdv2]) with the coefficient value of 0.9215 and the second, between the *AveAssetX* (ph8b) and the *LabourProductivityX* (ph9b) with the coefficient value of 0.9515. As it happens, however, in neither case is there cause for concern. In the first place, the problem does not arise because a regression cannot have two dependent variables. In the second case, the potential problem can be overcome by ensuring that the two variables are not regressed in combination with one another.

Table 5.1
Summary statistics in the provincial dataset.

| Variable | Code | Obs | Mean | Std. Dev. | Min | Max |
|------------------------|------|-----|--------|-----------|---------|--------|
| <i>SOEUnitX</i> | pdv1 | 450 | 0.5725 | 0.2747 | 0.1255 | 1.0000 |
| <i>SOEEmployeeX</i> | pdv2 | 450 | 0.6631 | 0.2306 | 0.2616 | 1.0000 |
| <i>SubsidyX</i> | ph1a | 450 | 0.5076 | 0.3561 | 0.0000 | 1.0000 |
| <i>IndustrialLoan%</i> | ph1b | 450 | 0.1747 | 0.0654 | 0.0000 | 0.3738 |
| <i>POE%</i> | ph2a | 450 | 0.2112 | 0.1916 | 0.0000 | 0.6855 |
| <i>POEEmployee%</i> | ph2b | 450 | 0.0617 | 0.0782 | 0.0009 | 0.5724 |
| <i>SelfFunding%</i> | ph3a | 450 | 0.4789 | 0.1235 | 0.0854 | 0.8387 |
| <i>FiscalAutonomy%</i> | ph3b | 450 | 0.5513 | 0.2238 | 0.0000 | 1.3912 |
| <i>NonSOEOutput%</i> | ph4a | 450 | 0.4442 | 0.2022 | 0.1012 | 0.8864 |
| <i>Openness%</i> | ph4b | 450 | 0.3204 | 0.4281 | 0.0316 | 2.3275 |
| <i>AssetLiability%</i> | ph5a | 450 | 0.5998 | 0.0907 | 0.1909 | 0.8401 |
| <i>DeficitBudget%</i> | ph5b | 450 | 0.4654 | 0.1891 | -0.0134 | 0.9530 |

| | | | | | | |
|--------------------------------|-------|-----|--------|--------|---------|--------|
| <i>PhysicalInfrastructureX</i> | ph6a | 450 | 0.2351 | 0.1786 | 0.0030 | 0.9509 |
| <i>LegalInfrastructureX</i> | ph6b | 450 | 0.0485 | 0.0863 | 0.0000 | 0.6430 |
| <i>AssetContribution%</i> | ph7a | 450 | 0.0975 | 0.0621 | -0.0127 | 0.6112 |
| <i>AssetOutput%</i> | ph7b | 450 | 0.5477 | 0.1768 | 0.1205 | 1.0150 |
| <i>AveEmployeeX</i> | ph8a | 450 | 0.6781 | 0.1834 | 0.2509 | 1.0000 |
| <i>AveAssetX</i> | ph8b | 450 | 0.3183 | 0.2930 | 0.0263 | 1.0000 |
| <i>ScientificPersonnel%</i> | ph9a | 450 | 0.2425 | 0.0746 | 0.1004 | 0.4108 |
| <i>LabourProductivityX</i> | ph9b | 450 | 0.3498 | 0.3057 | 0.0330 | 1.0000 |
| <i>Literacy%</i> | pcona | 450 | 0.8625 | 0.0985 | 0.3131 | 0.9689 |
| <i>Industrialisation%</i> | pconb | 450 | 0.3673 | 0.0990 | 0.0613 | 0.5649 |
| <i>IncomePercapitaX</i> | pconc | 450 | 0.2203 | 0.1659 | 0.0000 | 1.0000 |

| | pdv1 | pdv2 | ph1a | Ph1b | ph2a | ph2b | ph3a | ph3b | ph4a |
|--------------|-------------|-------------|--------------|--------------|--------------|-------------|-------------|-------------|-------------|
| pdv1 | 1.0000 | | | | | | | | |
| pdv2 | 0.9215 | 1.0000 | | | | | | | |
| ph1a | 0.6359 | 0.6135 | 1.0000 | | | | | | |
| ph1b | 0.6202 | 0.6658 | 0.5297 | 1.0000 | | | | | |
| ph2a | -0.8219 | -0.8066 | -0.6061 | -0.5786 | 1.0000 | | | | |
| ph2b | -0.4048 | -0.5188 | -0.2619 | -0.3865 | 0.4020 | 1.0000 | | | |
| ph3a | -0.5110 | -0.4817 | -0.3223 | -0.2196 | 0.6197 | 0.1818 | 1.0000 | | |
| ph3b | 0.1005 | -0.0079 | 0.0952 | 0.1240 | 0.0400 | 0.4168 | 0.1853 | 1.0000 | |
| ph4a | -0.2352 | -0.2945 | -0.1864 | -0.2162 | 0.4742 | 0.3762 | 0.4224 | 0.6043 | 1.0000 |
| ph4b | -0.0453 | -0.1447 | 0.0348 | -0.1080 | 0.0724 | 0.6024 | 0.0679 | 0.6471 | 0.4823 |
| ph5a | 0.1629 | 0.2239 | 0.1067 | 0.4555 | -0.0656 | -0.3533 | 0.1563 | 0.0665 | -0.0684 |
| ph5b | -0.1159 | -0.0619 | -0.1639 | -0.2059 | -0.0200 | -0.4127 | -0.1984 | -0.8702 | -0.6443 |
| ph6a | -0.5912 | -0.6766 | -0.4134 | -0.4870 | 0.6388 | 0.8153 | 0.4265 | 0.4980 | 0.5920 |
| ph6b | -0.3360 | -0.3895 | -0.1937 | -0.3081 | 0.4002 | 0.6591 | 0.1973 | 0.4622 | 0.4860 |
| ph7a | -0.2621 | -0.2534 | -0.2300 | -0.1380 | 0.2414 | 0.1044 | 0.4333 | 0.0070 | 0.0426 |
| ph7b | -0.4811 | -0.4849 | -0.3120 | -0.1838 | 0.6102 | 0.3504 | 0.7241 | 0.3042 | 0.5222 |
| ph8a | -0.7012 | -0.5566 | -0.4259 | -0.3256 | 0.6979 | 0.2303 | 0.5725 | 0.1638 | 0.4634 |
| ph8b | -0.8040 | -0.7764 | -0.6362 | -0.5896 | 0.8292 | 0.4995 | 0.5759 | 0.0421 | 0.3603 |
| ph9a | -0.7569 | -0.7693 | -0.5471 | -0.5479 | 0.8242 | 0.2958 | 0.4351 | -0.0293 | 0.4201 |
| ph9b | -0.7826 | -0.7798 | -0.6471 | -0.6668 | 0.8031 | 0.4885 | 0.5177 | -0.0348 | 0.3161 |
| pcona | -0.3544 | -0.3947 | -0.2089 | -0.0744 | 0.3229 | 0.3321 | 0.4549 | 0.5152 | 0.3202 |
| pconb | -0.3307 | -0.3080 | -0.2603 | 0.0984 | 0.4241 | 0.2800 | 0.5374 | 0.4632 | 0.4412 |
| pconc | -0.6568 | -0.7325 | -0.4927 | -0.6148 | 0.7088 | 0.7755 | 0.4214 | 0.3312 | 0.5431 |
| | ph4b | ph5a | ph5b | Ph6a | ph6b | ph7a | ph7b | ph8a | ph8b |
| ph4b | 1.0000 | | | | | | | | |
| ph5a | -0.2879 | 1.0000 | | | | | | | |
| ph5b | -0.6652 | -0.0903 | 1.0000 | | | | | | |
| ph6a | 0.6385 | -0.2872 | -0.4910 | 1.0000 | | | | | |
| ph6b | 0.6545 | -0.3011 | -0.5462 | 0.7258 | 1.0000 | | | | |
| ph7a | 0.0593 | -0.0656 | -0.0343 | 0.1864 | 0.0896 | 1.0000 | | | |
| ph7b | 0.2589 | 0.1230 | -0.3648 | 0.5686 | 0.3871 | 0.5590 | 1.0000 | | |
| ph8a | 0.0778 | 0.0873 | -0.1535 | 0.4443 | 0.2818 | 0.2468 | 0.5737 | 1.0000 | |
| ph8b | 0.1464 | -0.1667 | 0.0007 | 0.6774 | 0.4689 | 0.3000 | 0.5901 | 0.7324 | 1.0000 |
| ph9a | 0.0112 | -0.0611 | 0.0575 | 0.5102 | 0.2868 | 0.2434 | 0.4967 | 0.5901 | 0.6792 |
| ph9b | 0.1419 | -0.2917 | 0.0829 | 0.6709 | 0.4299 | 0.3324 | 0.5622 | 0.6040 | 0.9515 |
| pcona | 0.2831 | 0.2551 | -0.5117 | 0.4853 | 0.3090 | 0.1448 | 0.4486 | 0.3455 | 0.3316 |
| pconb | 0.1640 | 0.2316 | -0.4505 | 0.4130 | 0.2576 | 0.2778 | 0.5234 | 0.3843 | 0.3488 |
| pconc | 0.5403 | -0.3891 | -0.3055 | 0.8915 | 0.7497 | 0.2104 | 0.5245 | 0.5091 | 0.8165 |
| | ph9a | ph9b | pcona | pconb | pconc | | | | |

| | | | | | |
|--------------|--------|--------|--------|--------|--------|
| ph9a | 1.0000 | | | | |
| ph9b | 0.6907 | 1.0000 | | | |
| pcona | 0.1935 | 0.2222 | 1.0000 | | |
| pconb | 0.3431 | 0.2481 | 0.5453 | 1.0000 | |
| pconc | 0.6155 | 0.8243 | 0.3323 | 0.3152 | 1.0000 |

Source: *China Statistical Yearbook* (中國統計年鑑) China Statistics Press (1995-2009). Provincial statistical yearbooks 1995-2009. *The Data of the Third National Industrial Census of the People's Republic of China in 1995* (中華人民共和國 1995 年第三次全國工業普查資料匯編), China Statistics Press (1997). *China Economic Census Yearbook 2004* (中國經濟普查年鑑 2004), China Statistics Press (2006).

Note: All data periods are between 1994 and 2008. Data for Chongqing are subsumed in those for Sichuan, so that the cross-section number of provincial-level units is 30, rather than 31. Names of variables are all followed by -X or -%, where X denotes that it is an index variable and % indicates that it is a percentage variable. Code pdv1 denotes the first dependent variable; pcon1 denotes the first control variable; ph1a and h1b denote the two variables in hypothesis 1;... etc.

Relevant data for the two dependent variables, *SOEUnitX* and *SOEEmployeeX*, are listed in Tables 5.2 and 5.3. Full data for the remaining variables can be found in Appendix 2A.

In terms of the first dependent variable (the index of SOE numbers in each province), the data show that in most provinces privatisation of SOEs began to get under way within a two year period. Thus, the process was under way in nineteen provinces in 1996, and in a further eight provinces in 1997. Privatisation accelerated significantly during 2000-2003. As of 2000, in only six provinces – Neimenggu (Inner Mongolia), Heilongjiang, Zhejiang, Anhui, Sichuan (including Chongqing) and Ningxia – had the number of SOEs contracted by more than 50 per cent. Three years later, however, there were only five provinces – Tianjin, Henan, Hainan, Guizhou and Tibet – in which a 50 per cent reduction in SOE numbers had *not* taken place. The momentum of privatisation is captured in the finding that between 1994 and 2008 there was an 80 per cent reduction in SOE numbers in twelve provinces, while – with a single exception (Tianjin) – the remaining seventeen provinces achieved a contraction of 60-70 per cent.

The data for the second dependent variable, the index of the number of SOE

employees in each province, suggest that the impact of privatisation was less pronounced. The dismissal of SOE employees got under way in 13 provinces in 1995, and in a further 14 in the following year. The employment contraction accelerated between 2001 and 2003, during which eighteen provinces each laid off more than 50 per cent of their SOE work force. During 1994-2008 SOE employment was reduced by more than 70 per cent in six provinces, with a particular concentration in coastal provinces (Jiangsu and Zhejiang) and the northeast (Heilongjiang and Jilin). In fourteen provinces the corresponding figure was less than 60 per cent, and in four cases – Ningxia, Shaanxi, Guizhou and Shanxi – it was less than 50 per cent.

Table 5.2^a

Privatisation variable 1 – provincial index of state-owned and state holding enterprises.

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|--------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Beijing | 0.5071 | 0.5702 | 1.0000 | 0.8400 | 0.5620 | 0.8221 | 0.6037 | 0.5399 | 0.4636 | 0.3384 | 0.3307 | 0.4335 | 0.3650 | 0.2743 | 0.2773 |
| Tianjin | 0.8072 | 0.9549 | 0.9504 | 0.9480 | 1.0000 | 0.9073 | 0.9133 | 0.8969 | 0.8107 | 0.8053 | 0.6606 | 0.7418 | 0.6070 | 0.6492 | 0.4381 |
| Hebei | 0.9632 | 1.0000 | 0.9085 | 0.8027 | 0.7279 | 0.6839 | 0.6068 | 0.5631 | 0.4620 | 0.3755 | 0.3744 | 0.2764 | 0.2511 | 0.1865 | 0.1816 |
| Shanxi | 0.9672 | 1.0000 | 0.9910 | 0.8880 | 0.7396 | 0.6675 | 0.6452 | 0.6106 | 0.5450 | 0.4878 | 0.4103 | 0.4226 | 0.3721 | 0.2309 | 0.2341 |
| Neimenggu | 0.8154 | 0.9824 | 1.0000 | 0.7236 | 0.4410 | 0.3900 | 0.3091 | 0.2781 | 0.2789 | 0.2413 | 0.2242 | 0.1997 | 0.1997 | 0.1776 | 0.1964 |
| Liaoning | 0.9394 | 0.9813 | 1.0000 | 0.9248 | 0.6978 | 0.5965 | 0.5610 | 0.5002 | 0.3939 | 0.3050 | 0.2643 | 0.3194 | 0.2867 | 0.1918 | 0.2391 |
| Jilin | 0.9330 | 1.0000 | 0.9780 | 0.8708 | 0.6769 | 0.6674 | 0.6100 | 0.5093 | 0.4504 | 0.3546 | 0.3450 | 0.2133 | 0.1705 | 0.1431 | 0.1522 |
| Heilongjiang | 0.9467 | 1.0000 | 0.9658 | 0.8364 | 0.6403 | 0.5112 | 0.4028 | 0.3369 | 0.3128 | 0.2461 | 0.2471 | 0.1758 | 0.1677 | 0.1306 | 0.1377 |
| Shanghai | 0.6339 | 1.0000 | 0.8648 | 0.7875 | 0.6954 | 0.7290 | 0.6609 | 0.5524 | 0.4925 | 0.4292 | 0.4212 | 0.3904 | 0.3602 | 0.3111 | 0.3177 |
| Jiangsu | 0.8823 | 1.0000 | 0.8872 | 0.7948 | 0.7649 | 0.7262 | 0.5881 | 0.4778 | 0.3894 | 0.2860 | 0.2627 | 0.2206 | 0.2109 | 0.1808 | 0.2121 |
| Zhejiang | 0.9541 | 1.0000 | 0.9532 | 0.7631 | 0.7123 | 0.5723 | 0.4335 | 0.3430 | 0.2944 | 0.2632 | 0.2592 | 0.2479 | 0.2372 | 0.2122 | 0.2250 |
| Anhui | 0.8870 | 1.0000 | 0.8605 | 0.5743 | 0.5618 | 0.4811 | 0.3838 | 0.3447 | 0.3062 | 0.2542 | 0.2409 | 0.2106 | 0.1916 | 0.1977 | 0.2150 |
| Fujian | 0.9077 | 0.9685 | 1.0000 | 0.8012 | 0.7193 | 0.6534 | 0.5660 | 0.5416 | 0.4605 | 0.3677 | 0.3420 | 0.3130 | 0.2787 | 0.2195 | 0.2236 |
| Jiangxi | 0.8430 | 1.0000 | 0.9891 | 0.8018 | 0.6689 | 0.6379 | 0.5594 | 0.4417 | 0.3387 | 0.2388 | 0.2194 | 0.1793 | 0.1574 | 0.1255 | 0.1287 |
| Shandong | 0.8185 | 0.9996 | 1.0000 | 0.7986 | 0.6739 | 0.6280 | 0.5714 | 0.4950 | 0.4288 | 0.4039 | 0.3773 | 0.2871 | 0.2801 | 0.2690 | 0.2797 |
| Henan | 0.9262 | 0.9774 | 1.0000 | 0.7384 | 0.7841 | 0.7488 | 0.7233 | 0.6731 | 0.6038 | 0.5310 | 0.3929 | 0.3017 | 0.2809 | 0.2392 | 0.2286 |
| Hubei | 0.9440 | 1.0000 | 0.9451 | 0.8539 | 0.8269 | 0.7952 | 0.7011 | 0.5907 | 0.4966 | 0.3824 | 0.3462 | 0.2502 | 0.2064 | 0.1972 | 0.2097 |
| Hunan | 0.9464 | 1.0000 | 0.9769 | 0.7867 | 0.6657 | 0.6559 | 0.6061 | 0.5486 | 0.5294 | 0.4255 | 0.4141 | 0.2742 | 0.2672 | 0.2223 | 0.2213 |
| Guangdong | 0.9084 | 0.9516 | 1.0000 | 0.9099 | 0.8445 | 0.8296 | 0.6350 | 0.5342 | 0.4841 | 0.4023 | 0.3843 | 0.3454 | 0.2938 | 0.2548 | 0.2844 |
| Guangxi | 0.9479 | 1.0000 | 0.9553 | 0.8920 | 0.7978 | 0.7981 | 0.7549 | 0.6812 | 0.5959 | 0.4663 | 0.4685 | 0.3743 | 0.3374 | 0.2279 | 0.2335 |
| Hainan | 0.8041 | 1.0000 | 0.9540 | 0.9199 | 0.8279 | 0.7291 | 0.6831 | 0.6337 | 0.6031 | 0.5894 | 0.4566 | 0.4208 | 0.4072 | 0.2249 | 0.1857 |
| Sichuan | 0.9463 | 1.0000 | 0.9516 | 0.7832 | 0.6372 | 0.5656 | 0.4891 | 0.4112 | 0.3621 | 0.3041 | 0.2899 | 0.2602 | 0.2609 | 0.2500 | 0.2838 |
| Guizhou | 0.8454 | 0.9521 | 1.0000 | 0.8619 | 0.8016 | 0.7821 | 0.7197 | 0.6538 | 0.6136 | 0.5343 | 0.5018 | 0.4776 | 0.3916 | 0.2787 | 0.2731 |
| Yunnan | 0.9534 | 1.0000 | 0.9544 | 0.8237 | 0.8127 | 0.6663 | 0.6597 | 0.6069 | 0.5770 | 0.4482 | 0.4064 | 0.3099 | 0.3037 | 0.2457 | 0.2562 |
| Tibet | 0.6121 | 0.7543 | 0.7586 | 0.7802 | 0.9612 | 0.9397 | 1.0000 | 0.9871 | 0.8491 | 0.8578 | 0.6767 | 0.7328 | 0.6940 | 0.2284 | 0.1552 |
| Shaanxi | 0.9299 | 1.0000 | 0.9678 | 0.8742 | 0.6797 | 0.6283 | 0.5904 | 0.5202 | 0.4881 | 0.4465 | 0.4418 | 0.3416 | 0.3109 | 0.2328 | 0.2477 |
| Gansu | 0.9461 | 1.0000 | 0.9560 | 0.8080 | 0.7313 | 0.7307 | 0.5944 | 0.4632 | 0.4632 | 0.4372 | 0.4272 | 0.2824 | 0.2762 | 0.2675 | 0.2638 |
| Qinghai | 0.9343 | 0.9879 | 0.9723 | 1.0000 | 0.7855 | 0.8131 | 0.6263 | 0.4983 | 0.4118 | 0.3564 | 0.3893 | 0.2370 | 0.2561 | 0.2388 | 0.2526 |
| Ningxia | 0.9295 | 1.0000 | 0.9705 | 0.8727 | 0.8023 | 0.7477 | 0.4750 | 0.4614 | 0.4182 | 0.3500 | 0.3136 | 0.3182 | 0.2977 | 0.1977 | 0.2409 |
| Xinjiang | 0.8973 | 1.0000 | 0.9721 | 0.9333 | 0.8810 | 0.7678 | 0.6367 | 0.5165 | 0.4701 | 0.4039 | 0.3807 | 0.3389 | 0.3349 | 0.2618 | 0.2821 |

Source: *China Statistical Yearbook* (中國統計年鑑) 1995-2009.

Ave 0.5725

Note: Definition: (provincial index of SOEs) = (number of SOEs in a certain year) / (the S.D. maximum number of SOEs during 1994-2008). Data for Chongqing are subsumed under those for Sichuan.

Max 1.0000
Min 0.1255

^a In this table, there are in all 23 data instances of increases between years (except the first and last few years) which run counter the shrinking trend among 13 provinces. They all point to a certain degree of increase of SOE. A possible reason is this: some new SOEs were established to promote industries of strategic importance to a local province.

Table 5.3^a

Privatisation variable 2 – provincial index of employees in state-owned and state holding enterprises.

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|--------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Beijing | 1.0000 | 0.9574 | 0.9031 | 0.8361 | 0.7847 | 0.8163 | 0.7009 | 0.6392 | 0.5547 | 0.4697 | 0.4161 | 0.4803 | 0.4281 | 0.4314 | 0.4219 |
| Tianjin | 1.0000 | 0.9688 | 0.9301 | 0.9097 | 0.7966 | 0.7059 | 0.6163 | 0.6014 | 0.5353 | 0.4861 | 0.4522 | 0.4371 | 0.4103 | 0.4200 | 0.4216 |
| Hebei | 1.0000 | 0.9996 | 0.9796 | 0.9277 | 0.8775 | 0.8111 | 0.7369 | 0.6719 | 0.6093 | 0.5780 | 0.5623 | 0.4811 | 0.4543 | 0.4211 | 0.4123 |
| Shanxi | 0.9944 | 1.0000 | 0.9888 | 0.9426 | 0.8443 | 0.7760 | 0.7539 | 0.7223 | 0.6744 | 0.6284 | 0.6394 | 0.6740 | 0.6636 | 0.6074 | 0.6443 |
| Neimenggu | 0.9869 | 1.0000 | 0.9878 | 0.9195 | 0.7409 | 0.6810 | 0.5870 | 0.5416 | 0.5167 | 0.3953 | 0.3858 | 0.3652 | 0.3687 | 0.3469 | 0.3567 |
| Liaoning | 0.9396 | 1.0000 | 0.9372 | 0.8905 | 0.7781 | 0.6601 | 0.5988 | 0.5146 | 0.4491 | 0.3922 | 0.3681 | 0.3569 | 0.3446 | 0.3410 | 0.3540 |
| Jilin | 0.9941 | 1.0000 | 0.9947 | 0.9382 | 0.7704 | 0.6987 | 0.6320 | 0.5577 | 0.4942 | 0.4182 | 0.3941 | 0.3575 | 0.3182 | 0.2989 | 0.3098 |
| Heilongjiang | 1.0000 | 0.9822 | 0.9745 | 0.9195 | 0.7324 | 0.6346 | 0.5525 | 0.4954 | 0.4564 | 0.3239 | 0.3185 | 0.3061 | 0.3077 | 0.3008 | 0.2981 |
| Shanghai | 1.0000 | 0.9263 | 0.8258 | 0.7022 | 0.7942 | 0.7069 | 0.6361 | 0.5513 | 0.5070 | 0.4424 | 0.4167 | 0.3815 | 0.3585 | 0.3227 | 0.3122 |
| Jiangsu | 0.9932 | 1.0000 | 0.9537 | 0.9303 | 0.9578 | 0.8711 | 0.7047 | 0.5999 | 0.5282 | 0.4224 | 0.3811 | 0.3100 | 0.2996 | 0.2616 | 0.2844 |
| Zhejiang | 1.0000 | 0.9536 | 0.8958 | 0.8231 | 0.8113 | 0.6612 | 0.5055 | 0.3962 | 0.3493 | 0.3338 | 0.2912 | 0.3006 | 0.2859 | 0.2800 | 0.2842 |
| Anhui | 0.9527 | 1.0000 | 0.9806 | 0.8749 | 0.8069 | 0.7251 | 0.6572 | 0.5695 | 0.5336 | 0.4925 | 0.5047 | 0.4599 | 0.4446 | 0.4402 | 0.4780 |
| Fujian | 1.0000 | 0.9642 | 0.9083 | 0.8410 | 0.8285 | 0.7369 | 0.6278 | 0.5668 | 0.4913 | 0.4239 | 0.4087 | 0.4122 | 0.3811 | 0.3550 | 0.3454 |
| Jiangxi | 0.9775 | 1.0000 | 0.9768 | 0.9437 | 0.7896 | 0.7194 | 0.6271 | 0.5346 | 0.4656 | 0.3980 | 0.3690 | 0.3314 | 0.3246 | 0.2985 | 0.3049 |
| Shandong | 0.9231 | 1.0000 | 0.9748 | 0.9595 | 0.9445 | 0.8888 | 0.8117 | 0.7332 | 0.6788 | 0.6676 | 0.6124 | 0.4943 | 0.4929 | 0.4776 | 0.5157 |
| Henan | 0.9671 | 0.9865 | 1.0000 | 0.8896 | 0.8866 | 0.8308 | 0.7763 | 0.7392 | 0.6829 | 0.6519 | 0.5787 | 0.5464 | 0.5115 | 0.4823 | 0.4460 |
| Hubei | 0.9858 | 1.0000 | 0.9698 | 0.9235 | 0.9016 | 0.8211 | 0.7257 | 0.6603 | 0.5525 | 0.4869 | 0.4623 | 0.3629 | 0.3352 | 0.3307 | 0.3421 |
| Hunan | 0.9907 | 1.0000 | 0.9820 | 0.9431 | 0.7648 | 0.7122 | 0.6402 | 0.5513 | 0.4956 | 0.4443 | 0.4156 | 0.3360 | 0.3373 | 0.3301 | 0.3243 |
| Guangdong | 1.0000 | 0.9365 | 0.9031 | 0.8499 | 0.8775 | 0.8221 | 0.6696 | 0.5886 | 0.5324 | 0.4824 | 0.4795 | 0.4453 | 0.3902 | 0.3904 | 0.4993 |
| Guangxi | 1.0000 | 0.9893 | 0.9658 | 0.9209 | 0.8540 | 0.7947 | 0.6977 | 0.6188 | 0.5530 | 0.4728 | 0.4516 | 0.3979 | 0.3451 | 0.3260 | 0.3676 |
| Hainan | 1.0000 | 0.9773 | 0.9167 | 0.8939 | 0.8262 | 0.7607 | 0.7024 | 0.6530 | 0.7192 | 0.5924 | 0.4053 | 0.4485 | 0.4174 | 0.3409 | 0.2841 |
| Sichuan | 1.0000 | 0.9929 | 0.9788 | 0.9186 | 0.8652 | 0.7527 | 0.6262 | 0.5480 | 0.4822 | 0.4409 | 0.4173 | 0.3868 | 0.3906 | 0.3978 | 0.4116 |
| Guizhou | 1.0000 | 0.9762 | 0.9616 | 0.9405 | 0.8396 | 0.7989 | 0.7524 | 0.7029 | 0.6592 | 0.6220 | 0.5914 | 0.5851 | 0.5396 | 0.5144 | 0.5246 |
| Yunnan | 1.0000 | 0.9872 | 0.9821 | 0.9386 | 0.9080 | 0.7844 | 0.7554 | 0.6832 | 0.6355 | 0.5339 | 0.4789 | 0.4247 | 0.4207 | 0.4779 | 0.4247 |
| Tibet | 0.6738 | 0.6738 | 0.6738 | 0.6289 | 0.9341 | 0.9415 | 1.0000 | 0.9433 | 0.8648 | 0.8939 | 0.7547 | 0.7232 | 0.6289 | 0.4941 | 0.4986 |
| Shaanxi | 0.9817 | 1.0000 | 0.9898 | 0.9668 | 0.8439 | 0.7888 | 0.7111 | 0.6356 | 0.6056 | 0.5684 | 0.5835 | 0.5277 | 0.5248 | 0.5169 | 0.5293 |
| Gansu | 0.9858 | 1.0000 | 0.9617 | 0.9441 | 0.8822 | 0.7891 | 0.7225 | 0.6340 | 0.6118 | 0.5859 | 0.5740 | 0.4924 | 0.4966 | 0.4570 | 0.4666 |
| Qinghai | 0.9848 | 1.0000 | 0.9949 | 0.9192 | 0.8476 | 0.8401 | 0.7178 | 0.6045 | 0.5346 | 0.5258 | 0.5232 | 0.4556 | 0.4591 | 0.4742 | 0.5354 |
| Ningxia | 0.9747 | 0.9916 | 1.0000 | 0.9494 | 0.9028 | 0.8390 | 0.6976 | 0.6574 | 0.6396 | 0.6274 | 0.6143 | 0.5869 | 0.5105 | 0.5165 | 0.5456 |
| Xinjiang | 0.9694 | 1.0000 | 0.9810 | 0.9300 | 0.8936 | 0.8042 | 0.5700 | 0.4885 | 0.4702 | 0.4150 | 0.3895 | 0.4603 | 0.4972 | 0.5483 | 0.5723 |

Source: *China Statistical Yearbook* (中國統計年鑑)1995-2009.

Ave 0.6631

Note: Definition: (provincial index of employees in SOEs) = (number of SOE employees S.D. in a certain year) / (the maximum number of SOE employees during 1994-2008). Data for Chongqing are subsumed under those for Sichuan.

Max 1.0000
Min 0.2616

^a In this table, there are also 23 data instances of increases between years (except the first and last few years) which run counter to the shrinking trend among 16 provinces. They all suggest a certain degree of increase in SOE employment. A possible reason is this: some new SOE employees were recruited to promote industries of strategic importance to a local province.

5.2 Preliminary analysis

In this section, by way of a preliminary analysis, I present a non-parametric comparison, as well as a simple regression model for all independent variables as a preliminary analysis. The non-parametric comparison makes it possible to explore the changes in the macroeconomic environment and microeconomic conditions, and in the political context in which these economic changes were taking place. Regional and time differences are both reported. In short, this exercise offers a comprehensive account of the factors that shaped the dynamics of Chinese privatisation during 1994-2008. It is hoped that this simple regression analysis will confirm the appropriateness of the choice of hypotheses that underlie this research.

Changes in the political economy context

Soft budgets and credits. The subsidy index calculation in Table 5.4 shows unambiguously that the level of total subsidies extended to loss-making SOEs declined significantly, implying a rapid shrinkage in soft budgets. If to separate the whole period into two – i.e., the former period is between 1994 and 2001, and the latter period is between 2002 and 2008 – the mean for the coastal data declined from 0.7080 of the former period to 0.2631 of the latter period. The mean for the inland data declined similarly from 0.7136 of the early period to 0.2812 of the latter period. According to the provincial data set out in Table 5A.1a (see Appendix 5A), the shrinkage of soft budgets was particularly rapid in a number of inland provinces (for example, Xinjiang, Ningxia, Qinghai, Yunnan, Guizhou and Heilongjiang). By contrast, this hardening process proceeded more slowly in coastal regions. There are,

however, exceptions to these general patterns. Thus, coastal Zhejiang benefited from increased subsidy payments until 2002, suggesting that this province's local budget became softer, rather than harder. This implies a local policy to consolidate or support local state sector. This also happened in Gansu; which enjoyed a steady expansion of subsidy payments from 1998 to 2006, after which such payments abruptly ceased.

Meanwhile, there was also a major contraction in soft credits in the whole China. Shares of short-term industrial loans in coastal and inland regions dropped by about half in the latter period (in average, from 20.69 to 13.43 per cent in coastal data and from 22.01 to 12.49 per cent in inland data). There were severe reductions in some provinces, such as Heilongjiang, Beijing, Hubei, Hunan, Shanghai and Tianjin; as well as some small and remote provinces, such as Hainan, Qinghai, Tibet, Guizhou and Shaanxi (see Table 5A.1b). Two provinces – Jilin and Shandong – experienced cuts of a more moderate nature, before some increases in two or three latter years in data.

Table 5.4
Regional and time comparison.

| Variable | Code | Coastal (11 provinces) | | | Inland (19 provinces) | | |
|------------------------|------|------------------------|---------------|----------------|-----------------------|---------------|----------------|
| | | 1994-2001 | 2002-2008 | Gap | 1994-2001 | 2002-2008 | Gap |
| | | Obs=88 | Obs=77 | | Obs=152 | Obs=133 | |
| (a) | (b) | (c)=(b)-(a) | (d) | (e) | (f)=(e)-(d) | | |
| <i>SOEUnitX</i> | pdv1 | 0.7926 | 0.3586 | -0.4339 | 0.7684 | 0.3269 | -0.4415 |
| | | <i>0.1671</i> | <i>0.1449</i> | <i>-0.0222</i> | <i>0.1933</i> | <i>0.1397</i> | <i>-0.0536</i> |
| <i>SOEEmployeeX</i> | pdv2 | 0.8293 | 0.4252 | -0.4041 | 0.8442 | 0.4837 | -0.3605 |
| | | <i>0.1492</i> | <i>0.1002</i> | <i>-0.0490</i> | <i>0.1481</i> | <i>0.1172</i> | <i>-0.0309</i> |
| <i>SubsidyX</i> | ph1a | 0.7080 | 0.2631 | -0.4449 | 0.7136 | 0.2812 | -0.4324 |
| | | <i>0.2507</i> | <i>0.2726</i> | <i>0.0219</i> | <i>0.2743</i> | <i>0.3146</i> | <i>0.0403</i> |
| <i>IndustrialLoan%</i> | ph1b | 0.2069 | 0.1343 | -0.0727 | 0.2201 | 0.1249 | -0.0952 |
| | | <i>0.0499</i> | <i>0.0403</i> | <i>-0.0096</i> | <i>0.0537</i> | <i>0.0462</i> | <i>-0.0075</i> |
| <i>POE%</i> | ph2a | 0.0958 | 0.4027 | 0.3069 | 0.0587 | 0.3509 | 0.2922 |
| | | <i>0.0947</i> | <i>0.1478</i> | <i>0.0531</i> | <i>0.0585</i> | <i>0.1604</i> | <i>0.1019</i> |
| <i>POEEmployee%</i> | ph2b | 0.0492 | 0.1489 | 0.0997 | 0.0178 | 0.0696 | 0.0519 |
| | | <i>0.0440</i> | <i>0.1262</i> | <i>0.0822</i> | <i>0.0111</i> | <i>0.0584</i> | <i>0.0473</i> |
| <i>SelfFunding%</i> | ph3a | 0.4766 | 0.5545 | 0.0779 | 0.3957 | 0.5318 | 0.1362 |
| | | <i>0.0670</i> | <i>0.1058</i> | <i>0.0389</i> | <i>0.0750</i> | <i>0.1479</i> | <i>0.0729</i> |
| <i>FiscalAutonomy%</i> | ph3b | 0.7278 | 0.7278 | 0.0001 | 0.4789 | 0.4152 | -0.0637 |
| | | <i>0.1805</i> | <i>0.2038</i> | <i>0.0232</i> | <i>0.1727</i> | <i>0.1650</i> | <i>-0.0077</i> |

| | | | | | | | |
|--------------------------------|-------|---------------|---------------|---------|---------------|---------------|---------|
| <i>NonSOEOutput%</i> | ph4a | 0.5776 | 0.6798 | 0.1022 | 0.2866 | 0.3998 | 0.1133 |
| | | <i>0.1542</i> | <i>0.1479</i> | -0.0064 | <i>0.1155</i> | <i>0.1438</i> | 0.0283 |
| <i>Openness%</i> | ph4b | 0.4830 | 0.6741 | 0.1912 | 0.1709 | 0.1789 | 0.0080 |
| | | <i>0.3974</i> | <i>0.5045</i> | 0.1071 | <i>0.3562</i> | <i>0.3019</i> | -0.0543 |
| <i>AssetLiability%</i> | ph5a | 0.6208 | 0.5720 | -0.0488 | 0.6172 | 0.5821 | -0.0352 |
| | | <i>0.0620</i> | <i>0.0671</i> | 0.0050 | <i>0.0906</i> | <i>0.1098</i> | 0.0192 |
| <i>DeficitBudget%</i> | ph5b | 0.3036 | 0.3222 | 0.0185 | 0.5153 | 0.5984 | 0.0831 |
| | | <i>0.0901</i> | <i>0.1517</i> | 0.0616 | <i>0.1588</i> | <i>0.1554</i> | -0.0034 |
| <i>PhysicalInfrastructureX</i> | ph6a | 0.1912 | 0.4713 | 0.2801 | 0.0997 | 0.2822 | 0.1825 |
| | | <i>0.0977</i> | <i>0.1702</i> | 0.0726 | <i>0.0840</i> | <i>0.1423</i> | 0.0582 |
| <i>LegalInfrastructureX</i> | ph6b | 0.0357 | 0.1337 | 0.0980 | 0.0152 | 0.0458 | 0.0306 |
| | | <i>0.0318</i> | <i>0.1347</i> | 0.1029 | <i>0.0199</i> | <i>0.0901</i> | 0.0701 |
| <i>AssetContribution%</i> | ph7a | 0.0809 | 0.1170 | 0.0361 | 0.0822 | 0.1148 | 0.0326 |
| | | <i>0.0329</i> | <i>0.0294</i> | -0.0036 | <i>0.0762</i> | <i>0.0656</i> | -0.0106 |
| <i>AssetOutput%</i> | ph7b | 0.5244 | 0.7416 | 0.2172 | 0.4368 | 0.5776 | 0.1408 |
| | | <i>0.1122</i> | <i>0.1451</i> | 0.0329 | <i>0.1086</i> | <i>0.1871</i> | 0.0785 |
| <i>AveEmployeeX</i> | ph8a | 0.6625 | 0.7840 | 0.1215 | 0.5524 | 0.7707 | 0.2183 |
| | | <i>0.1182</i> | <i>0.1593</i> | 0.0411 | <i>0.1393</i> | <i>0.1868</i> | 0.0475 |
| <i>AveAssetX</i> | ph8b | 0.1370 | 0.5733 | 0.4363 | 0.1050 | 0.5344 | 0.4294 |
| | | <i>0.0687</i> | <i>0.2705</i> | 0.2017 | <i>0.0568</i> | <i>0.2895</i> | 0.2327 |
| <i>ScientificPersonnel%</i> | ph9a | 0.2045 | 0.3134 | 0.1088 | 0.1858 | 0.2914 | 0.1056 |
| | | <i>0.0562</i> | <i>0.0573</i> | 0.0012 | <i>0.0458</i> | <i>0.0507</i> | 0.0049 |
| <i>LabourProductivityX</i> | ph9b | 0.1278 | 0.6335 | 0.5056 | 0.1251 | 0.5890 | 0.4639 |
| | | <i>0.0656</i> | <i>0.2635</i> | 0.1979 | <i>0.0645</i> | <i>0.2735</i> | 0.2090 |
| <i>GDPX</i> | pcon1 | 0.1106 | 0.3063 | 0.1957 | 0.0491 | 0.1283 | 0.0791 |
| | | <i>0.0723</i> | <i>0.2287</i> | 0.1564 | <i>0.0380</i> | <i>0.1002</i> | 0.0622 |
| <i>PopulationX</i> | pcon2 | 0.3681 | 0.3987 | 0.0306 | 0.3119 | 0.3221 | 0.0102 |
| | | <i>0.2274</i> | <i>0.2461</i> | 0.0186 | <i>0.2477</i> | <i>0.2457</i> | -0.0021 |
| <i>Literacy%</i> | pcon3 | 0.8779 | 0.9184 | 0.0405 | 0.8192 | 0.8696 | 0.0504 |
| | | <i>0.0522</i> | <i>0.0323</i> | -0.0199 | <i>0.1244</i> | <i>0.0932</i> | -0.0312 |
| <i>Industrialisation%</i> | pcon4 | 0.3787 | 0.4303 | 0.0516 | 0.3272 | 0.3693 | 0.0421 |
| | | <i>0.1009</i> | <i>0.0956</i> | -0.0053 | <i>0.0826</i> | <i>0.0963</i> | 0.0137 |
| <i>IncomePercapitaX</i> | pcon5 | 0.1561 | 0.4208 | 0.2647 | 0.0933 | 0.2918 | 0.1985 |
| | | <i>0.0827</i> | <i>0.1822</i> | 0.0994 | <i>0.0591</i> | <i>0.1268</i> | 0.0677 |

Note: Values in italic are standard errors. Coastal provinces include Liaoning, Hebei, Tianjin, Shandong, Jiangsu, Shanghai, Zhejiang, Fujian, Guangdong, Guangxi, and Hainan. Chongqing is included in Sichuan.

Ideology. The prevailing political ideology during these years favoured expansion of the private economy. During 1994-2001, the mean share of private-owned enterprises (POEs) (i.e., the number of POEs to the number of total enterprises) was only 9.58 per cent in coastal region, and a mean 5.87 per cent in the interior.¹⁰⁴ By 2002-2008 the corresponding values had both increased around 30 per cent. That highlights the fundamental change in the structure of local economies that

¹⁰⁴ As already discussed, these very low figures may reflect local statistical distortions dictated by ideological factors or deliberate misrepresentation of enterprise status by *de facto* private owners.

was taking place. Thus, the data for 2008, show the POE share in half of all provinces to have exceeded 50 per cent (see Table 5A.2a). Private economy booms were especially rapid in Jiangsu, Zhejiang, Anhui, Shandong, Henan, Guizhou, Ningxia, Hunan and Sichuan, compared with a much slower pace of change in Tibet, Qinghai, Shaanxi, Gansu and Shanxi. The growing pace of private economy in inland region was faster than general expectation, according to which coastal regions should have taken the lead. Interestingly, among coastal provinces the growth of POEs was slowest in Beijing, whose latest data for 2008 are superior only to those of Hainan, Tibet and Qinghai. However, it would be premature to draw conclusions from this. If we take Beijing's rapid growth of private employment (discussed in the next paragraph) into consideration, it becomes clear that private enterprises based in Beijing should be relatively larger than those of other provinces.

The employment impact of privatisation reform was less pronounced. After 1994 POE employment scale increased in all provinces, but at a quite modest pace. During 2002-2008, coastal POEs accounted, on average, for only 14.89 per cent of total employment in average, whilst the corresponding figure for inland POEs was even lower at 6.96 per cent. Not surprisingly, the five fastest-growing coastal provinces – Shanghai, Beijing, Jiangsu, Zhejiang and Tianjin – were the driving force behind the private sector expansion, although in 2005 only in Shanghai did the private sector accommodate more than 50 per cent of total employment (see Table 5A.2b). Until quite recently, in two-thirds of all provinces less than one in ten workers were employed in the private sector. Besides, Beijing's relatively higher pace of private employment does not contradict its relatively slower growth in the number of private enterprises. Rather, this contrast indicates that private enterprises newly established in Beijing were larger than those of other provinces, embodying more employees per enterprise.

Decentralisation. Turning to decentralisation, the evidence suggests that after the mid-1990s local governments showed themselves much more willing and able to raise construction capital from their own resources. Data for coastal provinces point to a 7.79 per cent rise to reach 55.45 per cent in the mean of the self-funding share of total investment between 2002 and 2008. In inland regions the corresponding figure was significantly higher (13.62 per cent). As a result, during 2002-2008, with 53.18 per cent of total investment coming from self-funding, inland governments had almost caught up with their coastal counterparts (55.45 per cent). In some interior provinces – for example, Neimenggu, Jilin, Henan, Heilongjiang, Shanxi, Qinghai and Anhui – the accelerated pace of self-funding activities was especially noteworthy (see Table 5A.3a). On the contrary, Beijing, Shanghai, Hainan, Guangdong, Guangxi and Jiangsu experienced the most serious fluctuations.

A different picture emerges when we examine the extent of fiscal autonomy, whose mean remain stable throughout both periods in coastal provinces, but fell by 6.37 per cent in inland regions. The data variation is remarkable (around 18 per cent in national average), and shows the huge differences and fluctuations among provinces. The reason lies in the rapid increase of local expenditure in recent years. In most provinces, the growth of local revenue was slower than that of local expenditure, as a result of which local finances became more dependent on fiscal support from central government. In effect, about two-thirds of all provinces experienced a weakening of their fiscal autonomy, with Hainan, Henan, Hebei, Gansu, Heilongjiang, Jilin, Hubei, Hunan, Guangxi and Jiangxi being most seriously affected (see Table 5A.3b). With two exceptions (Neimenggu and Shanxi), there was an unambiguous weakening of fiscal autonomy in all inland provinces. Significant enhancement of fiscal autonomy was achieved in just seven coastal provinces, with Zhejiang, Jiangsu and Fujian recording the greatest improvements. This explains the wide regional gaps.

Thus, whereas the average extent of fiscal autonomy in coastal regions in all time is about 72 per cent, much higher than the corresponding feature 45 per cent in inland regions. In short, we may conclude that coastal governments enjoy greater fiscal autonomy than their inland counterparts. Moreover, this gap has continued to widen to the detriment of interior regions of the country.

In summary, the political economy context in which privatisation proceeded in China is consonant with the hypotheses set out in an earlier chapter. Starting in the late 1990s, soft budgets and credits lines were significantly reduced in all provinces, and from 2000 ideological support for the private economy strengthened. Local self-financing capability also gradually increased in the wake of the series of decentralisation reforms that took place in the mid-1990s. By contrast, however, thanks to the more rapid expansion in local expenditures compared with local revenue growth, the fiscal autonomy of most provincial governments weakened. This was reflected in deteriorating local finances which made local governments more dependent on central transfers.

In addition, regional variations are shown to have been significant. Among inland provincial governments, the process of hardening soft budgets and credits took place more rapidly, although the shift toward an ideology in favour of private ownership was slower. Coastal governments embraced a pro-privatisation ideology changes at an earlier stage; larger local revenues also gave them greater fiscal autonomy, and they experienced a slower rate of contraction of soft budgets and credits.

Some provinces deserve further notes. For the boom of private economy, in terms of employment scale, Shanghai, Jiangsu and Beijing took a clear leading role, followed by Tianjin and Zhejiang. Yet the private labour market in Guangdong and Shandong was not as much advanced as expected. In Zhejiang and Gansu, unlike rest provinces, budget and credit systems became softer, not harder, in the most of time.

That means the state sector in these two provinces was not the target to be shrunk but to be fostered, instead. More moderate cuts and slight increases of soft credits were seen in Jilin and Shandong, suggesting that their state sector (perhaps more orientated towards heavy industries) was a particular target for support (through state loans) and given a greater development responsibility after 2006.

Changes in macroeconomic environment

Market competition. In the product markets of both coastal and inland areas, data show that between 1994-2001 and 2002-08 the non-state share of industrial products rose by 10 per cent. A corollary of the increase in non-state activity was an intensification of market competition in all provinces after the mid-1990s. However, the gap between coastal and inland areas was huge: the average industrial output made by non-state sector in coastal data was about 30 per cent higher than that of interior regions (see Table 5.4). Competition was particularly severe in southeast coastal provinces, including Zhejiang, Jiangsu, Guangdong and Fujian (see Table 5A.4a). The most outstanding improvements of non-state activities occurred in inland provinces, especially in Neimenggu, Jiangxi, Ningxia, Hebei, Hunan, Henan and Sichuan (including Chongqing), accounted for an increasing share of local product markets. Yet in some remote provinces, such as Xinjiang, Gansu, Qinghai, Shaanxi and Heilongjiang, the increase in competition was much more limited, and markets were still mainly the output of SOEs.

In terms of the openness to foreign trade, regional gaps were even wider. The average ratio of foreign trade to provincial GDP in coastal regions during 1994-2001 was 48.30 per cent, or 30 per cent higher than the average in inland regions. By 2002-2008, the coastal average had increased by almost 20 per cent (67.41 per cent),

whereas the inland average remained virtually unchanged (rising by less than a percentage point from 17.09 to 17.89 per cent) (see Table 5.4). Four coastal provinces – Shanghai, Jiangsu, Zhejiang and Tianjin – achieved outstanding growth in foreign trade (see Table 5A.4b). By contrast, most inland provinces experienced stagnation. In 2008, the foreign trade share of GDP in eighteen out of nineteen inland provinces was still less than 20 per cent. In addition, data in most provinces show a U-style curve, indicating that the degree of openness declined slightly before rising sharply after 2000. This is because the growth of foreign trade in most provinces was slower than the growth of GDP during the 1990s, and foreign trade was significantly stimulated as a result of the increasing foreign direct investment. Interestingly, Beijing and Guangdong in 2008 were less open than they were in 1994.

Financial pressure. In terms of financial pressure, all provinces faced a long-term debt problem in their state sector. The national average asset-liability ratio consistently remained at a 60 per cent high after 1994. This burden, however, seems to have been kept under control, since the situation did not subsequently deteriorate. Indeed, in recent years it has slightly improved. The detailed local statistics show major fluctuations in all provinces (see Table 5A.5a). Three provinces – Beijing, Shanghai and Guangdong – achieved significant improvement in the later period. No clear distinction is found between coastal and inland areas, and it means that remote and rural provinces did not necessarily face a debt problem more serious than their coastal and relatively richer counterparts.

The *deficit* problem, nevertheless, facing inland governments has been far more severe than that facing coastal governments. During 2002-2008, the average deficit-budget ratio of inland data was close to 60 per cent, a rate almost double the average of coastal regions (see Table 5.4). In some inland provinces the ratio was even higher: for example, deficits in Tibet, Qinghai, Gansu, Ningxia, Jilin, Xinjiang and

Guizhou exceeded two-thirds of local expenditure. By contrast, in recent years some coastal provinces – for example, Zhejiang, Jiangsu, Beijing, Guangdong and Shanghai – have successfully addressed deficit problems by generating rapid local revenue growth.

Infrastructural institutions. Turning now to the institutional framework, all provinces display an improvement in their index of *physical* infrastructure during 1994-2008. This reflects the deliberate efforts of local governments to reduce transaction costs and to facilitate private business expansion. From a regional perspective, it is clear that coastal provinces started with a stronger infrastructural base than and that they achieved a further strengthening of that foundation, compared with inland provinces. Between 1994-2001 and 2002-08 the mean of physical infrastructure data in coastal provinces grew from 0.1912 to 0.4713, while in inland provinces, the increase was smaller (rising from 0.0997 to 0.2822) (see Table 5.4). As comparing nationally, the regional gap is clear (see Table 5A.6a): over one-third of all provinces – most of them inland provinces, except for Guangxi and Hainan – failed to raise this figure to more than 0.3 between the two periods. Meanwhile, the increase in some coastal provinces was huge. For example, Shanghai's index rose to more than 0.7, whilst that of Jiangsu, Beijing, Zhejiang and Shandong reached about 0.5.

However, the degree of improvement in the *legal* infrastructure was much more limited. For coastal provinces, the figure for 2002-08 averaged 0.1337, while for inland regions it was a mere 0.0458 (see Table 5.4). Clearly, the development of a legal framework was much slower in interior regions of the country. The gap between individual provinces was even wider. Whilst five major coastal provinces achieved significant improvement – Beijing (0.6430), Guangdong (0.5981), Zhejiang (0.4555), Jiangsu (0.4040) and Shanghai (0.3852) – during 2002-08, eleven inland provinces were still characterised by an underdeveloped legal infrastructure, as shown by a

figure lower than 0.0500 (see Table 5A.6b).

Overall, the development of the macroeconomic environment in China after the mid-1990s was exemplified by important advances: product competition intensified, foreign trade expanded, debt burdens diminished, deficit problems began to be brought under control, and both physical and legal infrastructures were enhanced. It is true that the record of progress was not uniformly positive (for example, in terms of deficit reduction or in the creation of an effective legal infrastructure); however, the overall direction of change was undoubtedly encouraging. As a result, China's macroeconomic setting was much better than that of other transitional economies of Eastern Europe and former Soviet bloc. The major deficiency in China's case was the huge developmental gap that continued to exist between coastal and inland areas. Debt burden apart, this regional gap was reflected in almost all macroeconomic variables, including openness to non-state business and the outside world, the scale of government deficits, and the development of physical and legal infrastructures. It is clear (and not surprising) that five coastal provinces – Beijing, Shanghai, Jiangsu, Zhejiang and Guangdong – showed a higher degree of macroeconomic development than any other provinces in China. The potential for catch-up remains great for many provinces.

Changes in microeconomic conditions

Economy efficiency. As for economic efficiency, the trend in asset-contribution ratio presents a slight improvement among local state sectors (see Table 5.4). For both coastal and inland provinces, the average asset-contribution ratios from 1994-2001 to 2002-08 period grew at around 3-4 per cent. Most provinces showed profitability fluctuating around a slightly rising trend (see Table 5A.7a). Growth could be adjudged

outstanding in only a few provinces – namely, Heilongjiang, Xinjiang, Shaanxi, Qinghai, Tianjin, Hainan and Shandong. Indeed, in some cases (for example, Yunnan, Beijing and Tibet) SOE profitability was in decline.^{105 106}

Nevertheless, the growth of productivity is much significant than that of profitability. Looking at the figures of asset-output ratio, both figures of two areas grew significantly between 1994-2001 and 2002-08, whilst 21.72 per cent increased in the average of coastal data and 14.08 per cent in the average of inland data (see Table 5.4). In general, coastal provinces showed a greater improvement than inland provinces over the entire period between 1994 and 2008. Fourteen provinces increased the average ratio during 2002-08 by over 70 per cent, ten of which were coastal provinces. The most significant improvements were recorded in Shandong, Jiangsu, Zhejiang, Guangdong, Heilongjiang and Jilin (see Table 5A.7b). By contrast, the degree of improvement was rather limited in Ningxia, Guizhou and Qinghai, close to zero in Hubei and Yunnan, and even negative in Beijing and Tibet. The inefficiency of production in these provinces can be justified by their remote location, except Beijing. Whose low level of profitability was mainly caused by rapid growth in accumulation of state (fixed) assets, which significantly reduced its efficiency performance. It is worth pointing out a contradiction inherent in the divergent performance of two efficiency variables in coastal provinces. Intriguingly, their outstanding productivity enhanced record is hardly consistent with their much more modest improvement in profitability. The reason this divergence may lie in the definition and coverage of two measures. Industrial output, the productivity variable, is a broad concept that embraces profits, taxes and interest. But the profitability

¹⁰⁵ Yunnan, where the values of asset-contribution rate are shown to have been unrealistically high throughout the whole years, seems to have been a special case. It remains to resolve this puzzle.

¹⁰⁶ At first glance, the retrogression in Beijing's data also seems puzzling. It is repeated in the estimates of the asset-output ratio. The reason lies in the rapid growth in the fixed assets after 2004. The total scale of fixed assets increased fourfold within four years.

variable focuses only on profits and excludes other transaction costs, such as management and sales costs. In short, the apparent paradox captured in divergent trends in productivity and profitability may conceal the reality that a significant share of the increase in profits was absorbed by rising costs of management and sales. Here, then, may be further evidence in favour of the widespread assumption that wages and bonuses were largely manipulated in China's state sector. By implication, we may suppose that the phenomenon of rent-seeking management should have been more prevalent in China's coastal provinces.

Firm size. Measured by the average number of employees in a local SOE, the national average size of firm was increasing. On average, the index of firm size in coastal regions increased by 0.1215 in 2002-08, while the corresponding figure for inland provinces was 0.2183. This phenomenon occurs when small SOEs (with the number of employees below the mean of total data) are more likely to be privatised. This corresponds to the central policy of “grasping the large and letting go of the small (*zhuada fangxiao*)”, promoted in the late 1990s, meaning that privatisation should start with *small* SOEs. Since local governments held fast to this principle, the average number of employees in SOEs increased significantly in 2002-08. Provincial statistics suggest that inland governments were more committed to this policy. In 2008, in eight inland provinces the average size of SOE exceeded over 1,000 employees, whereas in most coastal provinces the corresponding figure was around 400-700 employees.¹⁰⁷ In three provinces this figure fluctuated and declined. The average size of SOE contracted in Beijing, Tianjin and Shanghai – seemingly because these more advanced local economies did not follow central policy, but went in the opposite

¹⁰⁷ In 2008, there were totally eleven provinces in which the average number of employees was 1,000 or above; they are Shanxi (1,762), Heilongjiang (1,636), Jilin (1,266), Henan (1,228), Ningxia (1,220), Anhui (1,167), Hebei (1,147), Shandong (1,145), Shaanxi (1,141), Liaoning (1,109) and Gansu (1,000). By way of comparison, in the mid-1990s the corresponding figure was between 500 and 800.

direction (i.e., prioritising privatisation of relatively *large* SOEs). One may wonder how to explain this phenomenon of “grasping the small while letting go of the large” – an opposite practice to that of central government policy. The possible reason is that local governments in these three major cities faced less risk to raise protests among laid-off workers, because these workers would be better accommodated by larger and more advanced private sector. This spared more room for privatising larger SOEs.

Next, regarding the second size variable, the index of the average size of total assets, the nationwide numerical increases confirm the widespread impact of the central policy of privatisation. All provinces acquire a figure increased by over 0.4000 between 1994-2001 and 2002-08 – this suggesting a more than threefold increase (see Table 5.4). Nor in this case do Beijing, Tianjin and Shanghai emerge as exceptions. Yet this phenomenon of rapid expansion in average assets does not wholly reflect the policy of privatising small enterprises first. An examination of provincial statistics suggests that asset expansion was in part the result of pouring huge amounts of money into remaining SOEs in 2004/05-20008 (see Table 5A.8b). The underlying logic may be as follows: Those relatively large SOEs that survived the ‘privatisation tsunami’ may be in need of immediate recapitalisation. This may require that they undertake a certain degree of ownership reform (albeit of a kind that does not fundamentally change their state-owned or state-holding status), such as issuing more shares in domestic or foreign stock markets in order to increase cash flows and enhance competitiveness.¹⁰⁸ Thus, two explanations for the expansion in firm size in provincial state sectors are offered here. During 1994-2004, the increase in average firm size reflected the commitment to following the central policy of letting go of the

¹⁰⁸ This also means that, in Beijing, Shanghai and Tianjin, small SOEs are more likely to be preserved and to be recapitalised, too.

small SOEs first. Subsequently, large-scale recapitalisation by the remaining SOEs may have led to further expansion in asset size.

Human capital endowment. Finally, in terms of Chinese SOEs' human capital capacity, there was stable growth of about 10 per cent in the national average for the entire period (1994-2008), as captured by changes in managerial positions (measured by the share of scientific and technical personnel in the total number of employees). All provinces shared in this impressive record. In some less developed provinces – such as Anhui, Hunan, Guangxi, Jilin, Jiangxi and Yunnan – the corresponding increase was up to 20 per cent (see Table 5A.9a).¹⁰⁹ As for labour productivity (the alternative human capital variable), all provinces recorded positive growth during 1994-2008, but with major regional gaps. In 2008, the value-added per worker in nine provinces was more than 300,000 yuan per year; but in ten other provinces the corresponding figure was less than 200,000 yuan. The highest provincial figure (517,846 yuan/year in Guangdong) was 4.7 times higher than the lowest figure (110,798 yuan/year in Tibet). Over the entire period, there was a 13-17 fold improvement in average labour productivity in most provinces.¹¹⁰ The most outstanding records were achieved in Neimenggu, Shaanxi, Tianjin, Hainan and Zhejiang, all of which recorded increase of at least 2,000 per cent. Other provinces were, however, left far behind: in Guizhou and Gansu there was a 10-fold improvement; in Yunnan, only an eight-fold increase; and in Tibet, a mere six-fold. It is noteworthy that a simple coastal-interior dichotomy does not suffice to explain

¹⁰⁹ A noteworthy feature is that the shares in Beijing, Shanghai and Tianjin should have been surprisingly low, especially in the late 1990s – something that hardly meets the popular preconception of a high level of human capital in these three coastal major cities. The explanation may be as follows: Unlike other provinces, these three *city economies* afforded fewer managerial-level positions to be filled. In any case, the unique nature of these three provincial-level units does not affect the empirical result. Since regressions are conducted province by province, differences over a specific variable among provinces – as in this case – will not be carried out into the result.

¹¹⁰ This coefficient is calculated by the maximum value divided by the minimum value in a provincial series for the period 1994-2008.

regional differentials: the record of coastal provinces was not necessarily superior to that of inland provinces in terms of enhancing human capacity, especially given that the latter usually faced a relatively lower starting point in terms of human capital endowment.

In short, we may summarise changes in microeconomic conditions among provincial SOEs as follows: economic efficiency improved; firm size expanded; and human capital was enhanced. However, it is clear that concealed in these generalities were major regional differences and that these dictated the need for specific local strategies. Coastal SOEs are found to have been more susceptible to manipulate profitability because more economic rents were apparently lost in the management and sales process. They were also less committed to the central policy of prioritising the privatisation of small enterprises (the average size of privatised SOEs in most coastal provinces was smaller).¹¹¹ Meanwhile, in terms of the overall improvement of human capital, inland governments should be applauded for having achieved a level close to that of their coastal counterparts. Even in some remote and less developed inland provinces, growth was significant.

Simple regression analysis

This sub-section presents basic results of the simple regression analysis, conducted in a single-variate linear OLS model, where the dependent variable is regressed by singular independent variable with an intercept. This reveals the basic correlation between the dependent variable and each independent variable, and further enables us to check the appropriateness of hypothesis establishments in a preliminary manner. It is important to note, however, that this kind of analysis can be largely

¹¹¹ Except for Beijing, Tianjin and Shanghai, as discussed earlier.

biased because it does not contain any control variable over simultaneous impacts from other factors, nor any adjustment over the individual-specific and time-specific influences. The result, therefore, can only provide basic correlation and cannot underpin any meaningful conclusion according to a conservative manner of econometrics.

Most hypotheses introduced in this research assume a negative correlation between the scale of state sector and its determinants. This is necessarily reflected in a negative sign of coefficient in a simple regression. There are only two exceptions, where the original hypothesis would expect to generate a positive sign in estimated coefficients. Given that the removal of a soft budget constraint implies a contraction in the total amount, an increase of soft budgets will, conversely, encourage local governments to maintain the current scale of state sector. This positive correlation would generate an expected positive sign. Secondly, in the factor of economic efficiency, since the original assumption is based on the traditional orthodox argument which states that less efficient SOEs should be privatised first, the efficiency level of the remaining non-privatised SOEs should be raised. Accordingly, it leads to a positive sign in estimation. Table 5.5 lists the results of all simple regressions.

Table 5.5
Simple regression analysis by pooled-OLS.

| | | Coef. | Std. Err. | <i>T</i> | <i>P</i> > <i>t</i> | R-squared | Obs | Sign assumed | Correspondence |
|-------------------------------------|------|---------|-----------|----------|---------------------|-----------|-----|--------------|----------------|
| Dependent variable: <i>SOEUnitX</i> | | | | | | | | | |
| <i>SubsidyX</i> | ph1a | 0.4905 | 0.0281 | 17.44 | 0.00 | 0.4043 | 450 | + | V |
| <i>IndustrialLoan%</i> | ph1b | 2.6070 | 0.1558 | 16.73 | 0.00 | 0.3846 | 450 | + | V |
| <i>POE%</i> | ph2a | -1.1786 | 0.0386 | -30.54 | 0.00 | 0.6755 | 450 | - | V |
| <i>POEEmployee%</i> | ph2b | -1.4211 | 0.1517 | -9.37 | 0.00 | 0.1638 | 450 | - | V |
| <i>SelfFunding%</i> | ph3a | -1.1367 | 0.0903 | -12.58 | 0.00 | 0.2611 | 450 | - | V |
| <i>FiscalAutonomy%</i> | ph3b | 0.1234 | 0.0577 | 2.14 | 0.03 | 0.0101 | 450 | - | X |
| <i>NonSOEOutput%</i> | ph4a | -0.3196 | 0.0624 | -5.12 | 0.00 | 0.0553 | 450 | - | V |
| <i>Openness%</i> | ph4b | -0.0291 | 0.0303 | -0.96 | 0.34 | 0.0021 | 450 | - | V |
| <i>AssetLiability%</i> | ph5a | 0.4935 | 0.1412 | 3.50 | 0.00 | 0.0265 | 450 | - | X |
| <i>DeficitBudget%</i> | ph5b | -0.1684 | 0.0682 | -2.47 | 0.01 | 0.0134 | 450 | - | V |
| <i>PhysicalInfrastructureX</i> | ph6a | -0.9095 | 0.0586 | -15.51 | 0.00 | 0.3495 | 450 | - | V |
| <i>LegalInfrastructureX</i> | ph6b | -1.0703 | 0.1417 | -7.55 | 0.00 | 0.1129 | 450 | - | V |

| | | | | | | | | | |
|-----------------------------|------|---------|--------|--------|------|--------|-----|---|---|
| <i>AssetContribution%</i> | ph7a | -1.1591 | 0.2016 | -5.75 | 0.00 | 0.0687 | 450 | + | X |
| <i>AssetOutput%</i> | ph7b | -0.7477 | 0.0644 | -11.62 | 0.00 | 0.2315 | 450 | + | X |
| <i>AveEmployeeX</i> | ph8a | -1.0503 | 0.0504 | -20.82 | 0.00 | 0.4917 | 450 | - | V |
| <i>AveAssetX</i> | ph8b | -0.7538 | 0.0263 | -28.61 | 0.00 | 0.6463 | 450 | - | V |
| <i>ScientificPersonnel%</i> | ph9a | -2.7864 | 0.1137 | -24.51 | 0.00 | 0.5728 | 450 | - | V |
| <i>LabourProductivityX</i> | ph9b | -0.7033 | 0.0264 | -26.61 | 0.00 | 0.6125 | 450 | - | V |

| | | Coef. | Std. Err. | T | P > t | R-squared | Obs | Assumed | Consistent |
|---|------|---------|-----------|--------|-------|-----------|-----|---------|------------|
| Dependent variable: <i>SOEEmployeeX</i> | | | | | | | | | |
| <i>SubsidyX</i> | ph1a | 0.3973 | 0.0242 | 16.44 | 0.00 | 0.3764 | 450 | + | V |
| <i>IndustrialLoan%</i> | ph1b | 2.3492 | 0.1244 | 18.89 | 0.00 | 0.4433 | 450 | + | V |
| <i>POE%</i> | ph2a | -0.9709 | 0.0336 | -28.88 | 0.00 | 0.6506 | 450 | - | V |
| <i>POEEmployee%</i> | ph2b | -1.5289 | 0.1190 | -12.84 | 0.00 | 0.2691 | 450 | - | V |
| <i>SelfFunding%</i> | ph3a | -0.8996 | 0.0773 | -11.63 | 0.00 | 0.2321 | 450 | - | V |
| <i>FiscalAutonomy%</i> | ph3b | -0.0081 | 0.0487 | -0.17 | 0.87 | 0.0001 | 450 | - | V |
| <i>NonSOEOutput%</i> | ph4a | -0.3359 | 0.0515 | -6.52 | 0.00 | 0.0867 | 450 | - | V |
| <i>Openness%</i> | ph4b | -0.0780 | 0.0252 | -3.10 | 0.00 | 0.0209 | 450 | - | V |
| <i>AssetLiability%</i> | ph5a | 0.5692 | 0.1171 | 4.86 | 0.00 | 0.0501 | 450 | - | X |
| <i>DeficitBudget%</i> | ph5b | -0.0754 | 0.0575 | -1.31 | 0.19 | 0.0038 | 450 | - | V |
| <i>PhysicalInfrastructureX</i> | ph6a | -0.8738 | 0.0449 | -19.45 | 0.00 | 0.4578 | 450 | - | V |
| <i>LegalInfrastructureX</i> | ph6b | -1.0412 | 0.1163 | -8.95 | 0.00 | 0.1517 | 450 | - | V |
| <i>AssetContribution%</i> | ph7a | -0.9405 | 0.1696 | -5.54 | 0.00 | 0.0642 | 450 | + | X |
| <i>AssetOutput%</i> | ph7b | -0.6326 | 0.0539 | -11.73 | 0.00 | 0.2351 | 450 | + | X |
| <i>AveEmployeeX</i> | ph8a | -0.6998 | 0.0493 | -14.18 | 0.00 | 0.3099 | 450 | - | V |
| <i>AveAssetX</i> | ph8b | -0.6111 | 0.0234 | -26.08 | 0.00 | 0.6029 | 450 | - | V |
| <i>ScientificPersonnel%</i> | ph9a | -2.3773 | 0.0933 | -25.48 | 0.00 | 0.5918 | 450 | - | V |
| <i>LabourProductivityX</i> | ph9b | -0.5882 | 0.0223 | -26.37 | 0.00 | 0.6081 | 450 | - | V |

Note: Assumed signs accord to hypothesis settings. All regressions include intercepts but values are not reported here.

Most estimated coefficients are significant at the 1 per cent level. For the first privatisation variable, in the upper part of table, most coefficients obtain signs corresponding to the original assumptions.¹¹² The only four exceptions are in respect to the variables of fiscal autonomy, asset-liability rate, asset contribution rate and asset-output ration. Results obtained by the second privatisation variable, in the lower part of table, are similar. Only the coefficient signs of the asset-liability rate, asset contribution rate and asset-output ratio are not as would be expected. Nevertheless, these unexpected results would not affect each original hypothesis, because which has included counter-arguments that could offer explanations. In summary, the simple

¹¹² There are only three regressions in the table in which the *t*-value is less than the significant level of 10 per cent in the table.

regression analysis demonstrates that all hypotheses established in this research should be deemed appropriate.

5.3 Empirical results

The author's regression strategy is, first, to estimate hypothesis variables one by one in order to identify individual effects and then to estimate some selected variables put together for a broader comparison.¹¹³ All estimations are run with two respective time periods – a longer period (1994-2008 – the maximum time length of available data), and a shorter period (1997-2005). There are two reasons for this approach. On the one hand, it helps focus more on the peak period of the privatisation movement, which clearly experienced a sharp acceleration between the late 1990s and early 2000s. On the other hand, since some extreme values in data have been excluded, the results obtained from the shorter period may serve, to some extent, to check the econometric robustness of the results obtained from the longer period.¹¹⁴ Two baseline models, without hypothesis variables, are provided in (a0) and (a5) models in Table 5.6. All empirical results are obtained from the dynamic two-step system-GMM estimator with a balanced panel of data.¹¹⁵ The number of instruments is strictly controlled under the number of groups (cross-sections) in order to prevent proliferation bias caused by too many instruments.¹¹⁶ Following the suggestion by Roodman (2009b), instrument matrices are collapsed in all regressions. For the same purpose, the length of the lagged period of instrument variables is mainly limited to

¹¹³ It should be noted that there is econometric reason that does not allow too many variables to be run in a regression of system-GMM. Please see the detail in the final part of this section.

¹¹⁴ In general, extreme values exist in the data of the first or last few time periods in a panel dataset. By excluding data for the first and last three years in this dataset, it is possible to minimise the impact of extreme values.

¹¹⁵ Please see Chapter Four for more econometric discussion and justification.

¹¹⁶ Proliferation bias leads to the problem of over-identification.

six periods (from T-2 to T-7). The Hansen test and the Difference-in-Hansen test are applied in an attempt to detect this bias. Using the lagged term of dependent variable as one of the independent variables inevitably reduces the data of first period, and the number of observations therefore falls from 450 to 420, and the length of time period, from 15 to 14 (years).

Variables, serving for control purpose, include the lagged term of dependent variable, year dummies, intercept and four other specific control variables to absorb impacts relating to region (by sea dummy), education (by literacy rate), industrial development (by the degree of industrialisation) and economic growth (by per capita income). Strict econometric standards are adhered to in all regressions. In order to maintain high econometric quality, estimated results are accepted and reported only when all the following requirements are fulfilled:

- (1) The coefficient of the lagged term dependent variable is significant and less than the unity.
- (2) The first order serial correlation test (AR(1)) rejects the null hypothesis – the absence of serial correlation.¹¹⁷
- (3) The second order serial correlation test (AR(2)) accepts the null hypothesis at a level higher of 25 per cent, instead of the general level of 10 per cent (Roodman, 2009b).
- (4) Hansen test accepts the null hypothesis and confirms the validity of instruments.

Results for the political economy hypotheses

¹¹⁷ The first order serial correlation is inevitably and necessarily introduced by the lagged dependent variable as one of the independent variables in regression.

For the hypothesis of soft budget constraint, relevant evidence is found in (a1) and (a7) models in Table 5.6. The variable of subsidy index enters with positive and significant coefficient in both models. This suggests that provinces in receipt of above-average subsidies tended to maintain a larger size of state sector. This finding corresponds to the original assumption of causality that the existence of soft budgets constrained privatisation. The series of fiscal reforms starting in the mid-1990s, which sought to reduce soft budgets, proved successful in promoting subsequent privatisation. The soft credit variable, unlike the soft budget one, is shown to have exerted less influence on the privatisation decision. No evidence is found to support the supposition that a contraction in industrial loans would encourage more SOEs to undertake ownership reform. This is probably because the scale of soft credit reduction was relatively modest. Whilst loss-making subsidies were gradually reduced to zero in most provinces, industrial loans were cut by only half. This finding echoes empirical results in other part of the literature (e.g., Guo and Yao, 2005, Huyghebaert and Quan, 2009, Lopez De Silanes et al., 1997). In short, the expectation is that hardening local budget constraints should have encouraged the process of privatisation in China.

Evidence pertaining to the political ideology hypothesis may be found in (b2), (b4) and (b6) models. These significant and negative coefficients indicate a reciprocal relationship between the boom of the private sector and the shrinkage of the state sector in all provinces, particularly in the period 1997-2005.¹¹⁸ The evidence is strongly supportive of the original assumption that privatisation would be caused by the government's commitment to support the development of the private economy. It

¹¹⁸ It is noteworthy that those insignificant results obtained by the full length of time period are not against the finding here. It just says that this ideology impact is more concentrated in the peak time of privatisation reform.

is also apparent that the first ideology variable – the share of private enterprises in total enterprises – generates a result that is more significant than that forthcoming from the second ideology variable (the share of private employees in total work force). The finding suggests that the expansion of the labour market in the private sector had little effect on the shrinkage of the state sector, perhaps, because the scale of private employment was still quite limited. Although private sector labour expansion in all provinces have maintained sustained growth in recent years, in most cases such growth was as low as around 10 per cent, especially in inland area. This may explain why this ideology variable was less important. In any case, the more important implication of this finding is that it confirms the unique path of ideology change in China. This change was not brought about by a change in ruling party brought about through democratic elections, which has been the norm in other transitional countries. Rather, it was achieved by the government's growing commitment to private ownership and its sanctioning of the establishment of more private enterprises. In this characteristic Chinese way, privatisation was thereby encouraged.

The impact of decentralisation is evident in (c1) and (c8) models, although the results demonstrate different suggestions between two decentralisation variables. The significant and negative coefficient in the (c8) model suggests that provinces with greater fiscal autonomy were to accept a reduction in employment in their state sectors. More state workers were dismissed by local governments during 1997-2005. This is in line with the original assumption that decentralisation would facilitate privatisation because of the information advantage local governments gain. It deserves stating that this finding is the first piece of evidence of its kind so far to appear in the literature (Qian and Roland, 1998, Qian and Weingast, 1997, Dewatripont and Maskin, 1995, Cao et al., 1999).

However, the driving force of decentralisation may also have worked in the

opposite direction. The positive coefficient with significance at 1 per cent level obtained in the (c1) model indicates that provinces closer to attaining capital self-sufficiency would be willing to maintain a larger state sector during 1994-2008. This contradicts the original assumption and raises the interesting issue of the willingness of government to take ownership reform – local bureaucrats may become reluctant to privatise if they are more readily able to secure the investment funds they need. This reluctant attitude towards privatisation should have been more prevalent among coastal governments because the average level of this variable (*SelfFunding%*) in coastal areas was generally higher than in inland regions (see Table 5.4). This further points to another important implication, which is that economic self-sufficiency is likely to be reflected in local bureaucrats being more politically autonomous and therefore less willing to follow the central policy of privatisation. In other words, there is an implicit tension between the central and local governments.

Table 5.6
Empirical results for the hypothesis group of political economy.

| | DV: <i>SOEUnitX</i> | | | | | DV: <i>SOEEmployeeX</i> | | | | |
|--|---------------------|--------------------|--------------------|--------------------|--------------------|-------------------------|--------------------|---------------------|--------------------|--------------------|
| | (a0) | (a1) | (a2) | (a3) | (a4) | (a5) | (a6) | (a7) | (a8) | (a9) |
| Soft budget constraint hypothesis | | | | | | | | | | |
| <i>Lag.DV</i> | 0.712 *** 0.180 | 0.661 *** 0.215 | 0.675 *** 0.148 | 0.703 *** 0.213 | 0.542 *** 0.149 | 0.672 *** 0.244 | 0.841 *** 0.326 | 0.922 *** 0.152 | 0.908 *** 0.164 | 0.760 *** 0.160 |
| <i>SubsidyX</i> | | 0.237 * 0.137 | -0.009 0.151 | | | | -0.048 0.079 | 0.084 # 0.054 | | |
| <i>IndustrialLoan%</i> | | | | 0.519 1.572 | -1.812 1.813 | | | | 0.070 0.272 | -0.041 0.235 |
| <i>SeaDummy</i> | -0.096 0.539 | 0.075 0.396 | -0.042 0.398 | -0.087 0.512 | -0.069 0.481 | -0.386 0.332 | -0.286 0.544 | 0.176 0.204 | -0.097 0.151 | -0.117 0.127 |
| <i>Literacy%</i> | -0.592 0.396 | -0.387 0.505 | -0.415 0.787 | -0.434 1.038 | -0.562 0.751 | 0.010 0.697 | 0.776 0.861 | 0.163 0.292 | -0.422 0.409 | -0.097 0.248 |
| <i>Industrialisation%</i> | 0.284 1.274 | -0.166 1.083 | -0.370 0.788 | 0.190 1.665 | -0.498 0.735 | 1.087 # 0.742 | 0.543 1.575 | -1.189 0.911 | 0.510 0.380 | -0.440 0.635 |
| <i>IncomePercapitaX</i> | 0.321 0.904 | -0.136 0.569 | 0.302 0.674 | 0.286 0.992 | 0.327 0.710 | 0.470 0.527 | 0.255 0.518 | -0.113 0.350 | 0.272 0.272 | 0.339 # 0.226 |
| Obs | 420 | 420 | 270 | 420 | 270 | 420 | 420 | 270 | 420 | 270 |
| Groups | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 |
| Periods | 14 | 14 | 9 | 14 | 9 | 14 | 14 | 9 | 14 | 9 |
| Instruments | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 |
| AR(1) | 0.018 | 0.030 | 0.002 | 0.019 | 0.003 | 0.112 | 0.058 | 0.010 | 0.019 | 0.032 |
| AR(2) | 0.784 | 0.698 | 0.741 | 0.709 | 0.519 | 0.823 | 0.897 | 0.782 | 0.934 | 0.823 |
| Hansen | 0.298 | 0.514 | 0.518 | 0.402 | 0.411 | 0.222 | 0.330 | 0.352 | 0.195 | 0.399 |
| DIH-1 | 0.439 | 0.236 | 0.294 | 0.369 | 0.411 | 0.073 | 0.096 | 0.163 | 0.078 | 0.159 |
| DIH-2 | 0.203 | 0.844 | 0.848 | 0.408 | 0.380 | 0.831 | 0.922 | 0.856 | 0.656 | 0.967 |
| | | (b1) | (b2) | (b3) | (b4) | | (b5) | (b6) | (b7) | (b8) |
| Political ideology hypothesis | | | | | | | | | | |
| <i>Lag.DV</i> | | 0.847 *** 0.282 | 0.561 *** 0.146 | 0.592 *** 0.179 | 0.594 *** 0.197 | | 0.720 ** 0.289 | 0.652 *** 0.176 | 0.744 *** 0.274 | 0.705 *** 0.133 |
| <i>POE%</i> | | -0.080 0.325 | -0.581 ** 0.265 | | | | -0.153 0.237 | -0.467 *** 0.167 | | |
| <i>POEEmployee%</i> | | | | -0.634 1.039 | -1.017 # 0.701 | | | | -2.188 2.452 | -0.070 0.405 |
| <i>SeaDummy</i> | | 0.442 0.346 | -0.044 0.263 | 0.092 0.204 | -0.007 0.337 | | -0.226 0.438 | -0.204 0.248 | -0.013 0.285 | -0.180 0.208 |
| <i>Literacy%</i> | | 0.043 0.745 | -0.610 0.449 | -0.581 * 0.327 | 0.049 0.459 | | -0.136 0.769 | -0.370 # 0.228 | -0.706 0.921 | -0.381 0.494 |
| <i>Industrialisation%</i> | | -0.381 1.099 | -0.151 0.522 | -0.155 0.673 | -0.519 0.630 | | 1.059 1.201 | 0.407 0.330 | 0.410 0.568 | 0.286 0.254 |
| <i>IncomePercapitaX</i> | | -0.827 # 0.540 | 0.352 0.475 | 0.530 0.849 | 1.206 0.905 | | 0.250 0.563 | 0.351 0.381 | 1.123 1.339 | 0.387 0.765 |
| Obs | | 420 | 270 | 420 | 270 | | 420 | 270 | 420 | 270 |
| Groups | | 30 | 30 | 30 | 30 | | 30 | 30 | 30 | 30 |
| Periods | | 14 | 9 | 14 | 9 | | 14 | 9 | 14 | 9 |
| Instruments | | 29 | 29 | 29 | 29 | | 29 | 29 | 29 | 29 |
| AR(1) | | 0.046 | 0.012 | 0.015 | 0.020 | | 0.110 | 0.047 | 0.052 | 0.046 |
| AR(2) | | 0.549 | 0.794 | 0.629 | 0.950 | | 0.953 | 0.912 | 0.622 | 0.995 |
| Hansen | | 0.434 | 0.328 | 0.227 | 0.197 | | 0.405 | 0.197 | 0.191 | 0.314 |
| DIH-1 | | 0.233 | 0.170 | 0.086 | 0.282 | | 0.135 | 0.056 | 0.180 | 0.132 |
| DIH-2 | | 0.698 | 0.764 | 0.715 | 0.188 | | 0.917 | 0.973 | 0.305 | 0.884 |
| | | (c1) | (c2) | (c3) | (c4) | | (c5) | (c6) | (c7) | (c8) |
| Decentralisation hypothesis | | | | | | | | | | |
| <i>Lag.DV</i> | | 0.590 *** 0.169 | 0.681 *** 0.163 | 0.662 *** 0.237 | 0.727 *** 0.132 | | 0.541 *** 0.188 | 0.742 *** 0.150 | 0.615 * 0.343 | 0.857 *** 0.158 |
| <i>SelfFunding%</i> | | 0.425 *** | 0.065 | | | | 0.059 | -0.001 | | |

| | | | | | | | | |
|---------------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| | <i>0.146</i> | <i>0.127</i> | | | <i>0.148</i> | <i>0.100</i> | | |
| <i>FiscalAutonomy%</i> | | | -0.155 | -0.190 | | | -0.022 | -0.409 * |
| | | | <i>0.619</i> | <i>0.602</i> | | | <i>0.631</i> | <i>0.230</i> |
| <i>SeaDummy</i> | 0.178 | 0.282 | 0.018 | 0.130 | 0.054 | -0.201 | -0.337 | -0.029 |
| | <i>0.331</i> | <i>0.332</i> | <i>0.975</i> | <i>0.347</i> | <i>0.153</i> | <i>0.271</i> | <i>0.483</i> | <i>0.209</i> |
| <i>Literacy%</i> | -0.269 | -0.052 | -0.441 | -0.366 | -1.011 ** | -0.387 * | -0.234 | -0.029 |
| | <i>0.512</i> | <i>0.377</i> | <i>0.562</i> | <i>0.694</i> | <i>0.472</i> | <i>0.212</i> | <i>0.724</i> | <i>0.287</i> |
| <i>Industrialisation%</i> | -0.750 | -0.691 | 0.108 | -0.472 | -0.061 | 0.370 | 1.286 # | 0.328 |
| | <i>0.827</i> | <i>0.749</i> | <i>1.999</i> | <i>0.760</i> | <i>0.559</i> | <i>0.412</i> | <i>0.791</i> | <i>0.369</i> |
| <i>IncomePercapitaX</i> | -0.066 | -0.268 | 0.366 | 0.225 | -0.160 | 0.504 | 0.412 | 0.674 |
| | <i>0.529</i> | <i>0.556</i> | <i>0.948</i> | <i>0.820</i> | <i>0.346</i> | <i>0.437</i> | <i>0.690</i> | <i>0.546</i> |
| Obs | 420 | 270 | 420 | 270 | 420 | 270 | 420 | 270 |
| Groups | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 |
| Periods | 14 | 9 | 14 | 9 | 14 | 9 | 14 | 9 |
| Instruments | 29 | 29 | 29 | 29 | 9 | 29 | 29 | 29 |
| AR(1) | 0.015 | 0.014 | 0.032 | 0.003 | 0.055 | 0.033 | 0.118 | 0.019 |
| AR(2) | 0.641 | 0.890 | 0.954 | 0.770 | 0.432 | 0.987 | 0.754 | 0.893 |
| Hansen | 0.547 | 0.543 | 0.338 | 0.368 | 0.271 | 0.317 | 0.216 | 0.149 |
| DIH-1 | 0.520 | 0.658 | 0.416 | 0.140 | 0.060 | 0.130 | 0.079 | 0.062 |
| DIH-2 | 0.453 | 0.286 | 0.271 | 0.967 | 0.975 | 0.900 | 0.718 | 0.733 |

Note: All regressions are dynamic panel-data estimations by two-step system-GMM with Windmeijer's finite-sample correction for the two-step covariance matrix. Intercepts and year dummies are included but values are not reported. Standard errors are in italics. ***, **, * and # denote the significance level at 1%, 5%, 10% and 15%, respectively. The p -values are listed in the first and second order serial correlation tests, Hansen test and two Difference-in-Hansen tests.

Results for the hypotheses reflecting macroeconomic environment

In terms of the market competition hypothesis, significant supporting evidence is found in (d1) and (d3) models at the levels, respectively, of 15 and 10 per cent (see Table 5.7). The negative coefficients of two variables – the non-state share of industrial output and the degree of openness to the outside world – suggest that provinces with more competitive product markets were more likely to engage in SOE privatisation. However, due to the low significance level, the impact of competition is rather weak. This impact even disappears altogether in the results in respect to the second privatisation variable. That is to say, for local governments, whether or not to reduce the number of SOE employees is not a decision dictated by the rising pressure of market competition. Market force is not sufficient to justify the sacking of state workers. In literature, this finding to a certain degree echoes some cross-country studies (Li and Xu, 2002, Plane, 1997, Bortolotti et al., 2003) and some studies about

China (Guo and Yao, 2005, Li, 2003, Li and Rozelle, 2000, Li et al., 2004).

The impact of financial pressure on privatisation is found in (e2), (e3), (e4) and (e6) models, although the findings are not wholly consistent with respect to the two variables. Using the asset-liability rate as the variable of financial pressure, the results in both (e2) and (e6) models generate negative and significant coefficients. This suggests that provinces with a heavy SOE liability burden would more readily reduce the size of their state sector. This finding is in line with the traditional causal argument of fiscal stringency, which states that a government will privatise in order to reduce the growing financial costs caused by a sluggishly monolithic state sector.

Furthermore, using the deficit-budget rate as the second variable, both coefficients in (e3) and (e4) models remain significant but *positive*, indicating the opposite direction of driving force. That is, counter intuitively, pressure from the existence of a deficit would actually reduce the likelihood of privatisation taking place. This finding corresponds to the cash cow (patronage) argument that local bureaucrats will be reluctant to abandon SOEs as they attempt to maintain current cash flows as a way to tackle deficits or seek economic rents. Observation of the deficit situation in Chinese localities, this 'cash cow phenomenon' is more prevalent among inland provinces. As discussed earlier, the deficit problem for inland governments is more severe than that facing their coastal counterparts and, even worse, the scale of the problem is increasing. This divergence reveals the reality that the issue of SOE liability and that of government deficit are two quite distinct problems, which have been addressed differently in the process of privatisation. The reasoning is as follows: When the origin of the financial problem lay with the enterprise, local governments would try to reduce the liability burden by simply privatising more SOEs. By contrast, when the origin lay with the government, they would preserve SOEs as a way of increasing their cash flows and write off deficits. Interestingly, however, this deficit

impact affected not the employee side, only the enterprise side. In other words, the level of state employment was not affected by the deficit problem. It is apparent that local governments did not view sacking SOE employees as a means of reducing deficits. Awareness of the positive impact of job security on social stability was clearly a priority policy consideration. The first finding here, based on the liability impact on enterprises, is in line with most results obtained by firm level data in the literature (Brandt et al., 2005, Li and Rozelle, 2000, Liu et al., 2006, Huyghebaert and Quan, 2009, Kung and Lin, 2007). At the same time, the second finding here, based on the deficit impact on government, echoes different findings that are available in the literature (Li and Xu, 2002, Guo and Yao, 2005), but contradicts the most (Ramamurti, 1992, Plane, 1997, Clarke and Cull, 2002, Bortolotti et al., 2003).

In terms of the impact of institutional infrastructure toward privatisation reform, no results of any significance emerge from the data. There is no evidence to support the supposition that the shrinkage of China's state sector was led by market-supporting institutional change. Nobody would surely deny that the institutional environment was significantly reshaped in the past two decades, but its impact on local state sectors is shown to be rather limited here. A possible reason is that changes affecting the state sector were more determined by policy decisions in a top-down manner rather than by market forces in a bottom-up approach. Institutional change did not directly induce privatisation among Chinese provinces. However, it should also be noted that this finding does not wholly reject the possibility that institutional change might facilitate the development of the private sector. The contribution may be meaningful but it is just not testable in this dataset because no reliable data can reflect the actual boom of private economy in the 1990s.

In addition, this result of absence suggests another meaningful implication. The assumption of an induced privatisation approach in China is less well supported by

data; instead, the assumption of an *enforced* approach is more consistent with the data. This finding provides another piece of evidence that supports the supposition that the market-driven force is likely to be a less decisive cause than the policy-oriented force in the privatisation decision of local governments.

Table 5.7

Empirical results for the hypothesis group of macroeconomic environment.

| | DV: <i>SOEUnitX</i> | | | | DV: <i>SOEEmployeeX</i> | | | |
|--|---------------------|--------------------|--------------------|--------------------|-------------------------|--------------------|--------------------|--------------------|
| | (d1) | (d2) | (d3) | (d4) | (d5) | (d6) | (d7) | (d8) |
| Market competition hypothesis | | | | | | | | |
| <i>Lag.DV</i> | 0.667 *** 0.169 | 0.678 *** 0.175 | 0.560 * 0.330 | 0.594 *** 0.199 | 0.658 *** 0.214 | 0.794 *** 0.189 | 0.797 *** 0.242 | 0.599 *** 0.122 |
| <i>NonSOEOutput%</i> | -0.708 # 0.490 | 0.020 0.687 | | | -0.225 0.260 | -0.044 0.180 | | |
| <i>Openness%</i> | | | -0.321 * 0.188 | 0.221 0.167 | | | -0.093 0.118 | -0.072 0.076 |
| <i>SeaDummy</i> | 0.385 0.661 | 0.059 0.579 | 0.913 0.787 | -0.045 0.374 | 0.092 0.291 | 0.236 0.355 | 0.169 0.205 | 0.082 0.078 |
| <i>Literacy%</i> | -0.648 # 0.401 | -0.511 0.649 | -1.655 1.426 | -0.339 0.557 | 0.392 0.543 | -0.041 0.244 | -0.257 0.670 | -0.161 0.250 |
| <i>Industrialisation%</i> | 0.130 1.271 | -0.478 0.965 | -0.607 1.527 | -0.500 0.665 | -0.327 0.428 | -0.097 0.345 | -0.422 0.535 | -0.562 * 0.306 |
| <i>IncomePercapitaX</i> | 0.046 1.013 | 0.114 0.540 | -0.296 0.531 | -0.468 0.497 | -0.131 0.258 | 0.011 0.442 | -0.066 0.204 | 0.277 0.259 |
| Obs | 420 | 270 | 420 | 270 | 420 | 270 | 420 | 270 |
| Groups | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 |
| Periods | 14 | 9 | 14 | 9 | 14 | 9 | 14 | 9 |
| Instruments | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 |
| AR(1) | 0.061 | 0.010 | 0.068 | 0.007 | 0.039 | 0.079 | 0.016 | 0.011 |
| AR(2) | 0.658 | 0.823 | 0.433 | 0.370 | 0.990 | 0.762 | 0.609 | 0.766 |
| Hansen | 0.363 | 0.293 | 0.563 | 0.262 | 0.371 | 0.198 | 0.123 | 0.260 |
| DIH-1 | 0.368 | 0.153 | 0.235 | 0.158 | 0.105 | 0.212 | 0.018 | 0.102 |
| DIH-2 | 0.350 | 0.733 | 0.924 | 0.617 | 0.959 | 0.286 | 0.987 | 0.879 |
| | (e1) | (e2) | (e3) | (e4) | (e5) | (e6) | (e7) | (e8) |
| Financial pressure hypothesis | | | | | | | | |
| <i>Lag.DV</i> | 0.706 *** 0.176 | 0.583 *** 0.130 | 0.891 *** 0.202 | 0.531 *** 0.167 | 0.685 *** 0.250 | 0.750 *** 0.158 | 0.596 *** 0.214 | 0.778 *** 0.124 |
| <i>AssetLiability%</i> | 0.220 0.332 | -0.685 ** 0.322 | | | 0.217 0.522 | -0.435 # 0.294 | | |
| <i>DeficitBudget%</i> | | | 0.951 ** 0.387 | 0.721 * 0.422 | | | -0.182 0.649 | 0.281 0.342 |
| <i>SeaDummy</i> | -0.067 0.533 | -0.256 # 0.165 | 0.184 # 0.119 | 0.245 ** 0.134 | -0.351 0.259 | -0.130 0.195 | -0.071 0.288 | -0.008 0.108 |
| <i>Literacy%</i> | -0.606 # 0.420 | -0.294 0.612 | 1.134 0.807 | -0.107 0.417 | 0.107 0.810 | -0.025 0.353 | -0.707 # 0.488 | -0.142 0.292 |
| <i>Industrialisation%</i> | 0.146 1.276 | -0.012 0.305 | 0.240 0.663 | -0.147 0.460 | 0.958 0.713 | 0.042 0.409 | 0.122 0.260 | 0.218 0.202 |
| <i>IncomePercapitaX</i> | 0.319 0.903 | 0.382 0.363 | 0.880 ** 0.416 | 0.762 # 0.469 | 0.405 0.409 | 0.046 0.212 | -0.182 0.534 | 0.324 0.328 |
| Obs | 420 | 270 | 420 | 270 | 420 | 270 | 420 | 270 |
| Groups | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 |
| Periods | 14 | 9 | 14 | 9 | 14 | 9 | 14 | 9 |
| Instruments | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 |
| AR(1) | 0.022 | 0.003 | 0.007 | 0.019 | 0.089 | 0.010 | 0.012 | 0.008 |
| AR(2) | 0.579 | 0.477 | 0.632 | 0.544 | 0.891 | 0.756 | 0.535 | 0.923 |
| Hansen | 0.243 | 0.435 | 0.854 | 0.507 | 0.241 | 0.238 | 0.094 | 0.257 |
| DIH-1 | 0.368 | 0.279 | 0.973 | 0.805 | 0.075 | 0.091 | 0.021 | 0.077 |
| DIH-2 | 0.193 | 0.695 | 0.418 | 0.139 | 0.823 | 0.878 | 0.817 | 0.990 |
| | (f1) | (f2) | (f3) | (f4) | (f5) | (f6) | (f7) | (f8) |
| Institutional infrastructure hypothesis | | | | | | | | |
| <i>Lag.DV</i> | 0.628 *** 0.176 | 0.686 *** 0.126 | 0.680 *** 0.172 | 0.717 *** 0.129 | 0.755 *** 0.214 | 0.761 *** 0.144 | 0.702 ** 0.279 | 0.834 *** 0.104 |
| <i>PhysicalInfrastructureX</i> | 0.481 | 0.085 | | | 0.211 | 0.461 | | |

| | | | | | | | | |
|-----------------------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|
| | 0.379 | 0.880 | | | 0.382 | 0.570 | | |
| <i>LegalInfrastructureX</i> | | | -1.486 | 0.275 | | | 0.414 | 0.458 |
| | | | <i>1.102</i> | <i>0.915</i> | | | <i>0.664</i> | <i>0.810</i> |
| <i>SeaDummy</i> | 0.170 | 0.054 | -0.089 | 0.148 | -0.274 | 0.069 | -0.335 | -0.052 |
| | <i>0.251</i> | <i>0.367</i> | <i>0.304</i> | <i>0.402</i> | <i>0.341</i> | <i>0.158</i> | <i>0.338</i> | <i>0.164</i> |
| <i>Literacy%</i> | -0.661 # | -0.449 | -0.214 | -0.654 | -0.112 | -0.018 | 0.342 | -0.382 * |
| | <i>0.448</i> | <i>0.633</i> | <i>0.624</i> | <i>0.556</i> | <i>0.568</i> | <i>0.235</i> | <i>0.878</i> | <i>0.216</i> |
| <i>Industrialisation%</i> | -0.464 | -0.518 | -0.104 | -0.403 | 0.858 | -1.232 * | 1.254 | 0.116 |
| | <i>0.609</i> | <i>0.912</i> | <i>0.567</i> | <i>0.680</i> | <i>0.880</i> | <i>0.686</i> | <i>1.531</i> | <i>0.355</i> |
| <i>IncomePercapitaX</i> | -0.633 * | -0.065 | 1.502 | -0.143 | 0.086 | -0.387 | -0.008 | -0.089 |
| | <i>0.371</i> | <i>1.222</i> | <i>1.389</i> | <i>1.058</i> | <i>0.483</i> | <i>0.432</i> | <i>1.044</i> | <i>0.607</i> |
| Obs | 420 | 270 | 420 | 270 | 420 | 270 | 420 | 270 |
| Groups | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 |
| Periods | 14 | 9 | 14 | 9 | 14 | 9 | 14 | 9 |
| Instruments | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 |
| AR(1) | 0.021 | 0.002 | 0.010 | 0.005 | 0.070 | 0.009 | 0.091 | 0.026 |
| AR(2) | 0.929 | 0.837 | 0.626 | 0.825 | 0.851 | 0.976 | 0.939 | 0.942 |
| Hansen | 0.671 | 0.355 | 0.562 | 0.400 | 0.195 | 0.306 | 0.360 | 0.244 |
| DIH-1 | 0.521 | 0.156 | 0.373 | 0.246 | 0.050 | 0.146 | 0.131 | 0.067 |
| DIH-2 | 0.649 | 0.891 | 0.669 | 0.701 | 0.868 | 0.802 | 0.844 | 0.999 |

Note: All regressions are dynamic panel-data estimations by two-step system-GMM with Windmeijer's finite-sample correction for the two-step covariance matrix. Intercepts and year dummies are included but values are not reported. Standard errors are in the italic. ***, **, * and # denote the significance level at 1%, 5%, 10% and 15%, respectively. The p -values are listed in the first and second order serial correlation tests, Hansen test and two Difference-in-Hansen tests.

Results for the hypotheses relating to microeconomic conditions

In terms of the economic efficiency hypothesis, relevant evidence appears in (g3), (g4), (g6) and (g8) models in Table 5.8. Intriguingly, simultaneously contradictory findings emerge from the data. The highly significant and positive coefficient in (g3) strongly supports the traditional orthodox argument that privatisation will start where the most inefficiency exists.¹¹⁹ Evidently, provinces with more efficient state sectors were less likely to embrace privatisation. In other words, as assumed in the original hypothesis, the Chinese government did use ownership reform as a tool to improve overall SOE efficiency by releasing less efficient enterprises to the privatisation market. However, the significant and negative coefficients obtained in (g6) and (g8) models contradict this argument. Instead, they indicate that provinces with more

¹¹⁹ The reason for the contradictory result in (g4) model is not known, but, because of the much lower level of significance, it should not be regarded as concrete evidence on the basis of which the result in (g3) should be rejected.

efficient state sectors – especially coastal provinces – showed a greater tendency to dismiss SOE employees during 1997-2005 (see Table 5.4). This finding seems to endorse the ice-pop argument, assuming a causality between SOE efficiency and privatisation that the former discourages the latter, but actually it does not carry such an endorsement. In the ice-pop argument, efficient SOEs are privatised first because they are ‘valuable assets’, which the state wants to protect from mismanagement and corruption. In addition, the state may also favour ownership reform in the expectation of securing a higher tax return after privatisation has taken place. Yet this is not the case here. For the state, efficient workers indeed represent a valuable asset, but it only happens when they are working within the state sector. Once they have been laid off from a SOE or re-recruited by a private enterprise, they no longer generate any benefit for the state. The state, in most cases, will also not guarantee their re-recruitment after privatisation. Therefore, the evidence found here cannot suitably be used to support the ice-pop argument. This raises an interesting question: namely, why did those provinces with a better efficiency record abandon more state workers? A possible market explanation may be that such workers were more easily and rapidly accommodated by a booming private sector. Efficient workers are in high demand in the privatisation market. Thus, their absorption in the expanding private sector promises to minimise the potential for post-privatisation political protest by laid-off workers. Here we once more have confirmation that state enterprises and employees were not treated the same during privatisation. Policies as they affected enterprises were to a greater extent shaped by economic consideration; as they affected employees, they were influenced more by political factors. This finding corresponds to those that have emerged from parallel studies in other transitional economies (Ramamurti, 1992, Clarke and Cull, 2002) and in China (Wang et al., 2001, Lin and Su, 2008, Brandt et al., 2005, Guo and Yao, 2005, Liu et al., 2006, Kung and Lin,

2007).

The firm size hypothesis is strongly supported in (h1), (h2), (h4) and (h8) models. Both size variables generate significant and negative coefficients. The coefficient estimates indicate that provinces with SOEs whose size was larger than the average had privatised more since 1994, implying that privatisation had mainly embraced small SOEs (i.e., those whose size was less than the mean of data). This result accords well with the original hypothesis. Small-size advantage was significant, given the considerable transaction costs that attached to large SOEs. The finding also highlights the success of the policy of “grasping the large while letting go of the small”, to which local governments were firmly committed. It further reflects a kind of policy-driven nature, which points to a top-down approach as a distinct feature to the privatisation in China. Finally, it is worth noting that, as discussed earlier, most provinces’ post-2004 rapid expansion of firm assets (the second size variable) may be attributable to recapitalisation needs. This flood of assets may have affected the regressions and led to insignificant results in (h3) and (h7) models. Be that as it may, this does not affect the results in (h4) and (h8) models, where the time length is limited to the shorter period extending from 1997 to 2005. This finding is in line with those obtained in the Czech Republic, Hungary, Poland and Argentine (Aussenegg and Jelic, 2007, Clarke and Cull, 2002), and also complements others arising out of China’s experience (Li, 2003, Huyghebaert and Quan, 2009).

In terms of the human capital hypothesis, the results are forthcoming from (i2), (i6) and (i8) models. The estimated coefficients are all significant and negative, suggesting that provinces with a better human capital endowment are likely to experience a greater contraction of the local state sector. This endorses the original assumption that enhanced human capital will cause privatisation through reduced monitoring costs and lower production risks. This stimulatory role of human capital

was particularly clear during 1997-2005 since all levels of significance strengthened. This underlines the importance of this factor, since these years were the peak period of privatisation. This finding offers the first evidence that has yet been forthcoming for Li and his colleagues' human capital argument (Li and Rozelle, 2000, Li, 2003, Brandt et al., 2005). Notwithstanding their use of different proxies for human capital, their idea is well confirmed in our provincial dataset. In short, this factor emerges as one of the most distinctive drivers of privatisation in China.

Table 5.8

Empirical results for the hypothesis group of microeconomic conditions.

| | DV: <i>SOEUnitX</i> | | | | DV: <i>SOEEmployeeX</i> | | | |
|---------------------------------------|---------------------|--------------------|--------------------|--------------------|-------------------------|---------------------|--------------------|--------------------|
| | (g1) | (g2) | (g3) | (g4) | (g5) | (g6) | (g7) | (g8) |
| Economic efficiency hypothesis | | | | | | | | |
| <i>Lag.DV</i> | 0.797 *** 0.133 | 0.697 *** 0.124 | 0.643 *** 0.136 | 0.639 *** 0.120 | 0.577 ** 0.228 | 0.674 *** 0.111 | 0.709 *** 0.215 | 0.718 *** 0.136 |
| <i>AssetContribution%</i> | 2.004 2.426 | -1.266 1.020 | | | -0.447 0.425 | -0.846 # 0.553 | | |
| <i>AssetOutput%</i> | | | 0.635 *** 0.220 | -0.259 # 0.179 | | | -0.049 0.213 | -0.178 * 0.102 |
| <i>SeaDummy</i> | -0.273 0.624 | 0.080 0.321 | 0.238 0.280 | 0.013 0.284 | 0.012 0.122 | -0.201 # 0.127 | 0.089 0.162 | -0.202 0.182 |
| <i>Literacy%</i> | 0.563 0.943 | -0.829 0.720 | -0.548 0.436 | -0.559 0.746 | -1.462 ** 0.687 | -0.441 *** 0.163 | -0.531 0.550 | -0.374 * 0.227 |
| <i>Industrialisation%</i> | -0.054 0.942 | 0.142 0.859 | -1.138 0.844 | -0.152 0.651 | 0.706 * 0.370 | 0.551 * 0.291 | -0.301 0.516 | 0.437 0.385 |
| <i>IncomePercapitaX</i> | 0.612 1.120 | 0.047 0.531 | -0.322 0.512 | 0.290 0.435 | 0.147 0.204 | 0.301 0.274 | -0.167 0.223 | 0.370 0.294 |
| Obs | 420 | 270 | 420 | 270 | 420 | 270 | 420 | 270 |
| Groups | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 |
| Periods | 14 | 9 | 14 | 9 | 14 | 9 | 14 | 9 |
| Instruments | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 |
| AR(1) | 0.044 | 0.012 | 0.014 | 0.004 | 0.005 | 0.058 | 0.018 | 0.018 |
| AR(2) | 0.722 | 0.775 | 0.776 | 0.724 | 0.715 | 0.792 | 0.994 | 0.894 |
| Hansen | 0.790 | 0.350 | 0.672 | 0.382 | 0.266 | 0.315 | 0.189 | 0.267 |
| DIH-1 | 0.641 | 0.167 | 0.401 | 0.156 | 0.086 | 0.139 | 0.083 | 0.103 |
| DIH-2 | 0.717 | 0.839 | 0.819 | 0.946 | 0.828 | 0.860 | 0.608 | 0.894 |
| | (h1) | (h2) | (h3) | (h4) | (h5) | (h6) | (h7) | (h8) |
| Firm size hypothesis | | | | | | | | |
| <i>Lag.DV</i> | 0.553 *** 0.178 | 0.483 *** 0.164 | 0.608 ** 0.290 | 0.675 *** 0.163 | 0.632 *** 0.198 | 0.827 *** 0.126 | 0.451 ** 0.221 | 0.667 *** 0.162 |
| <i>AveEmployeeX</i> | -0.385 ** 0.169 | -0.441 * 0.246 | | | 0.106 0.100 | -0.064 0.187 | | |
| <i>AveAssetX</i> | | | -0.297 0.361 | -0.821 ** 0.404 | | | -0.056 0.264 | -0.438 ** 0.214 |
| <i>SeaDummy</i> | 0.137 * 0.081 | 0.188 0.245 | -0.242 0.586 | -0.143 0.116 | 0.046 0.293 | 0.125 0.136 | -0.115 0.137 | -0.215 0.280 |
| <i>Literacy%</i> | -0.513 0.553 | 0.083 0.434 | -0.546 0.423 | -0.119 0.322 | -1.147 * 0.688 | -0.387 * 0.205 | -0.620 0.868 | -0.229 0.235 |
| <i>Industrialisation%</i> | 0.236 0.597 | -0.655 0.474 | 0.700 1.529 | -0.046 0.461 | 0.182 1.094 | -0.003 0.267 | 0.498 0.560 | 0.311 0.502 |
| <i>IncomePercapitaX</i> | -0.278 * 0.143 | -0.065 0.364 | 0.638 1.040 | 0.668 ** 0.293 | 0.040 0.539 | -0.307 0.327 | 0.158 0.222 | 0.525 0.501 |
| Obs | 420 | 270 | 420 | 270 | 420 | 270 | 420 | 270 |
| Groups | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 |
| Periods | 14 | 9 | 14 | 9 | 14 | 9 | 14 | 9 |
| Instruments | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 |
| AR(1) | 0.016 | 0.020 | 0.095 | 0.024 | 0.037 | 0.027 | 0.057 | 0.032 |
| AR(2) | 0.407 | 0.975 | 0.494 | 0.868 | 0.376 | 0.967 | 0.888 | 0.942 |
| Hansen | 0.128 | 0.335 | 0.194 | 0.421 | 0.468 | 0.305 | 0.226 | 0.128 |
| DIH-1 | 0.039 | 0.155 | 0.321 | 0.251 | 0.162 | 0.200 | 0.123 | 0.108 |
| DIH-2 | 0.710 | 0.843 | 0.165 | 0.739 | 0.942 | 0.593 | 0.541 | 0.351 |
| | (i1) | (i2) | (i3) | (i4) | (i5) | (i6) | (i7) | (i8) |
| Human capital hypothesis | | | | | | | | |
| <i>Lag.DV</i> | 0.771 *** 0.144 | 0.529 *** 0.163 | 0.592 *** 0.206 | 0.783 *** 0.192 | 0.582 * 0.299 | 0.557 *** 0.188 | 0.605 ** 0.275 | 0.717 *** 0.176 |
| <i>ScientificPersonnel%</i> | -0.700 | -3.319 # | | | -0.886 | -2.938 # | | |

| | | | | | | | | |
|----------------------------|---------------|-----------------|-----------------|-----------------|-----------------|-----------------|---------------|------------------|
| | <i>0.620</i> | <i>2.242</i> | | | <i>0.809</i> | <i>1.849</i> | | |
| <i>LabourProductivityX</i> | | | <i>0.665</i> | <i>-1.160</i> | | | <i>0.116</i> | <i>-0.567 **</i> |
| | | | <i>0.522</i> | <i>0.816</i> | | | <i>0.229</i> | <i>0.286</i> |
| <i>SeaDummy</i> | <i>0.151</i> | <i>-0.063</i> | <i>0.401</i> | <i>0.040</i> | <i>0.169</i> | <i>-0.121</i> | <i>-0.031</i> | <i>-0.187</i> |
| | <i>0.168</i> | <i>0.188</i> | <i>0.348</i> | <i>0.500</i> | <i>0.307</i> | <i>0.312</i> | <i>0.158</i> | <i>0.231</i> |
| <i>Literacy%</i> | <i>-0.634</i> | <i>-0.599 #</i> | <i>-0.678 #</i> | <i>-0.608 #</i> | <i>-1.226 #</i> | <i>-0.582 *</i> | <i>-0.835</i> | <i>-0.458 *</i> |
| | <i>0.592</i> | <i>0.367</i> | <i>0.471</i> | <i>0.403</i> | <i>0.753</i> | <i>0.324</i> | <i>1.032</i> | <i>0.253</i> |
| <i>Industrialisation%</i> | <i>0.742</i> | <i>0.071</i> | <i>-0.979</i> | <i>-0.341</i> | <i>0.054</i> | <i>0.279</i> | <i>0.316</i> | <i>0.275</i> |
| | <i>0.982</i> | <i>0.475</i> | <i>0.929</i> | <i>0.803</i> | <i>0.566</i> | <i>0.746</i> | <i>0.262</i> | <i>0.401</i> |
| <i>IncomePercapitaX</i> | <i>-0.351</i> | <i>0.472</i> | <i>-0.514</i> | <i>0.624</i> | <i>-0.217</i> | <i>0.392</i> | <i>0.030</i> | <i>0.539</i> |
| | <i>0.246</i> | <i>0.377</i> | <i>0.585</i> | <i>1.071</i> | <i>0.381</i> | <i>0.392</i> | <i>0.097</i> | <i>0.529</i> |
| Obs | 420 | 270 | 420 | 270 | 420 | 270 | 420 | 270 |
| Groups | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 |
| Periods | 14 | 9 | 14 | 9 | 14 | 9 | 14 | 9 |
| Instruments | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 |
| AR(1) | 0.017 | 0.040 | 0.017 | 0.008 | 0.023 | 0.050 | 0.036 | 0.040 |
| AR(2) | 0.717 | 0.866 | 0.594 | 0.887 | 0.453 | 0.868 | 0.883 | 0.619 |
| Hansen | 0.516 | 0.387 | 0.513 | 0.338 | 0.658 | 0.285 | 0.183 | 0.286 |
| DIH-1 | 0.387 | 0.217 | 0.362 | 0.129 | 0.582 | 0.091 | 0.128 | 0.136 |
| DIH-2 | 0.568 | 0.758 | 0.601 | 0.955 | 0.554 | 0.984 | 0.406 | 0.791 |

Note: All regressions are dynamic panel-data estimations by two-step system-GMM with Windmeijer's finite-sample correction for the two-step covariance matrix. Intercepts and year dummies are included but values are not reported. Standard errors are in the italic. ***, **, * and # denote the significance level at 1%, 5%, 10% and 15%, respectively. The p -values are listed in the first and second order serial correlation tests, Hansen test and two Difference-in-Hansen tests.

The data lend empirical support to most of the hypotheses. The sole exception is the institutional infrastructure hypothesis, for which no supporting evidence is forthcoming. For the hypotheses relating to soft budget constraint, political ideology, market competition, firm size, and human capital, the consistent results are in line with original causal assumptions. However, the results are inconsistent in regard to the hypotheses embracing decentralisation, financial pressure and economic efficiency. Some of the findings are new and meaningful. There is an indication that local governments may have been reluctant to privatise thanks to their ability to raise the money they needed. Deficit pressures may have encouraged local bureaucrats to treat SOEs like cash cows rather than letting them be privatised. In order to minimise potential political resistance, the more efficient state workers may have been targeted first for dismissal on the grounds that they could be more readily accommodated by the private labour market. This also highlights the importance of job security and social stability considerations in helping shape privatisation decision.

Results for all hypotheses by Principal Component Analysis

It is worth noting that the merit of the system-GMM regression methodology lies in the unique design of its instrument matrix. This estimator addresses the critical econometric problem of endogeneity, but engages with the danger of committing the over-identification bias. Therefore, one of the most important requirements is that the validity of the instruments should be confirmed, by Hansen test, before any result can be considered to be econometrically meaningful. However, to follow this requirement will introduce another limitation. Too many variables cannot be regressed together at the same time; otherwise the validity of the instruments cannot be confirmed. This methodological constraint limits the attempt to compare the nine hypothesis factors all together in a regression model. To compromise on this limitation with the attempt to make a broader comparison, I have adopted the Principal Component Analysis (PCA) to generate new independent variables for each hypothesis, as well as to combine two dependent variables into a new variable. The process and summary statistics are listed in Appendix 5B. By doing so, the comparison can be made under a reduced number of variables.

The regression strategy is as follows:

(1) Factors of each hypothesis group (i.e. political economy, macroeconomic environment or microeconomic condition) will be regressed together in order to find out the most significant factor (in models (j2)-(j7)).

(2) These most significant factors found in each hypothesis group will be regressed together (in models (j8) and (j9)) in order to confirm their influence under simultaneous impacts from other strong factors.

(3) Factors found significant in individual tests (in Table 5.6, 5.7 and 5.8) will

also be regressed together (in model (j10) and (j11)) in order to confirm their influence under other strong impacts.

Going straight to the results, after comparing the three hypotheses of political economy in (j2) and (j3) models in Table 5.9, the most significant impact seems to be associated with the soft budget constraint variable. The positive sign endorses the original hypothesis. To shorten the time period does not change the result, while the robustness is also confirmed. The assumed impact of decentralisation is also significant, but only with respect to the shorter period of 1997-2005. The impact of political ideology, one of the most marked in the individual tests, is entirely absorbed by other simultaneous impacts.

Next, in the comparison of macroeconomic hypotheses, the only significant impact in (j4) and (j5) models is that associated with the financial pressure variable. This finding is strongly robust and the magnitude of the estimated coefficient does not change to any significant extent if the time period is shortened. Impacts from market competition and the institutional infrastructure are absent. However, the positive sign associated with the financial pressure variable contradicts the original hypothesis, indicating that this factor was a constraining factor that served to consolidate, rather than diminish, the state sector in Chinese provinces. This is perhaps the most distinctive finding.

As for the microeconomic hypotheses, only the impact of human capital can be identified in the comparison in (j7) models. This confirms again the stimulatory role it played in encouraging privatisation. Impacts from other two variables are entirely absorbed.

In effect, three hypotheses – soft budget constraint, financial pressure and human capital – are endorsed especially strongly in each comparison of the above three groups. The author has compared these in (j8) and (j9) models. The results are highly

consistent and robust. The signs of the estimated coefficients remain the same. Shortening the time period increases the level of significance in two variables (the soft budget variable and the human capital variable). These two models throw into sharp relief of the multi-level driven nature of Chinese privatisation.

Finally, I also have compared the three hypotheses outstanding in individual tests – political ideology, financial pressure and firm size. The results once more confirm the constraining effect of financial pressure and firm size, as hypothesised causality. Yet no significant impact of political ideology is found. The reason why this factor is significant in individual test but the result differs here may lie in the combination of two ideology variables (i.e., private enterprises versus employees). Since the second variable is much less influential than the first variable in stimulating privatisation, their combination as a new variable in PCA may therefore have been be less influential.

Table 5.9

Comparison of all hypotheses by principal component analysis.

| | (j1) | (j2) | (j3) | (j4) | (j5) | (j6) | (j7) | (j8) | (j9) | (j10) | (j11) |
|------------------------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|---------------------|-------------------|--------------------|--------------------|---------------------|
| Dependent variable: privatisation | | | | | | | | | | | |
| <i>Lag.Privatisation</i> | 0.565 *** 0.198 | 0.641 *** 0.231 | 0.697 *** 0.197 | 0.863 * 0.453 | 0.782 *** 0.134 | 0.903 *** 0.259 | 0.580 *** 0.185 | 0.430 * 0.220 | 0.560 *** 0.138 | 0.751 *** 0.162 | 0.417 ** 0.184 |
| <i>SoftBudget</i> | | 0.755 ** 0.431 | 0.358 # 0.220 | | | | | 0.572 # 0.376 | 0.374 * 0.205 | | |
| <i>PoliticalIdeology</i> | | -1.404 0.661 | -0.347 0.553 | | | | | | | 0.007 0.390 | 0.389 0.303 |
| <i>Decentralisation</i> | | 0.165 0.304 | -0.211 * 0.112 | | | | | | | | |
| <i>MarketCompetition</i> | | | | -0.458 0.592 | 0.079 0.630 | | | | | | |
| <i>FinancialPressure</i> | | | | 0.662 *** 0.235 | 0.443 *** 0.150 | | | 0.805 ** 0.318 | 0.622 ** 0.261 | 0.186 0.285 | 0.414 *** 0.160 |
| <i>InstitutionalInfrastructure</i> | | | | 0.432 0.330 | 0.162 0.491 | | | | | | |
| <i>EconomicEfficiency</i> | | | | | | 0.786 0.660 | -0.007 0.224 | | | | |
| <i>FirmSize</i> | | | | | | 0.526 0.457 | 0.482 0.369 | | | -0.281 # 0.180 | -0.760 *** 0.231 |
| <i>HumanCapital</i> | | | | | | -0.138 2.231 | -1.846 *** 0.470 | -0.479 # 0.324 | -1.358 ** 0.665 | | |
| <i>SeaDummy</i> | -3.333 2.457 | 1.126 3.072 | -0.552 1.881 | 2.137 3.429 | 0.441 3.215 | -1.783 1.496 | -0.612 1.314 | -0.341 0.904 | -1.398 2.797 | -0.082 0.998 | 2.010 # 1.347 |
| <i>Literacy%</i> | -0.973 2.917 | -4.909 # 3.271 | -2.869 2.600 | 2.325 3.739 | 1.893 4.073 | -2.117 4.739 | 0.513 2.622 | -2.844 2.594 | 0.200 2.283 | 0.782 3.036 | 0.763 1.533 |
| <i>Industrialisation%</i> | 7.470 6.051 | 1.475 6.628 | 2.383 4.156 | -0.431 2.520 | -1.968 2.336 | -1.658 4.431 | -6.756 ** 3.161 | 5.658 ** 2.818 | 3.896 4.529 | 1.273 3.845 | -3.064 2.658 |
| <i>IncomePercapitaX</i> | 4.850 # 2.980 | 4.924 3.577 | 2.909 4.363 | -4.250 4.990 | -2.257 5.287 | 3.885 2.937 | 5.533 ** 2.527 | 1.386 1.708 | 2.071 3.955 | -0.056 2.720 | -5.995 # 3.651 |

| | | | | | | | | | | | |
|-------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Obs | 420 | 420 | 270 | 420 | 270 | 420 | 270 | 420 | 270 | 420 | 270 |
| Groups | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 | 30 |
| Periods | 14 | 14 | 9 | 14 | 9 | 14 | 9 | 14 | 9 | 14 | 9 |
| Instruments | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 | 29 |
| AR(1) | 0.056 | 0.084 | 0.008 | 0.076 | 0.006 | 0.070 | 0.037 | 0.028 | 0.060 | 0.011 | 0.072 |
| AR(2) | 0.581 | 0.532 | 0.984 | 0.464 | 0.414 | 0.604 | 0.653 | 0.674 | 0.838 | 0.513 | 0.652 |
| Hansen | 0.296 | 0.883 | 0.362 | 0.708 | 0.277 | 0.503 | 0.588 | 0.707 | 0.788 | 0.165 | 0.667 |
| DIH-1 | 0.150 | 0.442 | 0.234 | 0.625 | 0.603 | 0.194 | 0.354 | 0.867 | 0.921 | 0.030 | 0.658 |
| DIH-2 | 0.662 | 0.988 | 0.601 | 0.583 | 0.100 | 0.807 | 0.809 | 0.421 | 0.336 | 0.832 | 0.480 |

Note: All regressions are dynamic panel-data estimations by two-step system-GMM with Windmeijer's finite-sample correction for the two-step covariance matrix. Intercepts and year dummies are included but values are not reported. Standard errors are in the italic. ***, **, * and # denote the significance level at 1%, 5%, 10% and 15%, respectively. The p -values are listed in the first and second order serial correlation tests, Hansen test and two Difference-in-Hansen tests.

Conclusion

On the basis of all the empirical evidences that has been cited here, the story of Chinese privatisation may be summarised as follows: The most distinctive finding is the multi-level driven nature of the dynamics of privatisation. Four factors are shown to have had particular significance. Of these, the continuing contraction of soft budgets has been the single most important driving force. Next in importance was the central government's policy of "grasping the large while letting go of the small", to which local governments firmly committed themselves. Meanwhile, the screening strategy for privatisation according to specific microeconomic conditions, especially in terms of human capital capacity, was clearly followed. At the same time, the evident cash cow (patronage) effect captures the basic nature of the relationship between governments and enterprises in China. Increasing financial pressure has constrained, rather than facilitated, the privatisation of the local state sector – something that stands in stark contrast privatisation experiences of other transitional economies.

This story generates some important implications. First, privatisation in China is closer to having been a policy-dominated, not a market-driven, process. Macroeconomic factors have made little contribution to the shrinkage of local state sectors. 'Enforced change', dominated by central and local governments, is a better phrase than 'induced change' to describe the nature of the process. Second, the whole process may be seen as having embodied, in combination, both top-down and bottom-up elements. It has been is top-down in the sense that privatisation has, to a significant extent, been driven by the central government policy and local government commitment to this policy. But it has also been bottom-up in the sense that the endowment of microeconomic conditions in SOEs has been crucial to screening

decisions. Thirdly, the whole process may be viewed as a compromise in the way in which it has embodied of central policies and local strategies. Local bureaucrats have shown quite a high degree of commitment to the central government's privatisation strategy, but at times some of them (especially those in inland provinces) have placed their own interests ahead of those of Beijing. Last but not least, it is apparent that social stability has been a core concern for Chinese reformist leaders in their implementation of privatisation. Accordingly, the job security of state employees has sometimes taken precedence, as a policy goal, over that of the ownership reform of state enterprises.

Chapter Six

Industrial Analysis

6.1. Data and descriptive statistics

This chapter explores a larger panel dataset, collected by the author, covering 37 industries in six provinces. It consists of 220 cross-sections with 15 time-periods and 3,300 observations in sum.¹²⁰ For purpose of comparison, all data are categorised under two regions (coastal and inland areas), and three sectors (light manufacturing, heavy manufacturing, and mining and energy). The coastal region is represented by three provinces – Guangdong, Jiangsu and Shandong; the inland area is also represented by three provinces – Jiangxi, Shanxi and Heilongjiang. Light manufacturing includes eighteen industries – food processing, food manufacturing, beverages, tobacco, textiles, textile garments, leather, timber, furniture, paper, printing, cultural articles, chemical, medicines, chemical fibres, communications equipment, measuring instruments, and artwork. The heavy manufacturing sector includes eleven industries – petroleum processing, rubber, plastics, non-metallic mineral manufactures, ferrous metals smelting, non-ferrous metals smelting, metal manufacturing, general machinery, special machinery, transport equipment, and electrical equipment. The mining and energy (ME) sector includes nine industries – coal, petroleum extraction, ferrous metal ores mining, non-ferrous metal ores mining, other ores mining, electricity, gas and water.

It is noteworthy that this panel is balanced in estimation only if the liability

¹²⁰ The number of cross-sections is 220, not 222, because there is no petroleum extraction industry in Jiangxi and Shandong.

variable is not included in the regressions because some relevant data of this variable are absent or not accessible.¹²¹ However, this does not damage the analysis for the following three reasons. First, many regressions in this research do not include the liability variable. Secondly, all regressions, including those including this variable, are also estimated for a shorter time period, thereby balancing the panel. Thirdly, there are only five years (three years for Guangdong and two years for Jiangsu) for which industry data are missing in the panel. These omissions have the effect of reducing the number of observations from 3,300 to 3,115, which still represents 94.4 per cent of total data. Summary statistics and the correlation table are listed in Table 6.1. The result indicates that there are no problems of multi-collinearity.

Table 6.1
Summary statistics and correlation table.

| Variable | Code | Obs | Mean | Std. Dev. | Min | Max |
|-------------------------------|-------|------|--------|-----------|---------|--------|
| <i>IndSOEUnitX</i> | idv1 | 3300 | 0.5188 | 0.3080 | 0.0000 | 1.0000 |
| <i>IndSOEEmployeeX</i> | idv2 | 3300 | 0.5536 | 0.3053 | 0.0000 | 1.0000 |
| <i>IndNonSOEOutput%</i> | ih4 | 3300 | 0.6025 | 0.3237 | 0.0000 | 1.0000 |
| <i>IndAssetLiability%</i> | ih5 | 3189 | 0.6570 | 0.2184 | -0.0040 | 4.2500 |
| <i>IndConstructInvestX</i> | ih6 | 3300 | 0.1640 | 0.2880 | 0.0000 | 1.0000 |
| <i>IndAssetOutput%</i> | ih7 | 3300 | 0.6655 | 0.5346 | 0.0000 | 8.3834 |
| <i>IndAveSOEEmployX</i> | ih8 | 3300 | 0.5891 | 0.2651 | 0.0000 | 1.0000 |
| <i>IndLabourProductivityX</i> | ih9 | 3300 | 0.3271 | 0.2970 | -0.9139 | 1.0000 |
| <i>SoftBudget</i> | ph1ab | 3300 | 0.0841 | 1.1389 | -2.0898 | 2.4882 |
| <i>PoliticalIdeology</i> | ph2ab | 3300 | 0.1025 | 1.1483 | -1.2766 | 3.7865 |
| <i>Decentralisation</i> | ph3ab | 3300 | 0.5854 | 0.8498 | -2.1657 | 2.0289 |
| <i>Literacy%</i> | icona | 3300 | 0.8990 | 0.0497 | 0.7554 | 0.9616 |
| <i>Industrialisation%</i> | iconb | 3300 | 0.4353 | 0.0746 | 0.2233 | 0.5649 |
| <i>IncomePercapitaX</i> | iconc | 3300 | 0.2269 | 0.1640 | 0.0028 | 0.7129 |

| Code | idv1 | idv2 | ih4 | ih5 | ih6 | ih7 | ih8 |
|-------------|---------|---------|---------|---------|--------|--------|--------|
| idv1 | 1.0000 | | | | | | |
| idv2 | 0.7024 | 1.0000 | | | | | |
| ih4 | -0.4053 | -0.4578 | 1.0000 | | | | |
| ih5 | 0.0139 | -0.0279 | 0.1517 | 1.0000 | | | |
| ih6 | -0.4420 | -0.3673 | 0.1721 | -0.1812 | 1.0000 | | |
| ih7 | -0.1667 | -0.1441 | 0.0588 | -0.0466 | 0.2926 | 1.0000 | |
| ih8 | -0.1469 | 0.2620 | -0.0370 | -0.0180 | 0.1607 | 0.0058 | 1.0000 |

¹²¹ Data of the total amount of SOE liabilities are not published in Guangdong statistics of 1994 and Jiangsu statistics of 1994 and 1995. The same data of Guangdong in 2007 and 2008 are not accessible to the author so far.

| | | | | | | | |
|--------------|------------|--------------|--------------|--------------|--------------|--------------|--------------|
| ih9 | -0.3544 | -0.2850 | 0.0279 | -0.1179 | 0.6222 | 0.3105 | 0.1881 |
| ph1ab | 0.6632 | 0.4749 | -0.1772 | 0.1331 | -0.6422 | -0.2058 | -0.1828 |
| ph2ab | -0.6079 | -0.5212 | 0.3204 | -0.1877 | 0.6803 | 0.3139 | 0.1920 |
| ph3ab | -0.3256 | -0.2387 | 0.3566 | -0.1658 | 0.4974 | 0.2544 | 0.2095 |
| icona | -0.3891 | -0.3876 | 0.0015 | -0.0073 | 0.3973 | 0.0343 | -0.0396 |
| iconb | -0.3675 | -0.2873 | 0.1889 | -0.0413 | 0.4027 | 0.0952 | 0.0934 |
| iconc | -0.5198 | -0.4393 | 0.3285 | -0.1999 | 0.7903 | 0.3236 | 0.2166 |
| | ih9 | ph1ab | ph2ab | ph3ab | icona | iconb | iconc |
| ih9 | 1.0000 | | | | | | |
| ph1ab | -0.5594 | 1.0000 | | | | | |
| ph2ab | 0.5212 | -0.6470 | 1.0000 | | | | |
| ph3ab | 0.3555 | -0.4406 | 0.6785 | 1.0000 | | | |
| icona | 0.3966 | -0.6066 | 0.3295 | 0.0994 | 1.0000 | | |
| iconb | 0.3466 | -0.4581 | 0.4927 | 0.5592 | 0.3610 | 1.0000 | |
| iconc | 0.5757 | -0.7603 | 0.8606 | 0.7212 | 0.4367 | 0.5157 | 1.0000 |

Note: Observation number is 3,189. The values of three control variables – *SoftBudget*, *PoliticalIdeology* and *Decentralisation* – are new variables created by Principal Component Analysis in Section 5.3.

6.2. Preliminary analysis

By way of preliminary analysis, I first examine the panel by sectors, regions and time-periods as shown in Table 6.2. Regardless of whether the basis of measurement is enterprise or employee, it would appear that privatisation disproportionately affected the light manufacturing sector. By contrast, the mining and energy sector displayed the smallest degree of privatisation. Competition was particularly intense in light manufacturing, whilst the product market in mining and energy remained highly monopolistic. Light and heavy manufacturing suffered to a greater extent from *financial* liabilities. The development of infrastructure appeared to have been sluggish across all sectors. The mining and energy sector was less efficient in production than the other two manufacturing. The rate of contraction of state involvement was similar in all sectors and yield similar level of the endowment of human capital.

In regional terms, privatisation was more apparent in inland provinces. In coastal areas product markets were more competitive, production process were more efficient,

SOE liabilities were lighter, implementation of the central government's policy of "letting go of the small" was more expeditious, and – unexpectedly – the level of labour productivity was slightly lower. In other words, inland regions faced a heavier SOE liability burden, had less competitive product markets, were less efficient in production, but, enjoyed higher labour productivity. However, the development of infrastructure was sluggish in both regions.

Over time, privatisation has had a slightly greater impact on enterprises than on employees. Some trends are clearly positive and increasing – for example, a strong improvement in production efficiency, steady growth in average firm size, modest increase in market competition, and slow but significant enhancement of infrastructure. Meanwhile, the liability burden showed a slight reduction over time.

Table 6.2

Summary statistics by sector, region and time.

| Variable | Light manufacture | | | Heavy manufacture | | | Mining & Energy | | |
|-------------------------------|-------------------|--------|--------|-------------------|--------|--------|-----------------|--------|--------|
| | Obs | Mean | S. D. | Obs | Mean | S. D. | Obs | Mean | S. D. |
| <i>IndSOEUnitX</i> | 1620 | 0.4691 | 0.3113 | 990 | 0.5120 | 0.2903 | 690 | 0.6452 | 0.2892 |
| <i>IndSOEEmployeeX</i> | 1620 | 0.5091 | 0.3105 | 990 | 0.5707 | 0.2968 | 690 | 0.6337 | 0.2861 |
| <i>IndNonSOEOutput%</i> | 1620 | 0.6877 | 0.2977 | 990 | 0.6277 | 0.2918 | 690 | 0.3663 | 0.3122 |
| <i>IndAssetLiability%</i> | 1566 | 0.6886 | 0.2461 | 957 | 0.6756 | 0.1370 | 666 | 0.5560 | 0.2149 |
| <i>IndConstructInvestX</i> | 1620 | 0.1686 | 0.2921 | 990 | 0.1543 | 0.2822 | 690 | 0.1670 | 0.2866 |
| <i>IndAssetOutput%</i> | 1620 | 0.7000 | 0.5512 | 990 | 0.7210 | 0.5323 | 690 | 0.5047 | 0.4632 |
| <i>IndAveSOEEmployeeX</i> | 1620 | 0.5726 | 0.2660 | 990 | 0.6082 | 0.2572 | 690 | 0.6005 | 0.2721 |
| <i>IndLabourProductivityX</i> | 1620 | 0.3316 | 0.2993 | 990 | 0.3149 | 0.2921 | 690 | 0.3341 | 0.2985 |
| | | | | Coastal area | | | Inland area | | |
| | | | | Obs | Mean | S.D. | Obs | Mean | S. D. |
| <i>IndSOEUnitX</i> | | | | 1665 | 0.5282 | 0.3000 | 1635 | 0.5092 | 0.3158 |
| <i>IndSOEEmployeeX</i> | | | | 1665 | 0.5749 | 0.3069 | 1635 | 0.5320 | 0.3023 |
| <i>IndNonSOEOutput%</i> | | | | 1665 | 0.7108 | 0.2966 | 1635 | 0.4922 | 0.3128 |
| <i>IndAssetLiability%</i> | | | | 1554 | 0.6270 | 0.1986 | 1635 | 0.6855 | 0.2322 |
| <i>IndConstructInvestX</i> | | | | 1665 | 0.1708 | 0.2928 | 1635 | 0.1570 | 0.2830 |
| <i>IndAssetOutput%</i> | | | | 1665 | 0.7511 | 0.5194 | 1635 | 0.5782 | 0.5360 |
| <i>IndAveSOEEmployeeX</i> | | | | 1665 | 0.6452 | 0.2409 | 1635 | 0.5320 | 0.2763 |
| <i>IndLabourProductivityX</i> | | | | 1665 | 0.3138 | 0.2905 | 1635 | 0.3406 | 0.3029 |
| | | | | 1994-2000 | | | 2001-2008 | | |
| | | | | Obs | Mean | S. D. | Obs | Mean | S. D. |
| <i>IndSOEUnitX</i> | | | | 1540 | 0.7374 | 0.2252 | 1760 | 0.3275 | 0.2347 |
| <i>IndSOEEmployeeX</i> | | | | 1540 | 0.7328 | 0.2374 | 1760 | 0.3968 | 0.2699 |
| <i>IndNonSOEOutput%</i> | | | | 1540 | 0.5499 | 0.3094 | 1760 | 0.6485 | 0.3290 |
| <i>IndAssetLiability%</i> | | | | 1429 | 0.6904 | 0.1736 | 1760 | 0.6299 | 0.2457 |
| <i>IndConstructInvestX</i> | | | | 1540 | 0.0027 | 0.0037 | 1760 | 0.3051 | 0.3359 |
| <i>IndAssetOutput%</i> | | | | 1540 | 0.5501 | 0.2696 | 1760 | 0.7664 | 0.6713 |
| <i>IndAveSOEEmployeeX</i> | | | | 1540 | 0.5533 | 0.2509 | 1760 | 0.6204 | 0.2732 |
| <i>IndLabourProductivityX</i> | | | | 1540 | 0.1548 | 0.1495 | 1760 | 0.4779 | 0.3116 |

If we change the basis of comparison by examining the estimates of means for each industry, several prominent features emerge. For SOEs, the average incidence of privatisation across all the industries was 52 per cent (see the first column of Table 6.3). The incidence was higher for some industries, such as leather, artwork, furniture, culture articles, timber, and food manufacturing (light industrial manufacturing); plastics and metal manufacture (heavy industrial manufacturing); and petroleum

extraction (mining). These industries share the same feature that the technical entry barrier for new comers are relatively low than other industries in the same sector.

By contrast, three energy industries (gas, electricity and water) continued to be characterised by a high degree of state-monopoly. Privatisation was relatively limited in three mining industries (ferrous metal ores mining, non-ferrous metal ores mining and coal), as well as in two heavy industries (petroleum processing and non-ferrous metals smelting). A common feature shared by these industries is their relative high entry barrier in terms of techniques and/or fixed capital. Tobacco was the only light manufacturing industry that retained a high degree of monopoly due to a government policy.

Across the entire SOE sector, on average, privatisation affected 55 per cent of enterprise employees (see the second column). It means that Chinese government has taken a slower pace in dismissing state workers. The issue of job security – to reduce risks of chaos caused by laid-off state workers – has been an obvious concern. Differences in the impact of privatisation on employees among industries are similar to the pattern that emerged with respect to enterprise units, with a few exceptions. For example, printing and chemical fibres are two light industries in which dismissal of state workers was preferred to shutting down or selling state firms outright. The same applies to two mining industries – non-ferrous and ferrous metal ores mining – in both of which the rate of dismissal of state workers was about 10 per cent higher than the rate of privatisation of enterprises themselves.

A comparison of the two mean values of different privatisation proxies for each industry, as shown in the third column of Table 6.3, shows whether enterprises and employees within a given industry affected differently by privatisation reform. (For example, the third column shows the difference of “transportation equipment” in terms of different privatisation proxies is 22 per cent, which is obtained by the figure

of this item's second column (73 per cent) minus that of the first column (51 per cent).)

The findings suggest that all the industries can be placed into one of three categories. In the first category are those industries in which the impact of privatisation was felt most forcefully by the enterprise, implying that employees in these industries were afforded special protection. This category is found to have included transport equipment manufacturing, petroleum extraction, ferrous metals smelting, furniture, medicines, textile garments, metal manufacturing and coal.¹²² Most industries fall into the second group, which is characterised by enterprises and enterprise employees having been impacted by privatisation to a similar extent (i.e., where there are differences in the impact, they are of no significance).¹²³ By final contrast, for industries in the final (third) category, privatisation reform primarily manifested itself through the sacking of redundant state workers. This policy approach emerges especially clearly in the two mining industries (non-ferrous and ferrous metal ores mining), as well as in all three energy industries (gas, electricity and water).¹²⁴

Table 6.3
Mean comparison of the privatisation degree by industry.

| Rank | Rank by <i>IndSOEUnitX</i> | | Rank by <i>IndSOEEmployeeX</i> | | Rank by mean gap | | |
|-------------------------------------|----------------------------|------|----------------------------------|-------|------------------|-----------------------------|-------|
| | Mean | S.D. | Mean | S.D. | | | |
| | (a) | | (b) | | | (b)-(a) | |
| 1 Leather | L 37% | 32% | Artwork | L 41% | 32% | Transport Equipment | H 22% |
| 2 Petroleum Extraction | M 38% | 30% | Leather | L 41% | 35% | Petroleum Extraction | M 22% |
| 3 Artwork | L 38% | 32% | Timber | L 41% | 32% | Ferrous Metals Smelting | H 15% |
| 4 Furniture | L 38% | 32% | Foods Manufacture | L 45% | 30% | Furniture | L 12% |
| 5 Culture Articles | L 41% | 30% | Plastics | H 46% | 34% | Medicines | L 11% |
| 6 Timber | L 41% | 31% | Printing | L 46% | 27% | Textile Wearing | L 10% |
| 7 Foods Manufacture | L 42% | 34% | Textile | L 46% | 32% | Metal Manufacture | H 10% |
| 8 Plastics | H 44% | 30% | Chemical Fibres | L 47% | 31% | Coal | M 10% |
| 9 Metal Manufacture | H 45% | 30% | Non-ferrous Metal Ores Mining | M 47% | 32% | Culture Articles | L 9% |
| 10 Beverages | L 46% | 31% | Rubber | H 47% | 33% | Beverages | L 7% |
| 11 Rubber | H 46% | 33% | Paper | L 47% | 34% | Tobacco | L 6% |
| 12 Textile Wearing | L 46% | 30% | Food Processing | L 48% | 35% | Chemical | L 6% |
| 13 Paper | L 46% | 32% | Other Ores Mining | M 50% | 29% | Measuring Instruments | L 5% |
| 14 Textile | L 47% | 32% | Culture Articles | L 50% | 34% | Petroleum Processing | H 5% |
| 15 Food Processing | L 48% | 33% | Non-metallic Mineral Manufacture | H 50% | 31% | Non-ferrous Metals Smelting | H 4% |
| 16 Chemical Fibres | L 48% | 30% | Furniture | L 50% | 33% | Leather | L 4% |
| 17 Non-metallic Mineral Manufacture | H 49% | 31% | Special Machinery | H 52% | 31% | Foods Manufacture | L 3% |
| 18 Ferrous Metals Smelting | H 49% | 29% | Electrical Equipment | H 53% | 29% | Special Machinery | H 3% |

¹²² The values for these industries are all beyond the mean plus the value of one standard deviation.

¹²³ Values for these industries are all in the range of the mean plus or minus the value of one standard deviation.

¹²⁴ Values for these industries are all less than the mean minus the value of one standard deviation.

| | | | | | | | | | | |
|----------------------------------|----------|-----|-----|-----------------------------|---|-----|-----|----------------------------------|---|------|
| 19 Measuring Instruments | L | 49% | 29% | Beverages | L | 53% | 29% | Artwork | L | 2% |
| 20 Special Machinery | H | 49% | 31% | Measuring Instruments | L | 54% | 29% | Plastics | H | 2% |
| 21 Printing | L | 50% | 30% | Communication Equipment | L | 55% | 27% | Rubber | H | 1% |
| 22 Transport Equipment | H | 51% | 25% | General Machinery | H | 55% | 28% | Non-metallic Mineral Manufacture | H | 1% |
| 23 Other Ores Mining | M | 51% | 29% | Metal Manufacture | H | 55% | 29% | General Machinery | H | 1% |
| 24 Chemical | L | 52% | 29% | Ferrous Metal Ores Mining | M | 56% | 28% | Paper | L | 1% |
| 25 Electrical Equipment | H | 52% | 28% | Textile Wearing | L | 56% | 26% | Electrical Equipment | H | 1% |
| 26 General Machinery | H | 54% | 28% | Chemical | L | 58% | 27% | Communication Equipment | L | 0% |
| 27 Medicines | L | 54% | 29% | Petroleum Extraction | M | 60% | 34% | Food Processing | L | 0% |
| 28 Communication Equipment | L | 54% | 27% | Ferrous Metals Smelting | H | 64% | 25% | Textile | L | 0% |
| 29 Coal | M | 56% | 29% | Medicines | L | 65% | 26% | Timber | L | 0% |
| 30 Non-ferrous Metal Ores Mining | M | 57% | 30% | Non-ferrous Metals Smelting | H | 66% | 26% | Other Ores Mining | M | -2% |
| 31 Non-ferrous Metals Smelting | H | 62% | 25% | Coal | M | 66% | 31% | Chemical Fibres | L | -2% |
| 32 Petroleum Processing | H | 62% | 23% | Petroleum Processing | H | 67% | 26% | Printing | L | -3% |
| 33 Ferrous Metal Ores Mining | M | 65% | 28% | Gas | E | 69% | 24% | Water | E | -4% |
| 34 Tobacco | L | 66% | 25% | Tobacco | L | 73% | 18% | Electricity | E | -4% |
| 35 Gas | E | 73% | 17% | Transport Equipment | H | 73% | 17% | Gas | E | -5% |
| 36 Electricity | E | 80% | 18% | Electricity | E | 76% | 13% | Ferrous Metal Ores Mining | M | -9% |
| 37 Water | E | 86% | 17% | Water | E | 83% | 13% | Non-ferrous Metal Ores Mining | M | -10% |
| | Average | 52% | | | | 55% | | | | 4% |
| | Std.Dev. | 11% | | | | 10% | | | | 7% |

Note: L: Light manufacturing; H: Heavy manufacturing; M: Mining; E: Energy.

A simple regression analysis is presented in Table 6.4. All the regressions are conducted in a single-variate linear model by pooled-OLS estimator. The basic correlation between the two privatisation variables and other independent variables are revealed by the sign of the estimated coefficient. This helps provide a preliminary check of the hypothesis. Note, however, that these results are generated in conditions in which no simultaneous impacts are absorbed by control variables. The results may therefore contain bias and, econometrically speaking, they are not sufficiently robust as a basis on which to draw meaningful conclusions.

The next stage is to apply necessary modifications to the following six hypotheses, developed in Chapter Four, in order to ensure that they accommodate the industrial specifics of this dataset.

Hypothesis 4. *Intensified market competition within an industry will encourage more SOEs in that industry to undertake privatisation reform.*

Hypothesis 5. *The degree of privatisation within an industry will increase when*

the financial pressure of its SOEs is mitigated.

Hypothesis 6. *The incidence of privatisation will increase in an industry when more capital for infrastructural construction is invested there.*

Hypothesis 7. *The greater the concentration of inefficient SOEs in an industry, the more likely it will be for privatisation to take place in that industry.*

Hypothesis 8. *Since small-size SOEs should be privatised first, the average size of SOEs within an industry will increase along with the progress of privatisation.*

Hypothesis 9. *Improvements in human capital among SOEs in an industry will encourage a greater scale of privatisation within that industry.*

As discussed in Chapter Five, we expect to find a negative correlation between each of most independent variables and any of the two dependent variables. The sole exception to this is in respect to the efficiency variable, *IndAsstOutput%*, because of the underlying assumption that less efficient SOEs will be the first to experience privatisation. The expectation is that industries whose SOEs are characterised by relatively low levels of efficiency will be more susceptible to privatisation and will therefore have smaller state sector involvement. With two variables changing in the same direction, this points to a positive correlation.

The results show that ten out of twelve estimated coefficients in simple regressions exceed the significant level at 1 per cent. The signs of seven coefficients in the ten regressions are as would be expected from the hypotheses, while three fail to show the expected signs. In correspondence, consistent and expected results are

derived from four hypotheses – market competition, financial pressure, infrastructure investment and human capital.¹²⁵ One consistent but unexpected result is derived from the economic efficiency hypothesis. The only inconsistent but significant result is in respect to the hypothesis of firm size.

In short, this preliminary analysis confirms the feasibility of this panel dataset as a basis on which to pursue further analysis. It also confirms the suitability of the hypotheses which we have established.

Table 6.4
Simple regression analysis by pooled-OLS.

| | Coef. | Std. Err. | t | P> t | R-squared | Obs | Sign assumed | As assumed |
|---|---------|-----------|--------|------|-----------|------|--------------|------------|
| Dependent variable: <i>IndSOEUnitX</i> | | | | | | | | |
| <i>IndNonSOEOutput%</i> | -0.3643 | 0.0153 | -23.80 | 0.00 | 0.1466 | 3300 | - | V |
| <i>IndAssetLiability%</i> | 0.0194 | 0.0247 | 0.79 | 0.43 | 0.0002 | 3189 | - | V |
| <i>IndConstructInvestX</i> | -0.4814 | 0.0166 | -28.95 | 0.00 | 0.2026 | 3300 | - | V |
| <i>IndAssetOutput%</i> | -0.0892 | 0.0099 | -9.00 | 0.00 | 0.0240 | 3300 | + | X |
| <i>IndAveSOEEmployeeX</i> | -0.1543 | 0.0201 | -7.70 | 0.00 | 0.0177 | 3300 | - | V |
| <i>IndLabourProductivityX</i> | -0.3865 | 0.0168 | -23.06 | 0.00 | 0.1389 | 3300 | - | V |
| Dependent variable: <i>IndSOEEmployeeX</i> | | | | | | | | |
| <i>IndNonSOEOutput%</i> | -0.4111 | 0.0148 | -27.81 | 0.00 | 0.1899 | 3300 | - | V |
| <i>IndAssetLiability%</i> | -0.0386 | 0.0244 | -1.58 | 0.12 | 0.0008 | 3189 | - | X |
| <i>IndConstructInvestX</i> | -0.4004 | 0.0171 | -23.42 | 0.00 | 0.1426 | 3300 | - | V |
| <i>IndAssetOutput%</i> | -0.0757 | 0.0099 | -7.68 | 0.00 | 0.0176 | 3300 | + | X |
| <i>IndAveSOEEmployeeX</i> | 0.3102 | 0.0193 | 16.06 | 0.00 | 0.0725 | 3300 | - | X |
| <i>IndLabourProductivityX</i> | -0.3141 | 0.0170 | -18.42 | 0.00 | 0.0933 | 3300 | - | V |

Note: ‘V’ denotes the consistency with hypothesis, while ‘X’ denotes the inconsistency. Assumed signs accord to hypothesis settings. All regressions include intercepts but values are not reported here.

6.3. Empirical results

This section sets out the empirical results. Estimates are, first, presented in three categories by sector – light manufacturing, heavy manufacturing and mining and energy – in an attempt to explore the differences between and among industries in the

¹²⁵ Although the liability variable generates a result not as assumed in the correlation with the first privatisation variable, this result is not significant enough to reject the original hypothesis.

course of privatisation reform in China. Second, estimates are presented by region – i.e., coastal areas (including Guangdong, Jiangsu and Shandong), and inland areas (including Heilongjiang, Shanxi and Jiangxi) – in an effort to identify regional variations. Thirdly, in order to discern the existence of different trajectories over time, the data are divided into two temporal categories: the first includes data from 1994 to 2001; the second, from 2002 to 2008.

Additionally, there are two time periods in the regressions. The longest time period is fifteen years (1994-2008).¹²⁶ However, alongside the results based on this longer time frame, I also show the results derived from the regression over a shorter time period (1997-2005). This serves two purposes. On the one hand, it helps focus the analysis on the discrete specific time period during which privatisation was mainly taking place. On the other hand, it helps to check the robustness of regressions by deleting some extreme values in data. Extreme values usually exist in the data towards the beginning or the end of the time period.¹²⁷

Results for light manufacturing

The empirical results for the privatisation of light manufacturing are listed in Table 6.5. For the first privatisation variable – the number of SOEs – three factors are shown to be significant – market competition, infrastructural investment and economic efficiency.

The strongest factor is market competition. It shows negative and significant

¹²⁶ However, the real length in regression will be reduced to fourteen in a dynamic model.

¹²⁷ One point deserves to be made here. When the length of time period is cut from fifteen to nine years, the result can be served as a support/rejection only if it is also significant. If the result of longer time period is significant while that of the shorter is not, the insignificant result of the shorter one is not sufficient to reject the significant result of the longer one. In this case, it indicates that the impact of this specific factor may be evenly distributed over time or be particularly stressed in the first or last few years.

coefficients in both (k1) and (k2) models. The negative correlation is consistent with the original causal assumption that the pace of privatisation will accelerate as competition in the product market intensifies.

Next, in terms of the strength of its impact, was economic efficiency. The sign of the coefficient in (k1) model suggests a negative correlation between economic efficiency and the incidence of privatisation. As such, it contradicts the original assumption of causality. Conventional theory would lead one to expect that privatisation would be used as a means of encouraging improvements in productivity in the state sector, with privatisation reform being first directed towards the most inefficient SOEs. However, the evidence presented here rejects this supposition. Rather, it indicates that in light manufacturing privatisation began with the more efficient industries, not those that were less efficient. This finding can be regarded as evidence that supports the “ice-pop” argument that a benevolent bureaucrat will be eager to privatise a valuable/efficient state asset/enterprise in order to prevent its meltdown as a result of mismanagement or corrupt activities (Guo and Yao, 2005). However, if considering the special industrial characteristics of light manufacturing, another market explanation may turn out to be more persuasive than this ‘bureaucratic argument’. As discussed in Chapter Two, China opened the markets of many light industries only a few years after the reforms started. Newcomers were quickly attracted by the absence of entry barriers and low capital requirements, which made the product market highly competitive. Almost certainly this also reduced the incentive for private investors to participate in SOEs’ privatisation programmes. After all, why should they feel compelled to purchase an inefficient SOE when they could just as easily – and perhaps more profitably – establish a new private firm? In other words, inefficient SOEs in light manufacturing proved to be insufficiently competitive for purposes of privatisation. In effect, the local bureaucrats had no choice but to

release the efficient SOEs to the market. This line of causal reasoning may lie at the heart of the negative correlation found here.

The third strongest impact is infrastructural investment, which shows negative and significant coefficients in (k2) models. The causality implied by the negative correlation is what was expected, suggesting that privatisation in light manufacturing has been investment-driven. The flow of money into the construction of infrastructure has encouraged privatisation and the expansion of the private economy. In short, the spillover effect of enhancement of infrastructure is confirmed.

In the case of the second privatisation variable – the number of SOE employees – three factors are significant – viz., market competition, infrastructural investment and human capital. Among these, the strongest factors were market competition and infrastructural investment. Evidence of the strength of the former is found in both (m1) and (m2) models. Negative and significant coefficients attach to both factors, confirming the causality derived from theoretical assumptions.

The third significant factor is that of human capital, which displays positive coefficients in (m2) model. This finding runs against the theoretical expectations. The positive correlation that emerges counter-factually suggests that light industries with a stronger human capital endowment will tend to retain more state employees and be less willing to dismiss them. This is a unique finding, albeit one that accord with reasoning set out in the previous paragraph. No matter whether it derives from ice-pop or market demand considerations, the highly competitive nature of this sector seems to have compelled local bureaucrats to allow superior and efficient SOEs to succumb to forces of privatisation. Meanwhile, the evidence presented here reveals that those same bureaucrats sought to better labour force in order to maintain the

competitiveness of the rest of the SOEs.¹²⁸

Two conclusions can be generalised.

The first and the most significant is the revelation of a baseline pattern of privatisation in light manufacturing. This baseline pattern comprised twin forces, made up of pressures associated with the emergence of an increasingly competitive environment and the spillover effect brought about by changes in infrastructure. These forces may be reduced to a single factor, which may be or 'thought of as' the impetus generated by market expansion. This market impetus played the crucial part in driving the privatisation of light manufacturing industries.

Second, a happy asymmetry emerges from two further findings. The evidence shows that, on the one hand, local governments were compelled to permit privatisation of SOEs in more efficient light industries, but, on the other hand, they also sought to maintain more SOEs in light industries with a higher average level of human capital. These two findings seem to contradict each other, but, in fact, they do not. Indeed, what is interesting is that they both highlight the adoption of local strategies by local governments that sought first, to meet market demand by giving up efficient SOEs whilst, second, seeking to serve their own interests by retaining SOEs with a stronger human capital base for themselves. In short, it seems clear that local bureaucrats were sufficiently skilful to take full advantage of this information asymmetry.¹²⁹

¹²⁸ Since the significance of financial pressure only reaches the level at 15 per cent in (m1) model without a confirmative result in (m2) model, it is not seen as a significant factor.

¹²⁹ In making this statement, I assume that the efficiency of production of an SOE is more easily detected by private buyers than an SOE's real endowment of human capital. Thus, the local bureaucrat secures an advantage from this asymmetry of information.

Table 6.5
Empirical results from light manufacturing industries.

| | <i>IndSOEUnitX</i> | | <i>IndSOEEmployeeX</i> | |
|-------------------------------|---------------------------|---------------------------|---------------------------|---------------------------|
| | (k1) | (k2) | (m1) | (m2) |
| <i>Lag.IndSOEUnitX</i> | 0.464 *** <i>0.119</i> | 0.642 *** <i>0.123</i> | | |
| <i>Lag.IndSOEEmployX</i> | | | 0.539 *** <i>0.074</i> | 0.533 *** <i>0.128</i> |
| <i>IndNonSOEOutput%</i> | -0.348 ** <i>0.143</i> | -0.148 # <i>0.101</i> | -0.397 ** <i>0.170</i> | -0.191 # <i>0.129</i> |
| <i>IndAssetLiability%</i> | 0.053 <i>0.085</i> | 0.090 <i>0.120</i> | -0.106 # <i>0.069</i> | 0.025 <i>0.155</i> |
| <i>IndConstructInvestX</i> | -1.046 <i>0.848</i> | -0.786 * <i>0.427</i> | -2.259 ** <i>1.039</i> | -1.075 * <i>0.635</i> |
| <i>IndAssetOutput%</i> | -0.033 ** <i>0.015</i> | -0.016 <i>0.049</i> | -0.012 <i>0.014</i> | -0.076 <i>0.069</i> |
| <i>IndAveSOEEmployX</i> | -0.085 <i>0.091</i> | -0.038 <i>0.061</i> | 0.111 <i>0.102</i> | 0.150 <i>0.128</i> |
| <i>IndLabourProductivityX</i> | 0.080 <i>0.065</i> | 0.075 <i>0.062</i> | -0.071 <i>0.062</i> | 0.206 * <i>0.111</i> |
| <i>SoftBudget</i> | -0.130 <i>0.096</i> | 0.091 # <i>0.060</i> | -0.056 <i>0.054</i> | -0.105 * <i>0.060</i> |
| <i>PoliticalIdeology</i> | 0.193 ** <i>0.089</i> | -0.084 <i>0.091</i> | 0.070 <i>0.052</i> | 0.065 <i>0.076</i> |
| <i>Decentralisation</i> | -0.073 # <i>0.046</i> | -0.127 ** <i>0.058</i> | -0.118 ** <i>0.047</i> | -0.014 <i>0.047</i> |
| <i>CoastalDummy</i> | 0.146 <i>0.126</i> | 0.346 * <i>0.196</i> | 0.301 ** <i>0.149</i> | -0.152 <i>0.224</i> |
| <i>Literacy%</i> | -1.122 <i>0.971</i> | 2.264 # <i>1.440</i> | 0.079 <i>0.570</i> | 0.567 <i>0.709</i> |
| <i>Industrialisation%</i> | -0.351 <i>0.497</i> | 1.102 <i>0.832</i> | 0.173 <i>0.548</i> | -0.208 <i>0.468</i> |
| <i>IncomePercapitaX</i> | -1.098 ** <i>0.477</i> | -0.164 <i>0.673</i> | -0.969 <i>0.685</i> | 1.424 <i>1.187</i> |
| Obs | 1494 | 972 | 1494 | 972 |
| Groups | 108 | 108 | 108 | 108 |
| Ave. periods | 13.83 | 9.00 | 13.83 | 9.00 |
| Instruments | 37 | 41 | 41 | 41 |
| AR(1) | 0.002 | 0.000 | 0.000 | 0.000 |
| AR(2) | 0.617 | 0.803 | 0.383 | 0.607 |
| Hansen | 0.152 | 0.345 | 0.455 | 0.224 |
| DIH-1 | - | 0.253 | 0.127 | 0.054 |
| DIH-2 | 0.167 | 0.496 | 0.706 | 0.709 |

Note: All regressions are dynamic panel-data estimations by two-step system-GMM with Windmeijer's finite-sample correction for the two-step covariance matrix. Intercepts and year dummies are included but values are not reported. Standard errors are in the italic. ***, **, * and # denote the significance level at 1%, 5%, 10% and 15%, respectively. The p -values are listed in the first and second order serial correlation tests, Hansen test and two Difference-in-Hansen tests.

Results for heavy manufacturing

In terms of the SOEs in the eleven heavy manufacturing industries, the empirical results identify three factors that are consistent and significant: viz., market competition, financial pressure and firm size (see Table 6.6).

First, estimated coefficients for market competition are significant in (n1) and (n2) models, where their negative sign accords with the underlying theoretical assumptions and indicates that privatisation in this sector was caused by intensified market competition.

Second, the coefficients for financial pressure also have a positive sign in both models, meaning that financial pressure – denoted by the asset-liability ratio – is a constraining force that prevented heavy manufacturing SOEs from going further with privatisation. Importantly, this finding is the first ever piece of evidence so far in the literature about China that endorses the “cash cow” argument that local bureaucrats would prefer to tolerate a debt burden that was manageable and impede privatisation in order to keep more cash flows for their own self-interests (Li and Xu, 2002). This constraining effect may also have reflected forces at work in the banking sector. For fear of debt non-payment, especially in respect to large-scale loans that had been granted to heavy industries, a risk-averse bank manager may sometimes have felt impelled to veto a privatisation programme (Guo and Yao, 2005). In other words, whatever prompted by the interests of the local authorities or of bank managers, the liability burden of heavy manufacturing SOEs had caused the slowdown in the pace of privatisation. This finding also highlights another significant distinction between light and heavy manufacturing: namely, that among local authorities, light manufacturing SOEs were not regarded as being as valuable as their heavy manufacturing counterparts. It would appear that the liability burden among SOEs in light

manufacturing was not something that local governments were willing to tolerate (see (k1) and (k2) models).

Third, the significant and negative coefficient for firm size in (n1) model is evidence of a driving force at work. This finding confirms the effectiveness of the “letting go of the small” policy in this sector. It also reveals that the privatisation in heavy manufacturing is more policy-dominated than that in light manufacturing, where the size effect is absent.

In terms of SOE employees – the second privatisation variable – three factors are found to have generated significant results.

The first is market competition. Supporting evidence appears in (o1) and (o2) models, with the expected negative sign. This finding once more confirms the stimulative impact of competition, which is a market driver for both enterprises and employees. Likewise, competition effect is the most significant factor in both heavy and light manufacturing.

The second factor is that of economic efficiency, which demonstrates positive and significant coefficients in both (o1) and (o2) models. Importantly, this piece of evidence is unique in all the data; in that it endorses the causal assumption that privatisation should start in those areas where inefficiency is greatest. It differs from the findings for light manufacturing and for the mining and energy industries. Uniquely, in the case of heavy manufacturing industry, the findings suggest that in the face of demands for improvements in economic efficiency, privatisation is an important vehicle for the fulfilment of this goal. Further, in pursuit of the same goal, there is an acceptance that privatisation should seek to reduce the large number inefficient workers in state-owned heavy industries.

The third is firm size. The positive correlation indicates the causality that fewer layoffs of state workers occurred in industries whose size was larger. This finding is

special and important. It is special because it does not apply to other sectors. It is important because it highlights the core element – “grasping the large” – of China’s privatisation policy. The way in which the “grasping” of heavy manufacturing SOEs took place was such as to minimise the number of layoffs. The reason for this was simple – it was pursued in an attempt to preserve job security and social stability. The background was that the ‘*xiagang*’ (laying-off) problem had become a serious policy-related concern, emerging out of the privatisation reform process since the late 1990s. Too many layoffs in the state sector would, it was feared, backfire, generating social unrest and even ‘chaos’ (*luan*). In truth, there was an inherent tension between the two policy goals – namely, trying to reduce the number inefficient state workers in heavy industries, whilst simultaneously seeking to maintain social harmony by maximising job security. Concealed in the tension associated with potentially conflicting goals is the reality that the Chinese government actually did quite well in fulfilling both goals. The selection of privatisation targets in heavy manufacturing was highly strategic. In inefficient heavy industries, privatisation sought to reduce the numbers of state employees; in efficient industries, it sought to protect job security for purposes of social stability.

Furthermore, it is worth noting that the findings obtained by two privatisation variables are different from one other. Enterprises were not protected as much as employees during the privatisation reform.

Some general conclusions follow from the preceding analysis, as follows:

First, the strongest inducement to privatisation in heavy manufacturing industry was market competition. Both state firms and workers were privatised in response to intensified competition in the product market.

Second, patterns of privatisation affecting enterprises and employees reflect coherent behaviour, but have their own distinctive characteristics. For enterprise,

‘environmental’ conditions (for example, changes in financial pressure, etc.) are more influential. For employee, however, individual conditions, such as efficiency and size, are clearly more decisive factors.

Third, there is abundant evidence to show that SOEs in this sector received special treatment. They were more likely to be treated as “cash cows” for local treasuries, or as debtors seized by local banks. In this regard, privatisation did not offer a solution (as had originally been intended) to relieve fiscal stringency, but raise the risks for local authorities or bank managers to lose current interests.

Finally, SOE employees in heavy manufacturing also received special treatment in order to minimise threats to job security. Whether or not to embark on privatisation was a highly strategic decision because of the need to “kill two birds with one stone”. In other words, privatisation reform sought to maximise SOE efficiency, whilst minimising the number of laid-off workers. In these circumstances, the only feasible compromise was to let inefficient industries bear the brunt of the cuts, which is exactly what China has done.

Table 6.6

Empirical results from the heavy manufacturing industries.

| | <i>IndSOEUnitX</i> | | <i>IndSOEEmployeeX</i> | |
|-------------------------------|----------------------------|----------------------------|---------------------------|----------------------------|
| | (n1) | (n2) | (o1) | (o2) |
| <i>Lag.IndSOEUnitX</i> | 0.491 *** <i>0.156</i> | 0.433 *** <i>0.161</i> | | |
| <i>Lag.IndSOEEmployX</i> | | | 0.342 *** <i>0.101</i> | 0.419 *** <i>0.090</i> |
| <i>IndNonSOEOutput%</i> | -0.270 ** <i>0.130</i> | -0.715 *** <i>0.236</i> | -0.191 # <i>0.124</i> | -0.364 *** <i>0.077</i> |
| <i>IndAssetLiability%</i> | 0.588 *** <i>0.212</i> | 0.433 * <i>0.257</i> | 0.048 <i>0.285</i> | 0.108 <i>0.193</i> |
| <i>IndConstructInvestX</i> | 0.085 <i>0.510</i> | 1.844 <i>2.399</i> | -0.210 <i>0.358</i> | -0.230 <i>0.283</i> |
| <i>IndAssetOutpout%</i> | -0.020 <i>0.027</i> | 0.006 <i>0.135</i> | 0.203 ** <i>0.099</i> | 0.097 * <i>0.051</i> |
| <i>IndAveSOEEmployX</i> | -0.213 ** <i>0.085</i> | 0.076 <i>0.232</i> | 0.459 *** <i>0.142</i> | 0.166 * <i>0.092</i> |
| <i>IndLabourProductivityX</i> | 0.016 <i>0.065</i> | 0.104 <i>0.161</i> | -0.188 <i>0.134</i> | -0.004 <i>0.107</i> |
| <i>SoftBudget</i> | -0.288 *** <i>0.108</i> | -0.074 <i>0.105</i> | -0.124 ** <i>0.056</i> | -0.149 *** <i>0.040</i> |
| <i>PoliticalIdeology</i> | 0.011 <i>0.121</i> | 0.086 <i>0.144</i> | -0.117 <i>0.121</i> | 0.079 # <i>0.054</i> |
| <i>Decentralisation</i> | 0.028 <i>0.065</i> | -0.174 ** <i>0.076</i> | 0.035 <i>0.040</i> | 0.024 <i>0.028</i> |
| <i>CoastalDummy</i> | -0.043 <i>0.095</i> | 0.465 <i>0.327</i> | 0.064 <i>0.110</i> | -0.067 <i>0.095</i> |
| <i>Literacy%</i> | -2.342 * <i>1.349</i> | 1.849 <i>1.388</i> | 1.569 * <i>0.803</i> | -0.195 <i>0.523</i> |
| <i>Industrialisation%</i> | 0.071 <i>0.767</i> | 0.084 <i>0.765</i> | 0.455 <i>0.555</i> | 0.217 <i>0.346</i> |
| <i>IncomePercapitaX</i> | 1.039 # <i>0.716</i> | -0.351 <i>1.798</i> | 0.147 <i>0.892</i> | 0.227 <i>0.631</i> |
| Obs | 913 | 594 | 913 | 594 |
| Groups | 66 | 66 | 66 | 66 |
| Ave. periods | 13.83 | 9.00 | 13.83 | 9.00 |
| Instruments | 41 | 31 | 43 | 64 |
| AR(1) | 0.017 | 0.002 | 0.000 | 0.004 |
| AR(2) | 0.710 | 0.723 | 0.270 | 0.721 |
| Hansen | 0.884 | 0.215 | 0.135 | 0.254 |
| DIH-1 | 0.662 | 0.011 | 0.092 | 0.211 |
| DIH-2 | 0.849 | 0.790 | 0.388 | 0.487 |

Note: All regressions are dynamic panel-data estimations by two-step system-GMM with Windmeijer's finite-sample correction for the two-step covariance matrix. Intercepts and year dummies are included but values are not reported. Standard errors are in the italic. ***, **, * and # denote the significance level at 1%, 5%, 10% and 15%, respectively. The p -values are listed in the first and second order serial correlation tests, Hansen test and two Difference-in-Hansen tests.

Mining and energy

In the mining and energy sector, three factors are found to have been significant and consistent (see Table 6.7): market competition, economic efficiency and firm size.

As expected, the competition impact is negative and echoes the findings in other sectors (see (p1) and (p2) models). We interpret this as final and definitive confirmation that market competition has been the most significant cause of privatisation in all sectors. Despite the high degree of state monopolisation of mining and energy industries (in general, the state accounted for 70 per cent or more of the product market), SOEs in these industries were still vulnerable to competition from newly-established private firms. We may infer that competition hurts SOEs, no matter where in the economy they may be located.

Next factor in importance is economic efficiency, evidence of its influence being found in (p1) and (p2) models. The negative correlation shown here suggests the causal relationship that privatisation in mining and energy actually began with more – not less – efficient SOEs. This runs in opposition to our original assumption, and it is the first piece of evidence that lends support to the “ice-pop” argument in the literature. This argument, it will be recalled, states that valuable state enterprises may be the first to undergo privatisation, if appropriate local authorities seeks to prevent meltdown of valuable assets as a result of mismanagement or corruption. The evidence found here lends strong support to this argument. We may recall that the same result emerged from the analysis of light manufacturing. In that case, the market forces were the basis of the suggested explanation, the argument being that less efficient SOEs in highly competitive light manufacturing industries found it difficult to secure private buyers. The same underlying factor is at the heart of the ‘bureaucratic explanation’ in the mining and energy sector. Here, the highly

monopolistic nature of the market constituted a severe barrier for new entrants. For potential private investors, the chance of securing government permission to enter mining or energy industries was rather limited. Thus, SOEs in this sector were easy to sell, even where their production efficiency was low. In other words, in this sector there was no compulsion for local bureaucrats to release efficient SOEs to the privatisation market. There was every reason why local authorities might wish to retain these valuable assets for their own self interest, but the reality is that they did, in fact, sell them on a significant scale. This is why the finding here should be attributed more to the ‘bureaucratic’ explanation – and be regarded as the first piece of evidence that confirms the “ice-pop” effect in China. To be fair, ‘bureaucratic benevolence’ seemed a reality.

Third, firm size is found to be a cause of privatisation. Not only does it highlight the susceptibility of small-scale firms to privatisation, but it also demonstrates that the central policy of “letting go the small” had special applicability to SOEs in this sector. Like the heavy manufacturing, the privatisation in mining and energy is also highly policy-oriented.

In terms of the contraction of employees, it seems clear that the only significant factor is economic efficiency. The negative correlation in (q1) and (q2) models suggests that the layoffs of state workers in mining and energy were also concentrated in relatively more efficient SOEs. We interpret this as further strong in support of the “ice-pop” effect, although it is even more significant here because it is the only instance in which SOE employees were caught up in this effect. Evidently, social stability was not a factor that inhibited privatisation decisions in this sector, or more precisely in the *energy* industries.¹³⁰ The ice-pop argument implies the causation that

¹³⁰ Due to the data limitations, it has not been possible to separate the mining and energy sub-sectors in the regression. Had we done so, the number of cross-sections would have been too small to fulfil the requirement of instrument use in GMM estimation. That is why it is impossible to differentiate between

state workers here were regarded as valuable assets because of the relatively higher skill that is required to work in these industries so that they were protected from being laid off in privatisation. This explanation is convincing because it fits well the then current boom conditions in all energy and some mining industries. Moreover, given the difficulty of training employees to the requisite level within a short time in the private sector, highly skilled mining and energy workers were indeed a scarce commodity in the labour market. As a result, as privatisation proceeded, there was high demand for skilled workers from the state sector.

By way of conclusion, we would make three points:

First, this section confirms that market competition was the single most important driver of privatisation in China's industrial state sector. Across all industries and activities, SOEs were exposed to the rising pressures of market competition.

Second, the "ice-pop" effect was a major determinant of the privatisation pattern of this sector. Contrary to what the original hypothesis would suggest, in this sector, contraction of state-owned enterprises and employees began with the more efficient units. Privatisation was not, it seems, used as a means of improving efficiency, but as a vehicle for transferring valuable state assets out of public into private hands.

Third, it is also apparent that the "letting go of the small" element in China's privatisation policy was most apparent in this sector. Reforms clearly focused on SOEs of below-average size. In contrast to conditions in heavy manufacturing, where the "grasping the large" element of policy protected employee, job security seems to have been a less important issue for mining and energy SOEs. The reason for this is perhaps that workers in this sector could be accommodated more readily and easily by the private sector than those engaged in heavy manufacturing activities. It may also

these two sectors. However, there is reason to believe that the labour force in the energy sector should have been more economically valuable (for higher requirement of skills) than that of the mining sector.

correspond to the then current boom of private energy market.

Table 6.7

Empirical results from mining, electricity, gas and water industries.

| | <i>IndSOEUnitX</i> | | <i>IndSOEEmployeeX</i> | |
|-------------------------------|---------------------------|---------------------------|---------------------------|---------------------------|
| | (p1) | (p2) | (q1) | (q2) |
| <i>Lag.IndSOEUnitX</i> | 0.764 *** <i>0.135</i> | 0.721 *** <i>0.125</i> | | |
| <i>Lag.IndSOEEmployX</i> | | | 0.867 *** <i>0.149</i> | 0.518 *** <i>0.188</i> |
| <i>IndNonSOEOutput%</i> | -0.145 * <i>0.088</i> | -0.214 * <i>0.129</i> | -0.018 <i>0.081</i> | -0.294 <i>0.266</i> |
| <i>IndAssetLiability%</i> | -0.135 <i>0.277</i> | -0.007 <i>0.109</i> | 0.115 <i>0.192</i> | 0.498 <i>0.418</i> |
| <i>IndConstructInvestX</i> | -0.637 <i>0.901</i> | -0.469 <i>0.517</i> | 0.439 <i>0.914</i> | -1.126 <i>1.142</i> |
| <i>IndAssetOutput%</i> | -0.094 ** <i>0.046</i> | -0.277 * <i>0.142</i> | -0.078 # <i>0.050</i> | -0.340 * <i>0.200</i> |
| <i>IndAveSOEEmployX</i> | -0.230 ** <i>0.116</i> | -0.265 ** <i>0.135</i> | -0.025 <i>0.083</i> | 0.043 <i>0.308</i> |
| <i>IndLabourProductivityX</i> | 0.086 <i>0.181</i> | 0.213 <i>0.165</i> | 0.001 <i>0.136</i> | -0.170 <i>0.396</i> |
| <i>SoftBudget</i> | -0.101 <i>0.115</i> | -0.050 <i>0.070</i> | 0.019 <i>0.119</i> | 0.031 <i>0.270</i> |
| <i>PoliticalIdeology</i> | -0.230 ** <i>0.116</i> | -0.132 <i>0.102</i> | 0.018 <i>0.087</i> | -0.335 * <i>0.204</i> |
| <i>Decentralisation</i> | 0.067 <i>0.087</i> | 0.039 <i>0.061</i> | -0.015 <i>0.091</i> | -0.113 <i>0.197</i> |
| <i>CoastalDummy</i> | 0.223 <i>0.276</i> | 0.077 <i>0.300</i> | -0.076 <i>0.176</i> | 0.879 # <i>0.579</i> |
| <i>Literacy%</i> | -0.704 <i>1.006</i> | -0.643 <i>1.167</i> | 0.719 <i>1.550</i> | 3.286 <i>2.847</i> |
| <i>Industrialisation%</i> | -1.505 <i>1.600</i> | 0.029 <i>0.760</i> | 0.255 <i>1.316</i> | 2.080 <i>1.817</i> |
| <i>IncomePercapitaX</i> | 0.754 <i>0.721</i> | 0.353 <i>1.768</i> | 0.098 <i>0.478</i> | -2.755 <i>2.653</i> |
| Obs | 636 | 414 | 636 | 414 |
| Groups | 46 | 46 | 46 | 46 |
| Ave. periods | 13.83 | 9.00 | 13.83 | 9.00 |
| Instruments | 46 | 43 | 46 | 37 |
| AR(1) | 0.001 | 0.019 | 0.009 | 0.028 |
| AR(2) | 0.661 | 0.923 | 0.888 | 0.889 |
| Hansen | 0.584 | 0.458 | 0.534 | 0.287 |
| DIH-1 | 0.638 | 0.727 | 0.158 | 0.047 |
| DIH-2 | 0.424 | 0.174 | 0.928 | 0.769 |

Note: All regressions are dynamic panel-data estimations by two-step system-GMM with Windmeijer's finite-sample correction for the two-step covariance matrix. Intercepts and year dummies are included but values are not reported. Standard errors are in the italic. ***, **, * and # denote the significance level at 1%, 5%, 10% and 15%, respectively. The *p*-values are listed in the first and second order serial correlation tests, Hansen test and two Difference-in-Hansen tests.

Results – regional perspective

Does the pattern of privatisation in China reveal any distinctive regional differences? In order to answer this question, we have divided the panel into two datasets. The ‘coastal dataset’ includes data from three coastal provinces – Guangdong, Jiangsu and Shandong; the ‘inland dataset’ includes data from the three inland provinces – Jiangxi, Shanxi and Heilongjiang. Two new control variables, light and heavy dummies, are introduced to absorb industrial variations.¹³¹

Estimates obtained by regressing the first privatisation variable, the number of SOEs, are reported in (r1)-(r4) models in Table 6.8. The two regions show similar results in terms of the shaping influences of three factors – market competition, financial pressure and firm size.

The stimulative impacts of competition and firm size cause no surprise. Market competition is once again confirmed as the chief cause of privatisation in both coastal and inland provinces. The central policy of “letting go of the small” was also firmly adhered to by all local authorities, with a slight stress on coastal region. The “cash cow” effect, whereby fiscal difficulties take second place to other interest concerns, is also shown to have been widespread in both coastal and inland areas.

However, the two regions differ in the respect of human capital. The fact shows that coastal authorities placed a much higher premium on SOEs’ human resource endowments. They were more selective in deciding whether or not to privatise, their decision being shaped by their desire to preserve those SOEs whose human capital was more advanced (for example, in terms of skill endowments). Such considerations were minimally important to local authorities in inland regions in making their

¹³¹ The dummy of the mining and energy sector should not be set for econometrical reason. The estimated coefficients obtained for the light and heavy dummies are based on the comparison with the ‘invisible dummy’ of the mining and energy sector.

privatisation decisions.

Estimates obtained by regressing the second privatisation variable, the number of SOE employees, in (r5)-(r8) models are striking for the absence of similarities between regions.

In coastal provinces, the workforce contraction was more competition-driven and highly dependent on the level and standard of human capital resources. In inland provinces, these factors were absent, the more important factors being infrastructural change and the size factor. There is some evidence that this pattern was investment-driven, although the nature of driving force is uncertain due to the inconsistent signs obtained in (r7) and (r8) models.¹³² But it could also be argued that the pattern reflects the “grasping the large” element of privatisation policy. It is suggested that job security was a major concern for inland governments, and this policy goal was a crucial determinant of privatisation in these regions. By contrast, it would seem that unemployment pressures facing coastal governments were much less pressing.

In short then, in answer to the original question, we find that regional differences are distinctive. In terms of enterprises, it is true that their trajectories were similar in both regions. Nor do these appear to have been any regional difference in terms of the impact of competition, size and financial pressures. However, coastal authorities were also more selective than their inland counterparts in determining the effect of human capital resource endowments on decisions whether or not to privatise an SOE. The clear implication is that a kind of regional strategy had emerged.

From the perspective of the workforce, patterns were more distinctive. Downsizing of coastal SOEs was driven by the pressure from intensified competition

¹³² Readers are reminded that the author may not provide a convincing explanation over this inconsistency.

under the screening strategy based on the consideration of human capital endowments. In inland regions, labour force contraction was most strikingly shaped by policy of “grasping the large”. The implication here is that inland governments tried hard to minimise the scale of social instability caused by large-scale dismissal of state workers.

Table 6.8
Empirical results by regions.

| | <i>IndSOEUnitX</i> | | | | <i>IndSOEEmployeeX</i> | | | |
|-------------------------------|--------------------|--------------|--------------|--------------|------------------------|--------------|--------------|--------------|
| | Coastal | | Inland | | Coastal | | Inland | |
| | (r1) | (r2) | (r3) | (r4) | (r5) | (r6) | (r7) | (r8) |
| <i>Lag.IndSOEUnitX</i> | 0.383 ** | 0.496 *** | 0.241 ** | 0.981 *** | | | | |
| | <i>0.157</i> | <i>0.137</i> | <i>0.114</i> | <i>0.109</i> | | | | |
| <i>Lag.IndSOEEmployeeX</i> | | | | | 0.441 *** | 0.489 *** | 0.571 *** | 0.304 ** |
| | | | | | <i>0.151</i> | <i>0.150</i> | <i>0.083</i> | <i>0.155</i> |
| <i>IndNonSOEOutput%</i> | -0.314 ** | -0.833 *** | -0.406 *** | -0.021 | -0.383 *** | -0.453 ** | -0.012 | -0.028 |
| | <i>0.128</i> | <i>0.182</i> | <i>0.126</i> | <i>0.084</i> | <i>0.123</i> | <i>0.199</i> | <i>0.101</i> | <i>0.126</i> |
| <i>IndAssetLiability%</i> | -0.012 | 0.292 # | 0.108 # | 0.149 * | -0.086 | 0.247 | 0.014 | -0.203 |
| | <i>0.192</i> | <i>0.185</i> | <i>0.069</i> | <i>0.091</i> | <i>0.148</i> | <i>0.278</i> | <i>0.055</i> | <i>0.184</i> |
| <i>IndConstructInvestX</i> | 1.862 # | -0.971 | 0.199 | 0.230 | 1.688 # | 0.786 | -1.282 *** | 1.452 *** |
| | <i>1.210</i> | <i>0.786</i> | <i>0.523</i> | <i>0.468</i> | <i>1.082</i> | <i>0.967</i> | <i>0.501</i> | <i>0.598</i> |
| <i>IndAssetOutpout%</i> | -0.043 | -0.010 | -0.031 | 0.028 | -0.022 | 0.100 | 0.006 | -0.092 |
| | <i>0.090</i> | <i>0.047</i> | <i>0.041</i> | <i>0.063</i> | <i>0.088</i> | <i>0.081</i> | <i>0.026</i> | <i>0.155</i> |
| <i>IndAveSOEEmployX</i> | -0.298 ** | -0.290 *** | -0.147 * | 0.158 | -0.072 | 0.087 | 0.137 * | 0.718 *** |
| | <i>0.139</i> | <i>0.090</i> | <i>0.076</i> | <i>0.112</i> | <i>0.147</i> | <i>0.133</i> | <i>0.074</i> | <i>0.321</i> |
| <i>IndLabourProductivityX</i> | 0.613 ** | 0.050 | 0.047 | -0.001 | 0.717 *** | 0.214 * | 0.020 | 0.161 |
| | <i>0.281</i> | <i>0.107</i> | <i>0.065</i> | <i>0.100</i> | <i>0.211</i> | <i>0.119</i> | <i>0.066</i> | <i>0.147</i> |
| <i>SoftBudget</i> | 0.071 | 0.006 | -0.053 | 0.072 | 0.122 * | 0.055 | -0.296 *** | -0.178 * |
| | <i>0.064</i> | <i>0.042</i> | <i>0.068</i> | <i>0.073</i> | <i>0.066</i> | <i>0.063</i> | <i>0.062</i> | <i>0.092</i> |
| <i>PoliticalIdeology</i> | 0.045 | 0.081 | 0.045 | -0.108 # | 0.063 | 0.011 | -0.268 *** | 0.070 |
| | <i>0.097</i> | <i>0.077</i> | <i>0.118</i> | <i>0.073</i> | <i>0.103</i> | <i>0.118</i> | <i>0.064</i> | <i>0.154</i> |
| <i>Decentralisation</i> | 0.047 | -0.158 *** | -0.104 # | -0.112 * | -0.022 | -0.209 *** | -0.198 *** | 0.022 |
| | <i>0.111</i> | <i>0.039</i> | <i>0.069</i> | <i>0.059</i> | <i>0.111</i> | <i>0.063</i> | <i>0.057</i> | <i>0.079</i> |
| <i>Literacy%</i> | -0.908 | -1.005 ** | 2.506 | -3.748 ** | -1.745 *** | -0.863 | 0.393 | 2.021 |
| | <i>0.756</i> | <i>0.435</i> | <i>2.411</i> | <i>1.549</i> | <i>0.597</i> | <i>0.701</i> | <i>0.893</i> | <i>1.644</i> |
| <i>Industrialisation%</i> | 0.504 | -0.095 | 1.123 | 0.945 ** | 0.448 | 6.869 *** | 0.722 ** | 0.425 |
| | <i>3.333</i> | <i>1.467</i> | <i>0.799</i> | <i>0.460</i> | <i>3.468</i> | <i>1.356</i> | <i>0.295</i> | <i>0.757</i> |
| <i>IncomePercapitaX</i> | 0.963 | 0.715 | -5.399 ** | -6.713 # | 1.006 | 1.210 * | -0.661 | -0.963 |
| | <i>1.267</i> | <i>1.008</i> | <i>2.243</i> | <i>4.183</i> | <i>1.328</i> | <i>0.689</i> | <i>0.964</i> | <i>7.044</i> |
| <i>LightDummy</i> | -0.324 ** | 0.252 * | -0.516 * | 0.072 | 0.091 | -0.005 | -0.093 | -0.538 |
| | <i>0.156</i> | <i>0.134</i> | <i>0.302</i> | <i>0.148</i> | <i>0.173</i> | <i>0.183</i> | <i>0.084</i> | <i>0.790</i> |
| <i>HeavyDummy</i> | -0.251 | 0.199 | -0.414 | -0.042 | -0.063 | -0.383 | 0.295 # | -0.403 |
| | <i>0.388</i> | <i>0.383</i> | <i>0.336</i> | <i>0.358</i> | <i>0.426</i> | <i>0.362</i> | <i>0.189</i> | <i>1.115</i> |
| Obs | 1517 | 999 | 1526 | 981 | 1517 | 999 | 1526 | 981 |
| Groups | 111 | 111 | 109 | 109 | 111 | 111 | 109 | 109 |
| Ave. periods | 13.67 | 9.00 | 14.00 | 9.00 | 13.67 | 9.00 | 14.00 | 9.00 |
| Instruments | 43 | 49 | 43 | 37 | 43 | 43 | 51 | 43 |
| AR(1) | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 | 0.000 |
| AR(2) | 0.236 | 0.867 | 0.626 | 0.941 | 0.908 | 0.807 | 0.973 | 0.184 |
| Hansen | 0.154 | 0.151 | 0.555 | 0.800 | 0.396 | 0.459 | 0.559 | 0.422 |
| DIH-1 | 0.113 | 0.119 | 0.243 | 0.188 | 0.766 | 0.858 | 0.284 | 0.269 |
| DIH-2 | 0.364 | 0.441 | 0.888 | 0.963 | 0.156 | 0.110 | 0.804 | 0.677 |

Note: All regressions are dynamic panel-data estimations by two-step system-GMM with Windmeijer's finite-sample correction for the two-step covariance matrix. Intercepts and year dummies are included but values are not reported. Standard errors are in the italic. ***, **, * and # denote the significance level at 1%, 5%, 10% and 15%, respectively. The p -values are listed in the first and second order serial correlation tests, Hansen test and two Difference-in-Hansen tests.

Results – temporal perspective

Next, differences between different time periods. Was the pattern of privatisation unchanged, or did it evolve over time? In order to investigate this, we have again divided the panel into two datasets. The dataset for the early period includes data for the years between 1994 and 2001 inclusive, while its later counterpart focuses more narrowly on the period from 2001 until 2008.¹³³ Regressions run over a shorter time period, which reduces both the first and last time periods, are also provided in order to verify the results. Industrial dummies are introduced as control variables.

In the privatisation of SOEs, first of all, two factors are found to have been constant over time in (s1)-(s4) models (see Table 6.9).

As expected, market competition remains the most significant stimulative factor in this time-based analysis. The importance of this factor as a driving force of privatisation is common to all sectors, all regions and all time periods. Market competition full deserves to be regarded as the prime cause of this process in China.

As expected, the policy of “letting go the small”, was faithfully adhered to throughout the era of privatisation. The *policy-dominated* character of privatisation is also clear. Thus, an important inference of these two findings is that privatisation in China is unique in reflecting the simultaneous competition-driven nature and the policy-dominated character of the process. This is a phenomenon that is absent in the privatisation reforms of other transitional economies.

Second, however, two effects are found to have *weakened* over time.

The first is the “cash cow” effect reflected in the factor of financial pressure.

¹³³ That time periods in (s1) and (s5) models sum only to seven, rather than eight reflects the use of the lagged term of dependent variable as one explanatory variable in dynamic GMM estimation. This necessarily causes a reduction of one period in the panel. However, there is no need to reduce one period in the calculation of sub-panels where the first time period is not included. This explains why the time periods sum to eight in (s3) and (s7) models.

This effect is very significant in the results of the early period (see (s1) and (s2) models), but in the later results it becomes more vague and there are even suggestions that its direction was reversed (i.e., the value of the coefficient changed from being positive to becoming negative). It would seem that local authorities became more responsive to the liability burden of SOEs in more recent years, and were more likely to use privatisation as a means of relieving this heavy financial burden, particularly by laying off more state workers. Taking other previous findings into the consideration, we would expect this phenomenon to have been particularly prevalent in heavy manufacturing SOEs (see (n1) and (n2) models in Table 6.5).

The next force which weakened over time was the “ice-pop” effect reflected in the factor of economic efficiency. The ice-pop effect was more significant in the results of the early period (see (s1) model). The causal implication is that, generally speaking, Chinese privatisation started with relatively more efficient SOEs, suggesting that privatisation was not used as a tool to improve SOE efficiency but – rather the reverse – mainly to protect efficient SOEs in the early stages of privatisation, especially in mining and energy sector.

Thirdly, it is in the results of latter period that the impact of the factor of human capital emerges most strongly (see (s3) model). It reveals that, in the early stages of privatisation, local governments’ selection of privatisation targets had no regard for human capital resource conditions. However, as time passed, this changed. Thus, in latter years SOEs with a stronger human capital endowment were more likely to remain state-owned, especially if they were coastal enterprises engaged in light manufacturing (see (m2), (r1), (r5) and (r6) models).

Fourthly, it is intriguing to observe the nature of the impact of the ‘infrastructure factor’ changing over time (the estimated coefficients turns from positive into negative between two periods in (s1), (s2) and (s4) models). This suggests that in

earlier years the infrastructural investment was used to fuel SOE development across sectors and regions. However, in later years, such investment facilitated *privatisation*. That is to say, both the state and private sectors were beneficiaries of improvements in infrastructure. This was especially the case in light manufacturing SOEs in coastal areas (see (k2), (m1), (m2), (r7) and (r8) models).

The impact on state employment of two factors obtained similar results (see (s6), (s7) and (s8) models). First, competition was constantly the major force driving downsizing in the state sector throughout the entire period. Since this has been thoroughly aired in the previous discussion, there is no need to elaborate the point further here. Second, the positive impact of infrastructural investment becomes vague in later years, though there is no opposite result found. Previous analysis is unaffected.

Next, there are two factors whose impacts became increasingly apparent in the latter period.

First is the “ice-pop” effect vis-à-vis state workers. This finding echoes the earlier finding obtained from the analysis of employees in mining and energy SOEs (see (q1) and (q2) models in Table 6.6). More efficient state workers were released to the private sector, especially in recent years, when the private energy market prospered.

The second factor relates to the way in which considerations of human capital resources impacted on the selection of targets for privatisation. This finding here is the same as the finding derived from another privatisation variable (see (s3) model). To be specific, this screening strategy over state workers was particularly in evidence among coastal light manufacturing SOEs (see (m2), (r5) and (r6) models) – no doubt because of highly competitive market conditions.

There are two factors the direction of whose impacts changed over time.

The “cash cow” effect (over the factor of liability) is significant in the results for the early period in (s5) model, but is absent in the results of the latter period in (s7) and (s8) models. The impact of financial pressure even works in the opposite direction – the first-ever finding that supports the traditional assumption that privatisation is adopted to tackle liability burden. Consequently, more state workers were laid off for reasons connected with financial liability. However, this argument has quite limited applicability. Except here, there is only one finding with weak significance in light manufacturing (see (m1) model).

Next, as for firm size, its impact is found to have been positive solely in the results of the early period (see (s6) model). Inherent in this is the finding that the privatisation policy of “grasping the large” had particular relevance to SOE employees in the early years of privatisation reform. It seems clear enough that the underlying rationale was one of job protection. Other findings also suggest that this protective policy was particularly enforced in heavy manufacturing SOEs in inland provinces (see (o1), (o2), (r7) and (r8) models).

In comparing the time patterns between two privatisation proxies (i.e., dependent variables), two similarities that emerge are significant. One, there is no difference in terms of the impact of market competition. Two, as for local authorities’ behaviour, the targeting of privatisation on the basis on human capital resource endowments only occurred in the later stage of reform.

Meanwhile, there are also some significant *differences*.

In the early years, for example, the need to “grasp the large” was clearly a point of emphasis in determining the downsizing of state enterprises. Layoffs of SOE employees were controlled carefully in order to maintain social stability, especially among heavy manufacturing SOEs in inland provinces. It was also to the advantage of local bureaucrats, in terms of preserving more perks (patronage), to retain a larger

state sector. However, in later years, state workers were obviously less regarded as a “cash cow”, their role gradually changing to become a target for cost saving in order to relieve liability burdens. It seems to be a general phenomenon, although a weak one in light manufacturing.

Regarding infrastructural development, there is no doubt that the investment funds were mainly used for the maintenance of the state sector, but the spillover effect to the private sector grew significantly in later years, especially among manufacturing SOEs in coastal areas.

Finally, the “ice-pop” phenomenon mainly initially characterised SOEs, but its effect was gradually felt more strongly by SOE *employees* by the later years. This shift illustrates the changing demand for privatisation over time, particularly for SOEs in the mining or energy sector, where over time the focus of privatisation shifted from being efficient SOEs to efficient SOE employees.

In summary, we have sought to offer some answers to the time difference issue. First, from a policy perspective, the process of privatisation basically followed the relatively more efficient state assets, via the “ice-pop” phenomenon, although the policy focus gradually shifted from enterprise to the employee over time. Second, the benefits of infrastructural improvements were initially concentrated in the state sector, but latterly started to spillover into the private sector. Third, job security having initially been a major rationale of privatisation, its importance clearly declined in more recent years. Fourthly, in terms of the bureaucratic behaviour, as the privatisation reform process matured, so local strategies emerged. Local authorities, especially in coastal regions, began to screen out privatisation targets, especially in light manufacturing, in order – out of self interest – to retain control over SOEs with a stronger human capital resource endowment. Meanwhile, fifthly, as it matured, the pattern of privatisation returned to a more normal path. The “cash cow” phenomenon,

once prevalent among heavy manufacturing SOEs, gradually disappeared, as the need to reduce liabilities became one of the major incentives for privatisation.

Table 6.9

Empirical results by time.

| | <i>IndSOEUnitX</i> | | | | <i>IndSOEEmployeeX</i> | | | |
|-------------------------------|--------------------|---------------|--------------|--------------|------------------------|--------------|--------------|--------------|
| | Early | | Later | | Early | | Later | |
| | (s1) | (s2) | (s3) | (s4) | (s5) | (s6) | (s7) | (s8) |
| <i>Lag.IndSOEUnitX</i> | 0.163 * | 0.421 ** | 0.386 *** | 0.599 *** | | | | |
| | <i>0.085</i> | <i>0.212</i> | <i>0.095</i> | <i>0.143</i> | | | | |
| <i>Lag.IndSOEEmployeeX</i> | | | | | 0.396 *** | 0.237 * | 0.437 *** | 0.712 *** |
| | | | | | <i>0.088</i> | <i>0.127</i> | <i>0.113</i> | <i>0.078</i> |
| <i>IndNonSOEOutput%</i> | -1.206 *** | -0.460 * | -0.090 * | -0.100 | -0.082 | -0.739 ** | -0.208 ** | -0.191 # |
| | <i>0.210</i> | <i>0.271</i> | <i>0.052</i> | <i>0.108</i> | <i>0.194</i> | <i>0.290</i> | <i>0.103</i> | <i>0.133</i> |
| <i>IndAssetLiability%</i> | 0.438 ** | 0.605 * | -0.021 | -0.012 | 0.550 * | 0.208 | -0.095 # | -0.131 ** |
| | <i>0.197</i> | <i>0.365</i> | <i>0.048</i> | <i>0.063</i> | <i>0.321</i> | <i>0.542</i> | <i>0.064</i> | <i>0.059</i> |
| <i>IndConstructInvestX</i> | 22.730 *** | 24.000 ** | -0.050 | -0.763 ** | 25.805 * | 14.051 # | -0.035 | 0.061 |
| | <i>7.031</i> | <i>10.167</i> | <i>0.285</i> | <i>0.342</i> | <i>13.664</i> | <i>9.190</i> | <i>0.520</i> | <i>0.202</i> |
| <i>IndAssetOutpout%</i> | -0.353 *** | -0.157 | 0.000 | 0.015 | 0.258 | 0.021 | -0.040 # | -0.029 * |
| | <i>0.126</i> | <i>0.332</i> | <i>0.017</i> | <i>0.023</i> | <i>0.193</i> | <i>0.216</i> | <i>0.024</i> | <i>0.015</i> |
| <i>IndAveSOEEmployX</i> | -0.417 *** | -0.430 ** | -0.104 ** | -0.095 # | 0.255 | 0.487 ** | 0.034 | -0.099 * |
| | <i>0.155</i> | <i>0.204</i> | <i>0.044</i> | <i>0.059</i> | <i>0.181</i> | <i>0.219</i> | <i>0.076</i> | <i>0.060</i> |
| <i>IndLabourProductivityX</i> | 0.035 | 0.211 | 0.074 ** | 0.023 | -0.048 | -0.148 | 0.213 * | 0.162 *** |
| | <i>0.210</i> | <i>0.479</i> | <i>0.029</i> | <i>0.050</i> | <i>0.390</i> | <i>0.177</i> | <i>0.126</i> | <i>0.050</i> |
| <i>SoftBudget</i> | 0.018 | -0.106 | 0.014 | 0.006 | -0.196 *** | -0.225 ** | -0.006 | -0.044 |
| | <i>0.061</i> | <i>0.102</i> | <i>0.018</i> | <i>0.016</i> | <i>0.066</i> | <i>0.094</i> | <i>0.039</i> | <i>0.034</i> |
| <i>PoliticalIdeology</i> | 0.096 | 0.142 # | -0.002 | -0.065 | 0.166 ** | 0.297 ** | -0.050 | -0.040 |
| | <i>0.084</i> | <i>0.092</i> | <i>0.048</i> | <i>0.096</i> | <i>0.084</i> | <i>0.118</i> | <i>0.077</i> | <i>0.047</i> |
| <i>Decentralisation</i> | -0.119 *** | -0.145 ** | -0.021 | 0.008 | -0.014 | 0.069 # | -0.019 | -0.007 |
| | <i>0.043</i> | <i>0.059</i> | <i>0.026</i> | <i>0.028</i> | <i>0.044</i> | <i>0.046</i> | <i>0.045</i> | <i>0.017</i> |
| <i>Literacy%</i> | 2.014 *** | 0.447 | 1.492 ** | -0.354 | -0.393 | 1.111 | -1.018 | -0.505 |
| | <i>0.756</i> | <i>0.791</i> | <i>0.761</i> | <i>1.082</i> | <i>0.679</i> | <i>0.794</i> | <i>0.991</i> | <i>0.403</i> |
| <i>Industrialisation%</i> | -1.371 * | 1.333 | 0.052 | -0.204 | -0.176 | 0.545 | -0.194 | -0.099 |
| | <i>0.795</i> | <i>1.214</i> | <i>0.397</i> | <i>0.321</i> | <i>0.823</i> | <i>0.894</i> | <i>0.592</i> | <i>0.230</i> |
| <i>IncomePercapitaX</i> | 4.065 *** | 1.950 * | 0.450 * | 0.798 | -1.262 | -1.406 | 0.445 | -0.087 |
| | <i>1.330</i> | <i>1.140</i> | <i>0.273</i> | <i>0.642</i> | <i>0.976</i> | <i>2.238</i> | <i>0.420</i> | <i>0.443</i> |
| <i>LightDummy</i> | 0.637 ** | -0.087 | -0.506 *** | -0.150 | -0.077 | -0.224 | -0.325 * | 0.009 |
| | <i>0.318</i> | <i>0.252</i> | <i>0.147</i> | <i>0.143</i> | <i>0.342</i> | <i>0.537</i> | <i>0.177</i> | <i>0.117</i> |
| <i>HeavyDummy</i> | 1.060 *** | 1.097 ** | -0.457 ** | -0.174 | 0.433 | 0.925 ** | -0.207 | 0.154 |
| | <i>0.233</i> | <i>0.435</i> | <i>0.226</i> | <i>0.195</i> | <i>0.321</i> | <i>0.452</i> | <i>0.242</i> | <i>0.151</i> |
| Obs | 1503 | 1283 | 1760 | 1320 | 1503 | 1283 | 1760 | 1320 |
| Groups | 220 | 220 | 220 | 220 | 220 | 220 | 220 | 220 |
| Ave. periods | 6.83 | 5.83 | 8.00 | 6.00 | 6.83 | 5.83 | 8.00 | 6.00 |
| Instruments | 37 | 33 | 49 | 31 | 37 | 31 | 43 | 55 |
| AR(1) | 0.009 | 0.002 | 0.000 | 0.000 | 0.000 | 0.021 | 0.000 | 0.000 |
| AR(2) | 0.765 | 0.313 | 0.333 | 0.232 | 0.559 | 0.550 | 0.301 | 0.306 |
| Hansen | 0.152 | 0.300 | 0.213 | 0.230 | 0.633 | 0.674 | 0.130 | 0.335 |
| DIH-1 | 0.063 | 0.080 | 0.143 | - | 0.822 | 0.173 | 0.124 | 0.266 |
| DIH-2 | 0.631 | 0.682 | 0.525 | - | 0.375 | 0.979 | 0.307 | 0.532 |

Note: All regressions are dynamic panel-data estimations by two-step system-GMM with Windmeijer's finite-sample correction for the two-step covariance matrix. Intercepts and year dummies are included but values are not reported. Standard errors are in the italic. ***, **, * and # denote the significance level at 1%, 5%, 10% and 15%, respectively. The p -values are listed in the first and second order serial correlation tests, Hansen test and two Difference-in-Hansen tests.

Conclusion

The privatisation patterns discussed above are categorised in Table 6.10 below.

Table 6.10
Privatisation patterns by sector, region and time.

| Light manufacture | | Heavy manufacture | | Mining and Energy | |
|--------------------------|-------------------------|---------------------------------|---|----------------------------------|---|
| 1. | Competition-driven | 1. | Competition-driven | 1. | Ice-pop phenomenon |
| 2. | Infrastructure-driven | 2. | Policy-dominated | 2. | Policy-dominated by letting go of the small |
| 3. | Human capital protected | 3. | Cash cow effect | 3. | Competition-driven |
| 4. | Efficiency-seeking | 4. | Efficiency-driven | | |
| | | Early period (1994-2001) | | Latter period (2001-2008) | |
| Coastal area | | 1. | Competition-driven | 1. | Competition-driven |
| | | 2. | Policy-dominated by letting go of the small | 2. | Policy-dominated by letting go of the small |
| | | 3. | Cash cow effect | 3. | Human-capital-protected |
| | | 4. | Infrastructure-constrained | 4. | Liability-driven |
| Inland area | | 1. | Policy-dominated by grasping the large | 1. | Liability-driven |
| | | 2. | Infrastructure-constrained | 2. | Competition-driven |
| | | 3. | Cash cow effect | 3. | Infrastructure-driven |
| | | 4. | Competition-driven | | |

Note: Dichotomies – liability-driven vs. cash cow effect (by financial pressure variable in H5); infrastructure-driven vs. infrastructure-constrained (by institutional infrastructure variable in H6); efficiency-driven vs. ice-pop phenomenon (by economic efficiency variable in H7); policy-dominated by letting go of the small vs. policy-dominated by grasping the large (by firm-size variable in H8); human capital driven vs. human capital protected (by human capital variable in H9). And the competition-driven is examined by the market competition variable in H4.

From this table, we may draw the following general inferences:

First, competition is the chief driver of privatisation in all sectors, regions and time periods. The market-driven nature is the most striking featured that emerges from all the data. In almost all the results, the impact of competition manifests itself most strongly – the only exception being in some of the results from inland regions and some of mining and energy industries.

Second, the data highlight the dominant influence of *policy*. This makes itself felt in two ways. In the interests of job security, the privatisation process was driven by a

commitment to the central government's policy of "grasping the large". This was especially prevalent in heavy manufacturing in inland provinces in the early period. By contrast, in booming markets – especially in mining or energy in coastal provinces – the same process was shaped by implementation of the policy of "letting go of the small".

Third, privatisation patterns differ considerably between sectors. Thus, to give some of the more striking examples: (1) The "cash cow" effect was only prevalent in the privatisation of heavy manufacturing, not of other sectors. (2) As for the hypothesis that privatisation would be driven by efficiency considerations, this was clearly confirmed only in heavy manufacturing, where privatisation was used in order to improve the efficiency of SOEs. This contrasts with the other two sectors, in which the "ice-pop" phenomenon was prevalent, with valuable/efficient state assets being particularly targeted for release to the private sector.¹³⁴ (3) Considerations of human capital resources shaped privatisation in light manufacturing, in which they were targeted for protection. This strategy is absent in other sectors. (4) The influence of infrastructure was only significant in light manufacturing. (5) Finally, only in mining or energy industries, especially in inland regions, was the competition weaker than other factors.

Fifth, within the framework of centrally determined policies, local authorities formulated their own strategies. In some circumstances, local authorities took advantage of asymmetrical information to protect their own interests. This was especially evident in light manufacturing, where local bureaucrats were under pressure to release the more efficient SOEs to be privatised, but where they often retained enterprises with more favourable human capital endowments under state

¹³⁴ However, the evidence obtained through data for light manufacturing is not regarded as sufficiently convincing to confirm the ice-pop phenomenon.

ownership – a practice that was increasingly observable in coastal provinces in more recent years. This clearly demonstrates that there was a tension between adhering to central government policy and protecting local interests. The evidence suggests that local authorities did not dare to ignore central policy diktats, but that they used every opportunity to protect their own interests.

Sixth, there are some significant regional differences. The coastal pattern of privatisation was not the same as that of inland areas. (1) In both regions, privatisation was strongly shaped by policy considerations but with different points of emphasis. In inland areas, the pattern was one in which the “grasping the large” part of privatisation policy was emphasised in order to minimise the number of layoffs and preserve social stability. In coastal areas, however, against the background of a private sector that was more advanced and could more readily accommodate workers laid off from SOEs, the policy emphasis was on the “letting go of the small” in order to realise the full potential of privatisation by putting it to its utmost. (2) In terms of local strategies, coastal governments were more inclined to keep SOEs with more favourable human capital endowments in their own hands, especially in light manufacturing. Moreover, this tendency became more pronounced in recent years.

Seventh, the pattern of privatisation was not static but evolved over time. (1) In the early period, infrastructural investment was distributed in such a way that it consolidated the state sector rather than promoting the private sector. But subsequently the spillover effect emerged, and in later years, *privatisation* was facilitated by infrastructural investment. (2) The “cash cow” effect gradually weakened as the liability burden became a more important inducement to privatisation. This rent-seeking phenomenon gradually disappeared, enabling privatisation to follow a more ‘normal’ path. (3) In coastal provinces, local bureaucrats became more inclined to induce a screening strategy as privatisation took place. Light

manufacturing SOEs with more favourable human capital endowments were particularly targeted for retention. This strategy was a more recent phenomenon, and it may have been forced on coastal authorities, as the light manufacturing product market became more competitive.

Chapter Seven

Concluding Analysis – Privatisation with Chinese Characteristics?

7.1. General analysis

The first section generalises findings from both provincial and industrial datasets and identifies and summarises ten significant features of the privatisation process in China. The features are ranked by the strength of which they display.

1. *Policy-oriented dominance*¹³⁵

The first significant feature derives from the factor of firm size. My findings support the traditional causal argument that large-scale SOEs will generate more agency problems, increase transaction costs, and result in a slow pace of privatisation (Li, 2003, Ramamurti, 2000, Li et al., 2005). In China, the process of privatisation mostly began in the late 1990s with small-scale SOEs. My finding also confirms the success of central government policy – captured in the mantra “grasp the large and let go of the small” – a top-down privatisation guiding principle, to which local governments were strongly committed.

Yet, the details are more complex. The provincial data show that this size-screening strategy was more strongly emphasised in inland provinces. This regional bias is echoed in the industrial data, which suggest that the prevailing policy thrust helped preserve more jobs among inland large-scale SOEs in heavy manufacturing. The reason why the state focused its efforts on large enterprises was

¹³⁵ Refer to Hypothesis 8.

quite simply, to minimise job losses in order to maintain social stability – or what later came to be called to create a “harmonious society” (*hexie shehui*). By contrast, in coastal areas, small-scale SOEs in heavy industries (including heavy manufacturing, mining and energy) were more encouraged to pursue privatisation in order to fulfil the policy goal of reducing inefficiency. Our first conclusion is therefore that privatisation in China was strongly policy-driven, particularly among SOEs in heavy industries, which Chinese leaders regarded as “strategically important” (Hassard et al., 2007:96).

2. *Cash cow effect*¹³⁶

The next highly significant and consistent finding that emerges from both datasets is the cash cow (patronage) effect, which reveals the existence of a fundamental relationship between local bureaucrat and state enterprise. From a theoretical economic perspective, privatisation should be pursued for the good of the enterprise, but, in reality, in China it was more likely to be advocated in the interests of local people. Two incentives are likely to have explain this phenomenon: first, the patronage of local bureaucrats (Li and Xu, 2002); second, local bank managers’ fear of debt avoidance (Guo and Yao, 2005).

Provincial data indicate that this rent-seeking phenomenon was more likely to characterise local governments facing deficit problems (see (e3) and (e4) models in Table 5.7, (j4), (j5), (j8), (j9) and (j11) models in Table 5.9). Industrial data further show that it was particularly prevalent among SOEs in heavy manufacturing (see (n1) and (n2) models in Table 6.5).¹³⁷ The regional analysis finds no difference among

¹³⁶ Refer to Hypothesis 5.

¹³⁷ It is noteworthy that in the provincial data, this effect is absent in respect to the liability problem for SOEs; instead, the effect turned out to be liability-driven (see (e2) and (e6) models in Table 5.7). This phenomenon corresponds to the absence in the industrial data of the cash cow effect among SOEs engaged in light manufacturing (see Table 6.4).

localities, while the temporal analysis shows a declining trend. The message is crystal clear: the once-prevalent rent-seeking behaviour became more effectively controlled over time, whilst the liability effect grew steadily more pronounced. In other words, more privatisation programmes were caused in the face of the orthodox business concerns of tackling soaring liabilities among SOEs. In short, it is the weakening of the cash cow effect that makes Chinese privatisation so different from that of other transitional economies.

3. *Distinctive regional characteristics*

Marked regional gaps appear in a number of variables in the preliminary analysis of provincial data (see Table 5.4). Inland governments suffered more from deficit burdens, as well as a more severe and quicker process of shrinkage in soft budgets and credits. By contrast, coastal governments experienced an earlier shift of attitude in favour of market-oriented reforms; enjoyed stronger autonomy in terms of local finance; and, in consequence, acquired a more competitive and outwardly-open product market and were more effective in upgrading their institutional infrastructure. However, the absence of relevant provincial data makes it econometrically impossible to explore this regional gap in greater detail.

Fortunately, the larger industrial dataset permits a more in-depth investigation. It finds that privatisation in coastal China focused especially on the “letting go of the small” aspect of policy in order to maximise the impact of reforms. In contrast, in inland China the main focus of policy was on “grasping the large” in order to preserve as many state jobs as possible and maintain a harmonious society. Our analysis further indicates that coastal governments tended to apply a screening strategy that was more protective of local than of central interests in the selection of privatisation targets. In

addition, the overall process of privatisation in coastal regions appears to have corresponded more closely with the pace of market development.

4. *Screening strategy of human capital*¹³⁸

In screening the human capital endowments of SOEs, a strategically strong behavioural thrust is widely identified at the local level.

In general, based on provincial data, our findings show that a strong human capital tended to facilitate privatisation (see (i2), (i6), and (i8) models in Table 5.8 and (j7), (j8), and (j9) models in Table 5.9), as other studies have suggested (Li and Rozelle, 2000, Li, 2003, Brandt et al., 2005).¹³⁹ Meanwhile, the findings generated by the industrial data point to the practice whereby that local bureaucrats sometimes used the selection to keep those SOEs with better human capital endowment under their control. Evidence of this is particularly clear from recent cases involving light manufacturing SOEs in coastal provinces. This finding corresponds to Table 5.4, which implies that the misappropriation of profits is a problem that has been more prevalent in coastal provinces.¹⁴⁰ Both facts suggest that, compared with their inland counterparts, coastal bureaucrats were more likely to take advantage of privatisation to defend local interests.

This finding also importantly illuminates the issue of information asymmetry. Since the quality of the endowment of a firm's human capital can not be fully known to by outsiders or potential investors, local bureaucrats have an information advantage in terms of their superior knowledge of a firm's real condition. They thereby occupy a

¹³⁸ Refer to Hypothesis 9.

¹³⁹ In the analysis of the industrial data, this finding holds for SOEs engaged in heavy manufacturing (see Table 6.5).

¹⁴⁰ This phenomenon is implied by the divergent performances of two efficiency measurements in the coastal data, where outstanding productivity is not consistent with moderate profitability. Please see the more detailed discussion in Section 2.2, 4.1 and 5.2.

position that allows them to gain an advantage by manipulating asymmetric information. Local interests, after all, frequently conflict with central interests – a problem that characterises China, where such friction is especially intense.

In short, the overall view at the provincial level supports the theory of human capital whereby the improvement of which will facilitate privatisation. Further examination, however, suggests a screening strategy that has favoured local interests. This pattern of behaviour is found to have been highly selective and prevalent only in specific industries, regions and periods. This may explain why such behaviour is concealed in the provincial data.

5. *Clear soft budget constraint among regions*¹⁴¹

Kornai's (1979) classic argument about the constraining effect of soft budget on public-ownership/privatisation is supported by evidence by China. All results derived from the provincial data are highly significant and consistent (see (a1) and (a7) models in Table 5.6 and (j2), (j3), (j8) and (j9) models in Table 5.9), indicating that this factor was far more decisive than the other two factors political economy factors – ideology and decentralisation – in explaining provincial-level privatisation in China.¹⁴²

In China, the nationwide shrinkage of soft (government) budgets and (bank) credits got under way in the late 1990s. Inland governments were hit harder than coastal governments, as their subsidies and loans shrank more rapidly. This reduction

¹⁴¹ Refer to Hypothesis 1.

¹⁴² It should be noted here that, because of the lack of relevant information, the author was unable to use the industrial data to test this variable. Instead, the variable has been used as a control variable in all regressions based on the industrial data, as analysed in Chapter Six. However, the estimated coefficients derived from industrial data should not be compared with those generated by the provincial data in Chapter Five, because the former results are simply not sufficiently robust to challenge the latter.

of soft budgets helped considerably in removing the constraints on SOEs, and, as expected, it was a major cause of privatisation of the state sector. Yet, this effect is found to have been lessening during the reduction of soft credits. This is probably because the reform to tighten soft credits was pursued on a more moderate scale and at a slower pace, compared with the cutting of soft budgets. Thus, this finding offers further evidence that is strongly echoed in some of the existing literature on China (Guo and Yao, 2005, Li and Rozelle, 2000, Li, 2003, Brandt et al., 2005, Lin and Su, 2008, Cao et al., 1999, Huyghebaert and Quan, 2009).

6. *Strong competition effect on industries*¹⁴³

In terms of the competition effect, the strength of the results differs according to which of the two datasets is used. The findings derived from the provincial data are much weaker than those generated by the industrial data. Only two provincial-level regressions are identified with low significance, while none is found in the PCA test (see (d1) and (d3) models in Table 5.7 and (j4) and (j5) models in Table 5.9). Yet, the industrial-level regressions suggest that the competition factor was the most significant driver, including (more importantly) across all four sectors.

This comparison suggests that the intensification of competition had a more marked impact on specific industries, rather than on specific regions, in driving privatisation in China. It further suggests that factors embedded in arguments about competition – such as agency costs, market failures and the comparative advantage of government ownership (Ramamurti, 2000, Li, 1996, Guo and Yao, 2005) – are likely to have been more pronounced among industries than regions.

An even more important message is that the channel by which increasing

¹⁴³ Refer to Hypothesis 4.

competition encourages an enterprise to pursue privatisation is mainly industrial, not regional. This industrial channel further explains the nature of the expansion of privatisation, which spread as a response to changes taking place among upstream and downstream enterprises or industries, rather than events unfolding in adjacent regions undergoing market reform.

This finding challenges the view of some current literature that attributes the diffusion of privatisation to the increasing inter-regional competition (Li et al., 2004). It further lends strong credence to the ‘uncertainty argument’, which states that the information advantage (obtained through reduced uncertainty) will help the middleman (i.e., someone whose upstream and/or downstream sector has already been privatised) to privatise more SOEs in neighbouring industries (Glaeser and Scheinkman, 1996). In short, it is no exaggeration to suggest that privatisation in China has been strongly driven by rising competition, but only (according to current evidence) among industries.¹⁴⁴

7. *Ice-pop effect on specific industries*¹⁴⁵

The ice-pop effect points to the existence of a negative correlation between the growth of enterprise efficiency and the incidence of privatisation designed to protect state assets (Guo and Yao, 2005). Results in support of this assumed causality are found several times in the two datasets, although not all of them are equally convincing and supportive.

Results derived from provincial data show a negative correlation between the

¹⁴⁴ This also echoes Aussenegg and Jelic’s argument that the industrial classification should be associated with government’s choice of privatisation; see AUSSENEGG, W. G. & JELIC, R. (2007) The operating performance of newly privatised firms in central European transition economies. *European Financial Management*, 5, 853-879.

¹⁴⁵ Refer to Hypothesis 7.

reduction of SOE employees and improved efficiency among SOEs (see (g6) and (g8) models in Table 5.8). Yet, these cases are not sufficient to uphold the ice-pop argument. A simple reason is that the state derives no benefit from state employees laid-off during privatisation, who on the contrary become a heavy burden in terms of their claims on social welfare.¹⁴⁶ Nor are results derived from industrial data showing the same correlation among light manufacturing SOEs convincing (see (m1) and (m2) models in Table 6.4). This is because, thanks to intense competition in this sector, buying out an inefficient SOE in need of restructuring will be less attractive than creating a new efficient private company – assuming that getting an entrance ticket to light manufacturing markets is the main goal for a private investor, especially while the ticket is cheap (i.e. the entrance cost in light manufacturing is low). The phenomenon found here may embody a market explanation: namely that in a highly competitive market such as light manufacturing, local bureaucrats may be compelled to release efficient/valuable SOEs to the privatisation market in order thereby to attract more potential private buyers.

By contrast, results derived from highly monopolistic markets such as mining and energy industries, convincingly endorse the existence of the ice-pop phenomenon (see (p1) and (p2) models in Table 6.6). The underlying reasoning is that because of the high entry barrier for newcomers, buying out a monopolistic share in the market is a sufficient motivation unto itself. There is no need for local bureaucrats to forfeit strongly performing and/or efficient monopolistic SOEs, because private buyers eager to join this monopolistic market will be happy to buy less efficient targets. The contradictory behaviour among local bureaucrats allows therefore for the possibility that they may do, as the ice-pop argument suggests, to prevent the melt-down of

¹⁴⁶ The basic assumption behind the ice-pop argument is that privatisation of efficient/profitable SOEs will generate higher tax remittances for the state.

valuable state assets during privatisation reform, especially in Chinese mining and energy industries. Though not prevalent, this effect gains concrete evidence from data of this sector.¹⁴⁷

8. *Evolutionary process*

This research has identified another important feature of Chinese privatisation: namely, that its dynamics are not static, but evolutionary. Time itself is a significant factor introducing fundamental changes to other factors.

First, time has witnessed a change in the dynamics of privatisation from an infrastructure-constrained pattern to an infrastructure-driven one (see Table 6.8). In the early years, the distribution of infrastructure investment was used as a tool to consolidate the local state sector. But, in later years, such funds were used for the establishment of infrastructure in whose benefits the local private sector was able to share. More impartial public spending created a relatively more friendly environment for private investors and thus facilitated privatisation.

Secondly, the liability impact of privatisation was transformed from a constraint into a stimulant. This change indicates that the cash cow effect disappeared or became insignificant in later years. Rent-seeking behaviour among local bureaucrats seems to have been considerably reduced after the implementation of banking reform, which encouraged and enabled the banking system to perform in a more commercially-oriented manner that led to a significant diminution in soft credits. Initially, privatisation was a policy by central government on local authorities (however selfish and recalcitrant they may have been towards the policy initiative).

¹⁴⁷ It is noteworthy that the low incidence of this effect in the industrial data may help explain the absence of significant results in the provincial data.

Yet, as they became increasingly responsible for their balance sheets, in later years local governments began to use this policy as a tool to tackle the liability problems of SOEs.

Third, a screening strategy over human capital emerged. Local bureaucrats, on occasions, became much keener to pursue self-interests when selecting privatisation targets. There was a growing tendency, when privatisation reform reached a more mature stage, for local bureaucrats to take advantages of the information asymmetry. This selective behaviour helped them to keep those SOEs with better endowments of human capital in their own hands.

In short, all these findings reject any suggestion that privatisation in China was an unchanging policy. The reality is that over time it changed markedly.

9. *Multi-level induced dynamics*

The final feature points to the process of privatisation as a process of multi-level induced dynamics, which is one of the most important characteristics of Chinese privatisation. If there is a single message delivered by this research, it is that there is no master theory, unique hypothesis or single factor that can fully account for the entire process. Each factor may have been significantly influential, but only within specific industries, in a specific region, and/or during a specific period of time. It is in this sense that privatisation in China may be regarded as a dynamic process induced by various factors over time.

Through different lenses different pictures emerge. Through the lens of the provincial-level analysis, political factors are particularly to the fore. Softness of the budget system, commitment to the central policy, and fiscal burden are major factors.

Market-related factors are clearly less influential in this regional comparison. However, after political factors controlled (in the industrial-level data), market impact becomes particularly outstanding in investigation. The competition factor turns out to be the strongest driver among all industries.

Above all, there is no fixed ranking in terms of the influence for the various factors. The influence of each factor differs by industry, region and time period. China's privatisation path reflects in varying degree of the impact of policy, markets and competition, enterprise conditions and bureaucratic interests. The incidence of privatisation is, therefore, an outcome that is multi-level induced, evolutionary over time, and embedded to a specific context.

7.2. The story of Chinese privatisation

From the perspective of this research, this section gives a brief overview of the origin and development of the privatisation process in China during the past two decades.

Before privatisation

Privatisation in China may be seen as the climax of a series of efforts, beginning in the early 1980s, to enhance the security of government revenues through the reforms of state enterprises.

The first round of such reforms sought to increase the autonomy of enterprises. Reformist leaders' intention in setting up a new profit distribution system was to make enterprises accountable for their performance, in order thereby to relieve the heavy financial burden on government shoulders. In pursuit of this goal, the role of

'enterprise manager' was divorced from the role of 'government official' and the manager's pre-eminent role became that of maximising enterprise performance. Centrally planned prices were also loosened through the introduction of a dual-track system, which allowed the emergence of a profit margin. This policy was soon found to be misplaced, as undesirable outcomes emerged. Since the level of profit-delivery was negotiated on a firm-by-firm basis, updated on the basis of fixed short period, this profit-sharing system actually created negative incentives that punished the growth of efficiency and encouraged a race to the bottom. The central government's response was to try to replace it with a new tax-for-profit system. In the event, the first two waves of tax reforms quickly failed. Meanwhile, the effort to replace free government appropriations by repayable bank loans – an initiative designed to relieve the fiscal burden of the central government, as well as to reduce opportunist behaviour by local governments – also proved to be a failure. Due to the lack of an effective mechanism to force enterprises to repay loans, the accumulation of non-performing loans grew rapidly and left a serious problem of 'triangular debts' among enterprises and banks.

It seems clearly that the failure of the first round of reforms intended to secure for the government a share in profits was rooted in the problem of information asymmetry in the profit-sharing system. Accordingly, the second round of reforms was designed to overcome the problem of information disadvantage for the government. The new Contract Responsibility System, in fact, cared nothing about how much profit was retained by enterprises, but merely required enterprise managers to guarantee a fixed amount of profit-delivery and taxes on the basis of a negotiated contract. A further requirement was that wages and bonuses were linked to the profits in order to stop prevalent misuses and abuse. This system was expected to turn around the declining trend of government revenue. Yet, the reality was that it led to another serious problem – namely, the emergence of a debt crisis. The origin of this lay in an

institutional failure generated by the new system, which encouraged state enterprises to over-report profits and hide losses. This problem was amplified by the behaviour of state banks, which acted like state agents granting loans through fiat. The outcome was to turn bank credits into cheap commodities, as a result of which these soft credits encouraged state enterprises to shower bad/inefficient projects or fund opportunist activities with cheap money. Furthermore, state banks were trapped by a kind of ‘hostage effect’ in that they could not stop funding loss-making state enterprises without risking losing all their money (capital and interest). As a result, the government revenue was – ironically – secured at the expense of the banking sector being pushed to the edge of bankruptcy.

It was inevitable and unavoidable that the third round of enterprise reform sought to cope with this debt crisis through efforts to adjust the management structure within enterprises. The management of state-owned enterprises (SOEs) was separated from government ownership through a new reform initiative – that of corporatisation. More new types of non-state ownership were created. The responsibilities of social provision previously carried on SOEs’ shoulders were largely removed. A new auditing and monitoring system was established in an attempt to reduce opportunist behaviour by managers. SOE ‘managers’ were no longer government ‘officials’, whilst state workers were also transformed into ‘state employees’ by a labour contract no longer based on lifelong employment. A modern market-oriented enterprise system emerged after these and other efforts to clarify property rights and diversify ownership types. Unprecedented autonomy, granted to SOEs, also facilitated a significant reduction in monitoring costs. Yet, the desired outcome still proved elusive. The looked-for reversal in the previous declining trend in profitability was not forthcoming: indeed, the number of loss-making SOEs grew even more rapidly. For the third time, enterprise reform had proved a failure.

From such perspectives, the reform of Chinese enterprises seemed to be trapped in a vicious circle: whenever a new policy was introduced, a new and even more severe problem had rapidly emerged. When enterprise reforms were first unveiled, the Chinese government wanted to stimulate enterprise performance by introducing a profit retention system; but the outcome was a contraction in government revenue. Thus, the second round of reform changed the strategy of profit distribution in an attempt to secure a guaranteed stake for the government. Unfortunately, however, the financial burden was merely transferred to state banks, leading to an even more severe problem in the form of a debt crisis. In the third round of reforms, therefore, the government sought to cut its ties with enterprises so as to make them more financially independent and more accountable for their performance. Yet, once again, the outcome was a rapid rise of loss-making SOEs in nearly all industries. It seems reasonable to conclude that, after all these reform failures, privatisation had become inevitable.

To sum up, several pressure points jointly triggered a nationwide reform of industrial ownership in China: rising competition in the product market caused by the rapid growth of local non-state economic actors, the deterioration of financial conditions facing the central government, the reduction of soft budgets and credits for local governments, a new regulatory policy fostering a commercial banking sector, and a shrinking space for the rent-seeking behaviour by SOE management.

During privatisation

The general idea that the privatisation in China is more focused on coastal provinces and in light industries is contradicted by available empirical evidence. The incidence of privatisation was, in fact, more equal than that is widely believed.

Privatisation was pursued as a nationwide policy in all but a few provinces and industries.

Concealed in this general finding is the most significant feature of this empirical study – the fact that the process of privatisation in China has been dominated by the central policy of “grasping the large and letting go of the small”. The “grasping the large” element on the strategy has had particular applicability to employees engaged in heavy manufacturing industry in inland provinces, while “letting go of the small” has impacted especially on heavy manufacturing, mining and energy activities in coastal provinces. For the central government, the social issue of job security has apparently been weighted against the parallel urgency of SOE privatisation. Meanwhile, efforts to reduce soft budgets and credits have also been major motivations for reform. The increasing heavy financial onus carried by local governments has also encouraged localities to seek more effective ways of reducing such burdens.

More importantly, this top-down driving force has been conjoined with a bottom-up stimulus – the impetus of market competition. Rising competition in the product market has undoubtedly been a powerful driver of privatisation among SOEs in all sectors of the economy. This competitive pressure has been transmitted through industrial channels, while the vehicle of the diffusion of privatisation has been related industries rather than neighbouring regions. There is an unequivocal underlying message: that the fundamental orientation of privatisation in China has also been that of the market.

The pattern of privatisation has differed between inland and coastal regions. Inland bureaucrats appear to have been more conservative in the efforts they have made to protect state employment. By contrast, perhaps because of the existence of more highly developed market conditions, coastal bureaucrats have been keener to

pursue policies designed to protect local interests.

A strong cash cow effect appears in the basic relationship between SOEs and their local official supervisors. Privatisation, in some industries, is not primarily a tool to serve the interests of local finance, but rather a channel for eliciting the interests of patronage-seeking bureaucrats or risk-averse bank managers. Some local bureaucrats have also benefited from information not available to others and kept for themselves more valuable state assets, such as SOEs with better-than-average human capital endowments (especially in light industries). However, the ice-pop effect has generated contrary evidence in heavy industries, where more valuable/efficient SOEs are more likely to have been sold to private buyers.

Above all, the whole process of Chinese privatisation appears to have been evolutionary, with the dynamics jointly induced by multi-level forces. The pattern of privatisation demonstrates significant changes over time. The strength of impact of various factors – economic and political operating at micro and macro levels – differs depending on the region, industry, or time period under consideration.

In sum, Chinese privatisation has been constrained by the political economy context in which it has taken place, propelled by macroeconomic developments, and screened by microeconomic conditions. Its origins were policy driven, but its outcome was market-oriented. Rent-seeking management is in decline. Public resources are spilling over to the private sector. The individual condition of respective SOE becomes crucial to the privatisation decision. In short, the overall pattern of Chinese privatisation is moving back to the orthodox track advocated by mainstream economics.

7.3. Concluding remarks: Privatisation with Chinese characteristics?

‘Chinese characteristics’ is not a term that has an unambiguous definition, but it has become the almost universal touchstone for capturing China’s developmental ethos. It is a truism, but also an important truth that China is too big to accommodate any simple theory. It would seem that the most distinctive feature of China is its ability to embody a plethora of ‘characteristics’. For example, for decades we have been familiar with the term ‘socialism with Chinese characteristics’. Sometimes too one encounters terms such as ‘capitalism’ or ‘democracy’, which (according to some) are also supposed to have their own ‘Chinese characteristics’. Even such contemporary phenomena as ‘google’, ‘e-bay’, or ‘facebook’ have their Chinese counterparts. As a researcher of Chinese privatisation, therefore, I feel compelled to ask the same question: is there a phenomenon that might be referred to as ‘privatisation with Chinese characteristics’? In these concluding remarks to my research analysis, I try to find an answer to this question.

We might begin by acknowledging that some characteristics of Chinese privatisation are similar to those that are highlighted elsewhere in the literature.

- First, the constraining effect of soft budgets on privatisation in China in the late 1990s is very similar to that of the United States a decade earlier (LopezdeSilanes et al., 1997). This would seem to indicate that decision making in the public sector – no matter whether it is in a highly developed country like the U.S. or a developing country in transition such as China – is highly sensitive to the changes of budgetary changes. China is no exception to this principle.
- Second, China is also no exception to the likely impact of competition. As empirical investigations have shown in dozens of countries during the 1980s and 1990s (Li and Xu, 2002, Plane, 1997, Bortolotti et al., 2003), in China

too rising competition in the product market as a result of a booming private sector has accompanied by the contraction of its state sector. This effect is further identified in my research as the strongest driving force in diffusing privatisation within and among neighbouring industries, although as an explanation of regional differences in privatisation behaviour, its impact is less clear.

- Third, the infrastructure driver identified in some manufacturing industries in later years lends further strong support to the transaction cost argument in privatisation theories (Alexeev and Kaganovich, 2001, Li et al., 2005). It also casts new light on the limited literature that sought to highlight the stimulus of infrastructure in mid-1990s China (Li et al., 2004).
- Fourth, the strong tendency towards the dominant role of policy in guiding the privatisation process, particularly in regard to firm size, is quite consistent with the successful privatisation reforms of the Czech Republic, Hungary, Poland and Argentina (Aussenegg and Jelic, 2007, Clarke and Cull, 2002).

Some characteristics in China, nevertheless, were extraordinary.

- Surprisingly, privatisation in China has not been noticeably ideology-driven: it did not reflect either a sudden change in domestic political alternation or an imposed solution by foreign powers. Nor was it a Machiavellian-type privatisation (i.e. using privatisation as a strategic policy to retain political power) (Biais and Perotti, 2002). Such features have made the pattern of privatisation in China quite distinctive, compared with that of the U.S, Argentina and many other transitional countries (Li and Xu, 2002, Clarke

and Cull, 2002, LopezdeSilanes et al., 1997, Bortolotti et al., 2003).

- Chinese privatisation has clearly not been driven by a decentralisation dynamics, nor by the emergence of so-called “Chinese federalism” (Qian and Roland, 1998, Qian and Weingast, 1997, Cao et al., 1999).¹⁴⁸ Increasing local autonomy (especially its implications for local financial self-sufficiency) made only a limited contribution to privatisation.
- Third, the shrinkage among local state sectors has not been directly triggered by rising financial stringency (Yarrow, 1999, Ramamurti, 2000). This finding makes China unique compared with other instances of privatisation in the world (Clarke and Cull, 2002, Ramamurti, 1992, Plane, 1997, Bortolotti et al., 2003). On the contrary, the cash cow effect throughout Chinese privatisation is a situation very similar to the prevalent corruption seen in the privatisation of telecommunication sector in many less-democratic countries (Li and Xu, 2002).
- The ice-pop effect on the efficiency of public firms (Ramamurti, 1992, Clarke and Cull, 2002) is a phenomenon that has only rarely been witnessed in other countries. Admittedly, it has not been widespread in China, merely affecting some mining or energy SOEs. Interestingly, this phenomenon has a precedent in the Czech Republic, where the focus of the first wave of privatisation in 1992 was the more efficient state enterprises (Gupta et al., 2008).
- The Chinese example of the screening of human capital is also unique in the literature. This factor has not previously been examined in the context of countries in transition. The increasing prevalence of this local strategy is

¹⁴⁸ This effect is significant only if it is separated into two individual factors – market competition and soft budget constraint – and being considered respectively; otherwise, this argument is not supported by any concrete evidence.

one of the most characteristic features of privatisation in China.

- The final feature relates to regional differences. One might argue that privatisation in China was less a national achievement than an agglomeration of achievements of many “little China” – i.e., many regional components of the whole. Local governments made unique and critically important contributions to the overall process of privatisation. In some cases and at some times, they lent valuable assistance; at others, they were the source of strong resistance. There were regional variations in local enforcement, as there were also in local strategies. In short, regional variations were remarkable in both their richness and scope.

Overall, privatisation in China appears to have been more multi-dimensional than in other transitional economies. It not only reflected a centrally-determined national policy, but was played out as a drama in which the principal actors were the central reformers, local bureaucrats, enterprise managers, bank lenders and private investors. Privatisation was not the optimal choice for all players at all times, but the interests of any given group of players (especially those able to take advantage of informational asymmetries) meant that it was variously promoted or resisted. The process of privatisation was also evolutionary, in accordance changing contextual conditions. Its dynamics adjusted gradually, but steadily from that of a top-down policy-enforced process towards one that was more bottom-up and market-induced. The basic relationship between local bureaucrats and enterprise managers was thereby reshaped, and their interests become more closely aligned. In short, the dynamics of the privatisation movement reflected a balance between different forces operating at different levels. It was not driven by a single factor, nor did it adhere to coherent and consistent pattern of evolution. The decision whether or not to privatise was

determined by the nature of the balance among multi-level forces, given the conditions prevailing at a particular point in time.

Thus, in answer to the question, “Is there such a phenomenon as ‘privatisation with Chinese characteristics’?” We would respond both affirmatively and negatively. The answer is negative in the sense that the Chinese experience does not wholly contradict theoretical orthodoxies as outlined in many current economic textbooks. To a significant extent too, the path followed by China is not dramatically different from that trodden by other countries (both developed and developing). At the same time, the answer is also affirmative because of its embodiment of characteristics that have not yet fully conceptualised in the mainstream literature. In terms of its ‘game’ nature, its regionally and industrially fragmented trajectory, its evolutionary process and its multi-level dynamics, it has followed a uniquely Chinese path of privatisation.

7.4. About this research

Contributions

The final section of this chapter demonstrates possible contributions to the privatisation literature. They are categorised in terms of their contributions to empirical and evidentially-based analysis, theory and methodology.

This research adds to the existing literature by making available new empirical evidence:

1. It is the first piece of evidence, *based on macro-level (provincial) data*, which supports the classic argument concerning the role of the soft budget constraint.

The rest existing relevant evidence in the literature is wholly derived from

firm-level data. Extending the scope of empirical analysis and evidence serves to underline the validity of the results.

2. It throws new light (through the introduction of a new variable) on how to measure the ideological component of China's marketisation trajectory. Official registers of private ownership, especially in the early 1990s, fails to reveal the reality of conditions at that time. This deficiency can, however, be turned into an advantage by using the relevant data to represent the strength of ideological control over the development of the private economy. Although the regression results point to this factor having a rather limited impact, it is possible to use the statistics as a proxy measure of the strength of ideological change taking place in China, even in circumstances, such as other transitional economies have encountered, in which no major domestic political realignments have taken place nor any pressures been brought to bear from external organisations.
3. This research is the first of its kind to provide empirical analysis of the decentralisation (Chinese-style federalism) argument, thanks to the use of another newly-designed variable. It suggests that decentralisation is not only the combination, as it is in current literature, of soft budget constraint and competition effect. Rather, it proposes that it can and should be measured independently, for example, through the prism of increasing local autonomy. The results show that the decentralised fiscal power does sometimes encourage the spread of privatisation, even if in most cases its impact is less decisive than that of other factors.
4. My research contributes to the literature by setting out strong and concrete evidence in favour of the competition impetus toward privatisation. This finding also pushes China into the mainstream school of privatisation studies. Furthermore, it is the first research of its kind to confirm the validity of the

Chinese variant of the federalism argument (in which, as it is in the literature, intensifying competition together with the hardening soft budgets represents the process of federalisation).

5. In terms of the widely advanced argument about financial stringency as a driver of privatisation, the findings of this research contradict the mainstream literature (some of it based on Chinese data). For the first time, evidence is offered in favour of the cash cow argument, with the implication that rent-seeking behaviour has been prevalent among Chinese SOEs.
6. The infrastructure-driven impact on privatisation is confirmed, though not universally. This result echoes Li, Vertinsky and Zhou's first finding in 2004, and endorses the theory of transaction cost. However, results derived from provincial data are less convincing, and to this extent weaken arguments about the impact of institutions on privatisation.
7. The mainstream argument relating to the role of efficiency is echoed in this research. That is, in some industries privatisation in China did begin with less efficient SOEs. Yet the results also suggest an alternative argument that points to the existence of an ice-pop effect in some industries, with privatisation focusing on *more efficient* enterprises. This is the first time that this phenomenon – first and uniquely identified by Guo and Yao's (2005) – has been confirmed.
8. In terms of the size factor, my research echoes the findings of previous studies and/or those that are implicit in current theories. Nevertheless, the results here offer the first econometric evidence in favour of the success of Chinese central government privatisation policy – namely, to “grasp the large while letting go of the small”. Also significant is the finding that the size factor had different effects on different industries.
9. Three new variables have been designed to measure changes in enterprises'

human capital endowments. Through the use of these variables, this research is unique in extending the pioneering work of Li *et al.* (2003).

As for the theoretical literature on privatisation, this research lends unambiguous and consistent support to the following theories:

- (1) the soft budget constraint argument in the literature on economics of shortage;
- (2) the competition argument in agency, property rights and traditional competition theories;
- (3) the cash cow argument in rent-seeking theory;
- (4) the firm size argument in agency and transaction cost theories; and
- (5) the human capital argument in the agency theory.

The inference of these theoretical contribution is that privatisation in China has been shaped by several drivers operating at the political economy, macroeconomic and microeconomic levels.

Some theories are, however, challenged by my research findings. Thus:

- (1) The results provide some evidence in support of the Pareto argument in traditional efficiency theory, although this is contradicted by the ice-pop phenomenon, which justifies the incentive theory. The inference we draw is that, in some circumstances, pursuit of enterprise efficiency may be seriously distorted by bureaucratic self-interest.
- (2) There are also two elements to the 'infrastructure effect'. The reduction of transaction costs through as a result of infrastructural improvements has not

necessarily benefited the private sector. In some cases, such improvements were used to consolidate the state's control, rather than to promote private business.

- (3) This research, meanwhile, lends only weak support to the 'Chinese federalism argument', which is represented by an independent variable focusing on changes in local financial capabilities, rather than a collective variable incorporating competition and budgetary factors.
- (4) The popular 'financial stringency' argument is seriously challenged by the findings of this research in respect to China, according to which privatisation did not apparently take place under heavy financial pressure. This makes China's experience very distinctive in the comparative context of studies of other transitional economies.

As for methodology, this research offers the first systematic review in the literature on privatisation in China. My hope is that through this contribution this study will be a foundation stone for future meta-analysis of Chinese privatisation. The research embodied in this thesis generates a dynamic framework in which privatisation can be studied through multi-level determinants – a framework that can be used as a platform to facilitate deeper cross-country analyses. China's privatisation experience can thereby be more readily compared and with that of other countries. The newly-developed econometric methodology utilised in this research is one of only few in the literature that effectively overcome the problem of endogenous bias – a critically important issue in a dynamic regression model. This promises to facilitate further quantitative research. In particular, we would draw attention to the higher level of data which have been used in this research and which have made it possible to extend the analysis into areas (especially those relating to the political and

macroeconomic factors shaping privatisation) that firm-level data cannot reach. Lastly, by introducing some newly designed political and institutional variables to the literature, this research will facilitate future research into privatisation.

To conclude, this empirical research is a *critical* work, especially in terms of structural arrangement. Its starting point is a rejection of mainstream theories of economic transition and an attempt to challenge some of the arguments that have gained the most currency in existing studies of privatisation in China. From my own perspective, the start of the research was a mainstream question (i.e., “What is the driving force of privatisation in China?”), but it has ended up with an alternative answer (i.e., “There is such a phenomenon as ‘privatisation with Chinese characteristics’.”). The methodology is generated from that that available in the existing literature, to which, however, new contributions have been made. The results of the research in this thesis are all derived from quantitative analysis, but their implications throw new light on qualitative aspects of study. In short, this study is econometrically conservative, but offer critical new economic insights.

In sum, this research adds to our understanding of privatisation in China by highlighting its enormous complexity, captured in its dynamic, evolutionary, multi-level induced, regionally and sectorally diverse nature. It has also shown privatisation in China to have been policy-driven as well as market-induced, top-down as well as bottom-up in its approach, embodying a combination of centrally planned and local strategies, and of liability-driven and patronage-constrained forces. It is shown to have been driven by considerations of efficiency (but with protection from an ice-pop outcome), of competition, of infrastructure, and human capital. It has been shaped by sometimes compliant, sometimes selfish local bureaucrats and by profit-making by also rent-seeking behaviour by SOE managers. Contained in this enormous complexity is the critically important finding that privatisation in China has

not followed a uniformly consistent path, and that the various elements listed above serve to characterise different privatisation trajectories, applicable to different circumstances in different regions of the country at different times.

Limitations

There are of course some inevitable limitations to this research, mainly caused by the limited availability of data.

The first limitation relates to the lack of sufficient data for variable selection. In such large-scale datasets as the two used in this study, a feasible criterion for inclusion of a hypothesis variable should be the existence of a balanced panel and full comprehensive panel of data. Fulfilling this requirement is a major and sometimes critical challenge to the Chinese statistics that are available. Some statistical items widely adopted in other countries' national statistics simply do not exist in China's case. Alternatively, some items are listed, but not reported and defined in a consistent manner. This problem considerably reduces the number of potential candidates for inclusion as feasible variables, and exacerbates the difficulty of making comparisons between China and other countries. However, I have endeavoured to make the best selection possible from the data that are available data, and I am confident that, in terms of variable design, this research is in no way inferior to other similar quantitative studies of Chinese privatisation.

Second, comprehensive data coverage of the industrial sector in all Chinese provinces is lacking. In nearly half of China's 31 provinces (municipalities and autonomous regions), there is a problem of lack of balanced panel data. Some provincial statistical yearbooks from the 1990s are, for unknown reasons, simply absent in major databases. Some data items have also disappeared in some provincial

statistics. These deficiencies have made it impossible to create a comprehensive industrial dataset that embraces all variables for 31 provinces over the long period from 1994 until 2008. The only realistic response to such problems is to use a sampling dataset in order pursue the kind of research attempted here.

The third data limitation relates to the issue of authenticity. The reason why this research cannot explain the boom of private enterprises (i.e., treat this phenomenon as one of dependent variables) is that the correct data about the development of private sector have been suppressed for ideological reasons, especially in the early years of economic reform. The literature has so far not generated a consensus about the actual number of private enterprises and employees in the late 1990s. This problem is a fundamental constraint on studies of privatisation in China, and it explains why this study has chosen to focus on the contraction of the state sector, where data are more authentic and reliable.

Fourth, the nature of the data used may colour any interpretation that is derived from the quantitative analysis. Given the nature of provincial and/or industrial level data, the impact of political factors or the macroeconomic environment may be magnified. Contrariwise, because of the lack of firm level data, the impact of micro conditions may be underestimated. Readers are reminded to keep such data limitations in mind in drawing further conclusions based on the empirical findings in this study.¹⁴⁹

Further questions

Some questions remain unanswered and demand further explorations.

¹⁴⁹ It should be lastly noted that these analyses are all based on the author's personal understanding and judgement, yet the empirical evidence found hereby should be open to many other theoretical interpretations.

One such question is: will the findings of this research prove to be valid if a larger scale firm-level dataset becomes available? This question cannot be answered until the Chinese statistical authorities are willing to release more of the information that is undoubtedly available about the transition of all SOEs in the late 1990s.

If such a 'mega database' becomes available, the next important question will be: What was the fate of each privatised SOE? The answer to this key question would certainly help us understand the true essence of China's privatisation.

A topic of great importance likely to draw increasing academic attention is the nature of political control after privatisation and its impact on China's newly emerging 'market economy'. On the surface, more than 90 per cent of state-owned enterprises have now been privatised. But there is considerable uncertainty about the extent to which these privatised SOEs and other private enterprises newly funded by big SOE groups are genuinely owned by the state? From a more theoretical perspective, this research topic refers to the 'boundary' of ownership – or, more precisely, the line that should be drawn between public and private ownership. Basically, there are two kinds of boundary issues that could be encountered during the transition of ownership restructure. One is that of a blurred boundary, a problem caused by the ambiguity in the definition of property rights. This problem is likely to happen particularly in the early stage of economic transition, where private ownership is gradually beginning to emerge. In this period, the boundary of private ownership is vague, difficult to be differentiated from public ownership. The other one is the boundary to be crossed, a problem caused by intended intrusion from the 'real' owner. This problem is likely to happen particularly after privatisation, when the state (public ownership) remains dominant power (even with minor shares) in privatised enterprises. In this situation, the boundary of private ownership is weak, difficult to protect against penetration from the state. Unfortunately, both cases happened in

China.

As mentioned earlier in the Section 4.4, the ‘red-hat’ phenomenon engages with the problem of ambiguous property rights for the private ownership. Since the relevant property rights were not yet clearly and legally separated from the public ownership in the late 1980s, a good number (though there is no consensus so far on precisely how many) of collective enterprises (in township and village level) were *de facto* “private” enterprises. The reason why those real private owners chose to register their enterprises under the type of “collective (public)” ownership was to avoid potential confiscation for ideological reasons. In other words, in an environment hostile to the private ownership, wearing a red hat became the best strategy to protect private properties.

This red-hat phenomenon gradually disappeared after a series of ownership reforms and eventual privatisation in the late 1990s. Since the environment became much friendly to private ownership, the risk of ideological confiscation was largely reduced. Most red hats were taken off when collective-owned enterprises were required to restructure or to re-register their ownership type, as a result of which a clearer line of boundary was drawn between public and private ownership. However, this boundary seemed not strong enough to full defend against state penetration.

During privatisation reform, a new kind of boundary issue was raised, in which the state (public ownership) still held strong political control over enterprises that had been “privatised”. This “red-hand” phenomenon, as I would argue, has considerably distorted the traditional definition of privatisation, whose practice in China seemed to consolidate state’s power toward the market, rather than the other way round.

An easy approach to explore this nature of political control after privatisation is through the formal institution – the State Asset Supervision and Administration Commission (SASAC). This institution embodies the state’s ambition to retain

ownership and control of the most important enterprises, through the authority given to appoint senior executives of enterprises under its administration (Chan, 2009; Green and He (2005); Koppell, 2007). Nevertheless, this approach would fall short in explaining daily businesses.

A more difficult but more accurate approach would shed light on the real party influence over enterprises. *Nomenklatura* – a terminology in comparative politics that refers to the Soviet party control over leadership positions of all types in the society (Liu et al., 2006) – offers a key clue. According to the party constitution after 2002, all enterprises having three or more party members should establish a party unit (Yu, 2013), from which almost all fundamental decisions related to management, personnel, projects and finance would be made (Chan, 2009). This “party supervises the cadre” rule (Qian, 1995) helped greatly to maintain state power in the post-privatisation period. It not only enhanced state control over the whole economy, but also transformed privatised enterprises into state agents whose priority was to carry out state policies rather than to maximise interests of private investors.

The future study, in accordance, tracing the party control in privatised enterprises would be highly meaningful. It would help answer an interesting question: How private have Chinese enterprises actually been after privatisation? The answer may overthrow the conventional wisdom on the privatisation in China.

In the end, this author’s conclusion is that privatisation in China has been far more complicated than many existing studies have suggested – which is precisely why more academic investigations are needed in the future.

Appendix 2A

Table 2A.1

Number of state-owned and state holding enterprises with independent accounting system in regions and industries (1994-2008).

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|----------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| National | 79731 | 87905 | 86982 | 74388 | 67845 | 61301 | 53489 | 46767 | 41125 | 34280 | 31750 | 27477 | 24961 | 20680 | 21313 |
| Beijing | 2041 | 2295 | 4025 | 3381 | 3345 | 3309 | 2430 | 2173 | 1866 | 1362 | 1331 | 1745 | 1469 | 1104 | 1116 |
| Tianjin | 1629 | 1927 | 1918 | 1913 | 1872 | 1831 | 1843 | 1810 | 1636 | 1625 | 1333 | 1497 | 1225 | 1310 | 884 |
| Hebei | 4297 | 4461 | 4053 | 3581 | 3316 | 3051 | 2707 | 2512 | 2061 | 1675 | 1670 | 1233 | 1120 | 832 | 810 |
| Shanxi | 2685 | 2776 | 2751 | 2465 | 2159 | 1853 | 1791 | 1695 | 1513 | 1354 | 1139 | 1173 | 1033 | 641 | 650 |
| Neimenggu | 1997 | 2406 | 2449 | 1772 | 1364 | 955 | 757 | 681 | 683 | 591 | 549 | 489 | 489 | 435 | 481 |
| Liaoning | 4109 | 4292 | 4374 | 4045 | 3327 | 2609 | 2454 | 2188 | 1723 | 1334 | 1156 | 1397 | 1254 | 839 | 1046 |
| Jilin | 2550 | 2733 | 2673 | 2380 | 2102 | 1824 | 1667 | 1392 | 1231 | 969 | 943 | 583 | 466 | 391 | 416 |
| Heilongjiang | 3732 | 3942 | 3807 | 3297 | 2656 | 2015 | 1588 | 1328 | 1233 | 970 | 974 | 693 | 661 | 515 | 543 |
| Shanghai | 2372 | 3742 | 3236 | 2947 | 2838 | 2728 | 2473 | 2067 | 1843 | 1606 | 1576 | 1461 | 1348 | 1164 | 1189 |
| Jiangsu | 3832 | 4343 | 3853 | 3452 | 3303 | 3154 | 2554 | 2075 | 1691 | 1242 | 1141 | 958 | 916 | 785 | 921 |
| Zhejiang | 3121 | 3271 | 3118 | 2496 | 2184 | 1872 | 1418 | 1122 | 963 | 861 | 848 | 811 | 776 | 694 | 736 |
| Anhui | 2607 | 2939 | 2529 | 1688 | 1551 | 1414 | 1128 | 1013 | 900 | 747 | 708 | 619 | 563 | 581 | 632 |
| Fujian | 2192 | 2339 | 2415 | 1935 | 1757 | 1578 | 1367 | 1308 | 1112 | 888 | 826 | 756 | 673 | 530 | 540 |
| Jiangxi | 3781 | 4485 | 4436 | 3596 | 3229 | 2861 | 2509 | 1981 | 1519 | 1071 | 984 | 804 | 706 | 563 | 577 |
| Shandong | 3974 | 4853 | 4855 | 3877 | 3463 | 3049 | 2774 | 2403 | 2082 | 1961 | 1832 | 1394 | 1360 | 1306 | 1358 |
| Henan | 3930 | 4147 | 4243 | 3133 | 3155 | 3177 | 3069 | 2856 | 2562 | 2253 | 1667 | 1280 | 1192 | 1015 | 970 |
| Hubei | 3992 | 4229 | 3997 | 3611 | 3487 | 3363 | 2965 | 2498 | 2100 | 1617 | 1464 | 1058 | 873 | 834 | 887 |
| Hunan | 3652 | 3859 | 3770 | 3036 | 2784 | 2531 | 2339 | 2117 | 2043 | 1642 | 1598 | 1058 | 1031 | 858 | 854 |
| Guangdong | 4749 | 4975 | 5228 | 4757 | 4547 | 4337 | 3320 | 2793 | 2531 | 2103 | 2009 | 1806 | 1536 | 1332 | 1487 |
| Guangxi | 2545 | 2685 | 2565 | 2395 | 2269 | 2143 | 2027 | 1829 | 1600 | 1252 | 1258 | 1005 | 906 | 612 | 627 |
| Hainan | 472 | 587 | 560 | 540 | 484 | 428 | 401 | 372 | 354 | 346 | 268 | 247 | 239 | 132 | 109 |
| Sichuan | 5088 | 5377 | 5117 | 4211 | 3626 | 3041 | 2630 | 2211 | 1947 | 1635 | 1559 | 1399 | 1403 | 1344 | 1526 |
| Guizhou | 1641 | 1848 | 1941 | 1673 | 1596 | 1518 | 1397 | 1269 | 1191 | 1037 | 974 | 927 | 760 | 541 | 530 |
| Yunnan | 2006 | 2104 | 2008 | 1733 | 1568 | 1402 | 1388 | 1277 | 1214 | 943 | 855 | 652 | 639 | 517 | 539 |
| Xizhan | 142 | 175 | 176 | 181 | 200 | 218 | 232 | 229 | 197 | 199 | 157 | 170 | 161 | 53 | 36 |
| Shaanxi | 2572 | 2766 | 2677 | 2418 | 2078 | 1738 | 1633 | 1439 | 1350 | 1235 | 1222 | 945 | 860 | 644 | 685 |
| Gansu | 1528 | 1615 | 1544 | 1305 | 1243 | 1180 | 960 | 748 | 748 | 706 | 690 | 456 | 446 | 432 | 426 |
| Qinghai | 540 | 571 | 562 | 578 | 524 | 470 | 362 | 288 | 238 | 206 | 225 | 137 | 148 | 138 | 146 |
| Ningxia | 409 | 440 | 427 | 384 | 357 | 329 | 209 | 203 | 184 | 154 | 138 | 140 | 131 | 87 | 106 |
| Xinjiang | 1546 | 1723 | 1675 | 1608 | 1466 | 1323 | 1097 | 890 | 810 | 696 | 656 | 584 | 577 | 451 | 486 |
| Coal | 1975 | 2095 | 2011 | 1810 | 1622 | 1434 | 1321 | 1204 | 1135 | 1008 | 981 | 912 | 884 | 795 | 864 |
| Petroleum Extraction | 69 | 54 | 71 | 52 | 59 | 66 | 67 | 70 | 68 | 81 | 81 | 102 | 87 | 91 | 112 |
| Ferrous Metal Ores Mining | 271 | 265 | 276 | 233 | 210 | 186 | 179 | 163 | 149 | 126 | 125 | 119 | 113 | 111 | 132 |
| Non-Ferrous Metal Ores Mining | 839 | 949 | 887 | 788 | 733 | 678 | 662 | 517 | 473 | 389 | 353 | 310 | 307 | 298 | 287 |
| Other Ores Mining | 1157 | 1190 | 1147 | 987 | 852 | 716 | 621 | 548 | 471 | 390 | 356 | 297 | 277 | 210 | 226 |
| Food Processing | 9463 | 9832 | 9586 | 8057 | 7137 | 6217 | 5082 | 4016 | 3149 | 2346 | 2039 | 1393 | 1137 | 857 | 805 |
| Foods Manufacture | 5154 | 5306 | 4934 | 4089 | 3349 | 2608 | 2071 | 1624 | 1298 | 1012 | 872 | 595 | 513 | 377 | 384 |
| Beverages | 3323 | 3607 | 3367 | 2737 | 2377 | 2017 | 1663 | 1376 | 1146 | 841 | 743 | 557 | 456 | 366 | 326 |
| Tobacco | 296 | 302 | 304 | 289 | 300 | 310 | 299 | 276 | 243 | 210 | 180 | 153 | 143 | 120 | 119 |
| Textile | 4177 | 4345 | 4031 | 3391 | 3201 | 3011 | 2631 | 2157 | 1812 | 1449 | 1274 | 905 | 742 | 601 | 486 |
| Textile Wearing | 918 | 1102 | 1177 | 935 | 864 | 792 | 638 | 546 | 452 | 370 | 332 | 282 | 212 | 221 | 206 |
| Leather | 738 | 847 | 764 | 595 | 511 | 426 | 331 | 267 | 202 | 138 | 118 | 72 | 54 | 36 | 35 |
| Timber | 1013 | 1265 | 1254 | 1045 | 905 | 765 | 638 | 502 | 427 | 358 | 299 | 243 | 222 | 171 | 170 |
| Furniture | 479 | 594 | 615 | 482 | 395 | 308 | 239 | 204 | 165 | 149 | 129 | 96 | 78 | 45 | 39 |
| Paper | 1644 | 1899 | 1795 | 1536 | 1373 | 1209 | 1028 | 846 | 708 | 571 | 493 | 374 | 283 | 220 | 196 |
| Printing | 3027 | 3552 | 3596 | 3155 | 2800 | 2445 | 2148 | 1890 | 1666 | 1448 | 1332 | 1149 | 1001 | 580 | 589 |
| Culture Articles | 414 | 527 | 487 | 415 | 363 | 310 | 268 | 213 | 186 | 128 | 104 | 92 | 68 | 55 | 61 |
| Petroleum Processing | 348 | 391 | 403 | 353 | 330 | 307 | 281 | 279 | 260 | 235 | 246 | 241 | 221 | 213 | 231 |
| Chemical | 5151 | 5834 | 5723 | 4855 | 4561 | 4267 | 3692 | 3261 | 2810 | 2271 | 2084 | 1696 | 1551 | 1377 | 1407 |
| Medicines | 1861 | 2099 | 2044 | 1775 | 1724 | 1673 | 1496 | 1341 | 1180 | 1001 | 939 | 676 | 590 | 559 | 527 |
| Chemical Fibers | 231 | 248 | 249 | 204 | 232 | 260 | 233 | 203 | 175 | 113 | 106 | 85 | 76 | 60 | 60 |
| Rubber | 573 | 640 | 621 | 533 | 492 | 451 | 374 | 341 | 286 | 234 | 222 | 184 | 143 | 122 | 122 |
| Plastics | 1162 | 1609 | 1667 | 1408 | 1286 | 1164 | 967 | 821 | 718 | 543 | 508 | 414 | 379 | 303 | 320 |

| | | | | | | | | | | | | | | | |
|----------------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Non-metallic Mineral Manufacture | 7064 | 7568 | 7392 | 6259 | 5605 | 4950 | 4279 | 3635 | 3145 | 2556 | 2354 | 1835 | 1613 | 1333 | 1413 |
| Ferrous Metals Smelting | 948 | 1078 | 1046 | 914 | 854 | 793 | 702 | 622 | 550 | 485 | 454 | 407 | 367 | 329 | 333 |
| Non-ferrous Metals Smelting | 613 | 725 | 750 | 662 | 657 | 652 | 608 | 614 | 555 | 481 | 469 | 429 | 436 | 432 | 476 |
| Metal Manufacture | 2055 | 2507 | 2641 | 2227 | 1966 | 1704 | 1426 | 1239 | 1034 | 730 | 676 | 655 | 556 | 486 | 510 |
| General Machinery | 3785 | 4346 | 4391 | 3787 | 3495 | 3202 | 2761 | 2475 | 2180 | 1921 | 1786 | 1573 | 1392 | 1124 | 1202 |
| Special Machinery | 4349 | 4365 | 4484 | 3797 | 3400 | 3002 | 2622 | 2239 | 1938 | 1687 | 1509 | 1323 | 1170 | 973 | 1007 |
| Transport Equipment | 3330 | 4083 | 4303 | 3644 | 3353 | 3061 | 2747 | 2478 | 2299 | 1977 | 1875 | 1732 | 1598 | 1358 | 1428 |
| Electrical Equipment | 2299 | 2685 | 2659 | 2268 | 2108 | 1948 | 1684 | 1474 | 1285 | 1062 | 1005 | 927 | 821 | 694 | 723 |
| Communication Equipment | 1475 | 1610 | 1579 | 1346 | 1410 | 1473 | 1330 | 1182 | 1061 | 932 | 886 | 830 | 762 | 726 | 770 |
| Measuring Instruments | 1036 | 1141 | 1179 | 1016 | 910 | 804 | 710 | 675 | 609 | 505 | 497 | 490 | 441 | 369 | 358 |
| Electricity | 4272 | 4679 | 4781 | 4476 | 4388 | 4300 | 4128 | 4116 | 4058 | 3933 | 3755 | 3829 | 3858 | 3481 | 3672 |
| Gas | 262 | 269 | 283 | 258 | 257 | 255 | 252 | 252 | 243 | 231 | 233 | 221 | 227 | 217 | 260 |
| Water | 2116 | 2261 | 2342 | 2262 | 2259 | 2255 | 2231 | 2205 | 2205 | 2150 | 2136 | 2070 | 1999 | 1211 | 1290 |

Source: *China Statistical Yearbook* (various years).

Note: Chongqing is included in Sichuan.

Unit: enterprise.

Table 2A.2

Number of employees in state-owned and state holding enterprises with independent accounting system in regions and industries (1994-2008).

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|----------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| National | 4371 | 4397 | 4277 | 4041 | 3741 | 3395 | 2995 | 2675 | 2424 | 2163 | 2048 | 1875 | 1804 | 1743 | 1794 |
| Beijing | 110.4 | 105.7 | 99.7 | 92.3 | 86.6 | 90.1 | 77.4 | 70.6 | 61.2 | 51.9 | 45.9 | 53.0 | 47.3 | 47.6 | 46.6 |
| Tianjin | 93.0 | 90.1 | 86.5 | 84.6 | 74.1 | 65.6 | 57.3 | 55.9 | 49.8 | 45.2 | 42.1 | 40.7 | 38.2 | 39.1 | 39.2 |
| Hebei | 225.3 | 225.2 | 220.7 | 209.0 | 197.7 | 182.8 | 166.0 | 151.4 | 137.3 | 130.2 | 126.7 | 108.4 | 102.4 | 94.9 | 92.9 |
| Shanxi | 176.8 | 177.8 | 175.8 | 167.6 | 150.1 | 138.0 | 134.0 | 128.4 | 119.9 | 111.7 | 113.7 | 119.8 | 118.0 | 108.0 | 114.6 |
| Neimenggu | 112.8 | 114.3 | 112.9 | 105.1 | 84.7 | 77.8 | 67.1 | 61.9 | 59.1 | 45.2 | 44.1 | 41.7 | 42.1 | 39.7 | 40.8 |
| Liaoning | 308.0 | 327.8 | 307.2 | 291.9 | 255.1 | 216.4 | 196.3 | 168.7 | 147.2 | 128.6 | 120.7 | 117.0 | 113.0 | 111.8 | 116.0 |
| Jilin | 169.0 | 170.0 | 169.1 | 159.5 | 131.0 | 118.8 | 107.4 | 94.8 | 84.0 | 71.1 | 67.0 | 60.8 | 54.1 | 50.8 | 52.7 |
| Heilongjiang | 298.0 | 292.7 | 290.4 | 274.0 | 218.3 | 189.1 | 164.6 | 147.6 | 136.0 | 96.5 | 94.9 | 91.2 | 91.7 | 89.7 | 88.8 |
| Shanghai | 160.2 | 148.4 | 132.3 | 112.5 | 127.2 | 113.2 | 101.9 | 88.3 | 81.2 | 70.9 | 66.8 | 61.1 | 57.4 | 51.7 | 50.0 |
| Jiangsu | 246.6 | 248.3 | 236.8 | 231.0 | 237.8 | 216.3 | 175.0 | 149.0 | 131.2 | 104.9 | 94.6 | 77.0 | 74.4 | 65.0 | 70.6 |
| Zhejiang | 114.2 | 108.9 | 102.3 | 94.0 | 92.6 | 75.5 | 57.7 | 45.2 | 39.9 | 38.1 | 33.3 | 34.3 | 32.7 | 32.0 | 32.5 |
| Anhui | 147.0 | 154.3 | 151.3 | 135.0 | 124.5 | 111.9 | 101.4 | 87.9 | 82.3 | 76.0 | 77.9 | 71.0 | 68.6 | 67.9 | 73.8 |
| Fujian | 69.8 | 67.3 | 63.4 | 58.7 | 57.8 | 51.4 | 43.8 | 39.6 | 34.3 | 29.6 | 28.5 | 28.8 | 26.6 | 24.8 | 24.1 |
| Jiangxi | 138.8 | 142.0 | 138.7 | 134.0 | 112.1 | 102.2 | 89.0 | 75.9 | 66.1 | 56.5 | 52.4 | 47.1 | 46.1 | 42.4 | 43.3 |
| Shandong | 278.3 | 301.5 | 293.9 | 289.3 | 284.8 | 268.0 | 244.7 | 221.1 | 204.6 | 201.3 | 184.6 | 149.0 | 148.6 | 144.0 | 155.5 |
| Henan | 258.3 | 263.5 | 267.1 | 237.6 | 236.8 | 221.9 | 207.3 | 197.4 | 182.4 | 174.1 | 154.6 | 146.0 | 136.6 | 128.8 | 119.1 |
| Hubei | 208.9 | 211.9 | 205.5 | 195.7 | 191.0 | 174.0 | 153.8 | 139.9 | 117.1 | 103.2 | 98.0 | 76.9 | 71.0 | 70.1 | 72.5 |
| Hunan | 181.2 | 182.9 | 179.6 | 172.5 | 139.9 | 130.3 | 117.1 | 100.8 | 90.6 | 81.3 | 76.0 | 61.5 | 61.7 | 60.4 | 59.3 |
| Guangdong | 155.9 | 146.0 | 140.8 | 132.5 | 136.8 | 128.2 | 104.4 | 91.8 | 83.0 | 75.2 | 74.8 | 69.4 | 60.8 | 60.9 | 77.8 |
| Guangxi | 93.6 | 92.6 | 90.4 | 86.2 | 79.9 | 74.4 | 65.3 | 57.9 | 51.8 | 44.3 | 42.3 | 37.2 | 32.3 | 30.5 | 34.4 |
| Hainan | 13.2 | 12.9 | 12.1 | 11.8 | 10.9 | 10.0 | 9.3 | 8.6 | 9.5 | 7.8 | 5.4 | 5.9 | 5.5 | 4.5 | 3.8 |
| Sichuan | 311.9 | 309.7 | 305.3 | 286.5 | 269.9 | 234.8 | 195.3 | 170.9 | 150.4 | 137.5 | 130.2 | 120.6 | 121.8 | 124.1 | 128.4 |
| Guizhou | 75.6 | 73.8 | 72.7 | 71.1 | 63.5 | 60.4 | 56.9 | 53.1 | 49.8 | 47.0 | 44.7 | 44.2 | 40.8 | 38.9 | 39.7 |
| Yunnan | 78.2 | 77.2 | 76.8 | 73.4 | 71.0 | 61.3 | 59.1 | 53.4 | 49.7 | 41.8 | 37.5 | 33.2 | 32.9 | 37.4 | 33.2 |
| Tibet | 1.5 | 1.5 | 1.5 | 1.4 | 2.1 | 2.1 | 2.2 | 2.1 | 1.9 | 2.0 | 1.7 | 1.6 | 1.4 | 1.1 | 1.1 |
| Shaanxi | 144.9 | 147.6 | 146.1 | 142.7 | 124.6 | 116.4 | 105.0 | 93.8 | 89.4 | 83.9 | 86.1 | 77.9 | 77.5 | 76.3 | 78.1 |
| Gansu | 90.0 | 91.3 | 87.8 | 86.2 | 80.5 | 72.0 | 66.0 | 57.9 | 55.9 | 53.5 | 52.4 | 45.0 | 45.3 | 41.7 | 42.6 |
| Qinghai | 19.5 | 19.8 | 19.7 | 18.2 | 16.8 | 16.6 | 14.2 | 12.0 | 10.6 | 10.4 | 10.4 | 9.0 | 9.1 | 9.4 | 10.6 |
| Ningxia | 23.1 | 23.5 | 23.7 | 22.5 | 21.4 | 19.9 | 16.5 | 15.6 | 15.2 | 14.9 | 14.6 | 13.9 | 12.1 | 12.2 | 12.9 |
| Xinjiang | 66.5 | 68.6 | 67.3 | 63.8 | 61.3 | 55.2 | 39.1 | 33.5 | 32.3 | 28.5 | 26.7 | 31.6 | 34.1 | 37.6 | 39.3 |
| Coal | 453.4 | 446.6 | 439.8 | 427.5 | 392.8 | 358.1 | 345.4 | 324.3 | 320.7 | 308.5 | 310.2 | 322.8 | 335.3 | 319.9 | 333.5 |
| Petroleum Extraction | 114.8 | 116.9 | 119.0 | 119.1 | 114.8 | 110.6 | 57.4 | 59.3 | 55.4 | 72.0 | 75.3 | 82.1 | 91.3 | 88.6 | 109.5 |
| Ferrous Metal Ores Mining | 18.9 | 18.0 | 17.2 | 15.7 | 15.1 | 14.5 | 14.1 | 13.1 | 12.8 | 12.5 | 10.9 | 11.7 | 11.2 | 11.0 | 13.4 |
| Non-Ferrous Metal Ores Mining | 51.5 | 49.8 | 48.0 | 44.7 | 36.8 | 29.0 | 33.2 | 29.5 | 26.7 | 23.2 | 20.5 | 18.6 | 18.4 | 22.3 | 16.9 |
| Other Ores Mining | 51.9 | 49.8 | 47.7 | 45.1 | 36.3 | 27.5 | 33.5 | 30.5 | 27.8 | 22.0 | 20.3 | 13.9 | 13.4 | 11.7 | 11.9 |
| Food Processing | 156.6 | 154.2 | 151.8 | 137.0 | 104.0 | 70.9 | 82.9 | 65.9 | 54.1 | 43.4 | 36.4 | 26.8 | 21.8 | 20.4 | 17.9 |
| Foods Manufacture | 83.5 | 76.9 | 70.3 | 62.1 | 46.6 | 31.1 | 37.5 | 30.5 | 28.5 | 24.1 | 22.5 | 16.7 | 16.8 | 13.6 | 14.2 |
| Beverages | 89.4 | 89.1 | 88.8 | 81.4 | 72.7 | 64.0 | 61.5 | 52.6 | 45.1 | 38.0 | 33.8 | 27.5 | 23.5 | 23.1 | 23.0 |
| Tobacco | 28.7 | 28.8 | 28.9 | 28.9 | 28.3 | 27.7 | 24.4 | 23.4 | 21.8 | 20.0 | 19.0 | 18.5 | 18.0 | 17.8 | 18.8 |
| Textile | 445.5 | 431.2 | 417.0 | 356.0 | 273.4 | 190.7 | 230.1 | 193.2 | 164.9 | 131.7 | 111.2 | 73.8 | 64.1 | 52.9 | 40.3 |
| Textile Wearing | 24.0 | 24.1 | 24.1 | 20.6 | 18.4 | 16.2 | 20.0 | 19.8 | 15.9 | 14.6 | 13.7 | 11.6 | 9.3 | 9.8 | 9.0 |
| Leather | 22.0 | 21.3 | 20.5 | 17.3 | 12.2 | 7.1 | 7.9 | 8.1 | 5.8 | 3.9 | 3.2 | 1.9 | 1.7 | 1.3 | 1.5 |
| Timber | 26.7 | 24.8 | 22.9 | 20.6 | 14.9 | 9.3 | 13.6 | 10.6 | 8.8 | 12.7 | 11.4 | 10.8 | 8.7 | 6.8 | 6.1 |
| Furniture | 6.4 | 5.8 | 5.1 | 4.8 | 3.8 | 2.8 | 3.1 | 2.9 | 2.4 | 2.4 | 2.2 | 1.8 | 1.7 | 1.4 | 1.0 |
| Paper | 73.2 | 73.4 | 73.6 | 61.0 | 48.7 | 36.4 | 43.2 | 37.2 | 31.6 | 25.1 | 21.9 | 15.9 | 14.1 | 11.0 | 11.7 |
| Printing | 56.1 | 55.6 | 55.0 | 47.1 | 38.3 | 29.5 | 31.7 | 28.2 | 24.3 | 20.9 | 19.3 | 16.6 | 15.1 | 13.3 | 13.4 |
| Culture Articles | 9.5 | 10.0 | 10.5 | 8.7 | 7.2 | 5.6 | 4.7 | 4.4 | 3.8 | 3.4 | 3.1 | 2.4 | 1.9 | 1.5 | 1.8 |
| Petroleum Processing | 54.8 | 55.8 | 56.7 | 56.5 | 59.8 | 63.1 | 47.5 | 43.7 | 37.0 | 36.9 | 37.0 | 38.1 | 38.0 | 40.0 | 42.9 |
| Chemical | 298.3 | 299.5 | 300.7 | 275.5 | 234.2 | 193.0 | 222.1 | 190.0 | 166.4 | 143.6 | 132.2 | 111.9 | 106.5 | 100.4 | 102.0 |
| Medicines | 78.0 | 75.7 | 73.4 | 64.6 | 59.6 | 54.5 | 60.8 | 55.9 | 51.0 | 48.1 | 43.9 | 36.3 | 31.5 | 32.0 | 29.7 |
| Chemical Fibers | 27.4 | 28.4 | 29.5 | 25.9 | 27.1 | 28.3 | 26.9 | 22.1 | 18.8 | 13.5 | 16.0 | 14.3 | 15.5 | 14.0 | 11.9 |
| Rubber | 38.0 | 38.3 | 38.6 | 34.6 | 29.9 | 25.3 | 27.7 | 23.2 | 20.2 | 15.5 | 13.9 | 12.8 | 10.7 | 10.6 | 11.9 |
| Plastics | 23.4 | 24.9 | 26.3 | 24.9 | 19.0 | 13.1 | 16.8 | 15.4 | 13.4 | 10.9 | 9.8 | 8.5 | 8.4 | 7.2 | 7.8 |
| Non-metallic Mineral Manufacture | 304.0 | 288.8 | 273.7 | 243.3 | 200.0 | 156.7 | 164.5 | 140.3 | 119.8 | 98.9 | 90.6 | 68.4 | 56.9 | 53.2 | 54.4 |
| Ferrous Metals Smelting | 263.6 | 262.0 | 260.4 | 250.1 | 234.7 | 219.3 | 204.5 | 187.6 | 169.8 | 160.3 | 147.5 | 141.0 | 133.5 | 132.9 | 130.2 |

| | | | | | | | | | | | | | | | |
|-----------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Non-ferrous Metals Smelting | 76.8 | 79.1 | 81.4 | 78.4 | 68.7 | 58.9 | 70.3 | 69.5 | 61.4 | 58.6 | 57.1 | 56.1 | 53.9 | 56.1 | 61.6 |
| Metal Manufacture | 59.6 | 59.3 | 59.1 | 51.2 | 38.5 | 25.7 | 32.7 | 28.9 | 23.2 | 19.7 | 17.4 | 16.3 | 15.4 | 15.0 | 16.5 |
| General Machinery | 240.2 | 238.3 | 236.4 | 215.5 | 174.9 | 134.3 | 152.7 | 132.5 | 112.5 | 100.4 | 94.9 | 79.1 | 72.3 | 67.8 | 67.9 |
| Special Machinery | 214.6 | 212.1 | 209.6 | 190.8 | 145.3 | 99.9 | 128.8 | 102.9 | 91.7 | 108.5 | 98.1 | 78.1 | 69.9 | 68.0 | 72.5 |
| Transport Equipment | 244.1 | 257.6 | 271.2 | 247.7 | 232.7 | 217.8 | 211.8 | 195.9 | 180.9 | 170.2 | 161.6 | 152.8 | 148.2 | 150.3 | 153.7 |
| Electrical Equipment | 110.0 | 107.8 | 105.5 | 95.4 | 76.2 | 57.0 | 79.3 | 64.6 | 56.8 | 47.7 | 42.2 | 37.3 | 33.8 | 32.5 | 35.4 |
| Communication Equipment | 88.2 | 86.0 | 83.8 | 77.5 | 78.5 | 79.6 | 75.0 | 67.4 | 63.4 | 58.9 | 61.6 | 55.9 | 44.9 | 45.4 | 55.5 |
| Measuring Instruments | 53.2 | 51.4 | 49.7 | 44.6 | 31.3 | 17.9 | 27.4 | 15.2 | 17.1 | 16.8 | 16.1 | 15.0 | 13.8 | 13.5 | 13.3 |
| Electricity | 163.0 | 169.9 | 176.8 | 184.1 | 190.4 | 196.6 | 216.0 | 211.6 | 212.7 | 213.9 | 212.7 | 220.0 | 226.9 | 225.7 | 227.3 |
| Gas | 13.9 | 14.5 | 15.2 | 19.4 | 16.4 | 13.4 | 15.6 | 14.1 | 13.8 | 13.1 | 12.9 | 11.8 | 10.6 | 10.5 | 10.5 |
| Water | 31.8 | 34.8 | 37.9 | 39.9 | 40.2 | 40.6 | 43.1 | 43.2 | 43.1 | 43.6 | 43.5 | 42.2 | 41.1 | 35.6 | 36.5 |

Source: *China Statistical Yearbook* (various years).

Note: Chongqing is included in Sichuan.

Unit: 10k persons.

Appendix 5A

Table 5A.1a
Soft budget variable 1 – index of subsidies for loss-making SOEs.

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|--------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Beijing | 0.9120 | 0.9120 | 0.9372 | 1.0000 | 0.9976 | 0.9023 | 0.8564 | 0.8413 | 0.8172 | 0.8070 | 0.7999 | 0.7949 | 0.7654 | 0.0000 | 0.0000 |
| Tianjin | 0.9399 | 1.0000 | 0.9523 | 0.7898 | 0.7898 | 0.7042 | 0.5417 | 0.4334 | 0.3250 | 0.3250 | 0.2708 | 0.2708 | 0.2708 | 0.0000 | 0.0000 |
| Hebei | 1.0000 | 1.0000 | 0.8618 | 0.6961 | 0.7179 | 0.5992 | 0.5619 | 0.5168 | 0.3008 | 0.2274 | 0.1834 | 0.2032 | 0.1279 | 0.0000 | 0.0000 |
| Shanxi | 0.8515 | 0.9118 | 1.0000 | 0.8951 | 0.9497 | 0.8968 | 0.5171 | 0.8000 | 0.3525 | 0.2972 | 0.3026 | 0.3014 | 0.3970 | 0.0000 | 0.0000 |
| Neimenggu | 1.0000 | 0.8914 | 0.6980 | 0.5608 | 0.5777 | 0.3453 | 0.1715 | 0.3640 | 0.0873 | 0.1550 | 0.1006 | 0.0625 | 0.2352 | 0.0000 | 0.0000 |
| Liaoning | 0.9599 | 1.0000 | 0.9487 | 0.9226 | 0.7293 | 0.6214 | 0.5358 | 0.2619 | 0.1951 | 0.1848 | 0.1593 | 0.1691 | 0.1666 | 0.0000 | 0.0000 |
| Jilin | 0.9507 | 0.9507 | 0.9206 | 0.9003 | 0.6288 | 0.8597 | 1.0000 | 0.9736 | 0.9407 | 0.9857 | 0.8335 | 0.8752 | 0.8464 | 0.0000 | 0.0000 |
| Heilongjiang | 1.0000 | 0.8996 | 0.5405 | 0.3989 | 0.3420 | 0.2717 | 0.2287 | 0.1884 | 0.1722 | 0.1666 | 0.1579 | 0.1607 | 0.1296 | 0.0000 | 0.0000 |
| Shanghai | 0.9157 | 0.9783 | 0.9903 | 0.9985 | 1.0000 | 0.9761 | 0.8104 | 0.7886 | 0.7732 | 0.7876 | 0.5988 | 0.3915 | 0.1053 | 0.1807 | 0.0000 |
| Jiangsu | 0.9058 | 0.8897 | 0.7925 | 0.6675 | 0.6928 | 0.6930 | 0.5708 | 0.5708 | 0.5534 | 0.5533 | 1.0000 | 0.7590 | 0.7561 | 0.0000 | 0.0000 |
| Zhejiang | 0.3271 | 0.3271 | 0.3929 | 0.4541 | 0.4941 | 0.4639 | 0.7152 | 1.0000 | 0.7707 | 0.6162 | 0.6030 | 0.5542 | 0.5650 | 0.6697 | 0.0000 |
| Anhui | 0.8037 | 0.5871 | 1.0000 | 0.9402 | 0.7609 | 0.5083 | 0.3755 | 0.9601 | 0.3021 | 0.3223 | 0.2968 | 0.7301 | 0.4346 | 0.0000 | 0.0000 |
| Fujian | 1.0000 | 0.6774 | 0.3755 | 0.2822 | 0.2101 | 0.1409 | 0.0952 | 0.1141 | 0.0827 | 0.0789 | 0.0662 | 0.0663 | 0.0724 | 0.0000 | 0.0000 |
| Jiangxi | 1.0000 | 1.0000 | 0.9630 | 0.7755 | 0.7430 | 0.4959 | 0.3932 | 0.3398 | 0.0945 | 0.3259 | 0.3010 | 0.3010 | 0.2966 | 0.0000 | 0.0000 |
| Shandong | 0.9601 | 0.9601 | 0.9192 | 0.7216 | 0.5575 | 0.6600 | 0.7155 | 1.0000 | 0.7252 | 0.5537 | 0.4968 | 0.4840 | 0.5052 | 0.0000 | 0.0000 |
| Henan | 0.3731 | 0.3731 | 0.3320 | 0.3195 | 0.2325 | 0.1841 | 0.1797 | 1.0000 | 0.1958 | 0.1489 | 0.1194 | 0.0769 | 0.0908 | 0.0000 | 0.0000 |
| Hubei | 0.9380 | 1.0000 | 0.9473 | 0.9410 | 0.8470 | 0.6241 | 0.4311 | 0.4124 | 0.3545 | 0.3654 | 0.2245 | 0.1730 | 0.1870 | 0.0000 | 0.0000 |
| Hunan | 0.6836 | 0.7724 | 0.8740 | 0.7161 | 0.8757 | 0.9164 | 0.8314 | 1.0000 | 0.9267 | 0.6733 | 0.6021 | 0.6381 | 0.6458 | 0.4686 | 0.0000 |
| Guangdong | 1.0000 | 1.0000 | 0.9907 | 0.8783 | 0.7763 | 0.5639 | 0.3407 | 0.2971 | 0.3208 | 0.1631 | 0.1290 | 0.1008 | 0.0514 | 0.0000 | 0.0000 |
| Guangxi | 1.0000 | 1.0000 | 0.9058 | 0.7231 | 0.6011 | 0.5818 | 0.4236 | 0.8090 | 0.7220 | 0.6913 | 0.4395 | 0.3115 | 0.3149 | 0.2659 | 0.0000 |
| Hainan | 0.8355 | 1.0000 | 0.6108 | 0.4500 | 0.8657 | 0.5864 | 0.7290 | 0.4441 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Sichuan | 0.9751 | 0.9399 | 1.0000 | 0.8155 | 0.5989 | 0.8886 | 0.8906 | 0.8726 | 0.8498 | 0.7959 | 0.7377 | 0.6969 | 0.5534 | 0.0000 | 0.0000 |
| Guizhou | 0.8420 | 0.6595 | 0.6922 | 1.0000 | 0.6479 | 0.5170 | 0.2806 | 0.2334 | 0.2464 | 0.2391 | 0.1703 | 0.1675 | 0.1669 | 0.0000 | 0.0000 |
| Yunnan | 0.8834 | 0.9606 | 1.0000 | 0.8301 | 0.4128 | 0.4002 | 0.3479 | 0.3666 | 0.2535 | 0.3017 | 0.2287 | 0.2353 | 0.2235 | 0.0000 | 0.0000 |
| Tibet | 1.0000 | 0.6770 | 0.9062 | 0.9334 | 0.9190 | 0.7851 | 0.7913 | 0.7560 | 0.6640 | 0.7158 | 0.7108 | 0.7129 | 0.2277 | 0.0000 | 0.0000 |
| Shaanxi | 1.0000 | 1.0000 | 0.9545 | 0.9982 | 0.8762 | 0.7730 | 0.5757 | 0.4532 | 0.5252 | 0.2785 | 0.3111 | 0.2587 | 0.3821 | 0.0000 | 0.0000 |
| Gansu | 0.3506 | 0.3506 | 0.1680 | 0.1359 | 0.4173 | 0.8597 | 0.9878 | 0.8897 | 0.9658 | 0.9613 | 0.9083 | 0.9513 | 1.0000 | 0.6658 | 0.0000 |
| Qinghai | 0.9457 | 0.9457 | 1.0000 | 0.5330 | 0.4661 | 0.0817 | 0.0390 | 0.0126 | 0.0042 | 0.0042 | 0.0043 | 0.0042 | 0.0042 | 0.0000 | 0.0000 |
| Ningxia | 0.8439 | 0.8439 | 0.7376 | 0.9080 | 0.8769 | 1.0000 | 0.4491 | 0.2587 | 0.1119 | 0.0051 | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Xinjiang | 0.9461 | 0.9461 | 0.8388 | 0.6950 | 0.5884 | 0.7872 | 0.8229 | 1.0000 | 0.3006 | 0.0046 | 0.0144 | 0.0027 | 0.0000 | 0.0000 | 0.0000 |

Source: Various provincial statistical yearbooks 1995-2009.

Note: Definition: (Index of subsidies for loss-making SOEs) = (subsidies for loss-making SOEs in a given certain year) / (the maximum subsidy for loss-making SOEs during 1994-2008). Chongqing is included in Sichuan.

Ave 0.5076
S.D. 0.3561
Max 1.0000
Min 0.0000

Table 5A.1b

Soft budget variable 2 – industrial loans to total loans in financial institutes.

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|--------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Beijing | 0.3632 | 0.2976 | 0.2760 | 0.2725 | 0.2681 | 0.2475 | 0.1747 | 0.1501 | 0.1159 | 0.1088 | 0.0966 | 0.0000 | 0.0000 | 0.0000 | 0.0000 |
| Tianjin | 0.2683 | 0.2599 | 0.2512 | 0.2527 | 0.2501 | 0.2352 | 0.1981 | 0.2006 | 0.1788 | 0.1253 | 0.1061 | 0.0964 | 0.1077 | 0.1052 | 0.0877 |
| Hebei | 0.2669 | 0.2365 | 0.2404 | 0.2472 | 0.2228 | 0.2027 | 0.1674 | 0.1602 | 0.1532 | 0.1536 | 0.1420 | 0.1263 | 0.1500 | 0.1410 | 0.1199 |
| Shanxi | 0.3004 | 0.2692 | 0.2343 | 0.2538 | 0.2444 | 0.2307 | 0.1759 | 0.1788 | 0.1652 | 0.1554 | 0.1438 | 0.1390 | 0.1471 | 0.1515 | 0.1560 |
| Neimenggu | 0.2399 | 0.2292 | 0.2209 | 0.2149 | 0.2134 | 0.1942 | 0.1725 | 0.1748 | 0.1695 | 0.1697 | 0.1487 | 0.1242 | 0.1423 | 0.1315 | 0.1203 |
| Liaoning | 0.3109 | 0.3020 | 0.2767 | 0.2903 | 0.2776 | 0.2663 | 0.2151 | 0.2276 | 0.2171 | 0.2016 | 0.1833 | 0.1247 | 0.1352 | 0.1342 | 0.1217 |
| Jilin | 0.2497 | 0.2285 | 0.2326 | 0.2676 | 0.2264 | 0.2178 | 0.2394 | 0.2372 | 0.2410 | 0.2299 | 0.2185 | 0.2055 | 0.2094 | 0.2525 | 0.2402 |
| Heilongjiang | 0.3143 | 0.2964 | 0.2887 | 0.2639 | 0.2476 | 0.2280 | 0.1870 | 0.1808 | 0.1822 | 0.1721 | 0.1621 | 0.1004 | 0.0919 | 0.1048 | 0.0747 |
| Shanghai | 0.3014 | 0.2899 | 0.2854 | 0.2698 | 0.2499 | 0.2205 | 0.1886 | 0.1572 | 0.1641 | 0.1335 | 0.0995 | 0.0990 | 0.0985 | 0.1035 | 0.0998 |
| Jiangsu | 0.2679 | 0.2451 | 0.2438 | 0.2417 | 0.2365 | 0.2206 | 0.2198 | 0.1944 | 0.1686 | 0.1530 | 0.1572 | 0.1472 | 0.1803 | 0.1800 | 0.1591 |
| Zhejiang | 0.2164 | 0.2006 | 0.1979 | 0.1977 | 0.1895 | 0.1656 | 0.1316 | 0.1285 | 0.1336 | 0.1349 | 0.1449 | 0.1688 | 0.2087 | 0.2247 | 0.2190 |
| Anhui | 0.2210 | 0.2136 | 0.2073 | 0.1972 | 0.1886 | 0.1921 | 0.1671 | 0.1672 | 0.1575 | 0.1529 | 0.1393 | 0.1138 | 0.1182 | 0.1183 | 0.0988 |
| Fujian | 0.2788 | 0.2262 | 0.2218 | 0.2224 | 0.2154 | 0.1916 | 0.1663 | 0.1640 | 0.1454 | 0.1551 | 0.1617 | 0.1549 | 0.1689 | 0.1585 | 0.1399 |
| Jiangxi | 0.2518 | 0.2452 | 0.2362 | 0.2361 | 0.2370 | 0.2353 | 0.2157 | 0.2146 | 0.1856 | 0.1753 | 0.1481 | 0.1164 | 0.1320 | 0.1298 | 0.1124 |
| Shandong | 0.2156 | 0.2073 | 0.2081 | 0.2069 | 0.1918 | 0.1829 | 0.1601 | 0.1635 | 0.1577 | 0.1560 | 0.1634 | 0.1511 | 0.1806 | 0.1881 | 0.1771 |
| Henan | 0.2060 | 0.1923 | 0.1889 | 0.2024 | 0.1888 | 0.1803 | 0.1674 | 0.1616 | 0.1660 | 0.1699 | 0.1586 | 0.1269 | 0.1435 | 0.1421 | 0.1183 |
| Hubei | 0.2977 | 0.2663 | 0.2829 | 0.2463 | 0.2216 | 0.2136 | 0.1947 | 0.1864 | 0.1564 | 0.1380 | 0.1270 | 0.0900 | 0.0907 | 0.0917 | 0.0939 |
| Hunan | 0.2619 | 0.2479 | 0.2304 | 0.2104 | 0.1988 | 0.1806 | 0.1601 | 0.1524 | 0.1449 | 0.1391 | 0.1377 | 0.1130 | 0.1142 | 0.0942 | 0.0864 |
| Guangdong | 0.2012 | 0.1904 | 0.1837 | 0.1793 | 0.1671 | 0.1462 | 0.1343 | 0.1308 | 0.1287 | 0.1194 | 0.1107 | 0.0898 | 0.0897 | 0.0896 | 0.0802 |
| Guangxi | 0.2149 | 0.1538 | 0.1638 | 0.2108 | 0.2024 | 0.1873 | 0.1558 | 0.1619 | 0.1524 | 0.1378 | 0.1188 | 0.1077 | 0.1126 | 0.1073 | 0.1056 |
| Hainan | 0.2057 | 0.1766 | 0.1823 | 0.1606 | 0.1470 | 0.0962 | 0.0770 | 0.0701 | 0.0919 | 0.0892 | 0.0709 | 0.0482 | 0.0445 | 0.0363 | 0.0592 |
| Sichuan | 0.2195 | 0.2030 | 0.2044 | 0.2045 | 0.2071 | 0.1687 | 0.1425 | 0.1540 | 0.1377 | 0.1341 | 0.1169 | 0.0957 | 0.0972 | 0.1025 | 0.0943 |
| Guizhou | 0.2908 | 0.2712 | 0.2685 | 0.2497 | 0.2307 | 0.2094 | 0.1687 | 0.1539 | 0.1393 | 0.1084 | 0.1108 | 0.0870 | 0.0894 | 0.0725 | 0.0738 |
| Yunnan | 0.2625 | 0.2504 | 0.2680 | 0.2466 | 0.2191 | 0.2071 | 0.1710 | 0.1821 | 0.1525 | 0.1347 | 0.1255 | 0.1123 | 0.1251 | 0.1070 | 0.1079 |
| Tibet | 0.1314 | 0.0641 | 0.0728 | 0.0804 | 0.0738 | 0.0813 | 0.1049 | 0.0928 | 0.0764 | 0.0652 | 0.0334 | 0.0430 | 0.0287 | 0.0450 | 0.0431 |
| Shaanxi | 0.2830 | 0.2819 | 0.2868 | 0.2739 | 0.2467 | 0.2317 | 0.2055 | 0.1751 | 0.1604 | 0.1510 | 0.1443 | 0.0998 | 0.0941 | 0.0991 | 0.0916 |
| Gansu | 0.2539 | 0.2510 | 0.2527 | 0.2408 | 0.2352 | 0.2412 | 0.2080 | 0.1931 | 0.1864 | 0.1876 | 0.1888 | 0.1521 | 0.1042 | 0.1136 | 0.1331 |
| Qinghai | 0.2916 | 0.2564 | 0.2625 | 0.3135 | 0.3733 | 0.3738 | 0.2436 | 0.2010 | 0.1847 | 0.1645 | 0.1291 | 0.0755 | 0.0867 | 0.0997 | 0.0817 |
| Ningxia | 0.2651 | 0.2702 | 0.2776 | 0.2672 | 0.2460 | 0.2317 | 0.1890 | 0.1790 | 0.1658 | 0.1455 | 0.1291 | 0.1087 | 0.1073 | 0.1214 | 0.1471 |
| Xinjiang | 0.1960 | 0.1841 | 0.1948 | 0.1964 | 0.1959 | 0.1948 | 0.1732 | 0.1886 | 0.1727 | 0.1522 | 0.1397 | 0.1094 | 0.1131 | 0.1047 | 0.0955 |

Source: Various provincial statistical yearbooks 1995-2009.

| | | |
|---|------|--------|
| | Ave | 0.1747 |
| Note: Definition: (share of industrial loans to the total) = (amount of industrial loans) / | S.D. | 0.0654 |
| (total loans granted by all financial institutes). Beijing's data after 2005 are absent in | Max | 0.3738 |
| statistics. Chongqing is included in Sichuan. | Min | 0.0000 |

Table 5A.2a

Political ideology variable 1 – private-owned enterprises to total enterprises.

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|--------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Beijing | 0.0097 | 0.0212 | 0.0328 | 0.0178 | 0.0496 | 0.0774 | 0.0782 | 0.0790 | 0.1127 | 0.1383 | 0.1547 | 0.2387 | 0.2603 | 0.3060 | 0.3267 |
| Tianjin | 0.0595 | 0.0633 | 0.0670 | 0.0708 | 0.0746 | 0.0783 | 0.0821 | 0.1032 | 0.1119 | 0.1410 | 0.2780 | 0.2873 | 0.3239 | 0.3298 | 0.4443 |
| Hebei | 0.0145 | 0.0336 | 0.0527 | 0.0718 | 0.0910 | 0.1170 | 0.1505 | 0.2131 | 0.2829 | 0.3631 | 0.3682 | 0.4755 | 0.5235 | 0.5581 | 0.6070 |
| Shanxi | 0.0015 | 0.0014 | 0.0012 | 0.0011 | 0.0629 | 0.0834 | 0.0995 | 0.1360 | 0.1957 | 0.2386 | 0.2521 | 0.2626 | 0.2806 | 0.3365 | 0.3608 |
| Neimenggu | 0.0040 | 0.0166 | 0.0292 | 0.0418 | 0.0544 | 0.0819 | 0.1347 | 0.1777 | 0.1931 | 0.2559 | 0.3855 | 0.4021 | 0.4559 | 0.4643 | 0.4651 |
| Liaoning | 0.0000 | 0.0023 | 0.0301 | 0.0408 | 0.0771 | 0.1186 | 0.1305 | 0.1710 | 0.2162 | 0.2987 | 0.3632 | 0.4447 | 0.5228 | 0.5649 | 0.6234 |
| Jilin | 0.0037 | 0.0047 | 0.0058 | 0.0068 | 0.0348 | 0.0569 | 0.0777 | 0.1258 | 0.1598 | 0.2172 | 0.1024 | 0.1355 | 0.1444 | 0.1463 | 0.5570 |
| Heilongjiang | 0.0026 | 0.0082 | 0.0138 | 0.0189 | 0.0238 | 0.0526 | 0.0814 | 0.1276 | 0.1793 | 0.2384 | 0.2449 | 0.3408 | 0.3792 | 0.4272 | 0.4854 |
| Shanghai | 0.0026 | 0.0053 | 0.0080 | 0.0105 | 0.0130 | 0.0214 | 0.0214 | 0.1399 | 0.1855 | 0.2414 | 0.2738 | 0.3698 | 0.3873 | 0.4116 | 0.4776 |
| Jiangsu | 0.0890 | 0.0986 | 0.1081 | 0.1940 | 0.2798 | 0.3070 | 0.3838 | 0.4606 | 0.5203 | 0.4836 | 0.5160 | 0.5509 | 0.5877 | 0.6054 | 0.6692 |
| Zhejiang | 0.0695 | 0.1022 | 0.1348 | 0.1675 | 0.1671 | 0.2086 | 0.2840 | 0.4021 | 0.4705 | 0.5254 | 0.5812 | 0.6020 | 0.6285 | 0.6566 | 0.6855 |
| Anhui | 0.0083 | 0.0151 | 0.0218 | 0.0286 | 0.0504 | 0.0976 | 0.1448 | 0.2082 | 0.2953 | 0.3920 | 0.4756 | 0.5164 | 0.5671 | 0.6051 | 0.6591 |
| Fujian | 0.0102 | 0.0339 | 0.0575 | 0.0812 | 0.0775 | 0.0739 | 0.1201 | 0.1682 | 0.2119 | 0.2758 | 0.3587 | 0.3826 | 0.4099 | 0.4418 | 0.4841 |
| Jiangxi | 0.0028 | 0.0069 | 0.0111 | 0.0152 | 0.0246 | 0.0281 | 0.0505 | 0.1758 | 0.2546 | 0.3786 | 0.3974 | 0.4722 | 0.5250 | 0.5378 | 0.5529 |
| Shandong | 0.0000 | 0.0018 | 0.0129 | 0.0132 | 0.0697 | 0.0930 | 0.1502 | 0.2620 | 0.2935 | 0.3789 | 0.4501 | 0.5196 | 0.5714 | 0.5987 | 0.6332 |
| Henan | 0.0362 | 0.0367 | 0.0550 | 0.0734 | 0.1061 | 0.1165 | 0.1320 | 0.1399 | 0.2166 | 0.2680 | 0.3774 | 0.5435 | 0.5116 | 0.5550 | 0.6216 |
| Hubei | 0.0356 | 0.0477 | 0.0463 | 0.0573 | 0.1121 | 0.1668 | 0.2216 | 0.2763 | 0.3311 | 0.3858 | 0.4142 | 0.4427 | 0.4711 | 0.5016 | 0.5330 |
| Hunan | 0.0220 | 0.0297 | 0.0373 | 0.0450 | 0.0526 | 0.0603 | 0.1184 | 0.1764 | 0.2396 | 0.3409 | 0.3665 | 0.5459 | 0.6011 | 0.6194 | 0.6510 |
| Guangdong | 0.0044 | 0.0062 | 0.0350 | 0.0781 | 0.1211 | 0.1642 | 0.2072 | 0.2503 | 0.2933 | 0.3364 | 0.3464 | 0.3565 | 0.3665 | 0.3866 | 0.4120 |
| Guangxi | 0.0061 | 0.0027 | 0.0123 | 0.0219 | 0.0315 | 0.0423 | 0.0732 | 0.1078 | 0.1446 | 0.2316 | 0.2625 | 0.3464 | 0.3942 | 0.4803 | 0.5414 |
| Hainan | 0.0222 | 0.0242 | 0.0262 | 0.0316 | 0.0625 | 0.0777 | 0.1005 | 0.1002 | 0.1048 | 0.1871 | 0.2405 | 0.2938 | 0.2908 | 0.2152 | 0.2062 |
| Sichuan | 0.0114 | 0.0127 | 0.0205 | 0.0569 | 0.0908 | 0.1297 | 0.1817 | 0.2688 | 0.3105 | 0.4036 | 0.4529 | 0.5010 | 0.5240 | 0.5494 | 0.6432 |
| Guizhou | 0.0320 | 0.0300 | 0.0280 | 0.0259 | 0.0239 | 0.0486 | 0.1385 | 0.2220 | 0.2642 | 0.3105 | 0.5682 | 0.6472 | 0.6812 | 0.4203 | 0.4735 |
| Yunnan | 0.0028 | 0.0045 | 0.0030 | 0.0042 | 0.0211 | 0.0325 | 0.0494 | 0.0822 | 0.1202 | 0.2236 | 0.3290 | 0.3916 | 0.4287 | 0.4733 | 0.5241 |
| Tibet | 0.0044 | 0.0135 | 0.0227 | 0.0318 | 0.0497 | 0.0729 | 0.1050 | 0.1253 | 0.1308 | 0.0267 | 0.0106 | 0.0254 | 0.0196 | 0.1500 | 0.2500 |
| Shaanxi | 0.0003 | 0.0146 | 0.0289 | 0.0432 | 0.0575 | 0.0718 | 0.0861 | 0.1004 | 0.1105 | 0.1492 | 0.1622 | 0.2312 | 0.2699 | 0.2998 | 0.3446 |
| Gansu | 0.0019 | 0.0016 | 0.0049 | 0.0082 | 0.0573 | 0.0387 | 0.0782 | 0.1989 | 0.1305 | 0.1777 | 0.2313 | 0.3272 | 0.3087 | 0.3683 | 0.3763 |
| Qinghai | 0.0106 | 0.0191 | 0.0276 | 0.0361 | 0.0446 | 0.0428 | 0.0286 | 0.0895 | 0.1729 | 0.1700 | 0.3080 | 0.3045 | 0.3103 | 0.3418 | 0.3049 |
| Ningxia | 0.0032 | 0.0092 | 0.0152 | 0.0212 | 0.0583 | 0.0746 | 0.1369 | 0.1488 | 0.1923 | 0.2976 | 0.5015 | 0.5168 | 0.5887 | 0.6121 | 0.6304 |
| Xinjiang | 0.0102 | 0.0103 | 0.0098 | 0.0212 | 0.0325 | 0.0439 | 0.0689 | 0.1901 | 0.2195 | 0.2899 | 0.2661 | 0.2422 | 0.2755 | 0.3556 | 0.4131 |

Source: Various provincial statistical yearbooks 1995-2009. *The Data of the Third National Industrial Census of the People's Republic of China in 1995* (中華人民共和國 1995 年第三次全國工業普查資料匯編), China Statistics Press (1997). *China Economic Census Yearbook 2004* (中國經濟普查年鑑 2004), China Statistics Press (2006).

Note: Definition: (POE share) = (registered number of POEs, above a certain scale) / (registered number of enterprises with all types of ownership, above a certain scale). Missing data, denoted italics, are supplemented through the use of data in adjacent or closest years. Some 17.6% of data in this table are 'supplementary' (in this sense) but 74.7% of such data are less than 10% with relative small impacts. Those supplemented data exceeding 10% are highly concentrated in two provinces, Guangdong and Hubei. Chongqing is included in Sichuan.

Table 5A.2b

Political ideology variable 2 – employees of private owned enterprises to total employees.

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|--------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Beijing | 0.0151 | 0.0188 | 0.0188 | 0.0169 | 0.0138 | 0.0135 | 0.0146 | 0.0140 | 0.2145 | 0.3113 | 0.3048 | 0.3200 | 0.3235 | 0.2658 | 0.2858 |
| Tianjin | 0.0249 | 0.0321 | 0.0386 | 0.0448 | 0.0667 | 0.0816 | 0.0933 | 0.1129 | 0.1270 | 0.1577 | 0.1817 | 0.2078 | 0.2256 | 0.2278 | 0.1911 |
| Hebei | 0.0114 | 0.0230 | 0.0299 | 0.0329 | 0.0439 | 0.0499 | 0.0586 | 0.0487 | 0.0490 | 0.0536 | 0.0656 | 0.0697 | 0.0708 | 0.0727 | 0.0771 |
| Shanxi | 0.0153 | 0.0184 | 0.0236 | 0.0254 | 0.0292 | 0.0293 | 0.0272 | 0.0310 | 0.0372 | 0.0751 | 0.0647 | 0.0557 | 0.0694 | 0.0710 | 0.0792 |
| Neimenggu | 0.0073 | 0.0100 | 0.0134 | 0.0202 | 0.0287 | 0.0381 | 0.0407 | 0.0449 | 0.0506 | 0.0511 | 0.0601 | 0.0655 | 0.0694 | 0.0766 | 0.0892 |
| Liaoning | 0.0176 | 0.0250 | 0.0302 | 0.0354 | 0.0477 | 0.0578 | 0.0689 | 0.0860 | 0.1010 | 0.1112 | 0.1157 | 0.1274 | 0.1372 | 0.1394 | 0.1377 |
| Jilin | 0.0124 | 0.0155 | 0.0182 | 0.0203 | 0.0301 | 0.0258 | 0.0265 | 0.0341 | 0.0310 | 0.0394 | 0.0889 | 0.0800 | 0.0703 | 0.0754 | 0.0873 |
| Heilongjiang | 0.0056 | 0.0124 | 0.0151 | 0.0188 | 0.0236 | 0.0305 | 0.0328 | 0.0369 | 0.0403 | 0.0470 | 0.0518 | 0.0586 | 0.0626 | 0.0705 | 0.0847 |
| Shanghai | 0.0276 | 0.0557 | 0.0758 | 0.0952 | 0.1404 | 0.1717 | 0.2242 | 0.2858 | 0.3375 | 0.4123 | 0.4984 | 0.5443 | 0.5460 | 0.5434 | 0.5724 |
| Jiangsu | 0.0096 | 0.0133 | 0.0162 | 0.0214 | 0.0368 | 0.0489 | 0.0658 | 0.0817 | 0.1037 | 0.1296 | 0.1511 | 0.2056 | 0.2275 | 0.2543 | 0.2936 |
| Zhejiang | 0.0252 | 0.0390 | 0.0471 | 0.0502 | 0.0577 | 0.0721 | 0.1113 | 0.1252 | 0.1425 | 0.1634 | 0.1673 | 0.1670 | 0.1764 | 0.2100 | 0.2052 |
| Anhui | 0.0039 | 0.0056 | 0.0067 | 0.0089 | 0.0128 | 0.0166 | 0.0193 | 0.0232 | 0.0282 | 0.0348 | 0.0409 | 0.0475 | 0.0650 | 0.0606 | 0.0555 |
| Fujian | 0.0195 | 0.0252 | 0.0277 | 0.0273 | 0.0305 | 0.0357 | 0.0409 | 0.0458 | 0.0496 | 0.0605 | 0.0612 | 0.0721 | 0.0843 | 0.1013 | 0.1117 |
| Jiangxi | 0.0073 | 0.0130 | 0.0181 | 0.0206 | 0.0198 | 0.0232 | 0.0244 | 0.0296 | 0.0369 | 0.0473 | 0.0560 | 0.0637 | 0.0747 | 0.0784 | 0.0943 |
| Shandong | 0.0111 | 0.0159 | 0.0196 | 0.0227 | 0.0306 | 0.0371 | 0.0459 | 0.0454 | 0.0533 | 0.0755 | 0.0790 | 0.0869 | 0.0979 | 0.0993 | 0.0935 |
| Henan | 0.0049 | 0.0067 | 0.0085 | 0.0097 | 0.0110 | 0.0119 | 0.0102 | 0.0102 | 0.0118 | 0.0145 | 0.0214 | 0.0245 | 0.0305 | 0.0315 | 0.0356 |
| Hubei | 0.0095 | 0.0155 | 0.0189 | 0.0225 | 0.0293 | 0.0326 | 0.0317 | 0.0290 | 0.0379 | 0.0415 | 0.0426 | 0.0458 | 0.0528 | 0.0585 | 0.0704 |
| Hunan | 0.0078 | 0.0097 | 0.0117 | 0.0121 | 0.0154 | 0.0159 | 0.0133 | 0.0163 | 0.0236 | 0.0310 | 0.0483 | 0.0548 | 0.0577 | 0.0599 | 0.0622 |
| Guangdong | 0.0257 | 0.0320 | 0.0362 | 0.0404 | 0.0473 | 0.0520 | 0.0563 | 0.0619 | 0.0709 | 0.0872 | 0.1007 | 0.1119 | 0.1306 | 0.1417 | 0.1465 |
| Guangxi | 0.0045 | 0.0067 | 0.0067 | 0.0067 | 0.0092 | 0.0115 | 0.0121 | 0.0125 | 0.0161 | 0.0190 | 0.0251 | 0.0309 | 0.0347 | 0.0449 | 0.0479 |
| Hainan | 0.0385 | 0.0435 | 0.0427 | 0.0305 | 0.0468 | 0.0514 | 0.0558 | 0.0603 | 0.0653 | 0.0800 | 0.0791 | 0.0956 | 0.1002 | 0.1167 | 0.0984 |
| Sichuan | 0.0049 | 0.0074 | 0.0096 | 0.0117 | 0.0159 | 0.0188 | 0.0214 | 0.0256 | 0.0304 | 0.0388 | 0.0465 | 0.0543 | 0.0599 | 0.0653 | 0.0752 |
| Guizhou | 0.0056 | 0.0067 | 0.0080 | 0.0086 | 0.0107 | 0.0115 | 0.0125 | 0.0137 | 0.0124 | 0.0139 | 0.0170 | 0.0229 | 0.0233 | 0.0250 | 0.0282 |
| Yunnan | 0.0029 | 0.0043 | 0.0049 | 0.0062 | 0.0114 | 0.0140 | 0.0151 | 0.0197 | 0.0210 | 0.0242 | 0.0320 | 0.0444 | 0.0435 | 0.0550 | 0.0667 |
| Tibet | 0.0009 | 0.0018 | 0.0017 | 0.0025 | 0.0034 | 0.0061 | 0.0064 | 0.0126 | 0.0179 | 0.0250 | 0.0322 | 0.0355 | 0.0402 | 0.0611 | 0.0704 |
| Shaanxi | 0.0072 | 0.0112 | 0.0155 | 0.0185 | 0.0263 | 0.0353 | 0.0460 | 0.0541 | 0.0844 | 0.0838 | 0.0807 | 0.0821 | 0.0824 | 0.0823 | 0.0785 |
| Gansu | 0.0060 | 0.0083 | 0.0106 | 0.0110 | 0.0151 | 0.0176 | 0.0189 | 0.0225 | 0.0245 | 0.0278 | 0.0321 | 0.0357 | 0.0393 | 0.0426 | 0.0438 |
| Qinghai | 0.0058 | 0.0071 | 0.0078 | 0.0149 | 0.0208 | 0.0259 | 0.0468 | 0.0584 | 0.0704 | 0.0808 | 0.0932 | 0.1042 | 0.1293 | 0.1326 | 0.1111 |
| Ningxia | 0.0085 | 0.0111 | 0.0156 | 0.0180 | 0.0281 | 0.0305 | 0.0386 | 0.0458 | 0.0536 | 0.0640 | 0.0715 | 0.0780 | 0.0931 | 0.1288 | 0.0978 |
| Xinjiang | 0.0112 | 0.0139 | 0.0159 | 0.0181 | 0.0217 | 0.0260 | 0.0333 | 0.0410 | 0.0552 | 0.0682 | 0.0769 | 0.0878 | 0.0962 | 0.0979 | 0.0965 |

Source: *China Statistical Yearbook 1995-2009*.

Note: Definition: (Share of POE employment) = (number of POE employees in both urban and rural areas) / (number of total employees in both urban and rural areas). Chongqing is included in Sichuan.

Ave 0.0617
S.D. 0.0782
Max 0.5724
Min 0.0009

Table 5A.3a

Decentralisation variable 1 – self-funding share of the investment of capital construction.

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|--------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Beijing | 0.4081 | 0.4588 | 0.4348 | 0.4564 | 0.5188 | 0.4662 | 0.4953 | 0.4889 | 0.5086 | 0.5369 | 0.3163 | 0.3172 | 0.3143 | 0.3588 | 0.3915 |
| Tianjin | 0.3928 | 0.3767 | 0.3799 | 0.3570 | 0.3541 | 0.3395 | 0.4469 | 0.4448 | 0.5387 | 0.5177 | 0.4935 | 0.5037 | 0.5178 | 0.5059 | 0.5723 |
| Hebei | 0.5442 | 0.5172 | 0.5068 | 0.5235 | 0.4604 | 0.4606 | 0.4782 | 0.5159 | 0.5903 | 0.6287 | 0.7082 | 0.7269 | 0.7502 | 0.7535 | 0.7731 |
| Shanxi | 0.4049 | 0.4994 | 0.4807 | 0.4026 | 0.3195 | 0.2632 | 0.3140 | 0.3484 | 0.4077 | 0.4819 | 0.5977 | 0.6129 | 0.6392 | 0.6714 | 0.6823 |
| Neimenggu | 0.3736 | 0.3663 | 0.3934 | 0.3355 | 0.3297 | 0.3152 | 0.3741 | 0.3184 | 0.3488 | 0.5152 | 0.6667 | 0.6586 | 0.7634 | 0.7975 | 0.8269 |
| Liaoning | 0.4387 | 0.3874 | 0.4729 | 0.3800 | 0.4092 | 0.4061 | 0.3933 | 0.4002 | 0.4681 | 0.5621 | 0.6680 | 0.6792 | 0.6944 | 0.6695 | 0.7197 |
| Jilin | 0.3521 | 0.3136 | 0.3829 | 0.4685 | 0.3514 | 0.4417 | 0.4153 | 0.4577 | 0.5603 | 0.5914 | 0.6635 | 0.6339 | 0.7190 | 0.7916 | 0.8387 |
| Heilongjiang | 0.4180 | 0.4639 | 0.3937 | 0.5155 | 0.4516 | 0.3976 | 0.4231 | 0.4865 | 0.5916 | 0.6316 | 0.7077 | 0.7038 | 0.6901 | 0.7247 | 0.7415 |
| Shanghai | 0.6240 | 0.5603 | 0.5741 | 0.5236 | 0.4842 | 0.4995 | 0.5193 | 0.4300 | 0.4433 | 0.5021 | 0.4152 | 0.4595 | 0.4555 | 0.4277 | 0.4948 |
| Jiangsu | 0.5583 | 0.5829 | 0.5127 | 0.5248 | 0.5258 | 0.5606 | 0.5167 | 0.5993 | 0.5911 | 0.5429 | 0.5809 | 0.6145 | 0.6308 | 0.6143 | 0.6437 |
| Zhejiang | 0.5936 | 0.5909 | 0.5179 | 0.5142 | 0.5242 | 0.4727 | 0.4834 | 0.4841 | 0.5352 | 0.5223 | 0.5151 | 0.5313 | 0.5678 | 0.5665 | 0.5937 |
| Anhui | 0.4214 | 0.3764 | 0.3792 | 0.4259 | 0.4382 | 0.4580 | 0.4354 | 0.4378 | 0.4251 | 0.4918 | 0.6271 | 0.5880 | 0.6237 | 0.6594 | 0.7184 |
| Fujian | 0.4769 | 0.4286 | 0.4668 | 0.4828 | 0.3729 | 0.4016 | 0.3830 | 0.3774 | 0.3430 | 0.4145 | 0.5041 | 0.4920 | 0.4629 | 0.4887 | 0.5495 |
| Jiangxi | 0.4121 | 0.4456 | 0.4858 | 0.5119 | 0.4201 | 0.3560 | 0.3237 | 0.3917 | 0.3968 | 0.3962 | 0.6003 | 0.6164 | 0.6277 | 0.6587 | 0.6948 |
| Shandong | 0.4634 | 0.4660 | 0.5007 | 0.5643 | 0.4453 | 0.4587 | 0.4972 | 0.5493 | 0.5956 | 0.6352 | 0.7117 | 0.7271 | 0.7246 | 0.7262 | 0.7382 |
| Henan | 0.3275 | 0.3789 | 0.4104 | 0.3966 | 0.3809 | 0.3732 | 0.4182 | 0.4444 | 0.4568 | 0.4776 | 0.6320 | 0.6836 | 0.7364 | 0.7602 | 0.7860 |
| Hubei | 0.3619 | 0.3958 | 0.3835 | 0.4712 | 0.3738 | 0.3756 | 0.3423 | 0.3767 | 0.3579 | 0.3475 | 0.5809 | 0.5930 | 0.5746 | 0.5832 | 0.6701 |
| Hunan | 0.4830 | 0.5159 | 0.5235 | 0.4857 | 0.4244 | 0.4204 | 0.4113 | 0.4591 | 0.4931 | 0.4884 | 0.6529 | 0.6665 | 0.6374 | 0.6503 | 0.6785 |
| Guangdong | 0.4372 | 0.4927 | 0.5201 | 0.5310 | 0.5406 | 0.5109 | 0.5346 | 0.5821 | 0.5523 | 0.5812 | 0.5200 | 0.5290 | 0.5029 | 0.5156 | 0.5814 |
| Guangxi | 0.4552 | 0.4254 | 0.5407 | 0.6147 | 0.4795 | 0.4021 | 0.3909 | 0.4630 | 0.3945 | 0.3907 | 0.5262 | 0.5273 | 0.5338 | 0.5611 | 0.6104 |
| Hainan | 0.4983 | 0.3954 | 0.4308 | 0.4604 | 0.4413 | 0.4126 | 0.4299 | 0.4520 | 0.3938 | 0.3404 | 0.4997 | 0.3678 | 0.3860 | 0.5479 | 0.4343 |
| Sichuan | 0.4144 | 0.3934 | 0.3977 | 0.4255 | 0.3942 | 0.3942 | 0.4106 | 0.4483 | 0.4301 | 0.4466 | 0.5458 | 0.5782 | 0.5561 | 0.5352 | 0.5914 |
| Guizhou | 0.3684 | 0.4021 | 0.3432 | 0.3801 | 0.3527 | 0.3532 | 0.3157 | 0.3805 | 0.3669 | 0.4811 | 0.5101 | 0.5384 | 0.5412 | 0.5471 | 0.5497 |
| Yunnan | 0.5312 | 0.5593 | 0.5713 | 0.5379 | 0.4792 | 0.4466 | 0.4870 | 0.4264 | 0.3468 | 0.3821 | 0.4904 | 0.4799 | 0.4630 | 0.4794 | 0.5351 |
| Tibet | 0.4002 | 0.1970 | 0.4748 | 0.4324 | 0.3154 | 0.3434 | 0.2260 | 0.2347 | 0.0854 | 0.2083 | 0.2243 | 0.1828 | 0.2754 | 0.2425 | 0.2452 |
| Shaanxi | 0.4232 | 0.4277 | 0.4256 | 0.3634 | 0.3622 | 0.3260 | 0.3610 | 0.4072 | 0.3837 | 0.3939 | 0.5332 | 0.5590 | 0.5761 | 0.6327 | 0.6594 |
| Gansu | 0.3514 | 0.2968 | 0.2750 | 0.3840 | 0.3234 | 0.3198 | 0.2856 | 0.2966 | 0.2845 | 0.2958 | 0.5110 | 0.5458 | 0.5518 | 0.5639 | 0.5440 |
| Qinghai | 0.2913 | 0.2801 | 0.2636 | 0.3258 | 0.2891 | 0.2811 | 0.2472 | 0.3146 | 0.2266 | 0.4657 | 0.5772 | 0.5082 | 0.4598 | 0.5493 | 0.5308 |
| Ningxia | 0.3304 | 0.3445 | 0.3227 | 0.3454 | 0.3708 | 0.3525 | 0.2718 | 0.2423 | 0.1899 | 0.3142 | 0.5091 | 0.5350 | 0.5244 | 0.5203 | 0.5243 |
| Xinjiang | 0.4023 | 0.4238 | 0.5099 | 0.5977 | 0.4658 | 0.4193 | 0.4957 | 0.5368 | 0.4223 | 0.4509 | 0.5769 | 0.5623 | 0.5865 | 0.5922 | 0.5807 |

Source: *China Statistical Yearbook 1995-2009*.

Note: Definition: (Share of self-funding) = (amount of the self-funding in the investment of capital construction) / (total amount of the investment of capital construction).

Chongqing is included in Sichuan.

Ave 0.4789
S.D. 0.1235
Max 0.8387
Min 0.0854

Table 5A.3b

Decentralisation variable 2 – local revenue share to local expenditure.

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|--------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Beijing | 1.0134 | 0.7465 | 0.8050 | 0.8006 | 0.8519 | 0.8041 | 0.8125 | 0.8256 | 0.8786 | 0.8228 | 0.8520 | 0.8858 | 0.8755 | 0.9102 | 0.9505 |
| Tianjin | 1.3912 | 1.2984 | 1.2474 | 1.0810 | 1.0962 | 1.0536 | 1.0627 | 1.0756 | 1.1324 | 1.1720 | 1.0317 | 1.2399 | 1.2452 | 1.2301 | 1.1886 |
| Hebei | 0.5921 | 0.6274 | 0.6545 | 0.6510 | 0.6857 | 0.6365 | 0.5987 | 0.5514 | 0.5243 | 0.5193 | 0.5192 | 0.5267 | 0.5257 | 0.5238 | 0.5036 |
| Shanxi | 0.0000 | 0.6396 | 0.6320 | 0.6467 | 0.6338 | 0.5891 | 0.5087 | 0.4586 | 0.4512 | 0.4476 | 0.4939 | 0.5508 | 0.6372 | 0.5695 | 0.5688 |
| Neimenggu | 0.3910 | 0.4277 | 0.4530 | 0.5120 | 0.4939 | 0.4737 | 0.4240 | 0.3494 | 0.3216 | 0.3454 | 0.3953 | 0.4562 | 0.6498 | 0.7720 | 0.7612 |
| Liaoning | 0.6874 | 0.6735 | 0.6725 | 0.6700 | 0.6779 | 0.6106 | 0.5705 | 0.5829 | 0.5785 | 0.5699 | 0.5686 | 0.5607 | 0.5748 | 0.6137 | 0.6297 |
| Jilin | 0.4902 | 0.5234 | 0.5250 | 0.4939 | 0.4926 | 0.4317 | 0.3983 | 0.3710 | 0.3626 | 0.3763 | 0.3275 | 0.3282 | 0.3413 | 0.3629 | 0.3583 |
| Heilongjiang | 0.5948 | 0.5802 | 0.6075 | 0.6447 | 0.6385 | 0.5307 | 0.5234 | 0.4840 | 0.4720 | 0.4840 | 0.4605 | 0.4558 | 0.4506 | 0.4370 | 0.4466 |
| Shanghai | 0.8901 | 0.8485 | 0.8419 | 0.8214 | 0.8159 | 0.7904 | 0.7995 | 0.8539 | 0.8200 | 0.8156 | 0.8023 | 0.8636 | 0.8823 | 0.9549 | 0.9101 |
| Jiangsu | 0.6825 | 0.6811 | 0.7177 | 0.7015 | 0.6980 | 0.7085 | 0.7582 | 0.7842 | 0.7483 | 0.7618 | 0.7473 | 0.7904 | 0.8229 | 0.8763 | 0.8411 |
| Zhejiang | 0.6184 | 0.6480 | 0.6534 | 0.6551 | 0.6907 | 0.7135 | 0.7947 | 0.6998 | 0.7559 | 0.7879 | 0.8476 | 0.8428 | 0.8820 | 0.9129 | 0.8754 |
| Anhui | 0.0000 | 0.6169 | 0.6409 | 0.6645 | 0.6572 | 0.6043 | 0.5539 | 0.4761 | 0.4386 | 0.4350 | 0.4566 | 0.4684 | 0.4552 | 0.4371 | 0.4399 |
| Fujian | 0.0000 | 0.6841 | 0.7095 | 0.7261 | 0.7373 | 0.7482 | 0.7222 | 0.7350 | 0.6864 | 0.6737 | 0.6455 | 0.7294 | 0.7427 | 0.7681 | 0.7325 |
| Jiangxi | 0.5356 | 0.5812 | 0.5847 | 0.5796 | 0.5544 | 0.5059 | 0.4992 | 0.4652 | 0.4117 | 0.4401 | 0.4532 | 0.4485 | 0.4387 | 0.4307 | 0.4038 |
| Shandong | 0.6155 | 0.6489 | 0.6732 | 0.7191 | 0.7224 | 0.7354 | 0.7563 | 0.7604 | 0.7090 | 0.7063 | 0.6964 | 0.7319 | 0.7397 | 0.7407 | 0.7236 |
| Henan | 0.5503 | 0.6013 | 0.6348 | 0.6623 | 0.6433 | 0.5812 | 0.5532 | 0.5265 | 0.4716 | 0.4717 | 0.4873 | 0.4817 | 0.4716 | 0.4609 | 0.4422 |
| Hubei | 0.5646 | 0.6137 | 0.6306 | 0.6253 | 0.6031 | 0.5779 | 0.5813 | 0.4788 | 0.4760 | 0.4806 | 0.4804 | 0.4822 | 0.4547 | 0.4633 | 0.4307 |
| Hunan | 0.5670 | 0.6218 | 0.5987 | 0.5942 | 0.5729 | 0.5317 | 0.5090 | 0.4758 | 0.4337 | 0.4682 | 0.4456 | 0.4526 | 0.4490 | 0.4470 | 0.4094 |
| Guangdong | 0.7166 | 0.7274 | 0.7974 | 0.7968 | 0.7761 | 0.7407 | 0.8511 | 0.8783 | 0.7900 | 0.7758 | 0.7655 | 0.7895 | 0.8536 | 0.8817 | 0.8761 |
| Guangxi | 0.4984 | 0.5651 | 0.5765 | 0.5804 | 0.6033 | 0.5937 | 0.5689 | 0.5081 | 0.4448 | 0.4591 | 0.4685 | 0.4629 | 0.4696 | 0.4248 | 0.3997 |
| Hainan | 0.6881 | 0.6732 | 0.6798 | 0.6528 | 0.6344 | 0.7039 | 0.6366 | 0.5864 | 0.5265 | 0.5348 | 0.4924 | 0.5066 | 0.5219 | 0.5310 | 0.5237 |
| Sichuan | 0.5729 | 0.6016 | 0.6397 | 0.6340 | 0.6196 | 0.5731 | 0.5169 | 0.4679 | 0.4297 | 0.4837 | 0.4986 | 0.5277 | 0.5246 | 0.5729 | 0.4560 |
| Guizhou | 0.0000 | 0.4547 | 0.4967 | 0.5086 | 0.4909 | 0.4350 | 0.4228 | 0.3625 | 0.3419 | 0.3748 | 0.3568 | 0.3505 | 0.3714 | 0.3585 | 0.3312 |
| Yunnan | 0.3765 | 0.4183 | 0.4808 | 0.4803 | 0.5129 | 0.4567 | 0.4365 | 0.3853 | 0.3924 | 0.3899 | 0.3968 | 0.4197 | 0.4252 | 0.4287 | 0.4177 |
| Tibet | 0.0470 | 0.0616 | 0.0640 | 0.0978 | 0.0958 | 0.1003 | 0.1027 | 0.0695 | 0.0624 | 0.0677 | 0.0881 | 0.0758 | 0.0854 | 0.0828 | 0.0744 |
| Shaanxi | 0.4980 | 0.4996 | 0.5551 | 0.5820 | 0.5616 | 0.5152 | 0.4231 | 0.3880 | 0.3712 | 0.4240 | 0.4163 | 0.4309 | 0.4408 | 0.4509 | 0.4140 |
| Gansu | 0.4018 | 0.4168 | 0.4769 | 0.4630 | 0.4310 | 0.3949 | 0.3256 | 0.2971 | 0.2782 | 0.2922 | 0.2918 | 0.2877 | 0.2672 | 0.2827 | 0.2736 |
| Qinghai | 0.2763 | 0.2985 | 0.2928 | 0.2994 | 0.2897 | 0.2544 | 0.2430 | 0.1957 | 0.1777 | 0.1970 | 0.1966 | 0.1992 | 0.1968 | 0.2010 | 0.1968 |
| Ningxia | 0.3702 | 0.3905 | 0.4296 | 0.4185 | 0.3934 | 0.3803 | 0.3423 | 0.2947 | 0.2311 | 0.2839 | 0.3046 | 0.2978 | 0.3176 | 0.3309 | 0.2927 |
| Xinjiang | 0.4573 | 0.3971 | 0.4205 | 0.4420 | 0.4479 | 0.4289 | 0.4141 | 0.3611 | 0.3225 | 0.3480 | 0.3698 | 0.3474 | 0.3235 | 0.3595 | 0.3408 |

Source: Various provincial statistical yearbooks 1995-2009.

Note: Definition: (Ratio of local revenue to expenditure) = (amount of local revenue in fiscal balance of payments) / (amount of local expenditure in fiscal balance of payments). Chongqing is included in Sichuan. 1994 data for Xinjiang are not available and 1990 data have been used instead.

| | |
|------|--------|
| Ave | 0.5513 |
| S.D. | 0.2238 |
| Max | 1.3912 |
| Min | 0.0000 |

Table 5A.4a

Market competition variable 1 – non-state share of industrial output.

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|--------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Beijing | 0.4464 | 0.4184 | 0.4504 | 0.4549 | 0.2709 | 0.2672 | 0.3207 | 0.3489 | 0.4181 | 0.4615 | 0.4363 | 0.4906 | 0.5463 | 0.5370 | 0.5229 |
| Tianjin | 0.4991 | 0.6070 | 0.6584 | 0.6592 | 0.6308 | 0.6763 | 0.6712 | 0.6686 | 0.6755 | 0.6403 | 0.6507 | 0.6119 | 0.5994 | 0.6184 | 0.6183 |
| Hebei | 0.4034 | 0.4488 | 0.5080 | 0.5470 | 0.4393 | 0.4595 | 0.4754 | 0.5007 | 0.5458 | 0.5865 | 0.6130 | 0.6345 | 0.6806 | 0.6924 | 0.7108 |
| Shanxi | 0.2899 | 0.2866 | 0.3322 | 0.3765 | 0.3474 | 0.3315 | 0.3115 | 0.3168 | 0.3737 | 0.4335 | 0.4828 | 0.4775 | 0.4836 | 0.4814 | 0.4813 |
| Neimenggu | 0.2254 | 0.2294 | 0.2942 | 0.3322 | 0.1620 | 0.1514 | 0.2015 | 0.2373 | 0.2799 | 0.4110 | 0.4703 | 0.4758 | 0.5550 | 0.5996 | 0.5949 |
| Liaoning | 0.3895 | 0.3868 | 0.4204 | 0.4434 | 0.3328 | 0.3485 | 0.3345 | 0.3463 | 0.3757 | 0.4189 | 0.4326 | 0.4664 | 0.5448 | 0.5584 | 0.6084 |
| Jilin | 0.2543 | 0.2721 | 0.2845 | 0.2862 | 0.1935 | 0.1816 | 0.1801 | 0.1980 | 0.2209 | 0.2421 | 0.3010 | 0.3319 | 0.3830 | 0.4361 | 0.5166 |
| Heilongjiang | 0.2178 | 0.2537 | 0.2964 | 0.3161 | 0.1672 | 0.1584 | 0.1584 | 0.1726 | 0.2041 | 0.2055 | 0.2251 | 0.2349 | 0.2271 | 0.2739 | 0.3252 |
| Shanghai | 0.5222 | 0.5801 | 0.6150 | 0.6537 | 0.5015 | 0.4833 | 0.4834 | 0.5132 | 0.5416 | 0.5682 | 0.6137 | 0.6183 | 0.6269 | 0.6445 | 0.6430 |
| Jiangsu | 0.7121 | 0.7028 | 0.7184 | 0.7318 | 0.6706 | 0.6840 | 0.7065 | 0.7351 | 0.7721 | 0.8103 | 0.8519 | 0.8456 | 0.8568 | 0.8759 | 0.8864 |
| Zhejiang | 0.7564 | 0.7401 | 0.7706 | 0.7710 | 0.7351 | 0.7720 | 0.8042 | 0.8484 | 0.8639 | 0.8689 | 0.8503 | 0.8528 | 0.8618 | 0.8715 | 0.8700 |
| Anhui | 0.4894 | 0.5265 | 0.5859 | 0.6902 | 0.3416 | 0.3505 | 0.3713 | 0.3899 | 0.4306 | 0.4487 | 0.4747 | 0.4705 | 0.5207 | 0.5660 | 0.5668 |
| Fujian | 0.6718 | 0.7217 | 0.7537 | 0.7944 | 0.6667 | 0.6566 | 0.6732 | 0.7032 | 0.7378 | 0.7728 | 0.8040 | 0.8116 | 0.8290 | 0.8514 | 0.8612 |
| Jiangxi | 0.3517 | 0.3176 | 0.3513 | 0.3960 | 0.2018 | 0.1908 | 0.2090 | 0.2436 | 0.2700 | 0.3571 | 0.4218 | 0.4859 | 0.5360 | 0.6238 | 0.6928 |
| Shandong | 0.5963 | 0.5386 | 0.5869 | 0.6076 | 0.5787 | 0.5865 | 0.5805 | 0.6113 | 0.6346 | 0.6652 | 0.7286 | 0.7575 | 0.7620 | 0.7868 | 0.7909 |
| Henan | 0.3905 | 0.4164 | 0.4583 | 0.4993 | 0.4543 | 0.4565 | 0.4618 | 0.4699 | 0.4860 | 0.4933 | 0.5741 | 0.6146 | 0.6817 | 0.6722 | 0.7315 |
| Hubei | 0.3873 | 0.4436 | 0.5250 | 0.5834 | 0.3973 | 0.3827 | 0.3705 | 0.3707 | 0.3959 | 0.4324 | 0.4671 | 0.4788 | 0.5251 | 0.5091 | 0.5559 |
| Hunan | 0.3657 | 0.3844 | 0.4498 | 0.4904 | 0.2948 | 0.3290 | 0.3381 | 0.3730 | 0.4119 | 0.4671 | 0.4845 | 0.5574 | 0.5712 | 0.6042 | 0.6625 |
| Guangdong | 0.7186 | 0.7792 | 0.7980 | 0.8165 | 0.7298 | 0.7129 | 0.7495 | 0.7694 | 0.8071 | 0.8164 | 0.7957 | 0.8226 | 0.8346 | 0.8443 | 0.8297 |
| Guangxi | 0.3603 | 0.4245 | 0.4566 | 0.4785 | 0.3259 | 0.3010 | 0.3378 | 0.3877 | 0.3997 | 0.4445 | 0.4572 | 0.5184 | 0.5537 | 0.5908 | 0.6250 |
| Hainan | 0.3770 | 0.5017 | 0.5791 | 0.5753 | 0.2944 | 0.2893 | 0.3252 | 0.3439 | 0.3858 | 0.3596 | 0.4864 | 0.4964 | 0.5708 | 0.6847 | 0.7508 |
| Sichuan | 0.4295 | 0.4389 | 0.4482 | 0.4634 | 0.3229 | 0.3420 | 0.3738 | 0.4100 | 0.4428 | 0.5051 | 0.5489 | 0.5648 | 0.5702 | 0.6115 | 0.6527 |
| Guizhou | 0.1551 | 0.2104 | 0.2723 | 0.3028 | 0.1656 | 0.1784 | 0.2072 | 0.2306 | 0.2636 | 0.3170 | 0.3184 | 0.3170 | 0.3420 | 0.3623 | 0.3961 |
| Yunnan | 0.1550 | 0.1860 | 0.2033 | 0.2502 | 0.1747 | 0.1894 | 0.1960 | 0.1966 | 0.2117 | 0.2641 | 0.3142 | 0.3559 | 0.3810 | 0.3941 | 0.4240 |
| Tibet | 0.1688 | 0.2122 | 0.2399 | 0.2958 | 0.1738 | 0.2525 | 0.2321 | 0.3082 | 0.2741 | 0.2165 | 0.2533 | 0.3335 | 0.4710 | 0.5633 | 0.5563 |
| Shaanxi | 0.2526 | 0.2534 | 0.3001 | 0.3610 | 0.2258 | 0.2259 | 0.2174 | 0.2241 | 0.2325 | 0.2593 | 0.2952 | 0.3135 | 0.2876 | 0.2954 | 0.3315 |
| Gansu | 0.1879 | 0.2110 | 0.2513 | 0.2884 | 0.1786 | 0.2132 | 0.2360 | 0.2526 | 0.2852 | 0.2325 | 0.2113 | 0.2085 | 0.2028 | 0.1981 | 0.2120 |
| Qinghai | 0.1068 | 0.1108 | 0.1353 | 0.1668 | 0.1083 | 0.1078 | 0.1089 | 0.1272 | 0.1766 | 0.2134 | 0.1885 | 0.1875 | 0.2023 | 0.2577 | 0.3217 |
| Ningxia | 0.2333 | 0.2578 | 0.3039 | 0.3267 | 0.1652 | 0.2356 | 0.2699 | 0.2831 | 0.3375 | 0.3998 | 0.4432 | 0.4460 | 0.4911 | 0.5158 | 0.5133 |
| Xinjiang | 0.1625 | 0.1602 | 0.1669 | 0.1747 | 0.1117 | 0.1012 | 0.1183 | 0.1546 | 0.1681 | 0.1825 | 0.2025 | 0.1750 | 0.1663 | 0.1998 | 0.2158 |

Source: *China Statistical Yearbook 1995-2009*.

Note: Definition: (Share of non-state-owned industrial output) = [(all industrial output) – (SOE industrial output)] / (all industrial output). Chongqing is included in Sichuan.

Ave 0.4442
S.D. 0.2022
Max 0.8864
Min 0.1012

Table 5A.4b

Market competition variable 2 – openness degree to international trade.

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|--------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Beijing | 2.3275 | 2.2172 | 1.5087 | 1.3917 | 1.2562 | 1.3081 | 1.6572 | 1.1497 | 1.0036 | 1.1286 | 1.2917 | 1.4930 | 1.6026 | 1.5690 | 1.7991 |
| Tianjin | 0.6591 | 0.7300 | 0.7198 | 0.6905 | 0.6575 | 0.7194 | 0.8662 | 0.7838 | 0.8779 | 0.9421 | 1.1182 | 1.1803 | 1.1829 | 1.0758 | 0.8788 |
| Hebei | 0.1244 | 0.1148 | 0.1010 | 0.0860 | 0.0822 | 0.0830 | 0.0852 | 0.0861 | 0.0917 | 0.1074 | 0.1321 | 0.1304 | 0.1283 | 0.1416 | 0.1648 |
| Shanxi | 0.0847 | 0.1072 | 0.0740 | 0.0751 | 0.0575 | 0.0707 | 0.0889 | 0.0792 | 0.0823 | 0.0896 | 0.1247 | 0.1087 | 0.1120 | 0.1536 | 0.1441 |
| Neimenggu | 0.1169 | 0.0995 | 0.0886 | 0.0813 | 0.0669 | 0.0845 | 0.1549 | 0.0983 | 0.1038 | 0.0980 | 0.1013 | 0.1025 | 0.0981 | 0.0966 | 0.0798 |
| Liaoning | 0.3584 | 0.3942 | 0.3704 | 0.3540 | 0.2717 | 0.2722 | 0.3374 | 0.3257 | 0.3297 | 0.3655 | 0.4269 | 0.4195 | 0.4187 | 0.4103 | 0.3737 |
| Jilin | 0.2568 | 0.1928 | 0.1308 | 0.1062 | 0.0878 | 0.1103 | 0.1168 | 0.1252 | 0.1305 | 0.1912 | 0.1800 | 0.1477 | 0.1476 | 0.1482 | 0.1441 |
| Heilongjiang | 0.1293 | 0.0989 | 0.0847 | 0.0754 | 0.0590 | 0.0628 | 0.0760 | 0.0826 | 0.0990 | 0.1087 | 0.1183 | 0.1422 | 0.1653 | 0.1862 | 0.1933 |
| Shanghai | 0.7894 | 0.8260 | 0.7775 | 0.7352 | 0.7036 | 0.7923 | 0.9951 | 0.9674 | 1.0471 | 1.3890 | 1.6405 | 1.6675 | 1.7497 | 1.7646 | 1.6329 |
| Jiangsu | 0.2497 | 0.2642 | 0.2866 | 0.2932 | 0.3030 | 0.3361 | 0.4402 | 0.4494 | 0.5485 | 0.7558 | 0.9425 | 1.0199 | 1.0459 | 1.0323 | 0.8988 |
| Zhejiang | 0.2904 | 0.2727 | 0.2512 | 0.2545 | 0.2466 | 0.2825 | 0.3817 | 0.3935 | 0.4339 | 0.5237 | 0.6054 | 0.6546 | 0.7046 | 0.7160 | 0.6824 |
| Anhui | 0.0907 | 0.0837 | 0.0790 | 0.0738 | 0.0666 | 0.0754 | 0.0912 | 0.0923 | 0.0983 | 0.1255 | 0.1254 | 0.1390 | 0.1592 | 0.1645 | 0.1580 |
| Fujian | 0.6234 | 0.5584 | 0.4992 | 0.5026 | 0.4266 | 0.4108 | 0.4481 | 0.4599 | 0.5261 | 0.5867 | 0.6825 | 0.6785 | 0.6586 | 0.6121 | 0.5443 |
| Jiangxi | 0.1188 | 0.0917 | 0.0611 | 0.0644 | 0.0558 | 0.0587 | 0.0671 | 0.0582 | 0.0572 | 0.0745 | 0.0845 | 0.0821 | 0.1057 | 0.1306 | 0.1459 |
| Shandong | 0.2141 | 0.2328 | 0.2255 | 0.2199 | 0.1922 | 0.1974 | 0.2422 | 0.2606 | 0.2733 | 0.3059 | 0.3342 | 0.3395 | 0.3438 | 0.3587 | 0.3541 |
| Henan | 0.0634 | 0.0620 | 0.0447 | 0.0384 | 0.0330 | 0.0316 | 0.0368 | 0.0416 | 0.0439 | 0.0568 | 0.0641 | 0.0598 | 0.0632 | 0.0648 | 0.0659 |
| Hubei | 0.1260 | 0.1189 | 0.0801 | 0.0770 | 0.0633 | 0.0575 | 0.0624 | 0.0763 | 0.0777 | 0.0889 | 0.0994 | 0.1138 | 0.1237 | 0.1225 | 0.1269 |
| Hunan | 0.1094 | 0.0775 | 0.0586 | 0.0524 | 0.0459 | 0.0487 | 0.0563 | 0.0596 | 0.0573 | 0.0663 | 0.0799 | 0.0755 | 0.0781 | 0.0801 | 0.0781 |
| Guangdong | 1.9644 | 1.6126 | 1.4017 | 1.4745 | 1.3573 | 1.3726 | 1.4574 | 1.2134 | 1.3553 | 1.4811 | 1.5669 | 1.5674 | 1.6066 | 1.5514 | 1.3327 |
| Guangxi | 0.2108 | 0.1723 | 0.0992 | 0.1308 | 0.1048 | 0.0743 | 0.0821 | 0.0653 | 0.0797 | 0.0935 | 0.1031 | 0.1041 | 0.1101 | 0.1182 | 0.1282 |
| Hainan | 0.7189 | 0.5402 | 0.4830 | 0.3897 | 0.3293 | 0.2138 | 0.2056 | 0.2590 | 0.2484 | 0.2716 | 0.3524 | 0.2328 | 0.2199 | 0.2185 | 0.2155 |
| Sichuan | 0.0961 | 0.0822 | 0.0745 | 0.0619 | 0.0517 | 0.0586 | 0.0640 | 0.0674 | 0.0772 | 0.0896 | 0.0978 | 0.0955 | 0.1087 | 0.1134 | 0.1248 |
| Guizhou | 0.0775 | 0.0880 | 0.0566 | 0.0658 | 0.0617 | 0.0497 | 0.0550 | 0.0472 | 0.0460 | 0.0571 | 0.0747 | 0.0581 | 0.0568 | 0.0630 | 0.0701 |
| Yunnan | 0.1444 | 0.1487 | 0.1031 | 0.0846 | 0.0762 | 0.0741 | 0.0768 | 0.0770 | 0.0797 | 0.0864 | 0.1005 | 0.1119 | 0.1246 | 0.1410 | 0.1169 |
| Tibet | 0.5876 | 0.3240 | 0.2268 | 0.1891 | 0.1087 | 0.1305 | 0.0918 | 0.0527 | 0.0648 | 0.0700 | 0.0751 | 0.0670 | 0.0900 | 0.0874 | 0.1343 |
| Shaanxi | 0.1499 | 0.1407 | 0.1234 | 0.1082 | 0.1230 | 0.1116 | 0.1067 | 0.0849 | 0.0817 | 0.0890 | 0.0949 | 0.1020 | 0.0945 | 0.0958 | 0.0844 |
| Gansu | 0.0960 | 0.0905 | 0.0551 | 0.0508 | 0.0426 | 0.0361 | 0.0479 | 0.0573 | 0.0589 | 0.0785 | 0.0864 | 0.1114 | 0.1339 | 0.1554 | 0.1333 |
| Qinghai | 0.0951 | 0.0778 | 0.0580 | 0.0528 | 0.0443 | 0.0375 | 0.0502 | 0.0565 | 0.0478 | 0.0719 | 0.1022 | 0.0623 | 0.0812 | 0.0594 | 0.0498 |
| Ningxia | 0.1113 | 0.1080 | 0.0815 | 0.0888 | 0.0870 | 0.1090 | 0.1381 | 0.1307 | 0.0972 | 0.1214 | 0.1399 | 0.1306 | 0.1612 | 0.1352 | 0.1188 |
| Xinjiang | 0.1098 | 0.1186 | 0.0856 | 0.0887 | 0.1131 | 0.1251 | 0.1374 | 0.0983 | 0.1382 | 0.2093 | 0.2111 | 0.2498 | 0.2383 | 0.2960 | 0.3671 |

Source: *China Statistical Yearbook* 1995-2009.

Note: Definition: (Openness degree of international trade) = (total amount of import and export trade) / (regional gross domestic product). Chongqing is included in Sichuan.

| | |
|------|--------|
| Ave | 0.3204 |
| S.D. | 0.4281 |
| Max | 2.3275 |
| Min | 0.0316 |

Table 5A.5a

Financial pressure variable 1 – asset-liability ratio.

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|--|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Beijing | 0.6222 | 0.5589 | 0.5575 | 0.5767 | 0.5868 | 0.5939 | 0.5549 | 0.5264 | 0.5139 | 0.5173 | 0.1909 | 0.3114 | 0.3235 | 0.3404 | 0.4480 |
| Tianjin | 0.6588 | 0.6228 | 0.6445 | 0.6774 | 0.6646 | 0.6553 | 0.6387 | 0.6118 | 0.6015 | 0.6001 | 0.5827 | 0.6019 | 0.6012 | 0.6266 | 0.6316 |
| Hebei | 0.6477 | 0.6368 | 0.6126 | 0.6058 | 0.6004 | 0.5961 | 0.6048 | 0.6337 | 0.6283 | 0.6232 | 0.6538 | 0.6401 | 0.6384 | 0.6102 | 0.6439 |
| Shanxi | 0.6129 | 0.5612 | 0.5539 | 0.5754 | 0.6182 | 0.6552 | 0.6362 | 0.6399 | 0.6113 | 0.6376 | 0.6130 | 0.6782 | 0.6797 | 0.6765 | 0.6753 |
| Neimenggu | 0.6037 | 0.5957 | 0.5925 | 0.6265 | 0.6184 | 0.6124 | 0.5802 | 0.5823 | 0.5625 | 0.5954 | 0.5935 | 0.6432 | 0.6298 | 0.6223 | 0.6626 |
| Liaoning | 0.6255 | 0.6075 | 0.5776 | 0.5790 | 0.5893 | 0.5983 | 0.6075 | 0.5942 | 0.6089 | 0.5942 | 0.5435 | 0.5933 | 0.5775 | 0.6088 | 0.6319 |
| Jilin | 0.6949 | 0.6772 | 0.6990 | 0.6870 | 0.6750 | 0.6644 | 0.6627 | 0.6345 | 0.6545 | 0.6316 | 0.5987 | 0.6057 | 0.5496 | 0.5853 | 0.5592 |
| Heilongjiang | 0.6400 | 0.5811 | 0.5748 | 0.5789 | 0.6118 | 0.6459 | 0.5656 | 0.5795 | 0.5553 | 0.5408 | 0.5316 | 0.5450 | 0.5325 | 0.5526 | 0.5405 |
| Shanghai | 0.5884 | 0.6045 | 0.6269 | 0.6536 | 0.5594 | 0.5083 | 0.4647 | 0.4278 | 0.4536 | 0.4453 | 0.4179 | 0.4360 | 0.4356 | 0.4562 | 0.4927 |
| Jiangsu | 0.6639 | 0.6097 | 0.6066 | 0.6136 | 0.6063 | 0.6009 | 0.6024 | 0.5822 | 0.5846 | 0.6025 | 0.6513 | 0.5967 | 0.5758 | 0.5899 | 0.6214 |
| Zhejiang | 0.6761 | 0.6250 | 0.5961 | 0.5991 | 0.5540 | 0.5224 | 0.5416 | 0.5186 | 0.5039 | 0.5097 | 0.3347 | 0.5741 | 0.5846 | 0.5881 | 0.6265 |
| Anhui | 0.6925 | 0.6703 | 0.6874 | 0.6099 | 0.6099 | 0.6099 | 0.6001 | 0.5948 | 0.5737 | 0.6070 | 0.6717 | 0.6283 | 0.6495 | 0.6565 | 0.6639 |
| Fujian | 0.7152 | 0.6601 | 0.6335 | 0.5337 | 0.5430 | 0.5487 | 0.6042 | 0.6079 | 0.6027 | 0.5904 | 0.5748 | 0.5615 | 0.6036 | 0.5934 | 0.6027 |
| Jiangxi | 0.7238 | 0.7031 | 0.7025 | 0.6964 | 0.6960 | 0.6958 | 0.6805 | 0.6662 | 0.6512 | 0.6889 | 0.6881 | 0.6938 | 0.6645 | 0.6512 | 0.6307 |
| Shandong | 0.8401 | 0.6186 | 0.6249 | 0.6226 | 0.6237 | 0.6246 | 0.5985 | 0.5839 | 0.5895 | 0.5843 | 0.6339 | 0.6018 | 0.6083 | 0.5902 | 0.5844 |
| Henan | 0.6480 | 0.6038 | 0.6041 | 0.6144 | 0.6331 | 0.6481 | 0.6613 | 0.6440 | 0.6449 | 0.6655 | 0.6184 | 0.6562 | 0.6491 | 0.6502 | 0.6520 |
| Hubei | 0.6294 | 0.6040 | 0.6132 | 0.6138 | 0.6293 | 0.6400 | 0.6233 | 0.6013 | 0.6182 | 0.5741 | 0.6696 | 0.5734 | 0.5408 | 0.5428 | 0.5151 |
| Hunan | 0.6491 | 0.6012 | 0.6211 | 0.6432 | 0.6720 | 0.6984 | 0.6690 | 0.6704 | 0.6785 | 0.6576 | 0.7044 | 0.6723 | 0.6536 | 0.6235 | 0.6465 |
| Guangdong | 0.6827 | 0.6888 | 0.6498 | 0.6816 | 0.6045 | 0.5638 | 0.5543 | 0.5296 | 0.5172 | 0.5348 | 0.5202 | 0.5321 | 0.4940 | 0.4865 | 0.5561 |
| Guangxi | 0.6759 | 0.6426 | 0.6426 | 0.6544 | 0.6750 | 0.6922 | 0.6869 | 0.6083 | 0.6608 | 0.6297 | 0.6266 | 0.6291 | 0.6231 | 0.6404 | 0.6827 |
| Hainan | 0.7234 | 0.6834 | 0.6188 | 0.7748 | 0.7498 | 0.7347 | 0.6711 | 0.6193 | 0.5528 | 0.5457 | 0.4790 | 0.5423 | 0.6133 | 0.4941 | 0.4393 |
| Sichuan | 0.6655 | 0.6383 | 0.6466 | 0.6463 | 0.6456 | 0.6450 | 0.6471 | 0.6339 | 0.6209 | 0.6216 | 0.6782 | 0.6267 | 0.6176 | 0.6227 | 0.6283 |
| Guizhou | 0.6621 | 0.6577 | 0.6518 | 0.6577 | 0.6748 | 0.6884 | 0.6958 | 0.6157 | 0.6346 | 0.6248 | 0.5486 | 0.6639 | 0.6724 | 0.6569 | 0.6771 |
| Yunnan | 0.6589 | 0.6266 | 0.6375 | 0.6129 | 0.5640 | 0.5281 | 0.5359 | 0.5262 | 0.5262 | 0.5272 | 0.4800 | 0.4744 | 0.5057 | 0.4916 | 0.5494 |
| Tibet | 0.2868 | 0.2733 | 0.2937 | 0.2847 | 0.3232 | 0.3453 | 0.2680 | 0.2285 | 0.2756 | 0.2746 | 0.2078 | 0.2548 | 0.4880 | 0.2040 | 0.2105 |
| Shaanxi | 0.7128 | 0.6718 | 0.6788 | 0.7020 | 0.6968 | 0.6929 | 0.6893 | 0.6388 | 0.6396 | 0.6356 | 0.6374 | 0.6188 | 0.5981 | 0.5728 | 0.5656 |
| Gansu | 0.6101 | 0.5887 | 0.5749 | 0.6127 | 0.6566 | 0.6983 | 0.6546 | 0.6533 | 0.6351 | 0.6508 | 0.6235 | 0.5932 | 0.5906 | 0.5838 | 0.5629 |
| Qinghai | 0.7582 | 0.6934 | 0.6294 | 0.7357 | 0.6948 | 0.6640 | 0.7339 | 0.6984 | 0.6866 | 0.6879 | 0.7269 | 0.6856 | 0.6687 | 0.6315 | 0.6298 |
| Ningxia | 0.6297 | 0.5915 | 0.5717 | 0.6109 | 0.6475 | 0.6773 | 0.5839 | 0.5538 | 0.6043 | 0.6477 | 0.5923 | 0.6094 | 0.6045 | 0.6353 | 0.6556 |
| Xinjiang | 0.6812 | 0.6437 | 0.6392 | 0.6111 | 0.6227 | 0.6334 | 0.6275 | 0.5987 | 0.5783 | 0.5151 | 0.5328 | 0.5058 | 0.5053 | 0.4936 | 0.5105 |
| Source: <i>China Statistical Yearbook 1995-2009</i> . | | | | | | | | | | | | | | Ave | 0.5998 |
| Note: Definition: (Asset-liability ratio) = (total amount of liability of SOEs) / (total assets S.D. of SOEs). Chongqing is included in Sichuan. Due to the unavailability of data for 1998 in all provinces, data from adjacent years have been interpolated for this year. | | | | | | | | | | | | | | Max | 0.8401 |
| | | | | | | | | | | | | | | Min | 0.1909 |

Table 5A.5b

Financial pressure variable 2 – deficit budget share.

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|--|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------|
| Beijing | -0.0134 | 0.2535 | 0.1950 | 0.2288 | 0.1825 | 0.2079 | 0.2212 | 0.1877 | 0.1502 | 0.1712 | 0.1712 | 0.1314 | 0.1386 | 0.0951 | 0.0622 |
| Tianjin | 0.3213 | 0.3368 | 0.3018 | 0.2678 | 0.2649 | 0.2834 | 0.2857 | 0.3027 | 0.3521 | 0.3436 | 0.3436 | 0.2494 | 0.2321 | 0.1985 | 0.2214 |
| Hebei | 0.4080 | 0.3726 | 0.3455 | 0.3490 | 0.3143 | 0.3635 | 0.4013 | 0.4486 | 0.4757 | 0.4808 | 0.4808 | 0.4733 | 0.4743 | 0.4762 | 0.4964 |
| Shanxi | 0.3968 | 0.3604 | 0.3680 | 0.3533 | 0.3662 | 0.4109 | 0.4913 | 0.5414 | 0.5488 | 0.5061 | 0.5061 | 0.4492 | 0.3628 | 0.4305 | 0.4312 |
| Neimenggu | 0.6089 | 0.5723 | 0.5470 | 0.5376 | 0.5440 | 0.5667 | 0.6157 | 0.6886 | 0.7133 | 0.6512 | 0.6512 | 0.5931 | 0.5772 | 0.5451 | 0.5527 |
| Liaoning | 0.3126 | 0.3267 | 0.3275 | 0.3302 | 0.3220 | 0.3893 | 0.4294 | 0.4170 | 0.4215 | 0.4313 | 0.4313 | 0.4393 | 0.4253 | 0.3863 | 0.3703 |
| Jilin | 0.5098 | 0.4766 | 0.4750 | 0.5061 | 0.5074 | 0.5683 | 0.6017 | 0.6290 | 0.6374 | 0.6725 | 0.6725 | 0.6718 | 0.6587 | 0.6371 | 0.6417 |
| Heilongjiang | 0.4055 | 0.4198 | 0.3926 | 0.3822 | 0.3938 | 0.4982 | 0.5147 | 0.5533 | 0.5640 | 0.5851 | 0.5851 | 0.5961 | 0.6006 | 0.6290 | 0.6251 |
| Shanghai | 0.1096 | 0.1804 | 0.1582 | 0.1868 | 0.1901 | 0.2129 | 0.2024 | 0.1393 | 0.1779 | 0.1999 | 0.1999 | 0.1390 | 0.1222 | 0.0491 | 0.0907 |
| Jiangsu | 0.3175 | 0.3189 | 0.2823 | 0.2985 | 0.3020 | 0.2915 | 0.2418 | 0.2159 | 0.2517 | 0.2527 | 0.2527 | 0.2096 | 0.1771 | 0.1237 | 0.1589 |
| Zhejiang | 0.3816 | 0.3520 | 0.3466 | 0.3449 | 0.3093 | 0.2865 | 0.2052 | 0.1617 | 0.2441 | 0.2418 | 0.2418 | 0.1572 | 0.1180 | 0.0871 | 0.1246 |
| Anhui | 0.4137 | 0.3831 | 0.3588 | 0.3219 | 0.3424 | 0.3961 | 0.4475 | 0.5241 | 0.5618 | 0.5434 | 0.5434 | 0.5316 | 0.5448 | 0.5629 | 0.5601 |
| Fujian | 0.0000 | 0.3159 | 0.2905 | 0.2739 | 0.2627 | 0.2518 | 0.2779 | 0.2650 | 0.3136 | 0.3545 | 0.3545 | 0.2706 | 0.2573 | 0.2319 | 0.2675 |
| Jiangxi | 0.4644 | 0.4188 | 0.4153 | 0.4110 | 0.4456 | 0.4941 | 0.5008 | 0.5348 | 0.5883 | 0.5468 | 0.5468 | 0.5515 | 0.5613 | 0.5693 | 0.5962 |
| Shandong | 0.3845 | 0.3511 | 0.3268 | 0.2879 | 0.2776 | 0.2646 | 0.2437 | 0.2396 | 0.2910 | 0.3036 | 0.3036 | 0.2681 | 0.2603 | 0.2593 | 0.2764 |
| Henan | 0.4497 | 0.3987 | 0.3652 | 0.3469 | 0.3567 | 0.4188 | 0.4468 | 0.4735 | 0.5284 | 0.5127 | 0.5127 | 0.5183 | 0.5284 | 0.5391 | 0.5578 |
| Hubei | 0.4354 | 0.3863 | 0.3694 | 0.3747 | 0.3969 | 0.4221 | 0.4188 | 0.5212 | 0.5240 | 0.5196 | 0.5196 | 0.5178 | 0.5453 | 0.5378 | 0.5693 |
| Hunan | 0.4330 | 0.3782 | 0.4013 | 0.4058 | 0.4271 | 0.4683 | 0.4910 | 0.5242 | 0.5663 | 0.5544 | 0.5544 | 0.5475 | 0.5510 | 0.5530 | 0.5906 |
| Guangdong | 0.2834 | 0.3471 | 0.2026 | 0.2032 | 0.2239 | 0.2068 | 0.1571 | 0.1217 | 0.2100 | 0.2345 | 0.2345 | 0.2105 | 0.1464 | 0.1183 | 0.1239 |
| Guangxi | 0.5016 | 0.4349 | 0.4235 | 0.4196 | 0.3967 | 0.4063 | 0.4311 | 0.4919 | 0.5552 | 0.5315 | 0.5315 | 0.5371 | 0.5304 | 0.5752 | 0.6003 |
| Hainan | 0.3119 | 0.3268 | 0.3202 | 0.3547 | 0.3867 | 0.3635 | 0.3886 | 0.4456 | 0.4988 | 0.5516 | 0.5516 | 0.5459 | 0.5313 | 0.5583 | 0.5953 |
| Sichuan | 0.4271 | 0.3984 | 0.3603 | 0.3826 | 0.3991 | 0.4390 | 0.4980 | 0.5464 | 0.5852 | 0.5458 | 0.5458 | 0.5308 | 0.5234 | 0.4882 | 0.5916 |
| Guizhou | 0.5791 | 0.5453 | 0.5033 | 0.5003 | 0.5090 | 0.5650 | 0.5772 | 0.6375 | 0.6581 | 0.6432 | 0.6432 | 0.6495 | 0.6286 | 0.6415 | 0.6699 |
| Yunnan | 0.6235 | 0.5817 | 0.5192 | 0.5197 | 0.4871 | 0.5433 | 0.5635 | 0.6147 | 0.6076 | 0.6032 | 0.6032 | 0.5920 | 0.5748 | 0.5713 | 0.5823 |
| Tibet | 0.9530 | 0.9384 | 0.9338 | 0.9227 | 0.9197 | 0.9141 | 0.9102 | 0.9416 | 0.9470 | 0.9251 | 0.9251 | 0.9351 | 0.9273 | 0.9269 | 0.9346 |
| Shaanxi | 0.5020 | 0.5004 | 0.4449 | 0.4442 | 0.4384 | 0.4848 | 0.5769 | 0.6120 | 0.6288 | 0.5837 | 0.5837 | 0.5691 | 0.5602 | 0.5491 | 0.5860 |
| Gansu | 0.5982 | 0.5832 | 0.5231 | 0.5502 | 0.5690 | 0.6051 | 0.6744 | 0.7029 | 0.7218 | 0.7082 | 0.7082 | 0.7123 | 0.7328 | 0.7173 | 0.7264 |
| Qinghai | 0.7236 | 0.7015 | 0.7072 | 0.7006 | 0.7103 | 0.7456 | 0.7570 | 0.8043 | 0.8223 | 0.8034 | 0.8034 | 0.8008 | 0.8032 | 0.7990 | 0.8032 |
| Ningxia | 0.6300 | 0.6095 | 0.5704 | 0.5815 | 0.6066 | 0.6197 | 0.6577 | 0.7053 | 0.7689 | 0.6954 | 0.6954 | 0.7022 | 0.6824 | 0.6691 | 0.7073 |
| Xinjiang | 0.5963 | 0.5953 | 0.5795 | 0.5580 | 0.5521 | 0.5711 | 0.5859 | 0.6389 | 0.6775 | 0.6302 | 0.6302 | 0.6526 | 0.6765 | 0.6405 | 0.6592 |
| Source: <i>China Statistical Yearbook</i> 1995-2009. | | | | | | | | | | | | | | Ave | 0.4654 |
| Note: Definition: (Share of deficit budget) = (Regional expenditure – revenue) / (Regional expenditure). Chongqing is included in Sichuan. | | | | | | | | | | | | | | S.D. | 0.1891 |
| | | | | | | | | | | | | | | Max | 0.9530 |
| | | | | | | | | | | | | | | Min | -0.0134 |

Table 5A.6a

Institutional infrastructure variable 1 – national physical infrastructure index.

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|--------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Beijing | 0.2555 | 0.2856 | 0.3190 | 0.3614 | 0.4047 | 0.4495 | 0.4846 | 0.5341 | 0.5670 | 0.6156 | 0.6997 | 0.7386 | 0.8011 | 0.7950 | 0.7569 |
| Tianjin | 0.1427 | 0.1680 | 0.1897 | 0.2132 | 0.2402 | 0.3837 | 0.4142 | 0.4537 | 0.4707 | 0.5295 | 0.5816 | 0.5958 | 0.5944 | 0.5683 | 0.5652 |
| Hebei | 0.0808 | 0.0919 | 0.1082 | 0.1213 | 0.1374 | 0.1553 | 0.1942 | 0.2617 | 0.3219 | 0.4027 | 0.4682 | 0.2934 | 0.3950 | 0.3902 | 0.3842 |
| Shanxi | 0.0613 | 0.0685 | 0.0791 | 0.0973 | 0.1178 | 0.1352 | 0.1654 | 0.1971 | 0.2273 | 0.2718 | 0.3021 | 0.3289 | 0.4001 | 0.4039 | 0.4068 |
| Neimenggu | 0.0176 | 0.0254 | 0.0326 | 0.0402 | 0.0489 | 0.0602 | 0.0786 | 0.0969 | 0.1157 | 0.1571 | 0.1820 | 0.1907 | 0.1996 | 0.1957 | 0.1832 |
| Liaoning | 0.0980 | 0.1115 | 0.1249 | 0.1391 | 0.1552 | 0.1751 | 0.1788 | 0.2400 | 0.2815 | 0.3362 | 0.3815 | 0.4098 | 0.4946 | 0.4970 | 0.4896 |
| Jilin | 0.0593 | 0.0719 | 0.0822 | 0.0917 | 0.1012 | 0.1114 | 0.1218 | 0.1400 | 0.1511 | 0.1842 | 0.2042 | 0.2945 | 0.3334 | 0.3377 | 0.3074 |
| Heilongjiang | 0.0430 | 0.0526 | 0.0631 | 0.0737 | 0.0829 | 0.1092 | 0.1304 | 0.1500 | 0.1733 | 0.2206 | 0.2686 | 0.2595 | 0.3025 | 0.3098 | 0.3044 |
| Shanghai | 0.2040 | 0.2281 | 0.2567 | 0.2836 | 0.3180 | 0.4467 | 0.4505 | 0.5716 | 0.6069 | 0.6283 | 0.7432 | 0.8077 | 0.9509 | 0.9331 | 0.9376 |
| Jiangsu | 0.0870 | 0.1000 | 0.1156 | 0.1330 | 0.1511 | 0.1693 | 0.1934 | 0.3077 | 0.3391 | 0.3957 | 0.4890 | 0.5518 | 0.6865 | 0.7013 | 0.6911 |
| Zhejiang | 0.1158 | 0.1340 | 0.1475 | 0.1645 | 0.1891 | 0.2235 | 0.2603 | 0.3112 | 0.3603 | 0.4083 | 0.4632 | 0.4983 | 0.6461 | 0.6550 | 0.6432 |
| Anhui | 0.0642 | 0.0783 | 0.0860 | 0.0949 | 0.1059 | 0.1177 | 0.1463 | 0.2053 | 0.2285 | 0.2585 | 0.2805 | 0.3175 | 0.4874 | 0.4879 | 0.4727 |
| Fujian | 0.1239 | 0.1408 | 0.1546 | 0.1720 | 0.1878 | 0.2144 | 0.2415 | 0.2931 | 0.3374 | 0.3819 | 0.4163 | 0.4498 | 0.5301 | 0.5306 | 0.5205 |
| Jiangxi | 0.0582 | 0.0644 | 0.0679 | 0.0821 | 0.0989 | 0.1023 | 0.1234 | 0.1774 | 0.1922 | 0.2152 | 0.2273 | 0.2531 | 0.3718 | 0.3753 | 0.3725 |
| Shandong | 0.0903 | 0.1075 | 0.1218 | 0.1350 | 0.1540 | 0.1762 | 0.2168 | 0.2527 | 0.2801 | 0.3151 | 0.3541 | 0.3678 | 0.5797 | 0.5869 | 0.5944 |
| Henan | 0.0840 | 0.0937 | 0.1024 | 0.1164 | 0.1278 | 0.1476 | 0.1796 | 0.2005 | 0.2116 | 0.2307 | 0.2548 | 0.2810 | 0.5553 | 0.5518 | 0.5284 |
| Hubei | 0.0752 | 0.0837 | 0.0939 | 0.1017 | 0.1099 | 0.1356 | 0.1522 | 0.2074 | 0.2210 | 0.2445 | 0.2333 | 0.3055 | 0.4546 | 0.4509 | 0.4418 |
| Hunan | 0.0815 | 0.0881 | 0.0953 | 0.1026 | 0.1108 | 0.1221 | 0.1526 | 0.1674 | 0.2029 | 0.2196 | 0.2398 | 0.2665 | 0.3908 | 0.3926 | 0.3956 |
| Guangdong | 0.1637 | 0.1938 | 0.2140 | 0.2316 | 0.2461 | 0.2688 | 0.2857 | 0.3352 | 0.3692 | 0.4282 | 0.4572 | 0.4786 | 0.5902 | 0.6010 | 0.5844 |
| Guangxi | 0.0466 | 0.0532 | 0.0602 | 0.0647 | 0.0750 | 0.0883 | 0.1118 | 0.1268 | 0.1454 | 0.1679 | 0.1976 | 0.2174 | 0.2569 | 0.2555 | 0.2526 |
| Hainan | 0.1231 | 0.1410 | 0.1463 | 0.1524 | 0.1695 | 0.1773 | 0.1887 | 0.2358 | 0.2617 | 0.3276 | 0.3607 | 0.3934 | 0.3802 | 0.3707 | 0.3597 |
| Sichuan | 0.0511 | 0.0563 | 0.0633 | 0.0731 | 0.0833 | 0.0969 | 0.1093 | 0.1447 | 0.1513 | 0.1753 | 0.2017 | 0.2349 | 0.3029 | 0.3208 | 0.3289 |
| Guizhou | 0.0464 | 0.0486 | 0.0520 | 0.0553 | 0.0603 | 0.0655 | 0.0756 | 0.0850 | 0.1048 | 0.1099 | 0.1171 | 0.1680 | 0.2782 | 0.2998 | 0.2976 |
| Yunnan | 0.0446 | 0.0546 | 0.0579 | 0.0681 | 0.0828 | 0.1086 | 0.1239 | 0.1760 | 0.1905 | 0.1993 | 0.2111 | 0.2200 | 0.2495 | 0.2471 | 0.2466 |
| Tibet | 0.0030 | 0.0052 | 0.0073 | 0.0106 | 0.0155 | 0.0216 | 0.0292 | 0.0445 | 0.0580 | 0.0758 | 0.1142 | 0.1552 | 0.1996 | 0.1969 | 0.2052 |
| Shaanxi | 0.0542 | 0.0607 | 0.0696 | 0.0795 | 0.0899 | 0.1024 | 0.1294 | 0.1466 | 0.1715 | 0.2086 | 0.2381 | 0.2547 | 0.3457 | 0.3583 | 0.3610 |
| Gansu | 0.0229 | 0.0273 | 0.0320 | 0.0372 | 0.0442 | 0.0515 | 0.0731 | 0.0955 | 0.1178 | 0.1428 | 0.1659 | 0.1901 | 0.2412 | 0.2365 | 0.2181 |
| Qinghai | 0.0071 | 0.0139 | 0.0211 | 0.0272 | 0.0334 | 0.0427 | 0.0569 | 0.0737 | 0.0904 | 0.1182 | 0.1459 | 0.1744 | 0.1976 | 0.1947 | 0.1900 |
| Ningxia | 0.0504 | 0.0617 | 0.0742 | 0.0838 | 0.0971 | 0.1138 | 0.1362 | 0.2018 | 0.2654 | 0.3580 | 0.4320 | 0.2374 | 0.2703 | 0.2663 | 0.2408 |
| Xinjiang | 0.0095 | 0.0183 | 0.0308 | 0.0420 | 0.0528 | 0.0651 | 0.0785 | 0.1197 | 0.1506 | 0.1883 | 0.2220 | 0.2484 | 0.2910 | 0.2814 | 0.2518 |

Source: *China Statistical Yearbook 1995-2009*.

Note: Definition: (Physical index) = [(road index) + (telephone index)] / 2; where the road index is calculated by the highway length per square kilometer, and the telephone index is calculated by the fixed line subscribers to local population; both indexes are under nationwide comparison. Chongqing is included in Sichuan.

| | |
|------|--------|
| Ave | 0.2351 |
| S.D. | 0.1786 |
| Max | 0.9509 |
| Min | 0.0030 |

Table 5A.6b

Institutional infrastructure variable 2 – national legal infrastructure index.

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|--------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Beijing | 0.0496 | 0.0525 | 0.0488 | 0.0532 | 0.0703 | 0.0918 | 0.1159 | 0.1433 | 0.1588 | 0.1956 | 0.2794 | 0.3197 | 0.4300 | 0.5501 | 0.6430 |
| Tianjin | 0.0132 | 0.0142 | 0.0137 | 0.0149 | 0.0181 | 0.0229 | 0.0258 | 0.0296 | 0.0324 | 0.0406 | 0.0427 | 0.0492 | 0.0622 | 0.0802 | 0.0969 |
| Hebei | 0.0161 | 0.0168 | 0.0170 | 0.0182 | 0.0236 | 0.0317 | 0.0272 | 0.0248 | 0.0300 | 0.0321 | 0.0310 | 0.0339 | 0.0409 | 0.0512 | 0.0524 |
| Shanxi | 0.0050 | 0.0055 | 0.0048 | 0.0044 | 0.0056 | 0.0076 | 0.0080 | 0.0091 | 0.0094 | 0.0110 | 0.0125 | 0.0122 | 0.0143 | 0.0201 | 0.0246 |
| Neimenggu | 0.0027 | 0.0039 | 0.0034 | 0.0044 | 0.0057 | 0.0072 | 0.0092 | 0.0090 | 0.0083 | 0.0118 | 0.0117 | 0.0121 | 0.0131 | 0.0159 | 0.0153 |
| Liaoning | 0.0324 | 0.0332 | 0.0315 | 0.0333 | 0.0391 | 0.0542 | 0.0559 | 0.0557 | 0.0614 | 0.0758 | 0.0830 | 0.0920 | 0.0989 | 0.1227 | 0.1345 |
| Jilin | 0.0104 | 0.0091 | 0.0092 | 0.0096 | 0.0130 | 0.0175 | 0.0168 | 0.0159 | 0.0162 | 0.0179 | 0.0225 | 0.0222 | 0.0262 | 0.0315 | 0.0336 |
| Heilongjiang | 0.0165 | 0.0167 | 0.0152 | 0.0175 | 0.0196 | 0.0268 | 0.0256 | 0.0205 | 0.0226 | 0.0284 | 0.0287 | 0.0303 | 0.0368 | 0.0517 | 0.0569 |
| Shanghai | 0.0225 | 0.0228 | 0.0254 | 0.0292 | 0.0341 | 0.0474 | 0.0686 | 0.0950 | 0.1125 | 0.2039 | 0.1692 | 0.2144 | 0.2845 | 0.3701 | 0.3852 |
| Jiangsu | 0.0263 | 0.0283 | 0.0324 | 0.0377 | 0.0466 | 0.0698 | 0.0737 | 0.0754 | 0.0902 | 0.1165 | 0.1350 | 0.1585 | 0.1895 | 0.2942 | 0.4040 |
| Zhejiang | 0.0198 | 0.0219 | 0.0246 | 0.0320 | 0.0439 | 0.0662 | 0.0738 | 0.0824 | 0.1034 | 0.1419 | 0.1512 | 0.1724 | 0.2691 | 0.3612 | 0.4555 |
| Anhui | 0.0054 | 0.0057 | 0.0057 | 0.0066 | 0.0094 | 0.0138 | 0.0149 | 0.0134 | 0.0151 | 0.0172 | 0.0174 | 0.0226 | 0.0270 | 0.0404 | 0.0508 |
| Fujian | 0.0071 | 0.0090 | 0.0119 | 0.0152 | 0.0220 | 0.0276 | 0.0326 | 0.0332 | 0.0385 | 0.0514 | 0.0452 | 0.0498 | 0.0572 | 0.0696 | 0.0727 |
| Jiangxi | 0.0048 | 0.0051 | 0.0052 | 0.0064 | 0.0080 | 0.0106 | 0.0120 | 0.0111 | 0.0115 | 0.0140 | 0.0140 | 0.0164 | 0.0169 | 0.0215 | 0.0223 |
| Shandong | 0.0294 | 0.0321 | 0.0320 | 0.0352 | 0.0460 | 0.0661 | 0.0701 | 0.0699 | 0.0757 | 0.0987 | 0.1150 | 0.1345 | 0.1397 | 0.2059 | 0.2472 |
| Henan | 0.0154 | 0.0152 | 0.0169 | 0.0176 | 0.0231 | 0.0329 | 0.0326 | 0.0311 | 0.0296 | 0.0332 | 0.0366 | 0.0430 | 0.0538 | 0.0691 | 0.0860 |
| Hubei | 0.0141 | 0.0143 | 0.0132 | 0.0155 | 0.0193 | 0.0291 | 0.0311 | 0.0342 | 0.0348 | 0.0432 | 0.0489 | 0.0555 | 0.0598 | 0.0787 | 0.0981 |
| Hunan | 0.0177 | 0.0173 | 0.0169 | 0.0186 | 0.0238 | 0.0323 | 0.0345 | 0.0336 | 0.0346 | 0.0436 | 0.0463 | 0.0498 | 0.0673 | 0.0683 | 0.0726 |
| Guangdong | 0.0300 | 0.0433 | 0.0489 | 0.0673 | 0.0984 | 0.1322 | 0.1508 | 0.1734 | 0.2168 | 0.2749 | 0.2813 | 0.3521 | 0.4029 | 0.5197 | 0.5981 |
| Guangxi | 0.0057 | 0.0063 | 0.0064 | 0.0065 | 0.0087 | 0.0111 | 0.0104 | 0.0107 | 0.0106 | 0.0127 | 0.0147 | 0.0144 | 0.0121 | 0.0158 | 0.0193 |
| Hainan | 0.0005 | 0.0009 | 0.0019 | 0.0031 | 0.0039 | 0.0068 | 0.0026 | 0.0065 | 0.0020 | 0.0030 | 0.0023 | 0.0021 | 0.0024 | 0.0027 | 0.0045 |
| Sichuan | 0.0256 | 0.0271 | 0.0246 | 0.0262 | 0.0327 | 0.0542 | 0.0548 | 0.0569 | 0.0653 | 0.0892 | 0.1018 | 0.0927 | 0.1341 | 0.1544 | 0.1466 |
| Guizhou | 0.0020 | 0.0027 | 0.0047 | 0.0028 | 0.0040 | 0.0050 | 0.0057 | 0.0052 | 0.0056 | 0.0067 | 0.0066 | 0.0080 | 0.0110 | 0.0142 | 0.0149 |
| Yunnan | 0.0041 | 0.0065 | 0.0049 | 0.0082 | 0.0129 | 0.0179 | 0.0189 | 0.0233 | 0.0178 | 0.0209 | 0.0207 | 0.0189 | 0.0172 | 0.0220 | 0.0187 |
| Tibet | 0.0000 | 0.0000 | 0.0000 | 0.0000 | 0.0001 | 0.0001 | 0.0001 | 0.0002 | 0.0000 | 0.0001 | 0.0002 | 0.0003 | 0.0006 | 0.0005 | 0.0007 |
| Shaanxi | 0.0121 | 0.0114 | 0.0100 | 0.0111 | 0.0119 | 0.0166 | 0.0163 | 0.0150 | 0.0196 | 0.0211 | 0.0229 | 0.0244 | 0.0287 | 0.0425 | 0.0567 |
| Gansu | 0.0038 | 0.0033 | 0.0035 | 0.0036 | 0.0042 | 0.0052 | 0.0052 | 0.0054 | 0.0058 | 0.0076 | 0.0099 | 0.0128 | 0.0171 | 0.0210 | 0.0229 |
| Qinghai | 0.0005 | 0.0006 | 0.0007 | 0.0010 | 0.0006 | 0.0012 | 0.0009 | 0.0010 | 0.0013 | 0.0011 | 0.0012 | 0.0012 | 0.0020 | 0.0044 | 0.0056 |
| Ningxia | 0.0011 | 0.0010 | 0.0009 | 0.0008 | 0.0009 | 0.0014 | 0.0021 | 0.0023 | 0.0021 | 0.0032 | 0.0030 | 0.0024 | 0.0026 | 0.0027 | 0.0053 |
| Xinjiang | 0.0038 | 0.0035 | 0.0041 | 0.0035 | 0.0052 | 0.0090 | 0.0090 | 0.0101 | 0.0099 | 0.0119 | 0.0129 | 0.0113 | 0.0133 | 0.0158 | 0.0156 |

Source: *China Statistical Yearbook 1995-2009*.

Note: Definition: (Legal index) = [(patent index) + (technical market index)] / 2; where the patent index is calculated by the number of three kinds of patents (i.e. inventions, utility models and designs) granted by local governments, and the technical market index is calculated by the total business volume in local technical markets; both indexes are under nationwide comparison. Chongqing is included in Sichuan.

| | |
|------|--------|
| Ave | 0.0485 |
| S.D. | 0.0863 |
| Max | 0.6430 |
| Min | 0.0000 |

Table 5A.7a

Economic efficiency variable 1 – asset-contribution rate.

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|--|--------|--------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|---------|
| Beijing | 0.1609 | 0.1320 | 0.0621 | 0.0623 | 0.0603 | 0.0601 | 0.0627 | 0.0606 | 0.0633 | 0.0772 | 0.0875 | 0.0450 | 0.0489 | 0.0552 | 0.0464 |
| Tianjin | 0.0727 | 0.0476 | 0.0407 | 0.0380 | 0.0416 | 0.0360 | 0.0549 | 0.0473 | 0.0640 | 0.0881 | 0.1095 | 0.1391 | 0.1756 | 0.1618 | 0.1332 |
| Hebei | 0.1072 | 0.0831 | 0.0771 | 0.0718 | 0.0633 | 0.0635 | 0.0756 | 0.0746 | 0.0827 | 0.0960 | 0.1082 | 0.1044 | 0.1062 | 0.1187 | 0.0958 |
| Shanxi | 0.0947 | 0.0732 | 0.0600 | 0.0489 | 0.0457 | 0.0391 | 0.0496 | 0.0492 | 0.0577 | 0.0753 | 0.0957 | 0.0938 | 0.1020 | 0.1128 | 0.1029 |
| Neimenggu | 0.0844 | 0.0641 | 0.0502 | 0.0608 | 0.0502 | 0.0516 | 0.0586 | 0.0546 | 0.0591 | 0.0661 | 0.0907 | 0.0982 | 0.0975 | 0.1143 | 0.0981 |
| Liaoning | 0.0933 | 0.0505 | 0.0457 | 0.0428 | 0.0460 | 0.0464 | 0.0648 | 0.0559 | 0.0557 | 0.0676 | 0.0926 | 0.0745 | 0.0728 | 0.0886 | 0.0433 |
| Jilin | 0.0845 | 0.0526 | 0.0354 | 0.0355 | 0.0504 | 0.0601 | 0.0788 | 0.0753 | 0.0806 | 0.1048 | 0.1090 | 0.0849 | 0.0930 | 0.1514 | 0.1042 |
| Heilongjiang | 0.1707 | 0.1351 | 0.1261 | 0.1361 | 0.0901 | 0.1340 | 0.2377 | 0.2034 | 0.1862 | 0.2247 | 0.2852 | 0.3535 | 0.3733 | 0.3367 | 0.3589 |
| Shanghai | 0.1502 | 0.1259 | 0.1038 | 0.0868 | 0.0690 | 0.0757 | 0.0845 | 0.0808 | 0.1110 | 0.1368 | 0.1487 | 0.1172 | 0.1212 | 0.1242 | 0.0867 |
| Jiangsu | 0.1061 | 0.0922 | 0.0776 | 0.0791 | 0.0614 | 0.0659 | 0.0728 | 0.0792 | 0.0795 | 0.0898 | 0.1115 | 0.1126 | 0.1274 | 0.1402 | 0.1091 |
| Zhejiang | 0.1391 | 0.0935 | 0.0830 | 0.0919 | 0.0763 | 0.0761 | 0.0874 | 0.0995 | 0.1159 | 0.1237 | 0.1616 | 0.1337 | 0.1322 | 0.1482 | 0.1010 |
| Anhui | 0.1214 | 0.1043 | 0.0913 | 0.0978 | 0.0627 | 0.0664 | 0.0684 | 0.0791 | 0.0889 | 0.1081 | 0.1084 | 0.1120 | 0.1001 | 0.1063 | 0.1094 |
| Fujian | 0.1970 | 0.1222 | 0.1319 | 0.1281 | 0.0938 | 0.0983 | 0.0967 | 0.0975 | 0.1148 | 0.1262 | 0.1488 | 0.1189 | 0.1151 | 0.1267 | 0.0992 |
| Jiangxi | 0.1040 | 0.0646 | 0.0465 | 0.0417 | 0.0482 | 0.0473 | 0.0595 | 0.0587 | 0.0664 | 0.0755 | 0.0914 | 0.0974 | 0.1239 | 0.1200 | 0.0941 |
| Shandong | 0.1035 | 0.0943 | 0.0979 | 0.0932 | 0.0752 | 0.0761 | 0.1116 | 0.1054 | 0.0997 | 0.1139 | 0.1397 | 0.1584 | 0.1671 | 0.1764 | 0.1665 |
| Henan | 0.1244 | 0.1006 | 0.0903 | 0.0749 | 0.0570 | 0.0562 | 0.0678 | 0.0669 | 0.0733 | 0.0831 | 0.1005 | 0.1022 | 0.1270 | 0.1302 | 0.1086 |
| Hubei | 0.1245 | 0.0794 | 0.0610 | 0.0620 | 0.0548 | 0.0589 | 0.0685 | 0.0733 | 0.0809 | 0.0666 | 0.0823 | 0.0918 | 0.1011 | 0.1065 | 0.1088 |
| Hunan | 0.1269 | 0.0908 | 0.0981 | 0.0803 | 0.0824 | 0.0813 | 0.0834 | 0.0885 | 0.0888 | 0.1017 | 0.1230 | 0.1274 | 0.1310 | 0.1662 | 0.1638 |
| Guangdong | 0.1642 | 0.1221 | 0.0869 | 0.0897 | 0.0767 | 0.0839 | 0.0925 | 0.0953 | 0.0934 | 0.1088 | 0.1265 | 0.1303 | 0.1546 | 0.1768 | 0.1549 |
| Guangxi | 0.1838 | 0.0889 | 0.0388 | 0.0396 | 0.0554 | 0.0584 | 0.0760 | 0.0644 | 0.0670 | 0.0895 | 0.1158 | 0.1082 | 0.1248 | 0.1212 | 0.0953 |
| Hainan | 0.0894 | 0.0385 | 0.0072 | 0.0117 | 0.0694 | 0.0477 | 0.0551 | 0.0653 | 0.0948 | 0.0928 | 0.1194 | 0.1172 | 0.1528 | 0.1359 | 0.1469 |
| Sichuan | 0.0845 | 0.0639 | 0.0619 | 0.0625 | 0.0592 | 0.0519 | 0.0597 | 0.0622 | 0.0708 | 0.0773 | 0.0821 | 0.0883 | 0.0983 | 0.1107 | 0.0814 |
| Guizhou | 0.1396 | 0.1036 | 0.0827 | 0.0927 | 0.0730 | 0.0701 | 0.0735 | 0.0703 | 0.0695 | 0.0799 | 0.1035 | 0.0970 | 0.1067 | 0.1252 | 0.1009 |
| Yunnan | 0.6112 | 0.4718 | 0.4344 | 0.3845 | 0.1915 | 0.1740 | 0.1726 | 0.1564 | 0.1625 | 0.1739 | 0.2131 | 0.2008 | 0.1972 | 0.2094 | 0.1668 |
| Tibet | 0.0225 | 0.0382 | 0.0450 | 0.0668 | 0.0575 | 0.0467 | 0.0435 | 0.0374 | 0.0316 | 0.0498 | 0.0483 | 0.0468 | 0.0431 | 0.0332 | 0.0173 |
| Shaanxi | 0.0652 | 0.0441 | 0.0284 | 0.0279 | 0.0399 | 0.0504 | 0.0697 | 0.0664 | 0.0789 | 0.0976 | 0.1303 | 0.1587 | 0.1640 | 0.1661 | 0.1679 |
| Gansu | 0.0817 | 0.0585 | 0.0453 | 0.0337 | 0.0385 | 0.0446 | 0.0491 | 0.0510 | 0.0613 | 0.0651 | 0.0948 | 0.0954 | 0.0957 | 0.1342 | 0.0742 |
| Qinghai | 0.0445 | 0.0182 | -0.0127 | 0.0019 | 0.0346 | 0.0481 | 0.0480 | 0.0463 | 0.0535 | 0.0480 | 0.0927 | 0.1216 | 0.1458 | 0.1458 | 0.1330 |
| Ningxia | 0.0548 | 0.0561 | 0.0400 | 0.0346 | 0.0472 | 0.0426 | 0.0497 | 0.0517 | 0.0536 | 0.0493 | 0.0697 | 0.0562 | 0.0633 | 0.0827 | 0.0609 |
| Xinjiang | 0.0488 | 0.0418 | 0.0315 | 0.0474 | 0.0583 | 0.0596 | 0.1131 | 0.1061 | 0.0915 | 0.1299 | 0.1906 | 0.2385 | 0.2795 | 0.2584 | 0.2328 |
| Source: <i>China Statistical Yearbook 1995-2009</i> . | | | | | | | | | | | | | | Ave | 0.0975 |
| Note: Definition: (Ratio of total asset contribution) = (total profits + tax + interest expenditure) / (total amount of fixed assets in original value). Chongqing is included in Sichuan. | | | | | | | | | | | | | | S.D. | 0.0621 |
| | | | | | | | | | | | | | | Max | 0.6112 |
| | | | | | | | | | | | | | | Min | -0.0127 |

Table 5A.7b

Economic efficiency variable 2 – asset-output ratio.

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|--|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Beijing | 0.6492 | 0.4810 | 0.4317 | 0.4159 | 0.4875 | 0.4603 | 0.5209 | 0.5554 | 0.5513 | 0.6056 | 0.3299 | 0.3501 | 0.3510 | 0.3676 | 0.4066 |
| Tianjin | 0.6087 | 0.4054 | 0.3837 | 0.3607 | 0.3933 | 0.3272 | 0.3576 | 0.3877 | 0.4160 | 0.5364 | 0.6783 | 0.8046 | 0.9341 | 0.8983 | 0.8803 |
| Hebei | 0.5975 | 0.5109 | 0.4822 | 0.4494 | 0.4475 | 0.4286 | 0.4591 | 0.4540 | 0.4727 | 0.5392 | 0.7111 | 0.7960 | 0.7873 | 0.7860 | 0.8087 |
| Shanxi | 0.4728 | 0.4100 | 0.3814 | 0.3460 | 0.3108 | 0.2940 | 0.3092 | 0.3222 | 0.3432 | 0.4135 | 0.4853 | 0.5575 | 0.5580 | 0.6154 | 0.6216 |
| Neimenggu | 0.4478 | 0.3953 | 0.3669 | 0.3644 | 0.3330 | 0.3285 | 0.3689 | 0.3802 | 0.3884 | 0.4418 | 0.5138 | 0.5630 | 0.5090 | 0.4911 | 0.5776 |
| Liaoning | 0.5487 | 0.4238 | 0.3973 | 0.3824 | 0.3777 | 0.3717 | 0.4649 | 0.4472 | 0.4588 | 0.5658 | 0.6719 | 0.7934 | 0.8123 | 0.8325 | 0.8151 |
| Jilin | 0.5482 | 0.4344 | 0.4292 | 0.4105 | 0.4067 | 0.4354 | 0.4953 | 0.5283 | 0.5891 | 0.6884 | 0.7274 | 0.7806 | 0.7932 | 0.9853 | 0.9063 |
| Heilongjiang | 0.5438 | 0.4746 | 0.4703 | 0.4501 | 0.4712 | 0.5179 | 0.5818 | 0.5394 | 0.5325 | 0.6242 | 0.7116 | 0.9055 | 0.9580 | 0.9151 | 0.9412 |
| Shanghai | 0.6723 | 0.5653 | 0.5405 | 0.5021 | 0.5735 | 0.4816 | 0.5101 | 0.4932 | 0.5945 | 0.7067 | 0.7455 | 0.7441 | 0.7891 | 0.7889 | 0.8200 |
| Jiangsu | 0.9047 | 0.7334 | 0.6892 | 0.6233 | 0.6570 | 0.6100 | 0.6162 | 0.6506 | 0.6397 | 0.6769 | 0.7847 | 0.9148 | 0.9359 | 0.9450 | 0.9278 |
| Zhejiang | 0.8273 | 0.6300 | 0.5675 | 0.5113 | 0.5643 | 0.4557 | 0.5357 | 0.4999 | 0.5438 | 0.6275 | 0.7956 | 0.8799 | 0.9318 | 0.9730 | 0.9552 |
| Anhui | 0.7413 | 0.6249 | 0.6187 | 0.5631 | 0.5402 | 0.4537 | 0.4559 | 0.4939 | 0.5281 | 0.5593 | 0.6815 | 0.7368 | 0.7265 | 0.7205 | 0.8060 |
| Fujian | 0.7284 | 0.5663 | 0.5057 | 0.4785 | 0.5880 | 0.5277 | 0.5786 | 0.5695 | 0.6088 | 0.6909 | 0.7597 | 0.8045 | 0.8039 | 0.7057 | 0.6755 |
| Jiangxi | 0.6740 | 0.5410 | 0.5077 | 0.4706 | 0.4498 | 0.4348 | 0.4515 | 0.4553 | 0.5091 | 0.5309 | 0.6900 | 0.7874 | 0.8939 | 0.9126 | 0.9130 |
| Shandong | 0.6934 | 0.6005 | 0.5773 | 0.5317 | 0.5269 | 0.5131 | 0.5700 | 0.5774 | 0.6305 | 0.6875 | 0.7892 | 0.8886 | 0.9215 | 0.9648 | 1.0150 |
| Henan | 0.6024 | 0.5506 | 0.5491 | 0.5007 | 0.4839 | 0.4456 | 0.4928 | 0.4901 | 0.5091 | 0.5779 | 0.6330 | 0.7491 | 0.7338 | 0.9251 | 0.8419 |
| Hubei | 0.6400 | 0.5346 | 0.5065 | 0.4819 | 0.5075 | 0.4552 | 0.4843 | 0.5022 | 0.5215 | 0.4206 | 0.4911 | 0.5239 | 0.5391 | 0.5606 | 0.6113 |
| Hunan | 0.6679 | 0.5347 | 0.5197 | 0.4496 | 0.4403 | 0.4412 | 0.4762 | 0.4840 | 0.4881 | 0.5428 | 0.6837 | 0.7493 | 0.7707 | 0.8474 | 0.8270 |
| Guangdong | 0.7439 | 0.5955 | 0.5405 | 0.4928 | 0.5952 | 0.5228 | 0.5589 | 0.5495 | 0.5387 | 0.6240 | 0.8841 | 0.9549 | 0.8406 | 0.8867 | 0.9367 |
| Guangxi | 0.8026 | 0.5554 | 0.4926 | 0.4500 | 0.4771 | 0.4460 | 0.4553 | 0.4031 | 0.4803 | 0.5371 | 0.6308 | 0.6830 | 0.7753 | 0.7140 | 0.7353 |
| Hainan | 0.5346 | 0.4007 | 0.3554 | 0.3688 | 0.4877 | 0.3961 | 0.4187 | 0.4870 | 0.5220 | 0.6602 | 0.6025 | 0.5544 | 0.6212 | 0.6208 | 0.6321 |
| Sichuan | 0.5909 | 0.4665 | 0.4641 | 0.4015 | 0.3995 | 0.3546 | 0.3716 | 0.3822 | 0.4141 | 0.4442 | 0.5476 | 0.5859 | 0.6465 | 0.6658 | 0.6151 |
| Guizhou | 0.4794 | 0.4157 | 0.3980 | 0.3748 | 0.3931 | 0.3774 | 0.3696 | 0.3603 | 0.3754 | 0.4012 | 0.4671 | 0.5099 | 0.5298 | 0.5835 | 0.5404 |
| Yunnan | 0.8114 | 0.6312 | 0.6284 | 0.5538 | 0.5239 | 0.4339 | 0.4371 | 0.4160 | 0.4523 | 0.4683 | 0.5243 | 0.5937 | 0.6433 | 0.6753 | 0.6216 |
| Tibet | 0.2488 | 0.2303 | 0.2335 | 0.1979 | 0.2204 | 0.1834 | 0.1655 | 0.1606 | 0.1818 | 0.2145 | 0.1795 | 0.1967 | 0.2249 | 0.1442 | 0.1205 |
| Shaanxi | 0.5261 | 0.4274 | 0.4134 | 0.3825 | 0.3756 | 0.3706 | 0.3992 | 0.4002 | 0.4279 | 0.4685 | 0.5592 | 0.6237 | 0.6658 | 0.6824 | 0.6510 |
| Gansu | 0.5495 | 0.4401 | 0.4147 | 0.3807 | 0.3922 | 0.3695 | 0.4205 | 0.4530 | 0.4346 | 0.4766 | 0.6305 | 0.8119 | 0.7519 | 0.8969 | 0.8293 |
| Qinghai | 0.3819 | 0.3205 | 0.2956 | 0.2569 | 0.2510 | 0.2392 | 0.2684 | 0.2444 | 0.2416 | 0.2515 | 0.3525 | 0.4113 | 0.4419 | 0.4619 | 0.4624 |
| Ningxia | 0.4547 | 0.4074 | 0.3980 | 0.3675 | 0.3967 | 0.3556 | 0.4119 | 0.3986 | 0.3850 | 0.3857 | 0.5395 | 0.4975 | 0.5398 | 0.5366 | 0.4925 |
| Xinjiang | 0.4301 | 0.3983 | 0.3687 | 0.3797 | 0.3637 | 0.3684 | 0.4898 | 0.4649 | 0.4568 | 0.5306 | 0.6369 | 0.7678 | 0.8079 | 0.7562 | 0.7475 |
| Source: <i>China Statistical Yearbook 1995-2009</i> . | | | | | | | | | | | | | | Ave | 0.5477 |
| Note: Definition: (Asset-output ratio) = (gross value of industrial output of SOEs) / (total S.D. assets of SOEs). Chongqing is included in Sichuan. | | | | | | | | | | | | | | Max | 1.0150 |
| | | | | | | | | | | | | | | Min | 0.1205 |

Table 5A.8a

Firm size variable 1 – provincial index of average number of employees in SOEs.

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|--------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Beijing | 1.0000 | 0.8515 | 0.4579 | 0.5047 | 0.7080 | 0.5035 | 0.5887 | 0.6004 | 0.6067 | 0.7039 | 0.6381 | 0.5617 | 0.5948 | 0.7976 | 0.7716 |
| Tianjin | 1.0000 | 0.8190 | 0.7900 | 0.7746 | 0.6430 | 0.6280 | 0.5447 | 0.5413 | 0.5330 | 0.4873 | 0.5526 | 0.4756 | 0.5456 | 0.5223 | 0.7769 |
| Hebei | 0.4572 | 0.4402 | 0.4748 | 0.5089 | 0.5309 | 0.5223 | 0.5348 | 0.5255 | 0.5808 | 0.6779 | 0.6615 | 0.7666 | 0.7969 | 0.9944 | 1.0000 |
| Shanxi | 0.3736 | 0.3634 | 0.3626 | 0.3858 | 0.4149 | 0.4225 | 0.4246 | 0.4299 | 0.4497 | 0.4682 | 0.5663 | 0.5797 | 0.6480 | 0.9559 | 1.0000 |
| Neimenggu | 0.6197 | 0.5212 | 0.5058 | 0.6507 | 0.8603 | 0.8943 | 0.9724 | 0.9974 | 0.9487 | 0.8387 | 0.8813 | 0.9365 | 0.9454 | 1.0000 | 0.9299 |
| Liaoning | 0.5626 | 0.5732 | 0.5271 | 0.5416 | 0.6272 | 0.6224 | 0.6003 | 0.5786 | 0.6412 | 0.7232 | 0.7834 | 0.6285 | 0.6761 | 1.0000 | 0.8325 |
| Jilin | 0.5099 | 0.4786 | 0.4867 | 0.5156 | 0.5447 | 0.5010 | 0.4959 | 0.5240 | 0.5251 | 0.5645 | 0.5466 | 0.8021 | 0.8930 | 1.0000 | 0.9739 |
| Heilongjiang | 0.4587 | 0.4265 | 0.4382 | 0.4774 | 0.4968 | 0.5391 | 0.5956 | 0.6386 | 0.6336 | 0.5717 | 0.5598 | 0.7562 | 0.7969 | 1.0000 | 0.9399 |
| Shanghai | 1.0000 | 0.5872 | 0.6053 | 0.5652 | 0.7240 | 0.6146 | 0.6102 | 0.6327 | 0.6526 | 0.6535 | 0.6272 | 0.6194 | 0.6308 | 0.6575 | 0.6229 |
| Jiangsu | 0.7621 | 0.6771 | 0.7279 | 0.7925 | 0.8479 | 0.8121 | 0.8114 | 0.8502 | 0.9185 | 1.0000 | 0.9821 | 0.9517 | 0.9617 | 0.9800 | 0.9081 |
| Zhejiang | 0.7941 | 0.7225 | 0.7120 | 0.8173 | 0.8629 | 0.8753 | 0.8835 | 0.8752 | 0.8990 | 0.9608 | 0.8509 | 0.9186 | 0.9131 | 1.0000 | 0.9571 |
| Anhui | 0.4628 | 0.4309 | 0.4910 | 0.6564 | 0.6189 | 0.6494 | 0.7378 | 0.7120 | 0.7508 | 0.8349 | 0.9028 | 0.9410 | 1.0000 | 0.9594 | 0.9577 |
| Fujian | 0.6811 | 0.6154 | 0.5615 | 0.6488 | 0.7121 | 0.6972 | 0.6856 | 0.6469 | 0.6596 | 0.7127 | 0.7387 | 0.8139 | 0.8454 | 1.0000 | 0.9549 |
| Jiangxi | 0.4877 | 0.4206 | 0.4154 | 0.4950 | 0.4965 | 0.4743 | 0.4715 | 0.5091 | 0.5782 | 0.7009 | 0.7074 | 0.7776 | 0.8674 | 1.0000 | 0.9967 |
| Shandong | 0.6117 | 0.5427 | 0.5288 | 0.6518 | 0.7602 | 0.7677 | 0.7706 | 0.8036 | 0.8586 | 0.8966 | 0.8803 | 0.9338 | 0.9544 | 0.9630 | 1.0000 |
| Henan | 0.5179 | 0.5006 | 0.4960 | 0.5975 | 0.5608 | 0.5503 | 0.5323 | 0.5447 | 0.5610 | 0.6089 | 0.7306 | 0.8984 | 0.9030 | 1.0000 | 0.9677 |
| Hubei | 0.6228 | 0.5963 | 0.6119 | 0.6450 | 0.6502 | 0.6157 | 0.6172 | 0.6666 | 0.6635 | 0.7593 | 0.7964 | 0.8650 | 0.9683 | 1.0000 | 0.9727 |
| Hunan | 0.7051 | 0.6735 | 0.6770 | 0.8074 | 0.7738 | 0.7313 | 0.7114 | 0.6768 | 0.6304 | 0.7033 | 0.6760 | 0.8255 | 0.8503 | 1.0000 | 0.9870 |
| Guangdong | 0.6271 | 0.5606 | 0.5145 | 0.5321 | 0.5919 | 0.5645 | 0.6007 | 0.6277 | 0.6265 | 0.6831 | 0.7109 | 0.7343 | 0.7565 | 0.8728 | 1.0000 |
| Guangxi | 0.6701 | 0.6284 | 0.6422 | 0.6558 | 0.6800 | 0.6325 | 0.5870 | 0.5770 | 0.5894 | 0.6440 | 0.6123 | 0.6752 | 0.6496 | 0.9084 | 1.0000 |
| Hainan | 0.8129 | 0.6388 | 0.6280 | 0.6352 | 0.6522 | 0.6820 | 0.6721 | 0.6735 | 0.7795 | 0.6569 | 0.5802 | 0.6967 | 0.6701 | 0.9909 | 1.0000 |
| Sichuan | 0.6641 | 0.6240 | 0.6464 | 0.7371 | 0.8533 | 0.8363 | 0.8045 | 0.8374 | 0.8369 | 0.9112 | 0.9045 | 0.9342 | 0.9408 | 1.0000 | 0.9114 |
| Guizhou | 0.6157 | 0.5337 | 0.5005 | 0.5679 | 0.5451 | 0.5317 | 0.5442 | 0.5596 | 0.5591 | 0.6059 | 0.6134 | 0.6376 | 0.7172 | 0.9606 | 1.0000 |
| Yunnan | 0.5393 | 0.5076 | 0.5291 | 0.5860 | 0.5745 | 0.6053 | 0.5888 | 0.5788 | 0.5663 | 0.6125 | 0.6060 | 0.7047 | 0.7123 | 1.0000 | 0.8524 |
| Tibet | 0.3426 | 0.2780 | 0.2764 | 0.2509 | 0.3024 | 0.3118 | 0.3112 | 0.2974 | 0.3169 | 0.3243 | 0.3470 | 0.3072 | 0.2820 | 0.6731 | 1.0000 |
| Shaanxi | 0.4756 | 0.4505 | 0.4607 | 0.4982 | 0.5593 | 0.5655 | 0.5425 | 0.5503 | 0.5589 | 0.5735 | 0.5950 | 0.6958 | 0.7603 | 1.0000 | 0.9628 |
| Gansu | 0.5794 | 0.5561 | 0.5594 | 0.6498 | 0.6709 | 0.6006 | 0.6759 | 0.7612 | 0.7345 | 0.7453 | 0.7472 | 0.9699 | 1.0000 | 0.9500 | 0.9837 |
| Qinghai | 0.4974 | 0.4776 | 0.4828 | 0.4337 | 0.5091 | 0.4874 | 0.5408 | 0.5725 | 0.6125 | 0.6960 | 0.6342 | 0.9068 | 0.8460 | 0.9372 | 1.0000 |
| Ningxia | 0.4014 | 0.3796 | 0.3945 | 0.4165 | 0.4308 | 0.4296 | 0.5623 | 0.5455 | 0.5855 | 0.6863 | 0.7499 | 0.7062 | 0.6565 | 1.0000 | 0.8670 |
| Xinjiang | 0.5158 | 0.4774 | 0.4818 | 0.4758 | 0.4842 | 0.5000 | 0.4274 | 0.4515 | 0.4775 | 0.4905 | 0.4884 | 0.6484 | 0.7089 | 1.0000 | 0.9687 |

Source: *China Statistical Yearbook 1995-2009*.

Note: Definition: (the average number of SOE employees) = (the total number of SOE employees) / (the total number of SOE units). Chongqing is included in Sichuan.

| | |
|------|--------|
| Ave | 0.6781 |
| S.D. | 0.1834 |
| Max | 1.0000 |
| Min | 0.2509 |

Table 5A.8b

Firm size variable 2 – provincial index of average assets in SOEs.

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|--------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Beijing | 0.0589 | 0.0694 | 0.0437 | 0.0604 | 0.1091 | 0.0874 | 0.1251 | 0.1426 | 0.1631 | 0.2260 | 0.6687 | 0.5261 | 0.6564 | 1.0000 | 0.9947 |
| Tianjin | 0.1065 | 0.1216 | 0.1238 | 0.1393 | 0.1564 | 0.1993 | 0.2120 | 0.2264 | 0.2583 | 0.2724 | 0.3687 | 0.3558 | 0.4867 | 0.5327 | 1.0000 |
| Hebei | 0.0456 | 0.0533 | 0.0663 | 0.0835 | 0.1032 | 0.1218 | 0.1423 | 0.1622 | 0.1970 | 0.2571 | 0.2783 | 0.4032 | 0.4806 | 0.7891 | 1.0000 |
| Shanxi | 0.0383 | 0.0476 | 0.0552 | 0.0679 | 0.0880 | 0.1046 | 0.1176 | 0.1358 | 0.1610 | 0.1918 | 0.2742 | 0.3012 | 0.4110 | 0.7959 | 1.0000 |
| Neimenggu | 0.0353 | 0.0346 | 0.0382 | 0.0548 | 0.1051 | 0.1360 | 0.1681 | 0.1920 | 0.2119 | 0.2400 | 0.3088 | 0.4476 | 0.5809 | 0.8549 | 1.0000 |
| Liaoning | 0.0746 | 0.0877 | 0.0952 | 0.1110 | 0.1579 | 0.1974 | 0.2148 | 0.2594 | 0.3346 | 0.4079 | 0.5447 | 0.4513 | 0.5488 | 1.0000 | 0.9861 |
| Jilin | 0.0525 | 0.0596 | 0.0696 | 0.0893 | 0.1219 | 0.1307 | 0.1548 | 0.1899 | 0.2164 | 0.2806 | 0.3161 | 0.5164 | 0.7359 | 0.8806 | 1.0000 |
| Heilongjiang | 0.0595 | 0.0659 | 0.0740 | 0.0945 | 0.1210 | 0.1485 | 0.2226 | 0.2714 | 0.2996 | 0.3793 | 0.4130 | 0.5710 | 0.6595 | 0.9402 | 1.0000 |
| Shanghai | 0.1194 | 0.0844 | 0.1016 | 0.1171 | 0.1885 | 0.2332 | 0.2762 | 0.3636 | 0.3521 | 0.4279 | 0.4992 | 0.6019 | 0.7082 | 0.9369 | 1.0000 |
| Jiangsu | 0.0604 | 0.0706 | 0.0909 | 0.1111 | 0.1349 | 0.1626 | 0.2164 | 0.2558 | 0.3242 | 0.4518 | 0.4898 | 0.6394 | 0.7680 | 0.9898 | 1.0000 |
| Zhejiang | 0.0458 | 0.0589 | 0.0676 | 0.0964 | 0.1255 | 0.1837 | 0.2254 | 0.2821 | 0.3366 | 0.4135 | 0.5502 | 0.6312 | 0.7371 | 0.9094 | 1.0000 |
| Anhui | 0.0416 | 0.0473 | 0.0612 | 0.0882 | 0.1152 | 0.1636 | 0.2140 | 0.2344 | 0.2680 | 0.3628 | 0.4198 | 0.5587 | 0.7303 | 0.8678 | 1.0000 |
| Fujian | 0.0449 | 0.0566 | 0.0617 | 0.0778 | 0.1149 | 0.1575 | 0.1867 | 0.2027 | 0.2460 | 0.3170 | 0.3661 | 0.4354 | 0.5464 | 0.8594 | 1.0000 |
| Jiangxi | 0.0453 | 0.0475 | 0.0541 | 0.0740 | 0.0978 | 0.1122 | 0.1313 | 0.1719 | 0.2264 | 0.3359 | 0.3800 | 0.4881 | 0.6297 | 0.9151 | 1.0000 |
| Shandong | 0.0749 | 0.0793 | 0.0886 | 0.1252 | 0.1637 | 0.1922 | 0.2309 | 0.2751 | 0.3351 | 0.3999 | 0.4426 | 0.6256 | 0.7711 | 0.8836 | 1.0000 |
| Henan | 0.0580 | 0.0700 | 0.0764 | 0.1140 | 0.1203 | 0.1395 | 0.1454 | 0.1701 | 0.1982 | 0.2441 | 0.3573 | 0.4927 | 0.5908 | 0.8340 | 1.0000 |
| Hubei | 0.0448 | 0.0490 | 0.0567 | 0.0665 | 0.0842 | 0.1037 | 0.1219 | 0.1475 | 0.1797 | 0.3052 | 0.3337 | 0.5177 | 0.6826 | 0.9148 | 1.0000 |
| Hunan | 0.0612 | 0.0741 | 0.0844 | 0.1177 | 0.1454 | 0.1539 | 0.1752 | 0.2008 | 0.2243 | 0.2829 | 0.3123 | 0.4809 | 0.5993 | 0.8345 | 1.0000 |
| Guangdong | 0.0530 | 0.0589 | 0.0653 | 0.0802 | 0.1251 | 0.1668 | 0.2106 | 0.2636 | 0.2896 | 0.3761 | 0.4249 | 0.4621 | 0.7152 | 0.9104 | 1.0000 |
| Guangxi | 0.0559 | 0.0754 | 0.0880 | 0.1012 | 0.1241 | 0.1349 | 0.1458 | 0.1781 | 0.1867 | 0.2403 | 0.2806 | 0.3619 | 0.4318 | 0.8700 | 1.0000 |
| Hainan | 0.0730 | 0.0686 | 0.0825 | 0.0949 | 0.1400 | 0.1983 | 0.2044 | 0.1993 | 0.2204 | 0.2343 | 0.3247 | 0.4361 | 0.4639 | 0.9673 | 1.0000 |
| Sichuan | 0.0594 | 0.0752 | 0.0836 | 0.1249 | 0.1750 | 0.2214 | 0.2565 | 0.3107 | 0.3610 | 0.4467 | 0.4775 | 0.6088 | 0.6959 | 0.8815 | 1.0000 |
| Guizhou | 0.0609 | 0.0644 | 0.0678 | 0.0870 | 0.1056 | 0.1207 | 0.1478 | 0.1787 | 0.2004 | 0.2447 | 0.3186 | 0.3724 | 0.5149 | 0.7762 | 1.0000 |
| Yunnan | 0.0473 | 0.0610 | 0.0690 | 0.0886 | 0.1060 | 0.1489 | 0.1593 | 0.1979 | 0.2144 | 0.2933 | 0.3618 | 0.4884 | 0.5776 | 0.8433 | 1.0000 |
| Tibet | 0.0263 | 0.0280 | 0.0316 | 0.0394 | 0.0438 | 0.0568 | 0.0667 | 0.0682 | 0.0801 | 0.0796 | 0.1221 | 0.1104 | 0.0988 | 0.4794 | 1.0000 |
| Shaanxi | 0.0378 | 0.0453 | 0.0519 | 0.0611 | 0.0906 | 0.1110 | 0.1268 | 0.1608 | 0.1784 | 0.2145 | 0.2515 | 0.3529 | 0.4929 | 0.8138 | 1.0000 |
| Gansu | 0.0664 | 0.0806 | 0.0924 | 0.1264 | 0.1434 | 0.1472 | 0.1945 | 0.2565 | 0.2783 | 0.3200 | 0.3507 | 0.5196 | 0.7217 | 0.8175 | 1.0000 |
| Qinghai | 0.0464 | 0.0522 | 0.0568 | 0.0707 | 0.1046 | 0.1151 | 0.1622 | 0.2172 | 0.2682 | 0.3396 | 0.3454 | 0.6333 | 0.7050 | 0.8643 | 1.0000 |
| Ningxia | 0.0440 | 0.0501 | 0.0569 | 0.0708 | 0.0857 | 0.1014 | 0.1592 | 0.1870 | 0.1972 | 0.2798 | 0.3250 | 0.4192 | 0.4857 | 0.8719 | 1.0000 |
| Xinjiang | 0.0622 | 0.0677 | 0.0845 | 0.0959 | 0.1058 | 0.1262 | 0.1515 | 0.1941 | 0.2234 | 0.2670 | 0.3251 | 0.4191 | 0.5200 | 0.8380 | 1.0000 |

Source: *China Statistical Yearbook 1995-2009*.

Ave 0.3183

Note: Definition: (the average amount of total assets of SOEs) = (the total amount of total S.D. assets, including fixed and mobile assets, of SOEs) / (the total number of SOE units). Max 1.0000

Chongqing is included in Sichuan.

Min 0.0263

Table 5A.9a

Human capital variable 1 – scientific and technical personnel share of total SOE employees.

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|--------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Beijing | 0.1971 | 0.1536 | 0.1088 | 0.1079 | 0.1262 | 0.1313 | 0.1395 | 0.1473 | 0.2086 | 0.2270 | 0.2145 | 0.1901 | 0.1959 | 0.1969 | 0.2040 |
| Tianjin | 0.1855 | 0.1686 | 0.1492 | 0.1485 | 0.2129 | 0.2462 | 0.2621 | 0.2604 | 0.2617 | 0.2651 | 0.2893 | 0.3127 | 0.3172 | 0.3247 | 0.3215 |
| Hebei | 0.1541 | 0.1451 | 0.1358 | 0.1452 | 0.1777 | 0.2037 | 0.2220 | 0.2372 | 0.2579 | 0.2672 | 0.2789 | 0.2902 | 0.2958 | 0.3006 | 0.3184 |
| Shanxi | 0.1550 | 0.1367 | 0.1196 | 0.1263 | 0.1652 | 0.1927 | 0.2054 | 0.2210 | 0.2390 | 0.2492 | 0.2551 | 0.2685 | 0.2711 | 0.2771 | 0.2874 |
| Neimenggu | 0.1380 | 0.1306 | 0.1235 | 0.1302 | 0.1661 | 0.1953 | 0.2119 | 0.2238 | 0.2373 | 0.2649 | 0.2769 | 0.2915 | 0.2972 | 0.3033 | 0.3055 |
| Liaoning | 0.1629 | 0.1414 | 0.1279 | 0.1308 | 0.1733 | 0.2041 | 0.2152 | 0.2311 | 0.2511 | 0.2525 | 0.2512 | 0.2492 | 0.2507 | 0.2472 | 0.2455 |
| Jilin | 0.1622 | 0.1501 | 0.1393 | 0.1493 | 0.1875 | 0.2107 | 0.2256 | 0.2401 | 0.2582 | 0.2679 | 0.2833 | 0.3174 | 0.3212 | 0.3363 | 0.3402 |
| Heilongjiang | 0.1299 | 0.1193 | 0.1090 | 0.1130 | 0.1529 | 0.1686 | 0.1891 | 0.1999 | 0.2063 | 0.2229 | 0.2240 | 0.2279 | 0.2324 | 0.2393 | 0.2500 |
| Shanghai | 0.1688 | 0.1488 | 0.1251 | 0.1243 | 0.1588 | 0.1837 | 0.2004 | 0.2184 | 0.2276 | 0.2249 | 0.2569 | 0.2770 | 0.2844 | 0.2897 | 0.3047 |
| Jiangsu | 0.1891 | 0.1831 | 0.1789 | 0.1856 | 0.2303 | 0.2470 | 0.2716 | 0.2899 | 0.3249 | 0.3388 | 0.3609 | 0.3639 | 0.3716 | 0.3717 | 0.3976 |
| Zhejiang | 0.1947 | 0.1945 | 0.1977 | 0.2097 | 0.2524 | 0.2880 | 0.3230 | 0.3578 | 0.3725 | 0.3861 | 0.3891 | 0.3869 | 0.3839 | 0.3793 | 0.3848 |
| Anhui | 0.1734 | 0.1620 | 0.1535 | 0.1638 | 0.2077 | 0.2411 | 0.2653 | 0.2847 | 0.3078 | 0.3343 | 0.3452 | 0.3586 | 0.3667 | 0.3729 | 0.3954 |
| Fujian | 0.2060 | 0.2083 | 0.2090 | 0.2200 | 0.2650 | 0.2929 | 0.3096 | 0.3258 | 0.3441 | 0.3475 | 0.3531 | 0.3569 | 0.3565 | 0.3640 | 0.3764 |
| Jiangxi | 0.1557 | 0.1481 | 0.1407 | 0.1482 | 0.1985 | 0.2302 | 0.2474 | 0.2621 | 0.2800 | 0.2937 | 0.3071 | 0.3163 | 0.3196 | 0.3245 | 0.3362 |
| Shandong | 0.1915 | 0.1805 | 0.1756 | 0.1866 | 0.2218 | 0.2502 | 0.2663 | 0.2805 | 0.3019 | 0.3090 | 0.3113 | 0.3619 | 0.3650 | 0.3630 | 0.3604 |
| Henan | 0.1497 | 0.1411 | 0.1308 | 0.1490 | 0.2003 | 0.2300 | 0.2525 | 0.2724 | 0.2937 | 0.3176 | 0.3068 | 0.3060 | 0.3198 | 0.3271 | 0.3307 |
| Hubei | 0.1719 | 0.1588 | 0.1476 | 0.1553 | 0.1970 | 0.2138 | 0.2197 | 0.2369 | 0.2514 | 0.2574 | 0.2727 | 0.2757 | 0.2860 | 0.2920 | 0.2974 |
| Hunan | 0.1720 | 0.1614 | 0.1510 | 0.1609 | 0.2100 | 0.2257 | 0.2443 | 0.2859 | 0.2944 | 0.3068 | 0.3253 | 0.3725 | 0.3637 | 0.3620 | 0.3582 |
| Guangdong | 0.1637 | 0.1665 | 0.1678 | 0.1802 | 0.2208 | 0.2388 | 0.2565 | 0.2756 | 0.2910 | 0.2983 | 0.3141 | 0.3226 | 0.3237 | 0.3328 | 0.3377 |
| Guangxi | 0.2062 | 0.2035 | 0.2011 | 0.2122 | 0.2537 | 0.2712 | 0.2920 | 0.3035 | 0.3384 | 0.3449 | 0.3640 | 0.3837 | 0.3924 | 0.3977 | 0.4108 |
| Hainan | 0.1004 | 0.1032 | 0.1090 | 0.1128 | 0.1401 | 0.1467 | 0.1558 | 0.1648 | 0.1849 | 0.1947 | 0.2020 | 0.2075 | 0.2204 | 0.2269 | 0.2428 |
| Sichuan | 0.1948 | 0.1818 | 0.1703 | 0.1818 | 0.2274 | 0.2505 | 0.2688 | 0.2807 | 0.3051 | 0.3100 | 0.3173 | 0.3184 | 0.3221 | 0.3229 | 0.3285 |
| Guizhou | 0.2106 | 0.2034 | 0.1917 | 0.2018 | 0.2470 | 0.2836 | 0.2995 | 0.3176 | 0.3271 | 0.3475 | 0.3593 | 0.3632 | 0.3785 | 0.3712 | 0.3782 |
| Yunnan | 0.2038 | 0.1990 | 0.1911 | 0.2004 | 0.2274 | 0.2531 | 0.2772 | 0.3047 | 0.3284 | 0.3505 | 0.3746 | 0.3843 | 0.3804 | 0.3767 | 0.3834 |
| Tibet | 0.1626 | 0.1649 | 0.1650 | 0.1735 | 0.1834 | 0.2073 | 0.2066 | 0.2181 | 0.2366 | 0.2468 | 0.2630 | 0.2474 | 0.2454 | 0.2532 | 0.2703 |
| Shaanxi | 0.1808 | 0.1538 | 0.1287 | 0.1321 | 0.1707 | 0.1812 | 0.1954 | 0.2063 | 0.2160 | 0.2296 | 0.2407 | 0.2488 | 0.2558 | 0.2581 | 0.2669 |
| Gansu | 0.1705 | 0.1539 | 0.1392 | 0.1474 | 0.1766 | 0.2020 | 0.2098 | 0.2248 | 0.2401 | 0.2469 | 0.2595 | 0.2651 | 0.3003 | 0.3049 | 0.3143 |
| Qinghai | 0.1722 | 0.1575 | 0.1450 | 0.1511 | 0.1739 | 0.1883 | 0.2179 | 0.2513 | 0.2476 | 0.2766 | 0.2895 | 0.3144 | 0.3242 | 0.3211 | 0.3166 |
| Ningxia | 0.1783 | 0.1689 | 0.1626 | 0.1650 | 0.1979 | 0.2127 | 0.2277 | 0.2413 | 0.2725 | 0.3055 | 0.3223 | 0.3243 | 0.3417 | 0.3331 | 0.3281 |
| Xinjiang | 0.1531 | 0.1346 | 0.1158 | 0.1240 | 0.1430 | 0.1549 | 0.1689 | 0.1963 | 0.2061 | 0.2107 | 0.2164 | 0.2217 | 0.2254 | 0.2265 | 0.2295 |

Source: *China Statistical Yearbook 1995-2009*.

Note: Definition: (the share of scientific and technical personnel in SOEs) = (the number of scientific and technical personnel in state-owned enterprises and institutions) / (the total number of staff and workers in all state-owned units). Chongqing is included in Sichuan.

Data from adjacent years have been used in order to overcome the absence of data for 1995 and 2004.

Ave 0.2425
S.D. 0.0746
Max 0.4108
Min 0.1004

Table 5A.9b

Human capital variable 2 – provincial index of labour productivity.

| | 1994 | 1995 | 1996 | 1997 | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 |
|--------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Beijing | 0.1039 | 0.1137 | 0.0878 | 0.1323 | 0.1778 | 0.1946 | 0.2570 | 0.2813 | 0.3196 | 0.4350 | 0.7199 | 0.7386 | 0.8310 | 1.0000 | 0.9322 |
| Tianjin | 0.0434 | 0.0481 | 0.0403 | 0.0547 | 0.0762 | 0.0920 | 0.1294 | 0.1467 | 0.1748 | 0.2808 | 0.3344 | 0.5743 | 0.8331 | 0.9113 | 1.0000 |
| Hebei | 0.0879 | 0.0974 | 0.1082 | 0.1174 | 0.1438 | 0.1659 | 0.2102 | 0.2381 | 0.2811 | 0.3411 | 0.3944 | 0.5889 | 0.6592 | 0.8506 | 1.0000 |
| Shanxi | 0.0715 | 0.0836 | 0.0907 | 0.1008 | 0.1048 | 0.1158 | 0.1333 | 0.1626 | 0.2034 | 0.2914 | 0.3470 | 0.4618 | 0.5860 | 0.8193 | 1.0000 |
| Neimenggu | 0.0330 | 0.0372 | 0.0405 | 0.0478 | 0.0631 | 0.0724 | 0.0928 | 0.1041 | 0.1269 | 0.1881 | 0.2670 | 0.4516 | 0.5512 | 0.7681 | 1.0000 |
| Liaoning | 0.0954 | 0.0780 | 0.0881 | 0.0946 | 0.1138 | 0.1418 | 0.2012 | 0.2435 | 0.2913 | 0.3900 | 0.4735 | 0.6849 | 0.8055 | 1.0000 | 0.9856 |
| Jilin | 0.0675 | 0.0622 | 0.0709 | 0.0730 | 0.0991 | 0.1270 | 0.1674 | 0.2203 | 0.2776 | 0.3937 | 0.4742 | 0.5634 | 0.7606 | 1.0000 | 0.9033 |
| Heilongjiang | 0.0581 | 0.0632 | 0.0699 | 0.0779 | 0.1023 | 0.1454 | 0.2162 | 0.2384 | 0.2627 | 0.3953 | 0.4798 | 0.6397 | 0.7658 | 0.8375 | 1.0000 |
| Shanghai | 0.0797 | 0.0723 | 0.0721 | 0.0963 | 0.1434 | 0.1888 | 0.2345 | 0.2850 | 0.3346 | 0.4942 | 0.5591 | 0.6576 | 0.7235 | 1.0000 | 0.8888 |
| Jiangsu | 0.0657 | 0.0762 | 0.0846 | 0.0857 | 0.1074 | 0.1325 | 0.1717 | 0.2092 | 0.2500 | 0.3403 | 0.4111 | 0.5701 | 0.7688 | 0.9617 | 1.0000 |
| Zhejiang | 0.0499 | 0.0614 | 0.0671 | 0.0827 | 0.1126 | 0.1420 | 0.1988 | 0.2471 | 0.3543 | 0.4471 | 0.5763 | 0.6938 | 0.8302 | 1.0000 | 0.9655 |
| Anhui | 0.0693 | 0.0673 | 0.0844 | 0.0904 | 0.1160 | 0.1426 | 0.1557 | 0.1988 | 0.2420 | 0.3254 | 0.3860 | 0.5461 | 0.6583 | 0.8273 | 1.0000 |
| Fujian | 0.0781 | 0.0921 | 0.0970 | 0.1001 | 0.1806 | 0.2277 | 0.2842 | 0.3590 | 0.4764 | 0.5953 | 0.6163 | 0.6556 | 0.7498 | 0.9524 | 1.0000 |
| Jiangxi | 0.0698 | 0.0649 | 0.0749 | 0.0753 | 0.1018 | 0.1228 | 0.1480 | 0.1922 | 0.2510 | 0.3080 | 0.3910 | 0.5436 | 0.7092 | 0.9028 | 1.0000 |
| Shandong | 0.0894 | 0.0993 | 0.1095 | 0.1173 | 0.1291 | 0.1509 | 0.2051 | 0.2414 | 0.2871 | 0.3553 | 0.4461 | 0.7223 | 0.8128 | 0.9275 | 1.0000 |
| Henan | 0.0678 | 0.0813 | 0.0859 | 0.1023 | 0.1070 | 0.1200 | 0.1324 | 0.1632 | 0.1979 | 0.2512 | 0.3257 | 0.4082 | 0.4805 | 0.9060 | 1.0000 |
| Hubei | 0.0758 | 0.0671 | 0.0686 | 0.0834 | 0.1167 | 0.1354 | 0.1678 | 0.1945 | 0.2385 | 0.3080 | 0.3525 | 0.5381 | 0.6197 | 0.8929 | 1.0000 |
| Hunan | 0.0523 | 0.0544 | 0.0663 | 0.0665 | 0.0892 | 0.0990 | 0.1226 | 0.1584 | 0.1937 | 0.2468 | 0.3144 | 0.4870 | 0.5973 | 0.7640 | 1.0000 |
| Guangdong | 0.0513 | 0.0518 | 0.0642 | 0.0665 | 0.1152 | 0.1402 | 0.1915 | 0.2228 | 0.2637 | 0.3700 | 0.3866 | 0.4701 | 0.7881 | 0.8966 | 1.0000 |
| Guangxi | 0.0952 | 0.0925 | 0.0903 | 0.0922 | 0.1226 | 0.1373 | 0.1742 | 0.1884 | 0.2248 | 0.3054 | 0.3670 | 0.5244 | 0.7148 | 1.0000 | 0.8843 |
| Hainan | 0.0650 | 0.0485 | 0.0509 | 0.0591 | 0.1290 | 0.1543 | 0.1729 | 0.1903 | 0.2210 | 0.3183 | 0.5455 | 0.5567 | 0.7016 | 0.9606 | 1.0000 |
| Sichuan | 0.0765 | 0.0774 | 0.0846 | 0.0931 | 0.1132 | 0.1406 | 0.1694 | 0.2260 | 0.2904 | 0.3438 | 0.3948 | 0.5623 | 0.7335 | 0.9387 | 1.0000 |
| Guizhou | 0.0945 | 0.1071 | 0.1109 | 0.1183 | 0.1554 | 0.1731 | 0.1969 | 0.2265 | 0.2782 | 0.3472 | 0.5032 | 0.6060 | 0.8092 | 0.9867 | 1.0000 |
| Yunnan | 0.1262 | 0.1435 | 0.1621 | 0.1674 | 0.1973 | 0.2120 | 0.2360 | 0.2853 | 0.3448 | 0.4421 | 0.5644 | 0.6709 | 0.8029 | 0.8548 | 1.0000 |
| Tibet | 0.1745 | 0.1769 | 0.2581 | 0.3649 | 0.2535 | 0.2650 | 0.2957 | 0.2630 | 0.3727 | 0.4300 | 0.5820 | 0.5684 | 0.6821 | 0.9337 | 1.0000 |
| Shaanxi | 0.0368 | 0.0432 | 0.0469 | 0.0460 | 0.0569 | 0.0754 | 0.0994 | 0.1216 | 0.1479 | 0.1936 | 0.2617 | 0.3921 | 0.5639 | 0.7329 | 1.0000 |
| Gansu | 0.0973 | 0.1079 | 0.1087 | 0.1116 | 0.1311 | 0.1479 | 0.1782 | 0.2357 | 0.2718 | 0.3462 | 0.4928 | 0.5463 | 0.7004 | 1.0000 | 0.8946 |
| Qinghai | 0.0679 | 0.0686 | 0.0683 | 0.0726 | 0.1018 | 0.1186 | 0.1517 | 0.2033 | 0.2390 | 0.2729 | 0.3829 | 0.6281 | 0.8405 | 1.0000 | 0.9686 |
| Ningxia | 0.0722 | 0.0810 | 0.0924 | 0.0955 | 0.1210 | 0.1278 | 0.1731 | 0.2080 | 0.1915 | 0.2496 | 0.3925 | 0.4818 | 0.6143 | 0.8846 | 1.0000 |
| Xinjiang | 0.0505 | 0.0662 | 0.0672 | 0.1021 | 0.0986 | 0.1178 | 0.2279 | 0.2638 | 0.2761 | 0.3873 | 0.5820 | 0.6725 | 0.8192 | 0.8657 | 1.0000 |

Source: *China Statistical Yearbook 1995-2009*.

Note: Definition: (labour productivity of SOEs) = (total amount of industrial value-added of SOEs) / (total number of SOE employees). Chongqing is included in Sichuan.

| | |
|------|--------|
| Ave | 0.3498 |
| S.D. | 0.3057 |
| Max | 1.0000 |
| Min | 0.0330 |

Appendix 5B

Table 5B.1

Principal component analysis and summary statistics of new variables.

| | Code | Component | | | Rotation | | |
|------------------------------------|-------|------------|------------|-------------|------------|------------|------------|
| | | Variable 1 | Variable 2 | Unexplained | Eigenvalue | Difference | Proportion |
| <i>Privatisation</i> | pri1 | 0.7071 | 0.7071 | 0.0000 | 1.9215 | 1.8430 | 0.9608 |
| <i>SoftBudget</i> | ph1ab | 0.7071 | 0.7071 | 0.0000 | 1.5297 | 1.0594 | 0.7649 |
| <i>PoliticalIdeology</i> | ph2ab | 0.7071 | 0.7071 | 0.0000 | 1.4020 | 0.8039 | 0.7010 |
| <i>Decentralisation</i> | ph3ab | 0.7071 | 0.7071 | 0.0000 | 1.1853 | 0.3706 | 0.5926 |
| <i>MarketCompetition</i> | ph4ab | 0.7071 | 0.7071 | 0.0000 | 1.4823 | 0.9646 | 0.7411 |
| <i>FinancialPressure</i> | ph5ab | -0.7071 | 0.7071 | 0.0000 | 1.0903 | 0.1805 | 0.5451 |
| <i>InstitutionalInfrastructure</i> | ph6ab | 0.7071 | 0.7071 | 0.0000 | 1.7258 | 1.4517 | 0.8629 |
| <i>EconomicEfficiency</i> | ph7ab | 0.7071 | 0.7071 | 0.0000 | 1.5591 | 1.1181 | 0.7795 |
| <i>FirmSize</i> | ph8ab | 0.7071 | 0.7071 | 0.0000 | 1.7324 | 1.4647 | 0.8662 |
| <i>HumanCapital</i> | ph9ab | 0.7071 | 0.7071 | 0.0000 | 1.6907 | 1.3814 | 0.8454 |

| Variable | Obs | Mean | Std. Dev. | Min | Max |
|----------|-----|--------|-----------|---------|--------|
| pri1 | 450 | 0.0000 | 1.3862 | -2.2684 | 2.1334 |
| ph1ab | 450 | 0.0000 | 1.2368 | -2.8980 | 2.8426 |
| ph2ab | 450 | 0.0000 | 1.1840 | -1.3124 | 5.5989 |
| ph3ab | 450 | 0.0000 | 1.0887 | -3.7980 | 2.6555 |
| ph4ab | 450 | 0.0000 | 1.2175 | -1.6440 | 3.6751 |
| ph5ab | 450 | 0.0000 | 1.0442 | -2.6397 | 4.8111 |
| ph6ab | 450 | 0.0000 | 1.3137 | -1.3166 | 6.9398 |
| ph7ab | 450 | 0.0000 | 1.2486 | -2.6220 | 6.9013 |
| ph8ab | 450 | 0.0000 | 1.3162 | -2.3200 | 2.8860 |
| ph9ab | 450 | 0.0000 | 1.3003 | -2.0168 | 2.9746 |

| | pri1 | ph1ab | ph2ab | ph3ab | ph4ab | ph5ab | ph6ab | ph7ab | ph8ab | ph9ab |
|-------|---------|---------|---------|---------|---------|---------|--------|--------|--------|--------|
| pri1 | 1.0000 | | | | | | | | | |
| ph1ab | 0.7394 | 1.0000 | | | | | | | | |
| ph2ab | -0.7774 | -0.6258 | 1.0000 | | | | | | | |
| ph3ab | -0.2982 | -0.1198 | 0.4881 | 1.0000 | | | | | | |
| ph4ab | -0.2132 | -0.1580 | 0.5290 | 0.6570 | 1.0000 | | | | | |
| ph5ab | -0.1950 | -0.3608 | -0.0056 | -0.5680 | -0.3749 | 1.0000 | | | | |
| ph6ab | -0.5473 | -0.4315 | 0.8079 | 0.5538 | 0.7412 | -0.1636 | 1.0000 | | | |
| ph7ab | -0.4280 | -0.2797 | 0.4418 | 0.5402 | 0.2904 | -0.1751 | 0.3755 | 1.0000 | | |
| ph8ab | -0.7778 | -0.6073 | 0.7241 | 0.4726 | 0.3270 | -0.0267 | 0.5414 | 0.5204 | 1.0000 | |
| ph9ab | -0.8568 | -0.7489 | 0.7832 | 0.3139 | 0.2809 | 0.1817 | 0.5555 | 0.5035 | 0.8253 | 1.0000 |

Note: Variable 1 denotes the first variable in each hypothesis, while variable 2 denotes the second. Only component 1 is reported. Component 2 is not used.

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