

**Three Essays on China's State Owned Enterprises:
Towards an Alternative to Privatization**

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Dedication

To the workers of the state owned paper-making factory of the City of Zhengzhou,
who in their banner wrote: “Reform must not lead to privatization.”

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Abstract

A common theme in the analysis of the contemporary Chinese economy is that the Chinese state owned enterprises fail to operate efficiently because of ambiguous property rights, soft budget constraints, and government intervention. These authors advocate an economic reform program based on large-scale privatization. This monograph advances an alternative perspective on the state owned enterprises. In the first essay, I argue that the state owned enterprises have made an important contribution to China's macroeconomic stability. This view draws from Hyman Minsky's argument that a large government sector is indispensable for a capitalist market economy to maintain macroeconomic stability and avoid deep recessions. I argue that in the Chinese context, the state owned enterprise sector must be sufficiently large so that public sector investment accounts for about 50 percent of the total capital formation. In the second essay, I argue that the performance of the state owned enterprises can be enhanced by promoting workers' participation in management. I conducted a survey of workers' participation in management in large and medium-sized industrial enterprises in China's Henan province. Using the data collected from this survey, I performed econometric analyses to explore the relationship between workers' participation and firm performance, finding evidence that participation does improve performance. The third essay addresses what is now termed "disguised unemployment" in the state owned enterprises. The existing literature argues that the state owned enterprises fail to use their labor force efficiently. In this view, a high percentage of workers in state owned enterprises are redundant and unemployed in a disguised manner. These workers have to be laid off for the sake of efficiency. I argue that much of the disguised unemployment in the state sector may be due to insufficient aggregate demand rather than technical inefficiency. My econometric analyses find that an increase in aggregate demand leads to substantially higher productivity in the state owned enterprises, allowing a substantial part of the redundant labor force to be efficiently employed. I argue for active

aggregate demand policy rather than layoff of workers as the primary solution to the problem of disguised unemployment.

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Chapter 1
Chinese State Owned Enterprises in Transition

1. Introduction

Between the 1930s and the 1970s, state owned enterprises had played a crucial role in the economic development of former state socialist countries and many developing countries. In the early post WWII years, state owned enterprises were a substantial part of the national economy in several West European countries.

Since the 1980s, many of the state owned enterprises in advanced capitalist countries have been privatized. Many developing countries have undertaken “structural adjustment” programs imposed by IMF and the World Bank, which required these countries to dismantle their state sectors. Since the late 1980s and the early 1990s, the former state socialist countries in Eastern Europe and Central Asia have attempted to make a transition towards an economic system based on market and private property. Large-scale privatization has been an essential component of the neoliberal strategy of transition. The economic performance of the developing countries and the former state socialist countries that have undertaken large-scale privatization has not been satisfactory, and has been disastrous in some cases.

China has followed a different strategy of transition and development. There had been virtually no privatization until the early 1990s. Since then privatization of state owned enterprises has proceeded relatively slowly. By the late 1990s, the state owned enterprises continued to be an important part of the national economy. In the second half of the 1990s, the state sector contributed about 40 percent of GDP and 30 percent of the industrial output. The Chinese economy had been one of the most rapidly growing economies in the world in the last two decades of the 20th century.

Many economists believe that state owned enterprises are fundamentally inefficient and have acted as a drag on economic development. According to these economists, due to ambiguous property rights, soft budget constraints, and government intervention, state owned enterprises are inevitably less efficient than private enterprises and tend to promote innovation less vigorously. Thus, privatization should have helped countries to grow faster by allowing them to make better use of available resources and to promote more rapid innovation. However,

the actual experience of privatization in developing and transition economies has so far failed to provide convincing evidence in support of this argument.

On the other hand, the success of the Chinese economy in the 1980s and the 1990s suggests that the relatively large state owned enterprise sector in China is likely to have played a positive role in China's economic development, rather than acting as a drag on the economy. This raises several questions. How and in what way has the state owned enterprise sector made a positive contribution to China's economic performance? If the state owned enterprise sector has made a positive contribution, will China continue to need a large state owned enterprise sector in the future, and how large? If the state owned enterprises are not going to be privatized, how to improve the performance of the state owned enterprises, to achieve higher level of efficiency and more rapid innovation? This dissertation is an attempt to address these questions.

The rest of this chapter provides the background information and reviews the literature on the Chinese state owned enterprises. Section 2 briefly reviews the history of state owned enterprises in developed, developing, and former state socialist countries. Section 3 reviews the performance and changing ownership structure of the Chinese economy in the last two decades. Section 4 reviews the theories and the practice of the state owned enterprise reform. Section 5 discusses empirical evidence on the performance of state owned enterprises. Section 6 argues that it is necessary to search for an alternative to privatization and discusses the plan of the dissertation.

2. State Owned Enterprises in the Global Economy

After WWII, inspired by the successful Soviet experience in the 1930s, many countries in Eastern Europe and Asia adopted state socialist economic systems based on central planning and state ownership of means of production. State socialist economies had been successful in mobilizing domestic resources to achieve basic industrialization. The long-term growth performance was broadly comparable to

that of capitalist economies.¹ A major accomplishment of state socialism was to provide employment, health care, education, the care for the elder, and freedom from sweatshop working conditions to all citizens (Stavrianos 1981: 509-12; 603-22; 709-54; Bramall 1993; Navarro 1993; Meisner 1999). In this respect, state socialism had been more successful than anything that the capitalist system has ever achieved, with the exception of a few Scandinavian countries. State socialist economies had also made major advances in women's conditions.

In the early postwar years, several Western European governments used nationalization as a strategy for modernization and industrial restructuring. In Britain, nationalized enterprises accounted for 17 percent of GDP, 19 percent of investment, and 10 percent of the labor force (Tomlinson 1994: 199). In Austria, the public sector accounted for 100 percent of utilities, two-thirds of mining, one-quarter of manufacturing, and 31 percent of non-agricultural GDP (Bottomore 1990: 114).

State owned enterprises played a pivotal role in the rapid industrialization of Korea, Taiwan, Mexico, Brazil, and many other developing countries. Before the 1980s, investment in public enterprises typically accounted for 40-60 percent of the total investment in developing countries (Collyer, McMaster, and Wettenhall 2001: 161).

With the end of the "Golden Age" of the global capitalist economy, conservative governments came to power in many advanced capitalist countries. In Britain, the Thatcher government aggressively pursued the policy of privatization, setting off a wave a privatization in Western Europe. The stabilization and "structural adjustment" programs imposed by IMF and the World Bank on developing countries invariably require large-scale privatization. After the mid-1970s, the

¹ According to Maddison (1995: 228), average annual growth rate of GDP per capita between 1950-89 was 2.4 percent in Eastern Europe, 3.8 percent in China, 3.1 percent in Western Europe, 2.2 percent in "Western Offshoots" (Australia, Canada, New Zealand, and USA), 3.5 percent in Southern Europe, 1.7 percent in Latin America, 3.5 percent in Asia and Oceania, 1.3 percent in Africa, and 2.3 percent for the world average.

performance of East European state socialist economies deteriorated.² The fundamental political change that took place in these countries between 1989-91 paved the way for neoliberal “economic reforms.” Large-scale privatization has been an essential component of the neoliberal transition strategy.³

Privatization and other neoliberal policies sponsored or implemented by IMF and the World Bank have caused economic collapse, falling living standards, degradation of environment, disintegration of public services, and rapid growth of unemployment, poverty, malnutrition, inequality, and social tensions in Africa, Latin America, Eastern Europe, and Central Asia (Green 1995: 90-113; Chossudovsky 1998; Haque 2001: 226-230).

3. The Chinese Economy: Performance and Structure

China pursued an alternative strategy of transition and development. In the 1980s and the early 1990s, the official goal of economic reform was to develop a “socialist commodity economy with planning.” In the rural sector, individual farming replaced people’s communes, land remained under collective ownership and collectively owned town and village enterprises prospered. In the urban sector, central planning remained largely intact. Until 1992, there had been virtually no privatization of state owned enterprises. The central government and provincial governments planned the national and provincial investments through direct government investment and control over state owned banks. The central government heavily regulated foreign trade and foreign investment.

In the 1980s and 1990s, the Chinese economy had been one of the most

² Since the mid-1980s, output had fallen in Bulgaria, Hungary, Poland, Romania, and Yugoslavia. By 1989, the output levels in these countries were below historic peak by 2.7 percent, 2.2 percent, 1.6 percent, 5.5 percent, and 3.8 percent respectively. On the other hand, the Soviet, East German, and Czechoslovak economy continued to grow. The Soviet economy grew at 1.3 percent, 2.1 percent, and 1.5 percent respectively in 1987, 1988, and 1989. These were quite sluggish rates. But the economy was obviously not collapsing. Data are from Maddison (1995: 200-201).

³ For a definition of the neoliberal transition strategy, see Kotz (1997).

rapidly growing economies in the world. Its performance was in striking contrast to the miserable conditions of other transition economies. Between 1990-99, the average annual rate of change of GDP was -4.3 percent for Belarus, -2.7 percent for Bulgaria, 0.9 percent for Czech Republic, 1.0 percent for Hungary, -5.9 percent for Kazakhstan, 4.7 percent for Poland, -1.2 percent for Romania, 1.9 percent for Slovak Republic, -6.1 percent for Russian Federation, and -10.8 percent for Ukraine (World Bank 2000: 294-295). While there has been some debate about the reliability of the Chinese official statistics for the late 1990s, according to Maddison (1998: 157), the average annual growth rate of China's GDP between 1980-95 was 7.7 percent, a much more favorable record compared to even the most successful of the other transition economies.⁴

Table 1.1 reports the basic indicators of the Chinese economy between 1980-2000. The capital formation rate stayed between 36-40 percent after 1985, suggesting that the Chinese economy has been a high-investment, high-saving economy. Before 1995, the state sector accounted for over 60 percent of the total fixed investments and the decline in the state sector investment share had been limited. The decline of the share of state owned enterprises in the industrial output had been more dramatic. But in the first half of the 1990s, the state sector contributed nearly half of the total industrial output. After 1995, the decline of the state sector share in investment and output apparently accelerated. But by the end of the 1990s, the state sector continued to be an important part of the national economy.

It is important to recognize that the Chinese government has been moving away from the state-directed development strategy that has been proven successful. During the 1990s, and especially after the mid-1990s, the Chinese government accelerated the pace of privatization and liberalization. The Fourteenth Congress of the Chinese Communist Party of September 1992 decided that the goal of economic

⁴ For a comparison of the Chinese strategy of transition and the neoliberal strategy of transition that has been adopted by East European countries and the successor states to the former Soviet Union, please read Kotz (1997), Qian (1999), and Stiglitz (1999).

reform was to become building a “socialist market economy.” In November 1993, the Party Central Committee had decided that the goal of the state owned enterprise reform was to develop “modern enterprises” characterized by “transparent property right, clearly identified rights and responsibilities, separation of government and enterprise, and scientific management.” Since then many of the small and medium-sized state owned enterprises and collectively owned enterprises have been privatized, and many large state owned enterprises have been transformed into publicly listed corporations or share-holding companies. Tens of millions of workers in the state and the collective sector have been laid off.

The Chinese government has taken steps to develop capital markets, liberalize trade, and remove regulations of foreign investment. In 1994, the Chinese currency *Renminbi* was made convertible on the current account. In 1998, state owned banks ceased allocating credits according to quantitative plans set by the State Planning Commission. In the second half of the 1990s, there was also a major increase in the stock market activity. By the end of 2001, China had become a member of World Trade Organization, promising further trade and financial liberalization.

The government policy of accelerating privatization and liberalization may have already had a negative effect on the economy. Privatization and liberalization provide opportunities for the growth of corruption, rent-seeking activities, and stripping of state assets. The layoffs of tens of millions of the state and the collective sector workers have caused rapid increase in urban unemployment and poverty, social instability, and have contributed to the problem of insufficient aggregate demand (He 1998; Yang, B. 2000). Since 1997, the Chinese economy has suffered from deflation, excess capacity, and significant slowdown in economic growth. Between 1995-2000, while official real GDP grew at an annual rate of 8.3 percent, real energy consumption actually declined at an annual rate of 0.5 percent, and non-agricultural employment increased at a sluggish rate of 1.8 percent. Some economists argue that the actual performance of the Chinese economy in the past few

years may have deteriorated more than what official statistics suggest.⁵

4. The State Owned Enterprise Reform: Theory and Practice

The Critique of State Owned Enterprises

Many economists believe that public ownership of capital is fundamentally flawed. First, while the market economy requires separation of government and business, state ownership by nature implies a close relationship between government and enterprise management. The government imposes decisions based on social or political concerns or simply arbitrary decisions on the state owned enterprises, preventing them from operating efficiently. More importantly, to the extent that the management does have autonomy in decision-making, state owned enterprises do not have the necessary incentive mechanisms to provide appropriate motivations to the management. It is widely recognized that the state owned enterprises suffer from the “soft budget constraints” (Liu and Gao 1998: 90-93; He 1998: 84-90; Miyamoto and Yu 2000: 762-5). That is, it is difficult to establish the accountability of the managers and they are often not punished for the loss of state property. While the government subsidies to loss-making state owned enterprises have been reduced substantially, it has continued to provide implicit subsidies through the allocation of bank credits (Lardy 1998: 33-43; Miyamoto and Yu 2000: 764). The asymmetry of management responsibilities and rights leads to bad managerial decisions and inefficient allocation of investment resources. As a result, the financial performance of state owned enterprises has been deteriorating, the state owned enterprises are extremely heavily leveraged, and the state owned banks are burdened with large stocks of non-performing debts due to their excessive exposure to state owned enterprises (Lardy 1998: 21-127; Liu and Gao 1998: 66-87).

The State Owned Enterprise Reform

⁵ For the debate on China’s economic growth rates, see Appendix.

The state owned enterprise reform has gone through several stages. In the first stage (1979-83), some state owned enterprises were allowed to retain a small portion of profits to be used at their own discretion and have certain autonomy in business management after completing state output plans. The second stage (1983-87) focused on the “tax for profit” program and the “loans for grants” program. With the “tax for profit” program, state owned enterprises ceased to surrender their entire profits to the government and have since then paid income taxes on their profits. Before the “loans for grants” program, the fixed investments of state owned enterprises were financed by state budgetary funds. Since then, they have been financed either by bank loans or by state owned enterprises’ retained earnings. The third stage (1987-92) resulted in the establishment of the so-called “contract system” in most state owned enterprises. Under the contract system, the government negotiated with state owned enterprise to reach a contract that specified the amount of profits and taxes of the enterprise. The government no longer gave the enterprise concrete planning directions and the management was provided with substantial autonomy with respect to output, prices, employment, and investment. Since 1992 there has been the fourth stage. The fourteenth congress of the Chinese Communist Party declared that the goal of the reform was to establish in the state owned enterprises the so-called “modern enterprise system” characterized by “transparent property rights, clearly identified rights and responsibilities, separation of government and enterprise, and scientific management” (Lardy 1998: 22-24; Liu and Gao 1999: 62-66; Ma and Liu 2000: 40-111). The Fifteenth Party Congress in 1997 took a further step, deciding that while collective owned enterprises and small state owned enterprises were to be privatized, large and medium-sized state owned enterprises were to be restructured as share holding corporations.

Debates over China’s State Owned Enterprise Reform

The orthodox view of China’s economic reform attributes China’s economic success to the introduction of standard market forces on the one hand, and China’s

supposedly favorable initial conditions on the other. According to the orthodox view, while China's "gradualist" approach of economic reform has managed to reduce short-term transition costs, it has failed to tackle the fundamental problem. As a result, the state owned enterprises continue to operate inefficiently and their performance has deteriorated over time. By absorbing more than three-fourths of domestic credit and over half of the total fixed investments, the state enterprise sector crowds out private investment, leading to inefficiency in resource allocation. The financial support that the state owned enterprises receive from the fiscal and the banking systems has threatened to generate inflationary pressure and macroeconomic instability. It follows that rather than making any positive contribution, the state enterprise sector has acted as a drag on China's economic performance. With the costs of maintaining a large state enterprise sector increasingly outweighing any short-run benefit that may still exist, large-scale privatization must not be delayed any longer. This perspective is upheld by many leading economists on transition economics (Kornai 1989; Sachs and Woo 1994; Woo, Hai, Jin, and Fan 1994) and sponsored by the World Bank (1996a, 1996b, 1997).

With the apparent failure of the orthodox transition strategy in Eastern Europe and the former Soviet Union, the orthodox perspective has been under heavy criticisms. The critics point out that the orthodox strategy failed because it destroyed the existing social and organizational institutions without creating new ones, it pursued privatization without promoting competition, it focused on restructuring of existing assets rather than the creation of new enterprises and jobs, and it ignored the possibility that the economy may be stuck in inefficient institutional equilibria (Galbraith 1990; Kregel and Matzner 1992; Weisskopf 1992; Murrell 1993; Goldman 1994; Millar 1994; Amsden, Kochanowicz, and Taylor 1994; Kotz 1997; Stiglitz 1999).

In this context, some economists have taken a more favorable view of the Chinese approach, which has managed to achieve rapid economic growth and rising living standards without large-scale privatization. They share the orthodox view that

China's economic success has been due to the unleashing of the forces of private incentives, harder budget constraints, and competition. But they praise China for achieving this in novel and practical ways that minimize the social costs and the number of losers. Despite their more favorable view of China's transition strategy, these economists have no disagreement with the orthodox view on the basic goal of the market-oriented reform. They argue that eventually China must carry out large-scale privatization and build a market economy based on "international best practice institutions," presumably institutions found in Anglo-Saxon style capitalist economies (Naughton 1995; Walder 1996; Qian 1999).

However, some other economists argue that the state owned enterprises have made an important and positive contribution to the Chinese economy and a state-directed model of development is likely to serve China better than a free market model (Kotz 1997; Lo 1997; Bramall 2000; Yang, B. 2000). Kotz (1997) praised the Chinese state owned enterprises for contributing to a high rate of domestic investment, and providing stable and reliable sources of inputs and market for outputs for the non-state sector.

Lo (1997) found that until the early 1990s large and medium-sized state owned enterprises performed as well as non-state owned enterprises, suggesting that state ownership was not necessarily inefficient. Inspired by Aoki's (1990) theory of Japanese firms, Lo argued that Chinese state owned enterprises were institutions accountable to major stake-holders, such as creditors and employees, rather than shareholders alone. Certain features of the state owned enterprises, such as low labor mobility and government-enterprise ties, though detrimental to allocative efficiency, may well be conducive to productive efficiency. For they encourage long-term commitment of major participants and facilitate collective learning.

5. The Performance of State Owned Enterprises

Productivity Performance

The empirical evidence on the productive efficiency of China's state owned

enterprises presents a mixed picture. Table 1.2 reports the results of three studies on the growth of total factor productivity in China's industrial sector. The performance of state owned enterprises, by alternative measures, was generally comparable to that of non-state owned enterprises in the 1980s.⁶ Large and medium-sized state owned enterprises actually outperformed the non-state owned enterprises.⁷ It was only after 1992 that the state sector saw its productivity deteriorating absolutely and was apparently outperformed by the non-state sector.

With respect to static efficiency or absolute level of total factor productivity, a study of garment, cotton textile, and consumer electronic industries finds that in 1992 the state owned enterprises had approximately the same level of technical efficiency as the non-state owned enterprises. While the average technical efficiency of the state owned enterprises was 0.716, that of the collective owned enterprises was 0.797, and that of the foreign invested enterprises was 0.800 (Li and Zhong 1998: 212-226). Jefferson, Rawski, Wang, and Zheng (2000) find that in 1996 the collectively owned enterprises were about 60 percent more efficient than the state owned enterprises, and the foreign invested enterprises were about 15 percent more efficient.

The available evidence does not suggest that state ownership necessarily leads to worse productivity performance. In the 1980s and the early 1990s, measured by either by the growth or the level of total factor productivity, state owned enterprises performed roughly as well as non-state owned enterprises. However, the performance of the state owned enterprises deteriorated both relatively and absolutely after around 1992.

⁶ While between 1980-1992, the productivity of collectively owned enterprises grew faster than that of state owned enterprises, Jefferson, Rawski, and Zhang (1996) pointed out that the difference was too small to be statistically significant. They were also concerned with the reliability of the data for the collective sector and maintained that one could conclude given the available evidence that the state owned enterprises performed less well than the non-state owned enterprises.

⁷ As of 1991, state owned enterprises accounted for 93 percent of the output of large and medium-sized enterprises. With many state owned enterprises transformed into stock-holding companies, the share of state owned enterprises decreased substantially after 1992. It fell to 80 percent in 1993 and 73 percent in 1994 (Lu 1997: 90).

Financial Performance

Table 1.3 reports financial performance for the state owned and the non-state industrial enterprises. The financial performance of state owned enterprises, by different measures, was largely comparable to that of non-state owned enterprises in the second half of the 1980s. Measured by the ratio of profits and taxes on assets, the performance of state owned enterprises remained comparable to that of non-state owned enterprises until the early 1990s. In the 1990s, the performance of both types of enterprises deteriorated. However, the performance of state owned enterprises suffered a more dramatic decline.

Interpreting the Performance of State Owned Enterprises

The available evidence on the performance of state owned enterprises suggests that until the early 1990s, the performance of state owned enterprises had been comparable to that of non-state owned enterprises, measured either by productive efficiency or by financial indicators. However, since then the performance of state owned enterprises has deteriorated in relative as well as absolute terms. There are a number of factors that can help to explain the deterioration of the performance of state owned enterprises in the 1990s. These include disproportionate burden of taxation, increasing social burden, unfair competition by non-state owned enterprises, and managerial corruption associated with the process of privatization. An investigation into these factors suggests that state ownership itself may not be responsible for the deterioration of the state sector performance.

The share of state owned enterprises in the national output had fallen consistently in the 1980s and the 1990s. Between 1985 and 1994, the share of state owned enterprises in China's industrial output fell from 65 percent to 34 percent. In the same period, the proportion of total government fiscal revenue that came from state owned enterprises only fell from 72 percent to 66 percent (Liu and Gao 1998: 76). In other words, although non-state owned enterprises account for about

two-thirds of the national output, they only contributed about one-third of the government revenue. Lo (1997: 99) noted that in 1987, the effective sales tax rate (taxes paid as a share of total sales) was 9.2 percent for state owned enterprises and 5.4 percent for collectively owned enterprises, and the effective income tax rate (taxes paid as a share of profits) was 60.7 percent for state owned enterprises and 30.7 percent for collectively owned enterprises. The high effective tax rates leave the state owned enterprises with inadequate internal funds, force the state owned enterprises to borrow heavily and become highly leveraged, and have seriously undermined their ability of expanded reproduction and technological development (Jin 1997: 120-123; Lo 1997: 99-102; Yu 1999). To give some idea of how much the private sector has been under-taxed, if the non-state owned enterprises are taxed as heavily as the state owned enterprises, the effective taxes on the non-state owned enterprises would have to be doubled or even tripled. That implies an increase of total government revenue from the current level of about 15 percent of GDP to 20-25 percent of GDP.

State owned enterprises are not only productive enterprises. They perform important social functions, providing education and medical and child care to their employees. In the mid-1990s, they operated more than 18,000 schools with an enrollment of 6.1 million students and 600,000 teachers and other staff. Hospitals built and run by state owned enterprises account for one-third of all hospital beds in China (Lardy 1998: 51). State owned enterprises were mostly founded in the 1950s-70s when all of their profits were submitted to the government, including the implicit pension funds of employees. However, since the early 1980s state owned enterprises have been required to be responsible for their own profits and losses, and the pension funds of their retired employees have to be paid out of retained earnings. With the ratio of retired employees to current employees rising steadily, the internal funds of many state owned enterprises have been depleted. In 1994, the retired employees amounted to 25 percent of the total current employees of the state owned enterprises. The pension payment of the state owned enterprises amounted to 56

percent of the profits of the state owned enterprises (Wei and Shen 1997; Jin 1997: 120-121). The social services provided by state owned enterprises and their pension payments are public functions that should have been performed by the government. To the extent that the government fails to perform these functions and the financial burden of these functions falls upon state owned enterprises, they are implicit taxes imposed upon state owned enterprises. Moreover, a proper measure of state owned enterprises' output needs to take into account not only the part of the output that has a market value, but also the benefits of these social services.

While state owned enterprises provide comprehensive welfare to their employees and are required by law to practice "democratic management" (meaning workers' participation in management through congress of employees' representatives, more on this below), non-state owned enterprises are notorious for their violation of labor rights and ruthless exploitation in the form of long working hours, low wages, and unsafe or otherwise detrimental working environments. A study on rural township and village enterprises (including enterprises owned "collectively" by township and village governments and rural private enterprises) observes that it is quite common for the management to arbitrarily extend working time and many township and village enterprises do not allow their employees to rest on weekends and public holidays (Xu 1995: 141). A 1992 nationwide survey found that 82 percent of town and village enterprises operated under conditions that had harmful effects on the physical health of workers. A 1988 research reported that town and village enterprises accounted for 50.1 percent of the total deaths related to professional diseases in the City of Shanghai. Many major industrial accidents took place in town and village enterprises (Xu 1995: 143). In foreign invested enterprises, it is not uncommon for the managers to beat, humiliate, and abuse employees. Workers are searched before they leave the workplace. They are forbidden to go to the restroom during work hours. Some manager punished workers by forcing the workers stand under the sun or in the rain for hours. Some even locked a worker in a cage with a dog (Qiao 1995: 166). Some foreign invested enterprises not only pay

extremely low wages to production workers, but also arbitrarily deduct or delay workers' wage payment or impose fines on workers. Many have their workers work nine or ten hours a day with no extra pay (Qiao 1995: 174). A survey by the Health Department of Guangdong Province found that over 70 percent of the foreign invested enterprises investigated did not have the necessary dust-prevention and poison-prevention equipment to protect their employees. In 1992, foreign invested enterprises accounted for 20 out of 80 major fire accidents in China. One of these accidents killed 84 workers. Since a Taiwanese enterprise was established in 1989, 43 accidents had occurred, each of which had cost some worker's hands or fingers (Qiao 1995: 176). The conditions in domestic private enterprises are no better. A study using the Marxist concept of surplus value found that in 1990, a typical private enterprise had a rate of surplus value of 587% (Qi and Xu 1995: 199). While the law requires private enterprises practice eight hour working day, a survey in four provinces found that 85 percent of private enterprises had their workers work longer than eight hour a day, and it was not uncommon for workers to work more than twelve hours a day. Some workers worked to death during the work. Like rural township and village enterprises and foreign invested enterprises, domestic private enterprises typically fail to provide the minimum safety conditions at workplace (Qi and Xu 1995: 200-201). The records of labor rights in non-state owned enterprises raise serious questions against their apparent "technical" efficiency. It is quite possible that controlling for labor right conditions, state owned enterprises are actually more efficient. The failure of the government to enforce labor laws in non-state owned enterprises has amounted to implicitly subsidizing non-state owned enterprises. Non-state owned enterprises are allowed to prevail in competition with state owned enterprises by paying low to workers, forcing workers to work long hours, and saving on necessary safety expenses.

In the reform period, the managers of state owned enterprises have been provided increasing autonomy with respect to the government. Moreover, the manager has acquired the power to hire and fire workers and to decide wage

distribution. As a result, the balance of power between workers and management has been turned decisively in favor of management (Zhao 1995: 83). While the managers have acquired more power, the process of privatization has created enormous profit opportunities that induce the managers to abuse their power. They move assets out of state owned enterprises into newly founded non-state owned enterprises, which often become their own property. Alternatively, they lease or contract out state assets but the profits or interest payments never flow back to the state owned enterprise. One government office estimated that between 1987 and 1992, the annual loss of asset stripping from state owned enterprises amounted to 33 billion Yuan. A later estimate found that between 1990 and 1995 the annual loss rose to 50 billion Yuan (Lardy 1998: 51-52). In the privatization wave in the mid-1990s, in which tens of thousands of small state owned enterprises were privatized, the asset stripping problem became perceptibly worse (He 1998: 106-116). A leading Chinese economist, Hu Angang, recently estimated that the annual loss of public investment and public expenditure funds caused by corruption amounts to 257.5 to 341 billion Yuan (*World Journal* or *Shijie Ribao*, March 24, 2001).

6. Towards an Alternative to Privatization

A comprehensive evaluation of the performance of state owned enterprises must not be restricted to microeconomic indicators. Arguably, a state sector has important positive externalities on the rest of the economy. State owned enterprises produce public goods, offer goods and services in natural monopoly industries without pursuing monopoly profits, function as model enterprises in protecting workers' interests and the environment, lead the development of strategic industries, and helps to stabilize the macro-economy. There is some empirical evidence that higher share of state owned enterprises in the economy is associated with a higher economic growth rate (Doamekpor 1998).

The experience of privatization in developing and transition economies suggests that privatization is not likely to be a good approach if the purpose of

economic reform is to improve the performance of state owned enterprises and the performance of the economy as a whole. Given the fact that political and economic power is concentrated in a small group of elites, privatization provides an opportunity for the elites to break previously established social contracts with certain sections of working people and to profit from the process of privatization at the expense of the public interest. Thus, privatization is often associated with large-scale corruption, the looting of state assets, and rapid increases in inequality. For several reasons, privatization has failed to contribute to better economic performance.

First, the new owners of the previously state owned assets are often not competent in productive management. Moreover, they are often more interested in selling the assets for quick profit and sending the money abroad where their illegitimately acquired assets would be safe, than in the productive management of these assets. Secondly, the breakdown of the previously established social contracts associated with the process of privatization results in a general loss of previously developed “social and organization capital,” and causes a decline of the society’s productive capability. Thirdly, the political instability associated with the distributive conflicts that arise in the process of privatization increases economic risks and discourages investment. Fourthly, where the privatized assets are put in productive use, they may be operated in a way that enhances private profit at the expense of the public interest. This is more likely to be the case in natural monopolistic industries (Green 1995: 72-76; Stiglitz 1999; Farazmand 2001: 13-14).⁸

If state owned enterprises serve important social and economic functions that cannot be performed by private enterprises, and privatization is not likely to be the right solution to the economic problems in developing and transition economies, an alternative to wholesale privatization has to be developed. This monograph argues that in the Chinese context, a large state owned enterprise sector is necessary for

⁸ Even in advanced capitalist countries, the available evidence on the performance of privatized enterprises has been ambiguous. There are many cases where the result of privatization is widely regarded as a failure (Terry 2001: 129-131; Collyer, McMaster, and Wettenhall 2001: 161-5).

maintaining macroeconomic stability. It also argues that the performance of state owned enterprises can be significantly improved with more workers' participation in management and a government policy that is committed to sufficient level of aggregate demand.

The body of this monograph consists of three essays. In Chapter 2, I argue that a large state owned enterprise sector has made an important contribution to macroeconomic stability in the Chinese context. John Maynard Keynes pointed out that a market economy is fundamentally unstable and a large public sector is indispensable for a modern complex economy to sustain reasonable economic performance in the long run. Hyman P. Minsky argued that in the context of the U.S. economy, the federal government needed to be as large as about 20 percent of GDP to maintain macroeconomic stability and avoid severe economic downturns. This essay applies Minsky's hypothesis to the Chinese context. It argues that public sector investment (primarily investments made by state owned enterprises) has played a crucial role in macroeconomic stabilization and the state owned enterprise sector needs to be sufficiently large so that the public sector investment accounts for about 50 percent of the total capital formation.

Chapter 3 explores the effects of workers' participation in management on firm level performance. Workers' participation in management may contribute to higher productivity by providing better motivations to the workers, encouraging the accumulation of human capital, and facilitating information exchange. The essay uses data collected from a survey that this author conducted in China's Henan province in summer 2000. The regression analyses find that a higher level of workers' participation in management has large and positive effects on productivity. These results suggest that the performance of state owned enterprises is likely to be improved if these enterprises make more effective use of the existing participatory institutions.

Chapter 4 addresses an issue of great social importance. Many economists argue that the employment regime of China's state owned enterprises is inefficient.

It sets the level of employment to meet social obligations rather than to maximize profits. As a result, they argue that many of the workers currently employed by the state owned enterprises are redundant and efficient allocation of labor force requires large-scale layoff of the state sector labor force. This essay argues that since the state owned enterprises provide employment security to their employees, the state sector labor productivity is likely to behave in a strongly pro-cyclical manner. Much of the “redundancy” or “disguised unemployment” in the state sector may be due to insufficient aggregate demand rather than technical inefficiency. If this is the case, then expansion of aggregate demand (by increasing the public sector investment), rather than layoff of tens of millions of workers, appears to be the most sensible solution to the problem of “disguised unemployment.”

Chapter 5 concludes the dissertation and argues that the policies and institutions proposed in this dissertation constitute a framework that may be referred to as Economic Democracy, which offers an alternative that is preferable to the strategy of neoliberalism and large-scale privatization.

Chapter 2

Public Sector Investment and Macroeconomic Stability

1. Introduction

Building from the analysis of Keynes, Hyman Minsky advanced a highly influential analytic framework showing how capitalist market economies are fundamentally unstable. According to Minsky, a capitalist market economy in which investment and finance are important is vulnerable to debt deflations and depressions. To avoid debt deflations and depressions, it is necessary to have a big government. Various authors have shown how Minsky's perspective is consistent with the historical experience of advanced capitalist economies (e.g. Pollin and Dymski 1994).

China has been undertaking transformation towards a market economy in the past two decades. This chapter applies Minsky's argument to the context of the Chinese economy. The Chinese economy is characterized by a high saving ratio and a small government share. I argue that in this context, a big public sector, including the government sector and state owned enterprises, is necessary for maintaining macroeconomic stability. Given certain assumptions, public sector investment needs to account for about 50 percent of the economy's total capital formation.

Section 2 briefly reviews the Keynesian-Minskian theory of instability and discusses the Minskian model of a modern capitalist economy. The model helps to explain why a big government is necessary for a modern capitalist economy to avoid depressions or deep recessions.

Section 3 discusses the relationship between public sector investment and macroeconomic stability in the Chinese context. In the 1980s and the 1990s, the central government had become too small to effectively maintain macroeconomic stability. However, the public sector investment remains large relative to GDP and has functioned as the major macroeconomic stabilizer. Section 4 explains how the state has intervened with the processes of finance and investment. Simple regression analyses find that the investment behavior of state owned enterprises is significantly different from that of non-state owned enterprises.

Section 5 develops a Minskian macroeconomic model with a state owned enterprise sector and a foreign trade sector. Section 6 discusses the size of the public

sector that is required to maintain macroeconomic stability in the Chinese context. Section 7 discusses the public sector financial sustainability and the possible loss of investment efficiency that may arise with a big public sector.

2. The Instability of Capitalist Market Economy and the Minskian Model

The Keynesian-Minskian Theory of Instability

Private investment is the driving force of capitalist market economy. In a simple macroeconomic model without government and foreign trade, aggregate demand is simply the sum of private consumption and private investment. Since consumption is largely a function of income, the level of national income depends on the level of investment. But investment is also the most volatile component of national income, and a major source of economic instability.

Investment is a function of expected profitability in the future. But private investors only have very limited knowledge of the future. The future is uncertain and this uncertainty cannot be reduced to probability calculations. In this case, private investment is subject to sudden and wide fluctuations (Keynes 1964[1936], Chapter 12; 1937).

The development of capital markets reduces risks perceived by individual investors by making individual investments more “liquid.” However, for society as a whole, investment (in the form of plants and equipment) remains illiquid despite the development of capital markets. To the extent that capital markets contribute to the separation of management and ownership, private investors have even less access to the knowledge of the actual conditions of business. A highly liquid capital market allows individual investors to avoid committing themselves to any long-term project, thus encouraging short time horizon and discouraging long-term investment. In addition, the profession of market analysts, whose function is supposed to be providing their best assessment of the true value of capital assets, facilitating efficient allocation of capital, is mainly occupied with “foreseeing changes in the conventional basis of valuation a short time ahead of the general public,” rather than forecasting the

long-term return of investment projects (Keynes 1964[1936]: 153-8). Therefore, while the development of capital markets helps to reduce the perceived risks of individual investors, by separating private investors from actual business, and encouraging short time horizon, it reinforces the speculative aspect of private investment and greatly intensifies its fluctuation.

Minsky (1975; 1982; 1986) developed the Keynesian theory of instability by studying the dynamics of financial structures and processes. According to Minsky, capitalist market economy suffers from endogenous financial instability. Over the course of a business cycle, a robust financial structure tends to be replaced by a fragile financial structure.

Cash commitments occur when businesses or households finance their investments with external funds (borrowings or sale of physical or financial assets). A unit (either business or household) expects its cash receipts to exceed its cash payments in each time period is engaged in what Minsky called hedge finance. A unit whose contractual cash flow out over a time period exceeds its expected cash flow in is engaged in what Minsky called speculative or Ponzi finance. The operation of a speculative or Ponzi unit depends more heavily on the financial market conditions than a hedge unit.

A financial structure is robust if it is dominated by hedge units. Where hedge finance dominates, profit opportunities exist for both borrowers and bankers to shift from hedge finance to speculative or Ponzi finance. With the growth of profitability, expectation rises and confidence improves. Private borrowers and lenders are willing to accept lower “margin of safety” and higher leverage. Thus, speculative and Ponzi finance are not only profitable but increasingly perceived as “safe.” With more and more units engaged in speculative or Ponzi finance, the robust financial structure is replaced by a fragile financial structure (Minsky 1986: Chapter 4, 9).

Thus, the operation of capitalist economy itself tends to generate a fragile financial structure. In small government capitalism, such financial fragility is likely to end with debt deflations and depressions.

The Minskian Model of Capitalist Economy

Following Minsky (1986: chapter 6), a simple model of capitalist economy may be set up as follows:

$$(1) C + I = WN + \Pi$$

Where C and I are consumption and investment respectively, and W is nominal wage rate and N is the total labor force employed, and Π is gross profits (which is the difference between total revenue and what Minsky calls “out-of-pocket costs” or “technologically determined costs,” and therefore include not only accounting profits, but also interests, rents, depreciation of the capital stock, and wages of managerial workers).

If one makes the Kaleckian assumption that workers spend all of their wages on consumption and capitalists spend all of their profits on investment, then it follows that:

$$(2) I = \Pi$$

Or the sum of profits is equal to investment. In a capitalist economy, investment is made for the purpose of making profits. The flow of profits validates past investment expectations and makes cash available for debt and interest payment. It also pays for managerial costs (management, marketing, research and development). From equation (2), it is obvious that the current flow of profits depends upon the size of investment, which in turn depends upon expectation of future profits. In a simple capitalist economy without government, a fall of investment results in falling profits, which leads to further decline of investment and collapse of profits. Such an

economy is therefore vulnerable to any investment fluctuation.⁹

Now assume a three sector capitalist economy with consumption, investment, and government:

$$(3) C + I + G = WN + \Pi + T$$

Where G stands for government expenditures and T stands for taxes. It can be easily established that:

$$(4) I + (G - T) = \Pi$$

The flow of profits is determined by the sum of private investment and government deficit. Thus, in a capitalist economy with government, a fall of private investment does not have to result in collapse of profits if it is offset by a corresponding increase in government deficit spending. In the long run, the deficits generated by a government in recessions need to be offset by the surpluses generated in expansions.¹⁰ In small government capitalism, the government cannot generate enough deficits to prevent a dramatic decline of investment and profits without

⁹ A traditional policy tool to deal with investment instability is monetary policy. Keynes (1964[1936]: 164-244) doubted that monetary policy could be effective in preventing or reversing an investment fall. In theory, an expansion of money supply should result in lower interest rate and a lower interest rate in turn should result in higher investment. In reality, monetary policy may fail in either of the two steps. An expansion of credits or money supply does not address the fundamental uncertainty of the future. When expected profitability is low or when investors have inadequate confidence, lower interest rate provides little incentive for investment. Low investor confidence may result in unlimited demand for money and produce a "liquidity trap." In that case, expansion of money supply fails to change the interest rate.

¹⁰ If the government runs sustainable structural deficits, then the positive excess deficits generated in the recessions need to be offset by the negative excess deficits generated in expansions. It is useful to distinguish government deficits on the current account from those on the capital account. Government deficits that are used to finance investment in capital assets are, to some extent, self-financing since they result in higher economic growth and generate more tax revenues in the future (Eisner 1986: Chapter 3).

undermining its creditworthiness, because under reasonable circumstances the small tax base does not allow the government to generate enough surpluses later to offset previously generated deficits. Formally, this can be represented as follows:

$$(5) I_1 + (G_1 - T_1) = \Pi_1$$

$$(6) I_2 + (G_2 - T_2) = \Pi_2$$

$$(7) G_1 - T_1 = (T_2 - G_2) / (1 + i)$$

Where I_1 , G_1 , T_1 , and Π_1 are investment, government expenditures, taxes, and profits in period 1, and I_2 , G_2 , T_2 , and Π_2 are investment, government expenditures, taxes, and profits in period 2. Equation (5) and (6) establish the macroeconomic equilibrium conditions in a two-stage model of a capitalist economy. Equation (7) establishes the budget balance constraint, which requires that the deficit spending in stage 1 be balanced by the surplus in stage 2, and “ i ” is the discount rate. If in stage 1 the economy is in recession, and in stage 2 the economy is in expansion, then the government runs deficit in stage 1 but enjoys surplus in stage 2. Let the ratio of deficit to taxes and the ratio of surplus to taxes be “ d ” and “ s ” respectively. Then equation (7) can be re-written as:

$$(8) dT_1 = sT_2 / (1 + i) \quad \text{or} \quad d = sT_2 / T_1 (1 + i)$$

Thus, the acceptable deficit ratio in stage 1 depends on the expected surplus ratio in stage 2, the ratio of tax revenue in stage 2 to that in stage 1, and the discount rate. The ratio of tax revenue in stage 2 to that in stage 1 in turn depends on the expected length of recession and expansion and the expected economic growth rate.

Minsky (1986: Chapter 13) argued that in the U.S. context, as a rule of thumb, the federal government must be at least as large as private investment. If

full-employment investment is 16 to 17 percent of GNP, then the federal government spending should be at least 16 percent of GNP, and perhaps 20 percent of GNP to protect the economy against a catastrophic decline of investment.¹¹

Evidence from Advanced Capitalist Economies

In the post WWII period, big government along with other institutions (central bank's lender of last resort operations, regulations of financial markets, and regulations of international capital flow) have successfully prevented prewar-style depressions from happening again in advanced capitalist economies. Big government capitalism has performed better than small government capitalism in terms of growth, employment, and financial stability (Pollin and Dymski 1994).

Table 2.1 presents the share of total government expenditures (including all levels of government) in GDP of six advanced capitalist economies from 1880-1996. The average government size had been around 10 percent of GDP between 1880-1913. It increased to near 28 percent at the end of the Great Depression. The post-WWII period has seen a dramatic increase in the role of the government. The average government size increased from about 27 percent of GDP in 1950 to 37 percent in 1973, and again to near 46 percent in 1992. In 1990s, despite the global drive towards free market and privatization, the government size stabilized around 45 percent.

Table 2.2 and Table 2.3 present the long-term performance of advanced capitalist economies in terms of real GDP growth and real per capita GDP growth. The small government era is represented by the period of 1870-1913 and the period of 1870-1939, with the first measure excluding while the second measure including WWI and the Great Depression. The big government era is represented by the period of 1950-1994 (1994 is the last year for which consistent data are available). The 1980s and the 1990s are presented separately to reflect the institutional changes

¹¹ For a discussion of the Minskian rule of thumb, see Appendix.

introduced by neoliberalism, a period when the role of the public sector had been substantially curtailed.

Table 2.2 suggests that the aggregate performance of advanced capitalist economies in the big government era is superior to that of the small government era. The average growth rate of GDP improved substantially in every advanced capitalist country in the big government era with the exception of the United States, which experienced rapid industrialization between 1870-1913. In the small government era, the average growth rate of six advanced capitalist economies was around 2.5 percent. In the big government era, it increased to near 4 percent. But the performance of advanced capitalist economies deteriorated significantly after 1980, with the average growth rate falling to 2.8 percent in 1980s and only 2.2 percent in 1990s. Table 2.3 presents essentially the same picture, except that the performance of the big government era appears to be even more impressive. The average growth rate of per capita GDP of the big government era more than doubles that of the small government era. But for the 1980s and the 1990s, it fell significantly to a level approaching that of the small government era.

3. Public Sector Investment and Macroeconomic Stability: the Chinese Case

China has been pursuing market-oriented economic reform since the early 1980s. Unlike in Eastern Europe and the former Soviet Union, the Chinese government had not been committed to privatization of state owned enterprises until recently. The financial sector has been under the control of state owned banks. The four largest state owned banks accounted for 72 percent of China's total non-central bank financial assets in 1995 (Lardy 1998: 224). China is one of the few countries that have not removed government control of capital flows and the Chinese currency remains inconvertible on capital accounts.

Many economists have criticized these features of the Chinese economic system. They argue that state ownership and government intervention are fundamentally inefficient (see Section 4, Chapter 1). Nevertheless, there is little

controversy that until the mid-1990s China had managed to achieve consistently rapid economic growth. Inflation has been under control. China enjoyed large trade surplus and massive inflow of foreign direct investment in 1990s (see Table 1.1).

Table 1.1 suggests that high investment ratios have contributed to China's rapid economic growth. The capital formation rate (the ratio of fixed and inventory investment to GDP) rose from about 35 percent in the 1980s to near 40 percent in the 1990s. Before 1995, the state sector accounted for over 60 percent of total fixed investments and over 40 percent of the industrial output.

Many economists have either ignored the Chinese experience in their analysis of the so-called "transition economies" (World Bank 1996b), or attributed the success of the Chinese economy to the market-oriented institutional changes that have unleashed standard forces market incentives, especially hard budget constraints and competition (Qian 1999). Implicit in the more favorable mainstream view of the Chinese economy is the neoclassical belief that the operation of the market economy itself is sufficient to allocate resources efficiently and generate sustained economic growth in the long run. However, from the Keynesian perspective, the market by itself cannot guarantee full utilization of existing resources and macroeconomic stability. On the contrary, in a modern economy relying on expensive capital goods crucial for output and productivity growth, the internal operation of the market tends to generate financial fragility that leads to crises and depressions. It follows that long-term sustained economic growth requires not only adequate market incentives and efficient allocation of resources, but also sustained growth of aggregate demand that usually requires the public sector play a significant role.

Table 2.4 analyzes the composition of aggregate demand for the Chinese economy over the past two decades. Household consumption had been a little bit above 50 percent of GDP in the 1980s and had stayed below 50 percent since 1990, suggesting a very high national saving rate. Among the autonomous demand variables, government expenditures were the most important. Total government budget and off-budget expenditures accounted for near 40 percent of GDP in the

mid-1980s, similar to the proportion of the government sector in an advanced capitalist economy in the post-WWII era. However, in the 1990s, the Chinese economy had been transformed from a big government economy into a small government economy. Total government budget and off-budget expenditures were probably below 20 percent of GDP by the end of the 1990s. By comparison, total federal, state, and local government expenditures accounted for 37 percent of U.S. GDP in 1996. Importantly, the share of the central government expenditures in China's GDP fell drastically between the early 1980s to the late 1990s from 17 percent to only 4-5 percent. Since the central government is the part of the government sector that ultimately bears the responsibility for government debts, the falling share of the central government significantly undermines the ability of the government sector to undertake effective macroeconomic intervention. By comparison, in the 1990s the U.S. federal government in average accounted for 20 percent of GDP.

The share of private investment increased dramatically from 4 percent in 1980 to 17 percent in 1999. In other words, by the end of the 1990s, private investment was more than three times as large as central government expenditures. Compared to the U.S. economy, the Chinese economy has a private investment sector as large as that of the U.S. in terms of GDP share, but a central government sector only a quarter of that of the U.S. A central government of 4-5 percent of GDP is likely to be too small to balance any significant fluctuation of private investment.

However, instead of falling into crisis and depression, China had managed to achieve rapid economic growth in the 1980s and the 1990s. From the point of view of aggregate demand, this can be explained by the importance of public sector investment. Total state sector fixed investments as a share of GDP increased from about 15 percent in the early 1980s to more than 20 percent by the mid-1990s, and stayed at about 19 percent in 1999. This increase had to some extent offset the fall of the government expenditures as a share of GDP. Of the total state sector investment, the investments by state owned enterprises had gained in importance

relative to government investments. Excluding the investments financed by government budgetary funds, the state sector investments increased from 8 percent of GDP in 1981 to 17 percent of GDP in 1999. These investments are financed either by domestic or foreign loans or by retained earnings and other self-raised funds. A comparison of the behavior of the private and the public sector investment shows that the public sector investment had played a stabilizing macroeconomic role.

Table 2.5 compares the growth of the state sector investment with that of the non-state sector investment and illustrates their relations to macroeconomic conditions. The state sector investment had been more stable than the non-state sector investment. While the standard deviation for the state sector investment is 14.7 percentage points, the standard deviation of the non-state sector investment is 26.2 percentage points. The state sector investment, relative to the non-state sector investment, had acted as a counter-cyclical factor.

The relative cyclical stance of state investments (numbers in column 3) is defined as the difference between the state sector investment growth and the non-state sector investment growth. A positive number suggests the state sector is more expansionary, and a negative number suggests it is more contractionary. Columns 4 and 5 report the GDP gaps and the annual changes of inflation. An examination of the numbers in columns 3, 4, and 5 find that in most of the cases, when the economy is in expansion (with positive GDP gaps or inflation acceleration), the relative cyclical stance of state investments is negative (meaning more contractionary), and when the economy is in contraction, the relative cyclical stance of state investments is more expansionary. This observation is verified by the correlation coefficients between these columns. The relative cyclical stance of state investments is negatively correlated with the GDP gaps with a coefficient of -0.352 , and negatively correlated with inflation changes with a coefficient of -0.478 .

These results therefore suggest that, although the central government in China is likely to be too small to balance any significant fluctuation of the private investment, public sector investment had remained relatively large and had functioned

as a macroeconomic stabilizer.

4. State Owned Enterprises and Investment

Before the market-oriented reforms, the government financed most of the fixed capital and a portion of the working capital of state owned enterprises through budgetary funds. Since the “loans for grants” program (see section 4, Chapter 1), the investments of state owned enterprises have been financed primarily by borrowings from state owned banks. In the mid-1990s, about 80 percent of the fixed investments of state owned enterprises were financed by bank loans. Nearly all of the state owned enterprises’ working capital is composed of funds borrowed from the state owned banks (Lardy 1998: 39-43).

While before the reform, almost the entire national savings were mobilized within the government sector, the household sector has become the predominant source of national savings in the reform period. Household savings as a percent of GDP rose from 2 percent in 1978 to 22 percent in 1994 (Lardy 1998: 14). In 1996, 77 percent of household financial assets were held as saving deposits, 12 percent as cash, 6 percent in the form of government bonds, and only 5 percent went to equities or enterprise bonds (Lardy 1998: 132). Thus, most of the household savings have been mobilized by the state owned banks. The state owned banks allocate most of their loans to state owned enterprises. In 1995, the outstanding borrowing of state owned enterprises accounted for 83 percent of all bank loans outstanding. Between 1980-95, 90 percent of the lending for fixed investment made by the Industrial and Commercial Bank of China (the largest commercial bank) went to state owned enterprises (Lardy 1998: 83).

Table 2.6 presents a simplified China’s flow of funds account in 1997. In 1997, the household sector financed about half of China’s national savings. Savings generated in the non-financial business sector and the government sector were completely re-invested in their own sector or provided to other sectors as capital transfer. The household sector generated large financial surpluses that were

mobilized by the financial sector (the state owned banks) to finance the deficits of the non-financial business sector, the government, and the rest of the world. Since only a small proportion of lending by the financial sector went to non-state owned enterprises, it is apparent that the state owned banks acted primarily as the intermediary between households and the state owned enterprises so that most of the household savings were directed to the state owned enterprises.

The government exercises significant control over the allocation of bank credits. Lardy (1998: 83-92) identifies two categories of “policy loans,” or credits directly allocated by the government. The first category refers to the so-called “re-lending” loans, referring to funds borrowed by the state owned banks from the central bank to finance specific projects identified by the State Planning Commission. In 1993, re-lending loans accounted for 37.2 percent of the total lending of the four largest state owned banks, though this proportion fell rapidly to 17.4 percent in 1995. Chinese banks also made loans to state owned enterprises or government projects at the request of local governments. Taking into account both categories, in 1991, policy loans accounted for 67, 51, 58, and 25 percent of the loan portfolio of the Bank of China, the Agricultural Bank, the Construction Bank, and the Industrial and Commercial Bank (the largest four state owned banks) respectively.

In addition to direct allocation of credits, before 1998, the State Planning Commission set credit quotas on regional distribution of lending. The national credit plan was built from bottom up. Each province aggregated borrowing needs of specific investment projects and large state owned enterprises in the region, making some allowance for general lending, to from regional lending plans. The State Planning Commission adjusted the sum of these regional lending requirements to reflect macroeconomic conditions. The final national credit plan then was broken down into a lending quota for each province or provincial-level municipalities and an annual credit plan was imposed on financial institutions (Lardy 1998: 86).¹²

¹² But after 1998, as a part of the broader trend towards financial liberalization, the State Planning Commission no longer imposes credit quotas on financial institutions

The pattern of real interest rates offers additional evidence of the government's control of finance and investment. With the state's monopoly over the financial sector, state owned banks are able to keep very low or even negative real interest rates to provide cheap credits to state owned enterprises. Table 2.7 shows that between 1985-97, for eight out of thirteen years, the 3-year time deposit rate was negative, and the average rate for this period was -1.87 percent. Even when taking into account the value-guarantee deposits introduced during high inflation periods, the average of the higher of 3-year time deposit rates and value guarantee deposit rates was only 1.57 percent. On the other hand, state owned banks made investment loans available to state owned enterprises at extremely low real interest rates. The working capital loan rate was below zero for seven years and averaged -0.64 percent. The capital construction loan rate was negative for five years and the average was barely above zero by one percent.¹³

While the investments of state owned enterprises are primarily financed by loans made by state owned banks, the investments of non-state owned enterprises are primarily financed by retained earnings and informal credit markets (Lardy 1998: 7). Given their different control structures and different sources of finance, one would expect the investment behavior of state owned enterprises to be significantly different from that of non-state owned enterprises. Jefferson, Rawski, and Zheng (1996) and Li and Zhong (1998: 207-210) observe that in the 1985-92 business cycle, while the growth rate of the capital stock in the state industrial sector had been roughly stable, that in the non-state industrial sector exhibited significant pro-cyclical fluctuations.

(Liu and Gao 1999: 23).

¹³ State owned banks have maintained relatively stable nominal interest rates. As a result, large swings of inflation rates were translated into large swings of real interest rates. From 1993 (the peak year of the business cycle) to 1997 (the year when price deflation and recession started), the real interest rate for working capital loans rose drastically by 23.4 percentage points, and that for capital construction loans by 21.9 percentage points. Thus, the banks' interest rate policy had been in effect strongly pro-cyclical. That may have contributed to the length and depth of the current recession (for the growth performance after 1995, see section 2, Chapter 1).

While they attribute this difference to the inefficient investment decisions of state owned enterprises, from a macroeconomic point of view, the investment behavior of state owned enterprises had apparently been stabilizing while that of non-state owned enterprises had been de-stabilizing.

Using data from *China Statistical Yearbook*, various issues, I performed simple regression analyses of the investment behavior of state and non-state owned enterprises. The data are for industrial enterprises with independent accounts from 1982 to 1997. I test the response of investment to output growth.¹⁴ The following two relationships are tested:

$$(9) \quad (dK/K)_t = a_1 + b_1(dQ/Q)_t + b_2(dQ/Q)_{t-1}$$

$$(10) \quad (dI/I)_t = a_2 + b_3(dQ/Q)_t + b_4(dQ/Q)_{t-1}$$

dK/K is the growth rate of real capital stock, $(dQ/Q)_t$ and $(dQ/Q)_{t-1}$ are growth rates of real output in the current and previous year, and dI/I is the growth rate of real investment (investment is defined as the annual difference of original value of fixed assets). Assuming output growth expectation is a linear combination of the current and past output growth, equation (9) and (10) say that capital accumulation or investment is a function of expected output growth.

The regression results are reported in Table 2.8. All regressions are corrected for first-order auto-correlation. When the capital stock growth is the dependent variable, the sum of b_1+b_2 is -0.07 for state owned enterprises and 0.17 for non-state owned enterprises. But the poor R-square statistics suggest that the underlying model has limited explanatory power. The negative R-square statistic for the non-state sector is due to disturbance caused by $(dQ/Q)_t$, which reduces degrees of freedom without contributing to the explanatory power of the model. When $(dQ/Q)_t$

¹⁴ For detailed description of the sources, compilations, and definitions of data, see the appendix of Chapter 4.

is dropped, other coefficients remain virtually the same while the R-square turns positive. When investment growth is the dependent variable, the sum of b_3+b_4 is 0.52 for state owned enterprises and 1.53 for non-state owned enterprises, and R-square statistics improve significantly. For the non-state sector, $(dQ/Q)_t$ again appears as a disturbing factor. When it is dropped, the coefficient on $(dQ/Q)_{t-1}$ becomes 1.70, and R-square rises to a reasonable level.

The implications of these regression results are consistent. The investment of non-state owned enterprises, as expected, responds positively to output growth and exhibits strong pro-cyclical movements. State owned enterprises, however, respond to output growth by either contracting capital accumulation or expanding investment moderately. Their investments are either counter-cyclical or slightly pro-cyclical and tend to smooth out business cycles. These results are consistent with the hypothesis that the state sector investment has contributed to macroeconomic stability and the non-state sector investment has been a de-stabilizing factor.

5. Macroeconomic Equilibrium with State Owned Enterprises and Foreign Trade

The Minskian perspective demonstrates that in advanced capitalist economies, big government is necessary for maintaining macroeconomic stability and preventing fluctuations of private investment from causing crises or deep recessions. In China, the central government now accounts for only about five percent of GDP. The size of the central government is too small to run sufficiently large deficits when there is a drastic fall of private investment. However, China has maintained a relatively large state business sector. In recession periods, state owned enterprises maintain investment growth even when output, profits and private investment are falling. The large share of public sector investment allows the Chinese economy to operate at near full employment level by absorbing the large private savings. Moreover, it implies that any significant fall of private investment can be readily offset by a corresponding

increase in public sector investment.¹⁵

Conceive a Minskian macroeconomic model with state owned enterprises and a foreign trade sector:

$$(11) C + I_s + I_p + G + EX - IM = (WN)_s + (WN)_p + \Pi_s + \Pi_p + T$$

where I_s and I_p stand for the investments of state and private enterprises, $(WN)_s$ and $(WN)_p$ stand for the total wage bills of state and private enterprises, and Π_s and Π_p are the profits of state and private enterprises. EX and IM stand for exports and imports.

In recent years, exports have accounted for about 20 percent of China's GDP, and trade surplus has been around 3 percent of GDP. However, about half of the exports and imports belong to the category "processing trade," in contrast to "general trade." Processing trade refers to re-export of processed imported goods and includes little domestic content. Excluding the imported content of the processing exports, the general exports and the domestic content of the processing exports together account for about 12 percent of GDP. The general imports account for about 9 percent of GDP. Since we are only interested in the effect of net exports, in the text below we only need to consider the general exports (including the domestic content of the processing exports) and the general imports.

Assume total wages equal total consumption and workers consume no imported goods. Moreover, suppose imports (meaning the general imports) are proportional to the non-consumption expenditures, and investment, government expenditures, and exports (meaning the general exports) have the same import propensity. Therefore, $IM = m(I_s + I_p + G + EX)$, and m is the import propensity. It is easy to see that:

¹⁵ In fact, China's emphasis on public investment may be more consistent with Keynes's original conception of "comprehensive socialization of investment." The conventional model of big government based on large transfer payments may imply a much lower saving rate and significantly lower economic growth rate.

$$(12) (1-m) (I_s + I_p + G + EX) = \Pi_s + \Pi_p + T$$

Simple manipulations result in (13):

$$(13) (1-m)[I_p + (I_s - \Pi_s) + (G-T) + EX] = \Pi_p + m(\Pi_s + T)$$

Define “q” as the ratio of the public sector revenue ($\Pi_s + T$) over the private sector profits Π_p (one can imagine that this ratio measures the degree of socialization).

Equation (13) can be re-written as:

$$(14) I_p + (I_s - \Pi_s) + (G-T) + EX = [(1+mq)/(1-m)]\Pi_p$$

Equation (14) says that the private sector profits, adjusted for the import propensity, equal the sum of private investment, exports, and the total public sector deficit. It is obvious from this equation that if either private investment or exports fall, the private sector profits suffer. To stabilize the private sector profits and prevent a profit and investment collapse, the public sector needs to generate a deficit large enough to offset any fall of private investment or exports. To generate large deficits in recession years without undermining the creditworthiness of the public sector, the public sector has to be sufficiently large.

Since the sum of wages and the private sector profits is the total private sector income. Assume total wages equal consumption, it follows that the private sector profits equal the private savings. Equation (14) can be reinterpreted to say that the private savings generated at full employment level have to be absorbed by private investment, exports, or the public sector deficit for the economy to stay at the full employment level.

From equation (11), it can be established that:

$$(15) (I_s - \Pi_s) + (G-T) + (EX - IM) = \Pi_p - I_p$$

That is, if the private sector surplus ($\Pi_p - I_p$) is consistent with full employment, it has to be absorbed by either the public sector deficit or the current account surplus. Since in the long run, the current account is likely to be balanced, any structural private sector surplus has to be absorbed by structural public sector deficit for the economy to stay at full employment.

In 1997 the household sector ran a large surplus that was 14 percent of GDP. The business sector ran a deficit of 12 percent of GDP (Table 2.6). If three-quarters of the business sector deficit went to state owned enterprises, the private business sector deficit should have been 3 percent of GDP. It follows that the private sector as a whole ran a large surplus of 11 percent of GDP.

With the private sector running large structural surpluses, it is necessary for the public sector to run large structural deficits for the economy to operate at full employment. In fact, the World Bank estimated that China's public sector (the government and state owned enterprises) had run non-financial deficits at an annual rate of over 10 percent of GDP between the mid-1980s and the mid-1990s (Lardy 1998: 5). From a macroeconomic perspective, these public sector deficits do not simply symbolize the inefficiency of the state sector. Instead, they have been a central instrument in maintaining sufficient and steadily growing aggregate demand.

6. How Big Does the Public Sector Need to Be?

Applying the Minskian rule of thumb to the Chinese context, the public sector regular income needs to be at least as large as private investment. But the Minskian rule does not take into account the fluctuation of exports.

Suppose the fluctuation of exports is totally uncorrelated with the fluctuation of private investment. Since the size of private investment is larger than the size of the general exports, if the public sector is sufficiently large relative to private investment, it must also be sufficiently large relative to exports. Since exports are primarily determined by the conditions of the world economy and private investment

is primarily determined by the investors' expectation of the conditions of the domestic economy, it is reasonable to expect that private investment and exports are mostly not correlated.

However, it is conceivable that at times private investment and exports may move simultaneously in the same direction. If that happens, a public sector as large as private investment may not be sufficient to offset their combined undesirable movement. To provide a margin of safety, the public sector regular income needs to be larger than private investment. How large this margin of safety should be is a matter of judgment. Table 2.4 reports that between 1980-99, the share of net exports in GDP had fluctuated between -4.2 percent and 3.9 percent. But since 1994, it had fluctuated within a relatively narrow range, between 1.4 percent and 3.9 percent. Suppose the normal range of fluctuation of net exports is about 2.5 percent of GDP, this is one-fifth or one-quarter of China's general exports.

If the margin of safety is set to be one-fifth of the general exports, then the public sector regular income needs to be as large as private investment plus one-fifth of the general exports. This requirement is summarized by equation (16):

$$(16) \quad I_p + 0.2EX = \Pi_s + T$$

It says that the sum of total private capital formation and the "normal fluctuation" of exports shall be of the same magnitude of the sum of the public sector after-tax gross profits and the government revenue. Since it is the central government that is ultimately responsible for paying government debts, it should be the revenue of the central government rather than the revenue of all levels of government that applies in equation (16). The size of private investment depends on the national investment rate and how the national investment is divided between public and private investment. Assume all public sector deficits are used for investment, it can be established that:

$$(17) I = I_p + I_s \quad \text{or} \quad I = I_p + \Pi_s + SD - CB$$

SD and CB are the structural primary deficit and the cyclical balance of the public sector respectively. The level of the structural primary deficit is related to the relative efficiency between state owned enterprises and private enterprises. In the long run, the share of state owned enterprises and private enterprises in investment should approach their respective share in the total capital assets. If state owned enterprises are less efficient than private enterprises, and their assets generate lower rate of return, their share in the total business sector after-tax profits will be less than their share in investment. To maintain their level of investment, the difference has to be covered by borrowings from the private sector.

Table 1.3 provides information on the relative rates of return of state and non-state enterprises. What is relevant here is the gross rate of return on assets. In the late 1990s, by this measure, the rate of return of state owned enterprises was about two-thirds that of non-state owned enterprises, or three-quarters of the average for all enterprises. This implies a structural primary deficit of approximately one-quarter of the state sector investment.

If the capital formation rate is 35 percent, the structural primary deficit is assumed to be 25 percent of the public sector investment, the cyclical deficits in recessions are cancelled out by cyclical surpluses in expansions, the general exports account for 12 percent of GDP, and the central government accounts for 7 percent for GDP (allowing for a small increase from its current size), equation (16) and (17) imply that state owned enterprises need to generate after-tax gross profits as much as 13 percent of GDP, public sector investment needs to be 17.4 percent of GDP, the public sector primary deficit stands at 4.4 percent of GDP, and private investment accounts for 17.6 percent of GDP. Total capital formation is about equally distributed between the public sector and the private sector.

Table 2.9 presents three different scenarios of macroeconomic stabilization, assuming different degrees of economic fluctuation. Assume the public sector

regular income equals 120 percent of private investment and net exports do not change, it is capable of offsetting a fall of private investment by 12, 24, and 48 percent respectively under the low, the midrange, and the high fluctuation scenarios. If net exports fall, the public sector is able to offset a fall of private investment by smaller proportions.

In the Chinese context, the state controls the financial sector, most of the household surpluses are directed towards state owned banks, and most of the bank loans went to state owned enterprises. In this context, it is less likely for the private sector to suffer from a complete investment collapse. Thus, a public sector that is capable of offsetting a fall of private investment by about 25 percent under the average conditions is probably sufficiently large for maintaining macroeconomic stability.¹⁶

7. Is a Big Public Sector Sustainable?

Financial Sustainability

If a big public sector is necessary for maintaining macroeconomic stability, would the low efficiency of state owned enterprises make it unsustainable in the long run in financial terms. The Chinese household sector regularly runs an annual financial surplus of about 15 percent of GDP. Suppose one-quarter of it goes to the private business sector, the structural deficit that is allowed for the public sector is about 11 percent of GDP.

If the public sector structural primary deficit stands at 4.4 percent of GDP,

¹⁶ However, if private investment does fall by a significantly larger proportion, and the public sector runs additional cyclical deficits to stabilize the economy, the public sector will accumulate additional liabilities that have to be repaid by the structural surpluses generated later (or by reducing the structural deficits). This can be accomplished if the additional cyclical deficits generated are used to finance investment in revenue-generating assets. The additional liabilities can be repaid either by the surpluses generated by these assets or by the sale of these assets. Thus, if the public sector has an unlimited willingness to hold revenue-generating assets, there is in principle no real financial constraint on the public sector that can prevent it from getting an economy out of a recession, regardless of its severity.

assume the trend nominal GDP growth being 12 percent (assume real GDP growth of 7 percent and some single-digit inflation), and assume the nominal interest rate being 5 percent, or just enough to cover inflation, the long-run equilibrium debt-GDP ratio can be calculated as follows:

$$(18) \text{Debt / Income} = \text{Annual Deficit} / (\text{Economic Growth Rate} \times \text{GDP}) \\ = (\text{Annual Primary Deficit} + \text{Debt} * \text{Interest Rate}) / (\text{Economic Growth Rate} \times \text{GDP})$$

The long-run equilibrium debt-GDP ratio can be solved to be 63 percent. The sum of interest payment and the structural primary deficit amount to 7.5 percent of GDP, or within the range within which the household sector is willing to finance the borrowings by the public sector. These estimates are made assuming that the efficiency of state owned enterprises will continue to stay at its current, historically low level. If the state owned enterprises manage to at least partially restore their historical level of efficiency, the state sector needs to run smaller primary deficits and the public sector debt will be more manageable.

The Loss of Investment Efficiency

In the last decade, the state sector has suffered from low profitability and low microeconomic efficiency. Many economists have pointed to privatization as the fundamental solution to the problems of state owned enterprises. They believe that the transfer of productive assets from the state sector to the private sector should lead to an overall increase in investment efficiency (see section 4, Chapter 1).

In big government capitalism, the government runs large deficits in recessions to maintain the private sector's profitability, and the central bank is ready to undertake lender of last resort operation to bail out the private banking sector when necessary. These institutional arrangements have basically socialized private investment risks. They encourage excessively risky investment and finance behaviors and contribute to the growth of financial fragility. However, the solution

to the problem does not lie with returning to small government capitalism because the latter involves even higher social and economic costs under modern conditions. The institutions of big government capitalism are necessary to prevent socially unacceptable deep depressions and have contributed to better long-term economic performance. The growth of financial fragility and excessively risky private investment behaviors are the price that people have to pay for the benefits of big government within the existing framework of market capitalism (Minsky 1986; Pollin and Dymski 1994).

In the Chinese context, government control of investment resources and its willingness to make credits readily available to state owned enterprises that experience financial troubles have encouraged state owned enterprises to maintain stable investment growth through different stages of business cycle. The investment behavior of state owned enterprises has contributed to macroeconomic stability and indirectly contributed to the stability of the private sector's profit flow and investment. As a result, the Chinese economy has consistently maintained a high saving rate and rapid economic growth. In this sense, the relatively low efficiency of state owned enterprises, measured by standard productivity and financial indicators, may be the price that China has paid for the macroeconomic success.

The alternative approach is to pursue privatization and hope that privately owned capital assets will generate higher rates of return. While private property may help to improve microeconomic efficiency, the macroeconomic implication could be disappointing or even dangerous. Without a sufficiently large public sector, China's high level of private savings may not be fully absorbed and the economy cannot operate with full employment. Alternatively, it can operate with full employment only with a high level of private investment relative to GDP. Since private investment is by nature volatile, the economy is vulnerable to more severe cyclical fluctuations. Macroeconomic instability may in turn discourage long-term investment, reduce economic growth, and prevents the private sector from realizing its potential microeconomic efficiency.

Chapter 3

Workers' Participation in Management and Firm Performance: Evidence from Large and Medium-Sized Chinese Industrial Enterprises

1. Introduction

Whether workers' participation in managerial decision-making contributes positively to firm performance is a question open to debate in economic theory. Empirical studies based on evidence from advanced capitalist countries often find that participatory management tends to improve firm performance in terms of productivity and profitability.

The Chinese Enterprise Law provides the congress of employees' representatives in state owned enterprises with extensive power in evaluating management decisions and participating in the decisions that concern work rules, wage setting, and benefit distribution. However, in practice, there is significant variance across firms with respect to the degree to which the congress of employees' representatives actually exercises its legal power. Chinese state owned enterprises have undergone substantial changes during the market-oriented economic reform that started in the early 1980s. While the economic reformers have spent much effort in searching for better managerial and ownership structures, little if any attention has been paid to the possibility that workers' participation in management can play an important role in improving the performance of state owned enterprises. In fact, it is a widely shared belief among Chinese government officials and economists that workers' participation, while being of certain political importance, is likely to have a negative impact on firm performance. However, to the knowledge of this author, there has not yet been any study that evaluates the validity of this belief based on empirical evidence in the Chinese context.

In the summer of 2000, I conducted a field research in China's Henan Province. Henan province has an area of 167 thousand square kilometers, and had a population of 92.4 million in 1998. It is now the most populous province in China. With the help of the Economics Department of Zhengzhou University, I sent out survey questionnaires to over 1,000 industrial enterprises that are classified as large or medium-sized by the Chinese State Statistical Bureau. The questionnaire asked the enterprise's union officials to comment on questions that would help to evaluate the

degree to which the employees participate in managerial decision-making. 378 questionnaires were returned. The data collected from this field research allow me to do an empirical analysis of how workers' participation in management affects firm performance in the Chinese context.

The next section reviews the theoretical arguments for and against workers' participation in management and some of the empirical evidence on this issue. Section 3 introduces the legal framework for workers' participation in management in the state owned enterprises. Section 4 describes the data, the sample enterprises, the survey, and the construction of the participation indices. Section 5 analyzes the effects of individual participation indices on firm performance. Section 6 analyzes the relationships between workers' participation and firm performance by using the method of principal component analysis. Section 7 examines if the levels of participation are endogenously determined by productivity performance. Section 8 discusses the performance of the non-state owned enterprises in the sample. Section 9 concludes the chapter.

2. Workers' Participation in Management: Theory and Empirical Evidence

Theoretical Debate

Workers' participation in management may make important contributions to production and innovation by improving information communication, lowering monitoring costs, encouraging the accumulation of human capital, and enhancing workers' motivation. Workers often have access to practical knowledge of production processes that are not available to the management. To the extent participatory management allows workers to make more adequate use of their knowledge in their work and to communicate their knowledge to the managers, workers' participation improves firm's performance (Levine and Tyson 1990: 186).

Participatory management may also enhance efficiency by lowering monitoring costs. If labor contracts are complete and monitoring of workers' labor is

costless, then the conventional capitalist firm can be efficient.¹⁷ But in reality, workers have private information that the owner or the manager does not have, and monitoring is expensive. This was understood by Frederick W. Taylor, the founding father of "scientific management," who knew that "foremen and superintendents know ... that their own knowledge and personal skill falls far short of the combined knowledge and dexterity of all the workmen under them (cited from Shaiken 1984: 24)."

The purpose of scientific management was to obtain workers' private knowledge and make the knowledge of production the monopolized knowledge of the management. However, the effectiveness of scientific management turned out to be limited due to workers' resistance, the enormous cost of implementation and the fundamental impossibility to fully remove skill and control from the workers (Shaiken 1984: 20-28). Empirical evidence suggests that a significant part of social resources is spent on the monitoring of labor in advanced capitalist economies. In the United States, the ratio of supervisory workers to production workers in the nonagricultural labor force increased from 13.7 percent in 1948 to 22.4 percent in 1979 (Bowles, Gordon and Weisskopf 1990: 103; Gordon 1996: Figure 2.2). Case studies found that even with carefully designed piece rate system, workers' productivity was way below what was potentially possible (Whyte et al. 1955).¹⁸ More efficiency loss results from the tendency under capitalism for technological progress to be biased towards those technologies that make it less difficult to monitor labor but are often not the most productive (Shaiken 1984; Bowles 1985). Given the difficulty to monitor labor and the incompleteness of labor contracts, it is reasonable to suggest that assigning at least part of the residual claimancy and the control right to the workers rather than the equity capital owner can be efficiency-enhancing.

¹⁷ A conventional capitalist firm refers to a firm in which residual claimancy (the net income of a firm after all fixed contract payments have been made) and the ultimate control right over the decisions of the firm (including the right to delegate some or all decisions to managerial organs) are fully assigned to the owner of equity capital.

¹⁸ For more discussions and evidences on the difficulty to monitor labor in advanced capitalist economies, see Perelman (1991: 47-140).

Participatory management may encourage the accumulation of human capital. If a worker invests in firm-specific human capital, he or she bears the risk that the entire rent generated by the investment could be fully appropriated by the manager or the capital owner, since the value of the next best use of this worker's human capital may be near zero. The worker, realizing this risk, is discouraged from investing in firm-specific human capital. Participatory management, by allowing workers to share some of the managerial power, reduces the risk of managerial opportunism and encourages investment in firm-specific human capital.

Buchele and Christiansen (1999) made a similar argument. They argue that workers will not be willing to contribute their efforts or communicate information to the management unless they have reason to believe that they will indeed receive a fair share of the productivity gains to which they have made a contribution. To develop a mutual-trust relationship between workers and the management, workers must have certain power that prevents the management from engaging in opportunistic behaviors. This can be achieved through either an effective collective bargaining system in combination with a well-developed social safety net, or a set of explicit legal rights for workers to participate in managerial decision-making.

Finally, some behavioral studies suggest that participation itself may raise workers' morale and satisfaction, increase their commitment to the firm's goals, promotes their trust and goodwill towards the managers and fellow workers. These positive psychological effects could contribute to higher productivity (Levine and Tyson 1990: 187-188).

Interestingly, a major critique of participatory management rests upon the argument that participatory firms fail to monitor workers effectively. Alchian and Demsetz (1972) argued that when there is team production and output is shared by all team members, individual members of the team are likely to shirk. While each team member bears the full cost of her own effort, each receives only $1/n$ of her own output, where "n" is the number of team members. Individual members thus will choose an effort level far below what is socially optimal. To solve the shirking problem, team

members have to be monitored. But the monitor will not have adequate incentives to monitor unless he is the residual claimant and the central party common to all contracts with inputs. Thus, according to Alchian and Demsetz, the classical capitalist firm is efficient because it provides adequate monitoring in team production, while the participatory firm is not because the monitor in a participatory firm, who is only entitled to a small proportion of the residual, will not have as strong an incentive as a capitalist. .

Alchian and Demsetz assumed that centralized monitoring is the only possible monitoring mechanism in team production, an assumption central for their argument. But this assumption is not warranted. Many empirical studies have found that when workers are entitled to share the residual claimancy, they tend to monitor each other and increase their effort level collectively. The mutual monitoring by workers themselves is often more effective than centralized monitoring because the workers have private information of the production process that the central monitor does not have (Putterman 1984: 172-5; Weitzman and Kruse 1990). Bowles and Gintis (1998) demonstrated that mutual monitoring can work in large teams if team members are residual claimants and some members are motivated by reciprocity norms to punish fellow members who are observed to shirk.

Jensen and Meckling (1979) argued that participatory firms are likely to under-invest because of what they termed the “short horizon problem” and the “common property problem.” The short horizon problem arises because workers benefit from their investment only during their employment. The common property problem arises because old workers have to share with new workers the cash flows from past investment. Jensen and Meckling believed that participatory firms will invest less than conventional firm and will over-consume the existing capital goods by paying wages out of the depreciation fund. The under-investment problem raised by Jensen and Meckling could be alleviated if the participatory firm is characterized by long-term employment relationships that help the workers to develop a long time horizon. For Chinese state owned enterprises, the retired workers’ pensions are paid

out of the enterprise's retained earnings. This could be considered to be a mechanism that allows the workers to make claim on the firm's cash flow after the termination of their employment.

Participatory firms may also suffer from the cost of collective decision-making. Democratic decision-making based on majority voting tends to select the outcome preferred by the median voter. To the extent that workers have heterogeneous preferences, the median voter's preference deviates from that of the average voter and can lead to inefficient decisions. Heterogeneous preferences could also result in voting cycles that lead to costly and repetitive policy changes. Participatory management may encourage costly political activities to build or break coalitions. Control over the political process may fall into the hands of an unrepresentative minority who use that control to exploit the majority (Hansmann 1996: 39-43).

While the deviation of the median voter's preference from that of the average voter implies inefficiency in the utilitarian sense, the objective of the conventional firm may be inefficient as well. Maximization of profit is often inconsistent with maximization of efficiency (Bowles 1985). In this case, it is not obvious that the objective of the participatory firm is less efficient than that of the conventional firm. Similarly, while the democratic decision-making process of the participatory firm may incur substantial cost, it is not obvious that this cost is greater than what is incurred by comparable processes in the conventional firm. First, where workers are organized into unions, presumably they engage in similar democratic processes and therefore bear similar costs. Secondly, since the capital owner is not accountable to the workers, the conflicts between the two sides have to be resolved by bargaining rather than democratic election, and bargaining may involve substantial social wastes and inefficiency (Moene 1989).

Empirical Evidence

Empirical studies often find that workers' participation in management have positive effects on firm performance. Levine and Tyson (1990) conducted a survey

of the participation literature. Their survey covered a large number of empirical studies that used a wide variety of methodologies, including econometric analyses, field experiments, and case studies.

They concluded that participation usually leads to small, short-run improvements in performance, sometimes leads to significant, long-lasting improvements in performance, and almost never has a negative effect. Furthermore, they concluded that participation is more likely to produce a significant, long lasting increases in productivity when it involves substantive rather than consultative arrangements (1990: 203-4).

More recent studies have also found positive effects of workers' participation on productivity. Ichniowski, Shaw, and Prennushi (1997) found that participatory work practices substantially increased productivity in steel-making processes. Winther and Marens (1997) studied the performance of participatory employee ownership firms and conventional firms in New York and the Washington states and found that participatory decision-making contributed to the better performance of the employee ownership firms.

Bartlett etc. (1992) used a matched sample of labor-managed cooperatives and private firms in North-Central Italy and found the labor-managed cooperatives more productive. Jones and Kato (1993) found that employee ownership had a positive impact on productivity in seven Japanese industries. Buchele and Christiansen (1999), using data for 15 advanced capitalist countries, found that strong worker rights and cooperative labor-management relations had positive effects on long-run productivity growth.

3. The Chinese Enterprise Law and Workers' Participation

Since the early 1980s , the managerial and ownership structures of Chinese state owned enterprises have undergone substantial changes (see Section 4 of Chapter 1). The Chinese enterprise reform has been focused on searching for better control mechanisms, which would allow the government to provide adequate and proper

incentives to the managers. If this cannot be accomplished, it has now become the consensus among government officials and economists that certain changes in ownerships structures, including partial privatization, would be necessary and desirable.

The Chinese economic reformers have implicitly assumed that as soon as the managers of the enterprises are provided with the proper motivations, as a result of either better designed control mechanisms or improved ownerships structures, the manager would have little difficulty to achieve the optimal allocation and utilization of available resources, including labor. In fact, it is a widely shared belief among Chinese economic reformers that the Yugoslavian experience has decisively proved that workers' participation in management inevitably leads to high inflation, high unemployment, under-investment, and inefficient management decisions (Ma and Liu 2000: 166-171).

Despite that the economic reformers had strong distrust of workers' participation in management, the *All-People Owned Enterprise Law* enacted in 1988 (below referred to as the Enterprise Law for short) provided that the state owned enterprises must adopt democratic management, and the congress of employees' representatives is the organ in which the employees exercise the power of democratic management. The Enterprise Law was a product of political compromise. Zhao Ziyang, then the prime minister, hoped that the new Enterprise Law would establish the unchallenged power of the manager in the state owned enterprise. The initial draft provided the manager with enormous power. Both the trade unions and the communist party committees in the state owned enterprises had strong disagreement. The Enterprise Law as was enacted by the National Congress of People's Representatives took account of the opinions of the representatives of the trade unions.¹⁹

¹⁹ The information concerning the drafting and the approval of the Enterprise Law was provided by former officials of All China Federation of Trade Unions, with whom this author made an interview in Beijing in the last week of June 2000.

The Enterprise Law provides the congress of employees' representatives with the following rights and power. First, the congress of employees' representatives *reviews* major management decisions, annual business plan, major investment projects, allocation of retained profit, and changes in ownership structures, and makes suggestions or proposals. Secondly, the congress of employees' representatives *approves* or *disapproves* wage and bonus distribution schemes, work protection measures, work rules and other important rules and policies. Thirdly, the congress of employees' representatives *decides* the use of employees' welfare fund, the distribution of housing, and other major issues concerning employees' welfare. Fourthly, the congress of employees' representatives evaluates and oversees the managerial staff and makes reward or punishment proposals. Fifthly, the congress of employees' representatives may elect the manager of the enterprise, provided this is required by a decision by the government office that is in charge of the enterprise (An, Huang, and Cui 1990: 126-134; 182-186).

Despite the power provided by the Enterprise Law to the congress of the employees' representatives, under the contract system, the manager had become the more dominant part in the relations with the workers (Zhao 1995). The congress of employees' representatives often failed to exercise effective power. A survey made by All-China Federation of Trade Unions in 1986 found that only 6 percent of the employees investigated found the congress of employees' representatives "very effective" in reviewing the enterprise's major decisions and in evaluating the managerial staff. 23.1 percent of the employees found the congress of employees' representatives "somewhat effective," while 23.8 percent found it "occasionally effective" and as many as 45.4 percent of the employees believed it is simply "a formality with no substance." (An, Huang, and Cui 1990: 198) Since 1992, many state owned enterprises have been restructured as corporations. The Corporation Law enacted in 1993 significantly reduces the power of employees' representatives. Under the Corporation Law, the employees' representatives no longer have the power to review major managerial decisions, approve or disapprove wage and bonus

distribution schemes and rules and policies at workplace, and decide welfare distribution. Instead, the Law only requires the management consult with the employees' representatives before it makes the relevant decisions (PRC 2000).

4. Workers' Participation in Henan Province: Data Description

In the summer of 2000, with the help of the Economics Department of Zhengzhou University, I sent out survey questionnaires to 1,050 industrial enterprises that are classified as large or medium-sized by the Chinese State Statistical Bureau.²⁰ The questionnaire asked the enterprise's union officials to comment on questions that would help to evaluate the degree to which the employees participate in managerial decision-making. 378 questionnaires were returned. In the rest of this paper, I will use the data collected from the field research that I conducted in Henan Province to make an empirical analysis of the impact of workers' participation in management on firm performance.

The Statistical Yearbook of Henan Province of various issues provides financial data of large and medium-sized industrial enterprises for 1995-98. Excluding returned questionnaires with missing answers and firms with missing financial data, there are 273 observations in 1998, 243 observations in 1997, 255 observations in 1996, and 248 observations in 1995. There are 275 enterprises that returned complete questionnaires and have financial data for at least one year between 1995-98. Among the 275 enterprises, 202 are state owned, 20 are collectively owned, 10 are shareholding cooperatives, 36 are shareholding companies, 2 are enterprises with foreign ownership, 3 are enterprises with ownership by residents in Hong Kong, Macau and Taiwan, and 2 are not identified with any of the above

²⁰ The classification of enterprise size varies from industry to industry. But in general there are two approaches. For industries with relatively homogeneous products, such as electric power, mining, steel, chemical industries, transport equipment, textiles, paper making, and some machinery industries, enterprises are classified by their annual productive capacity of their product or major product. For industries with heterogeneous products, enterprises are classified by original value of fixed assets.

categories.

The 275 enterprises are distributed among 31 industries. The distribution of the sample enterprises and that of *all* large and medium-sized industrial enterprises across industries are presented in Table 3.1. The sample enterprises are mostly concentrated in the coal mining, textiles, chemical, nonmetal mineral products, ordinary machinery, special purpose equipment, electric equipment and machinery, and electric power industries. The distribution of the sample enterprises closely resembles that of *all* large and medium-sized industrial enterprises. The correlation coefficient between the two distributions is 0.921.

Table 3.2 presents the average financial indicators of the sample enterprises between 1995-98. The average employment had declined from 2778 in 1995 to 2419 in 1998. Both the average sales per employee and the average value added per employee increased between 1995-97 but fell in 1998. The average profit and taxes per employee, however, had decreased since 1996, while the total assets per employee had increased steadily.

Table 3.3 compares the financial indicators of the sample enterprises with those of *all* large and medium-sized industrial enterprises represented by a random sample for the year of 1998. The random sample is created by selecting one out of every four observations and includes 262 enterprises. The sample enterprises are broadly similar to all enterprises represented by the random sample in terms of productivity and capital intensity. But an average sample enterprise appears to be significantly larger than an average large and medium-sized industrial enterprise. While the average employment for the sample enterprises was 2419, the average employment for the enterprises in the random sample was 1545.

All of the sample enterprises have established congress of employees' representatives. The survey questionnaire asked the union official of the investigated enterprise to comment on how frequently the congress of employees' representatives meet, and how effectively the congress of employees' representatives exercises power over the first three of the five issues over which the 1988 Enterprise

Law provides the congress of employees' representatives with legal power. The questionnaires are sent to the union officials because they are responsible for organizing workers' participation in management and have access to the relevant information. A sample of the questionnaire is presented in the Appendix.²¹

The answers to the four questions are used to construct participation indices. Each question has options (a) through (e). An answer of (a) indicates least participatory and is assigned one point, and an answer of (e) indicates most participatory and is assigned five points. Similarly, point two, three, and four are assigned to answer (b), (c), and (d). As a result, four individual participation indices are constructed, each corresponding to a survey question.

Table 3.4-3.7 present the distribution of the returned answers to each survey question across sample firms. About two-thirds of the congresses of employees' representatives of sample firms meet two or three times a year, about 27 percent meet once a year, five percent meet more than three times, and less than two percent do not meet at all. As one would have expected, the workers participate more in decisions with respect to wages and benefits than those with respect to business and investment. To the question on how major business and investment decisions are made, about 62 percent of the firms answered "made by the management" or "primarily made by the management," and about 15 percent answered "made by the employees" or "primarily made by the employees." To the question on how decisions with respect to wage distribution and workplace rules and policies are made, about 52 percent of the firms answered "made by the management" or "primarily made by the management," and about 20 percent answered "made by the employees" or "primarily made by the employees." To the question on how the decisions with respect to the use of the employees' benefits fund and the distribution of employees' housing are made, however, only about 41 percent of the firms answered "made by the management" or

²¹ The design of the questionnaire was inspired by the work of Quarrey and Rosen (1986), cited in Conte and Svejnar (1990: 162-4), and Winther and Marens (1997: 408).

“primarily made by the management,” while about 28 percent answered “made by employees” or “primarily made by employees.”

One concern is if the responding rate may be correlated with the degree of participation. For instance, union officials in more participatory firms may be more enthusiastic to respond to the questionnaires. This author does not have access to information on the conditions of participation in non-responding firms. However, the returned answers reported in Table 3.4-3.7 do not suggest a bias in the sample distribution towards more participatory firms. While the distribution of the sample enterprises in terms of degrees of participation may not exactly reflect the distribution of all enterprises, as long as the sample enterprises are widely distributed across different levels of participation, one is still allowed to proceed with a study on how the varying levels of participation affect the level of productivity.

5. Participation and Performance: Individual Index Analysis

This section studies the relationships between the four individual participation indices and firm performance. Workers’ participation affects firm performance by changing the relationship between inputs and the output. A participation-augmented Cobb-Douglas production function can be written as:

$$(1) Y = Ae^{\gamma PAR} K^{\alpha} L^{\beta}$$

Where A is the constant, “e” is the base of the natural logarithm, PAR is the participation index, γ is the coefficient of the participation index, or the degree to which efficiency is “augmented” by participation, K and L are capital and labor input respectively, and α and β are output elasticity of capital and labor respectively. Taking logarithm on both sides of the equation, we have:

$$(2) \ln Y = \ln A + \gamma \ln(PAR) + \alpha \ln K + \beta \ln L$$

Subtracting from both sides $\ln L$, there is:

$$(3) \ln(Y/L) = \ln A + \gamma \ln(\text{PAR}) + \alpha \ln(K/L) + (\alpha + \beta - 1) \ln L$$

The equation says that productivity is the function of a constant, participation, the capital-labor ratio, and economy of scale (represented by $\alpha + \beta - 1$, the coefficient in front of $\ln L$).

The capital input is measured by the total assets, which include fixed assets and circulating assets. The labor input is measured by the number of employees. The output is measured by sales, value added, and profit and taxes. Among the total of 1019 observations, there are 37 observations reporting negative value added, and 199 observations reporting negative profit and taxes. After taking logarithms, observations with negative value added and negative profit and taxes are excluded when output is measured by profit and taxes. To avoid possible biases that may arise from exclusion of large number of observations, another measure of productivity is constructed by adding forty thousand Yuan to the profit and taxes per employee for each observation. The smallest profit and taxes per employee of all observations is a little bit larger than negative forty thousand Yuan. This new measure of productivity is referred to as the “adjusted profit and taxes” per employee.

Since the sample firms are of a variety of ownership types and distributed across 31 industries, taking into account the ownership effects and the industry effects, the equation to be tested is re-written as follows:

$$(4) \ln(Y/L) = \beta_0 + \beta_1 \ln(K/L) + \beta_2 \ln L + \beta_3 \text{PAR} + \sum \beta_i (\text{OWNERSHIP})_i + \sum \beta_m (\text{INDUSTRY})_m + \sum \beta_n (\text{YEAR})_n$$

Where OWNERSHIP, INDUSTRY, and YEAR are dummy variables for different ownership types, industries, and years.

Since there are four individual indices and four alternative output measures,

Table 3.8 reports results from sixteen regressions, pooling all observations between 1995-98. For simplicity, only the coefficients on the participation indices are reported. The individual participation indices are standardized to have a standard deviation of one before they enter the regressions.

Workers' participation in wage distribution and enterprise's internal rules and policies has the strongest effects on alternative productivity measures. An increase in this participation index by one standard deviation raises sales per employee, value added per employee, and profit and taxes per employee by 12 percent, 9 percent, and 14 percent respectively. Workers' participation in business and investment decisions also has positive and significant effects on productivity. An increase in this participation index by one standard deviation is associated with an increase in sales per employee, value added per employee, and profit and taxes per employee by 9 percent, 5 percent, and 8 percent. Workers' participation in using employees' benefits fund and housing distribution is also associated with higher level of productivity, though the coefficients are smaller and are not statistically significant. The regression results also suggest that more active congress of employees' representatives raises the level of productivity. The coefficients are large and significant. However, this participation index is based on a survey question that asks for a different type of information from other questions in the survey. Thus, the regression results for this participation index cannot be directly compared to results for other indices.

Some economists believe that workers' participation tends to lead to higher wages, squeeze profit, and as a result lower the internal fund available for investment. The evidence produced by these regressions contradicts this belief. The results suggest that higher level of participation leads to higher level of productivity as well as higher level of profitability (in terms of profit and taxes per employee). The pattern of the regression results for "adjusted profit and taxes per employee" are consistent with that for profit and taxes per employee. The coefficients for "adjusted profit and taxes per employee" are much smaller because, as explained, it was

constructed by adding a large constant number (40,000 yuan) to profit and taxes per employee. These results suggest that the exclusion of the observations with negative profit and taxes is not likely to affect the basic conclusion.

6. Participation and Performance: Principal Component Analysis

This section studies the overall effect of workers' participation on firm performance. That is, it attempts to understand what the effect of workers' participation is likely to be when all dimensions of workers' participation are taken into account. For this purpose, I use the method of principal component analysis. This statistical procedure creates several new indices that are the linear combinations of the original individual indices. The first of such indices accounts for the greatest possible amount of the variation of the four individual indices. The second accounts for the greatest possible amount of the remaining variation, and so on. Such a procedure transforms the highly correlated variables into orthogonal factors, avoiding problems that would likely arise if more than one of the individual participation indices were included as independent variables in a single regression equation.

Table 3.9 reports the correlation matrix among individual participation indices. The correlation coefficients suggest that individual indices 2, 3, and 4 are strongly correlated.

Table 3.10 reports the results of the principal component analysis. The first and the second constructed indices are referred to Participation 1 and Participation 2 respectively. Participation 1 captures primarily variations in individual index 2, 3, and 4, the indices that reflect the substance of workers' participation (to what extent workers influence business decisions, wage distribution, enterprise's internal rules, the use of employees' benefits fund, and housing distribution). Participation 2 is dominated by individual index 1, which measures how active the congress of employees' representatives is. I refer to it as Participation 2. The two constructed indices together account for 85% of the total variation of the four individual participation indices.

Table 3.11 reports the mean of the two participation indices, for the whole sample and for different ownership types, stated in terms of the standard deviations of the whole sample. When workers' influence over managerial decisions (Participation 1) is concerned, state owned enterprises have the highest level of participation, and foreign owned enterprises, enterprises owned by residents in Hong Kong, Macau, and Taiwan, and other enterprises have low levels of participation. Interestingly, shareholding companies also have a relatively high level of participation.

When the question is about how active the congress of employees' representatives is (Participation 2), however, state owned enterprises and shareholding companies appear to have the least active congresses of employees' representatives. Shareholding cooperatives, foreign owned enterprises, and other enterprises have the more active congresses of employees' representatives.

Equation 5 explains the relationship to be tested. The two participation indices, Participation 1 and 2, are standardized to have a standard deviation of one and a mean of zero before they enter the regressions.

$$(5) \ln(Y/L) = \beta_0 + \beta_1 \ln(K/L) + \beta_2 \ln L + \beta_3 \text{PAR1} + \beta_4 \text{PAR2} + \sum \beta_i (\text{OWNERSHIP})_i + \sum \beta_m (\text{INDUSTRY})_m + \sum \beta_n (\text{YEAR})_n$$

The regression results are reported in Table 3.12A and 3.12B. The results in Table 3.12A suggest that both participation variables have large positive effects on productivity. An increase in Participation 1 by one standard deviation is associated with an increase in sales per employee, value added per employee, and profit and taxes per employee by 10, 7, and 11 percent respectively. An increase in Participation 2 by one standard deviation is associated with an increase in sales per employee, value added per employee, and profit and taxes per employee by 8, 6, and 7 percent respectively. All but one of the results is statistically significant.

Table 3.12B reports the estimated coefficients on ownership dummy

variables. The results suggest that there are large differences in the performance across different ownership types. Collectively owned enterprises, shareholding cooperatives, and shareholding companies are more productive than state owned enterprises by a margin of 36-68 percent when output is measured by total sales or value added. The coefficients for foreign owned, Hong Kong owned, and other enterprises are mixed. Since there are only two foreign owned firms, three Hong Kong owned firms, and two other firms in the sample, the coefficients for these enterprises do not provide much meaningful information.

Equation (5) in effect assumes that the slopes of the participation variables remain the same across all ownership types. Equation (6) tests the effect of participation variables on productivity, allowing different ownership types to have different slopes of the participation variables.

$$(6) \ln(Y/L) = \beta_0 + \beta_1 \ln(K/L) + \beta_2 \ln L + \beta_3 \text{PAR1} + \beta_4 \text{PAR2} + \sum \beta_i (\text{OWNERSHIP})_i + \sum \beta_j (\text{OWNERSHIP} * \text{PAR1})_j + \sum \beta_k (\text{OWNERSHIP} * \text{PAR2})_k + \sum \beta_m (\text{INDUSTRY})_m + \sum \beta_n (\text{YEAR})_n$$

β_3 and β_4 now represent slopes of the participation variables for state owned enterprises. $\text{OWNERSHIP} * \text{PAR1}$ and $\text{OWNERSHIP} * \text{PAR2}$ are the interaction variables between ownership dummy variables and participation variables.

The regression results are reported in Table 3.13A and 3.13B. Both participation variables have large positive effects on the performance of state owned enterprises. An increase in Participation 1 by one standard deviation leads to an increase in sales per employee, value added per employee, profit and taxes per employee by 12, 8, and 16 percent respectively. An increase in Participation 2 by one standard deviation leads to an increase in these productivity measures by 13, 8, and 14 percent respectively.

Table 3.13B reports results only for collective owned enterprises, shareholding cooperatives, and shareholding companies. The samples size for the

rest of the enterprises is too small to yield meaningful results. Most of the coefficients on the ownership-participation interaction variables are negative, suggesting that participation variables tend to have negative effects on productivity in non-state owned enterprises, or positive effects that are smaller than in state owned enterprises.

Since the two participation indices have been standardized to have a mean of zero, the coefficients on the “pure” ownership variables indicate the difference in productivity between the ownership type and state owned enterprises when both participation variables are evaluated at their mean. The results suggest that all three types of non-state owned enterprises are more productive than state owned enterprises by a substantial margin. The results are broadly similar to those reported in Table 3.12B.

7. Is Participation Endogenous?

The results in Table 3.13A suggest that higher level of workers’ participation in management is likely to lead to significantly higher level of productivity in state owned enterprises. However, this result may be spurious if the participation variables are not truly independent variables. If more productive firms are also the firms that are likely to allow more workers’ participation in management, then the participation variables may simply be good proxies of past productivity performance, rather than being variables that have an independent effect on current productivity performance.

If the participation variables are no more than proxies of productivity performance, one should expect that any variable that has a strong positive effect on productivity, such as the capital-labor ratio, should have a similar positive effect on the level of participation. To evaluate this possibility, I test the following relationships, where the two participation variables are tested as functions of the capital-labor ratio, controlling for the size of employment, industries, ownership types, and years.

$$(7) \text{ PAR1} = \beta_0 + \beta_1 \ln(K/L) + \beta_2 \ln L + \sum \beta_i (\text{OWNERSHIP})_i + \sum \beta_m (\text{INDUSTRY})_m + \sum \beta_n (\text{YEAR})_n$$

$$(8) \text{ PAR2} = \beta_0 + \beta_1 \ln(K/L) + \beta_2 \ln L + \sum \beta_i (\text{OWNERSHIP})_i + \sum \beta_m (\text{INDUSTRY})_m + \sum \beta_n (\text{YEAR})_n$$

The results are reported in Table 3.14. The variable of total assets per employee seems to have no correlation with either of the two participation indices. If any thing, it may have a small negative correlation with Participation 1. The coefficients for ownership types suggest results largely consistent with what are reported in Table 3.11. Interestingly, larger firms in terms of employment seem to have a higher level of Participation 1. The fact that the variable of total assets per employee, which has an overwhelming effect on the level of productivity (see the results reported in Table 3.12A and 3.13A), fails to have any positive effect on the level of participation, lends support to the hypothesis that the causal relationship is likely to be one that runs from participation to productivity rather than that from productivity to participation.

8. The Performance of Non-State Owned Enterprises

The regression results reported in Table 3.12B and 3.13B suggest that the collectively owned enterprises, shareholding cooperatives, and shareholding companies in the sample are more productive than the state owned enterprises. The collectively owned enterprises are often township and village enterprises, owned by local community governments. Shareholding companies are usually re-structured state owned enterprises with the state holding a controlling stake.

A shareholding cooperative is legally a different ownership structure from a shareholding company. A shareholding cooperative is in principle, if not in practice, a firm that shares features with both capital-controlled firms and labor-controlled

firms. The ownership of a shareholding cooperative is restricted to its employees, though there could be substantial inequality in the distribution of the ownership. The profit is shared among the owners in proportion to their capital stake. However, the ultimate managerial power lies with the congress of all employee-owners, or the congress of employee-owners' representatives, where each employee-owner has one vote. Shareholding cooperatives are usually re-structured collectively owned or state owned enterprises.

In the case of shareholding companies and shareholding cooperatives, it is not clear whether their better performance results from improvement in performance that takes place after the ownership re-structuring or from their initial better performance before the re-structuring. Jefferson, Rawski, Wang, and Zheng (2000: 805), using national-level data, found that while the shareholding companies were initially selected from the upper echelons of the state sector, had performed poorly relative to the state owned enterprises in terms of total factor productivity growth for 1993-96.

On the other hand, the better performance of the collectively owned enterprises and shareholding cooperatives may suggest that the performance of state owned enterprises can be improved if some elements of employee or community ownership can be introduced into the organization structure of the state owned enterprises.

9. Conclusion

In this paper, I use panel data of large and medium-sized industrial enterprises in China's Henan province between 1995-98 to test how workers' participation in management affects firm performance. Participation indices are constructed using data collected from a survey that this author conducted in a field research. I find that workers' participation in management has large positive effects on the productivity performance of state owned enterprises (accounting for three-quarters of all sample enterprises). The effects are robust with respect to alternative productivity measures and different analytical approaches.

One concern is that more productive firms may also be firms that are more likely to encourage workers' participation. To test this possibility, I did regression of participation variables on the variable of total assets per employee, which has a strong independent effect on productivity, controlling for firm size, industries, and ownership types. I did not find positive relationship between the level of participation and total assets per employee. This result suggests that the observed positive relationship between productivity and participation is not likely to result from more productive firms practicing more workers' participation in management.

The non-state owned enterprises in the sample are found to be more productive than the state owned enterprises. However, in the case of shareholding companies and shareholding cooperatives, one cannot rule out the possibility that their better performance reflects their better initial conditions before the re-structuring. On the other hand, the better performance of the collectively owned enterprises and shareholding cooperatives may suggest that the performance of state owned enterprises can be improved if some elements of employee or community ownership can be introduced into the organization structure of the state owned enterprises.

Chapter 4
Aggregate Demand, Capacity Utilization, and
"Disguised Unemployment" in the Chinese Urban Sector

1. Introduction

Since the late 1970s China has undertaken market-oriented economic reform. Unlike in Eastern Europe and the former Soviet Union, until the early 1990s there had been no privatization of state and collectively owned enterprises. In the 1980s state and collectively owned enterprises continued to provide job security and other benefits to the urban sector workers. Rapid economic growth was accompanied by rising living standards for the majority of people. But in the 1990s, the pace of privatization accelerated. The Fifteenth Party Congress in 1997 decided that while collectively owned enterprises and small state owned enterprises were to be privatized, and large and medium-sized state owned enterprises were to be restructured as share holding corporations.

The enterprise reform since the early 1990s has resulted in large-scale layoff of workers. In the 1980s there was virtual full employment in the urban sector. But since 1993, urban unemployment has grown rapidly. By 1997, about 18.5 million workers had been laid off from state owned enterprises and urban collective enterprises, raising the actual urban unemployment rate to about 10 percent. Table 4.1 shows the rapid growth of urban unemployment in 1990s.

Unlike in the 1980s, since the early 1990s while the economy has continued to grow rapidly, the living standards of working people have grown slowly, and for a significant part of them, have actually declined. Many of the laid off workers live in poverty. The stagnation and the decline of the living standards of the majority people and rising inequality have undermined the legitimacy of the market-oriented reform, generated large number of protests and social unrest, and raised serious questions to the current strategy of reform (He 1998: 218-244).

In this chapter I will argue that much of the rise of urban unemployment is neither desirable nor necessary. By pursuing active macroeconomic policy intended to maintain and increase the level of aggregate demand, the efficiency of state and collectively owned enterprises can be substantially improved without increasing layoffs. Section 2 of the chapter discusses the arguments of mainstream economists

that state and collectively owned enterprises are fundamentally inefficient and a large section of the workers in these enterprises are unemployed in a disguised manner and have to be laid off in order to improve efficiency. Section 3 advances an alternative interpretation. It argues that the underutilization of the labor force in state and collectively owned enterprises may be caused by insufficient aggregate demand and an increase in the level of aggregate demand could lead to higher productivity and help to eliminate much of the disguised unemployment. Section 4 tests the hypothesis using data of Chinese industrial enterprises with independent accounts. Section 5 discusses the composition of aggregate demand expansion and possible constraints on the expansion. Section 6 discusses the likely effects of aggregate demand expansion on disguised unemployment. Section 7 concludes the chapter.

2. State and Collectively Owned Enterprises and "Disguised Unemployment"

State Owned Enterprises: The Mainstream Critique

The mainstream literature on the Chinese economy argues that public ownership of capital is in fundamental conflict with the basic requirements of a market economy. State owned enterprises suffer from excessive government intervention, soft budget constraint, and ambiguous property rights.

According to many economists, the Chinese enterprise reform has failed to tackle these fundamental problems. As a result, the state owned enterprises continue to operate inefficiently and their performance has deteriorated overtime. Rather than making any positive contribution, state owned enterprises have acted as a drag on China's economic performance. Large-scale privatization should therefore not be delayed any longer (Sachs and Woo 1994; Woo, Hai, Jin, and Fan 1994; World Bank 1996 and 1997; Lardy 1998: 33-43; Liu and Gao 1999: 87-93; ZGFB 1999: 17-30).

Urban and Rural Collective Enterprises

The collectively owned enterprises include urban collective enterprises and rural town and village collective enterprises. Urban collective enterprises are

technically owned by the workers. But local governments often control the management of these enterprises (Simon 1996: 274-284). Rural town and village collective enterprises are owned by town and village governments. Some economists argue that like state owned enterprises, collectively owned enterprises suffer from ambiguous property rights, excessive government intervention and soft budget constraints that result in inefficiency (ZGFB 1999: 66).

However, not all enterprises officially classified as “collectively owned enterprises” are truly collectively owned. Many town and village collective enterprises are leased and contracted out to private entrepreneurs. Moreover, many private enterprises are wrongly registered as collectively owned enterprises (Smith 1993: 86-90; ZGFB 1999: 82).

“Disguised Unemployment”

In particular, many economists argue that the labor regime of state and collectively owned enterprises is inefficient. Under the pre-reformed system, the Government offered employment to all urban residents to promote social welfare. The system resulted in excessive labor supply that was absorbed by state and collectively owned enterprises without considering efficiency criteria. In this view, a large segment of those employed in state and collectively owned enterprises are actually "redundant" (Zhang, Huang, and Li 1998: 362-364; Liu and Gao 1999: 96; ZGFB 1999: 468-470). The International Labor Organization, the World Bank, and different branches of the Chinese government have made alternative estimates of the size of redundant workers, ranging between 15-35 percent of the labor force of state and urban collectively owned enterprises (Liu and Gao 1999: 299-302; World Bank 1999: 60).

These economists argue that the redundant workers in state and collectively owned enterprises should properly be categorized as constituting a pool of workers unemployed in a disguised manner. Because while these workers do receive income from their employment, their employment cannot be justified on efficiency grounds.

Formally, the argument can be illustrated by figure A.

MPL stands for the marginal product of labor, which is a decreasing function of the level of employment (L). WS is the wage-setting curve that determines the level of real wage, and reflects the relative bargaining power between the workers and the state and the collective sector employers. FE is the government's full employment target. Suppose state and collectively owned enterprises hire workers until the employment level reaches FE, then for the workers between point B and point C, their real wage would be higher than their marginal product of labor. The employment between B and C is inefficient and should be regarded as "disguised unemployment." The employment to the left of point B may be referred to as "effective employment (E)," since the marginal product of labor for this portion of the employment is higher than real wage.²²

Now imagine what would be the case in a market economy. The government's full employment target (FE) and the wage-setting curve (WS) would be replaced by a positively sloped labor supply curve (LS), which should reflect the workers' preference for liquidity. The labor demand curve would lie exactly on the marginal product of labor function. The labor market would clear where the labor supply curve crosses the labor demand curve. The marginal product of labor would equal real wage, and there would be no disguised unemployment.

Many economists argue that in the transition to a market economy, it is no longer possible for state and collective enterprises to maintain the inefficient labor regime characterized by disguised unemployment. This is the case since these enterprises have failed to compete with private enterprises effectively and are suffering from deteriorating profitability. The proponents of this view believe that

²² The wage-setting curve is arbitrarily drawn to be horizontal. But one can imagine cases where the real wage is either positively or negatively associated with the level of effective employment. Higher effective employment may give the workers more bargaining power that will push up the nominal wage. On the other hand, to the extent a higher level of effective employment is associated with a higher level of capacity utilization, firms may have more pricing power, and a higher price level may more than offset the increase of the nominal wage.

the disguised unemployment has to be exposed and turned into explicit unemployment. By freeing the redundant workers from inefficient state owned enterprises, it is possible to re-allocate these workers to private enterprises and the growing service industries where they can be more efficiently employed. In the long run, this will contribute to higher efficiency and higher living standards (Yang, Y. 1997: 75-76; Zhang, Huang, and Li 1998: 362-364; ZGFB 1999: 468-470).

Disguised unemployment is not necessarily inefficient. For example, firms that provide job security to their workers may suffer from disguised unemployment during the downturn of a business cycle. But by offering the workers a long-term stake in the firm, job security encourages workers to make investment in firm specific human capital. This may contribute to higher productivity in the long run (Aoki 1988; Boyer 1993; Lo 1997: 113-118).

Further, a labor regime that tolerates disguised unemployment in cyclical downturns is likely to have macroeconomic benefits. When an economic downturn occurs, state and collectively owned enterprises help to dampen the multiplier effect and alleviate the effect of any unfavorable demand shock through maintaining their employment. By comparison, private enterprises tend to reduce employment and wage expenditures when shortfalls of market demand occur. Falling employment and wages further reduce the level of expenditure and tend to amplify the decline of aggregate demand.

A reform strategy based on exposing the disguised unemployment may be desirable, if the workers who are displaced from state and collectively owned enterprises can be swiftly re-employed by the private sector. But this is likely to be the case only if the economy grows rapidly enough to absorb not only the natural growth of the labor force but also the tens of millions of workers laid off by the state and the collective sector. Given the fact that since the mid-1990s, China has been suffering from insufficient aggregate demand and the economy has been growing below its potential, large scale layoff of workers by the state and the collective sector could further reduce effective demand. This would increase the difficulty for the

private sector to expand at a sufficient pace to absorb the rapidly growing unemployment.

3. An Alternative Perspective: Underutilization of the Labor Force Resulting from Insufficient Aggregate Demand

In 1993 and 1994, China experienced double-digit inflation, which was partly caused by the real estate bubble that emerged after the liberalization of the land market (Yang, B. 2000: 122-124). The Chinese government conducted contractionary monetary policy to contain inflation. By the end of 1996, the government declared that a "soft landing" had been successfully accomplished. However, the economy continued to slow down. In 1998, the Chinese economy was literally in deflation. The growth rates of consumer and producer prices fell into negative territory, while economic growth rate fell to the lowest point since 1991. Price deflation and a declining rate of economic growth suggest substantial shortfalls in aggregate demand.

It is a common observation that productivity typically behaves in a pro-cyclical manner. A fall of aggregate demand reduces the utilization rate of the capital stock. With lower capacity utilization, labor productivity would be lower at every given level of employment than it otherwise could be even without any change in technology. This can be illustrated by assuming a revised generalized Cobb-Douglas production function that takes into account capacity utilization. The production function is written as:

$$(1) Y = A(ZK)^{\alpha}L^{\beta}M^{\gamma}$$

Y, K, L, and M are for output, capital, labor, and intermediate inputs (materials), and Z is for capacity utilization. Let "y" be Y/L, then the production function is re-written as:

$$(2) y = A(ZK)^\alpha L^{\beta-1} M^\gamma$$

Clearly, "y" is positively dependent upon Z, and $\partial y / \partial Z$ is $\alpha y / Z > 0$, suggesting that a fall of capacity utilization leads to lower productivity.

If the employment regime is completely "flexible," the firm should adjust its employment level to reflect lower capacity utilization, and the adjustment will have the effect to raise labor productivity (assuming marginal product of labor declines with the increase of employment). However, in that case, the firm is already moving along a lower labor demand curve. The effect of falling capacity utilization is likely to be absorbed partly by lower productivity, and partly by a lower employment level. There will be no "disguised unemployment" because eventually, with the fall of employment, the marginal product of labor will be adjusted to equal real wage.

Now consider the case for a socialist economy where the enterprises provide their employees with complete job security. One would expect that for these enterprises, not only the capital stock but also the level of employment is a "fixed" input. Thus, a fall of aggregate demand would result in not only the underutilization of the capital stock but also the underutilization of the labor force. In this case, a change in capacity utilization is likely to have an even bigger effect on productivity. This can be illustrated by a production function that takes into account utilization of capital as well as labor, assuming the two factors of production have the same utilization rates.

$$(3) Y = A(ZK)^\alpha (ZL)^\beta M^\gamma$$

$$(4) y = AZ^{\alpha+\beta} K^\alpha L^{\beta-1} M^\gamma, \quad \partial y / \partial Z = (\alpha+\beta)y / Z > 0$$

Equation (3) and (4) show that in a socialist economy with completely "rigid" employment regime, a change in capacity utilization has a stronger effect on productivity. Moreover, in such an economy, the effect of falling capacity utilization

has to be completely absorbed by the fall of productivity. Thus, insufficient aggregate demand and underutilization of capacity are going to result in disguised unemployment. But if this is the case, then in principle, the disguised unemployment can be eliminated by increasing the level of aggregate demand. For an increase in aggregate demand leads to higher productivity by eliminating the underutilization of the capital stock and the labor force, allowing the marginal product of labor to be lifted to a level that is above real wage.

If the socialist economy starts with a given level of disguised unemployment even when the economy operates with full capacity, then the fall of capacity utilization will result in even more disguised unemployment. In this case, at least the portion of the disguised unemployment that is caused by the underutilization of capacity can be eliminated by an increase in aggregate demand.

In real capitalist economies and real socialist economies, enterprises are likely to behave in a manner in between the two extreme cases, with real capitalist enterprises closer to the completely “flexible” case and real state and collectively owned enterprises in China closer to the completely “rigid” case.²³

4. Testing the Alternative Perspective

In this section, I will test the hypothesis that the productivity of state and collectively owned enterprises is strongly dependent upon capacity utilization. If this hypothesis is not rejected, it would be possible for one to argue that active aggregate demand policy that leads to higher capacity utilization is likely to result in substantial improvement in the efficiency of state and collectively owned enterprises. The disguised unemployment in these enterprises can therefore be addressed with by aggregate demand expansion rather than by layoffs. I will also test the extent to which

²³ A general case can be presented by the production function: $Y = A(ZK)^\alpha(Z^0L)^\beta M^\gamma$, where $0 < \theta < 1$. A completely “flexible” system is one where $\theta = 0$, and a completely “rigid” system is one where $\theta = 1$. Thus, θ can be seen as an indicator of the degree of “rigidity.”

the productivity of private enterprises depends on capacity utilization.

The relationship to be tested is as follows:

$$(5) Y = AK^{\beta_1}L^{\beta_2}M^{\beta_3}Z^{\beta_4}$$

which is equivalent to:

$$(6) y = Ak^{\beta_1}m^{\beta_3}L^{\beta_1+\beta_2+\beta_3-1}Z^{\beta_4}$$

where "k" and "m" are the capital-labor ratio and the materials-labor ratio respectively. Rewrite equation (6) in growth rate form:

$$(7) (\Delta y)/y = \beta^0 + \beta^1(\Delta k)/k + \beta^3(\Delta m)/m + (\beta^1 + \beta^2 + \beta^3 - 1)(\Delta L)/L + \beta^4(\Delta Z)/Z$$

The coefficient before the growth rate of labor indicates return to scale. For state and collectively owned enterprises, β^4 is expected to be positive. For "enterprises of other economic types," which are private enterprises, β^4 is also expected to be positive, but the estimated coefficient is expected to be smaller than that for state and collectively owned enterprises.

Data

To test equation (7), it is necessary to have the following data: output, capital input, materials input, labor input, and capacity utilization. *The China Statistical Yearbook* (CSY, 1985-1999) provides the relevant data or the necessary information from which the required data can be constructed for the *industrial enterprises with independent accounts*. In 1997, all industrial enterprises with independent accounts accounted for 58.7 percent of China's gross output value of industry. In the same year, the state owned enterprises accounted for 41.7 percent of the total output of all industrial enterprises with independent accounts, the collectively owned enterprises

accounted for 29.6 percent, the share holding corporations accounted for 7.4 percent, the foreign owned enterprises accounted for 12.3 percent, and the enterprises owned by residents in Hong Kong, Macau and Taiwan accounted for 9.0 percent.

Before 1993, the share holding corporations, the foreign owned enterprises, and the enterprises owned by residents in Hong Kong, Macau and Taiwan are all included in the category of "enterprises of other economic types." The share holding corporations were originally state owned enterprises that were later restructured as corporations. The government continues to have majority ownership in most of these corporations. Thus, it is more appropriate to include them into the state sector. For the rest of this paper, the "state owned enterprises" refer to not only those defined as such according to the Chinese official statistical categorization, but also those that are referred to as the share holding corporations.

In constructing data series on urban unemployment, one would ideally wish to use separate data for urban collective enterprises. Unfortunately, *The China Statistical Yearbook* only provides data for the collective sector as a whole, including urban collective enterprises as well as town and village collective enterprises. Thus, the "collectively owned enterprises" are used as proxies for urban collective enterprises. Data for the state owned enterprises and the collectively owned enterprises are available or can be constructed for 1980-98. Data for the "enterprises of other economic types" are not available until 1988. Since 1993, the foreign owned enterprises and the enterprises owned by the residents in Hong Kong, Macau and Taiwan are combined as the "enterprises of other economic types." Thus, for the enterprises of other economic types, data are available or can be constructed for 1988-98.

For details of data construction, see the Appendix.

Results

Table 4.2 summarizes the regression results. The dependent variable is the growth rate of productivity (output per employee). The independent variables are

the growth rate of the capital-labor ratio, the growth rate of the materials-labor ratio, the growth rate of the labor input, and the annual change of the capacity utilization rate.²⁴ All regressions are corrected for auto-correlation by using the iterative Cochrane-Orcutt procedure. For state owned enterprises, a one percent increase of capacity utilization is associated with 0.747 percent increase of productivity. The result is statistically significant at 0.1% level. It has been explained that I have to use data for the collective sector as a whole instead of those for urban collective enterprises, and officially registered “collectively owned enterprises” are likely to include some *de facto* private enterprises. Despite these concerns, it is interesting to see that the estimated coefficient of CAPACITY for collectively owned enterprises is 0.787, very similar to that for state owned enterprises. The result is statistically significant at 5% level. For enterprises of other economic types, the coefficient of CAPACITY is 0.375, and it is not statistically significant.

The results reported in Table 2 are consistent with the hypothesis that the productivity of state and collectively owned enterprises is positively correlated with capacity utilization, which should reflect the level of aggregate demand. An increase in capacity utilization has a large and positive effect on the productivity of state and collectively owned enterprises. The results also suggest that the increase of capacity utilization tends to have a larger impact on the productivity of state and collectively owned enterprises than that on the productivity of private enterprises. The coefficient of CAPACITY is larger for state and collectively owned enterprises than that for “enterprises of other economic types.” However, the differences are not statistically significant.²⁵

²⁴ Given the way in which capacity utilization rates are measured (see Appendix), the trend capacity utilization rate is one. Thus, $(\Delta Z)/Z$ is approximately equal to ΔZ . As a matter of convenience, I used the “annual change” rather than the growth rate of capacity utilization rates in the regressions.

²⁵ The t-statistic for the difference in the coefficient of CAPACITY between the state sector and the other sector is 1.525, and that between the collective sector and the other sector is 1.090. Neither is statistically significant at 10% or lower level.

5. Some Issues of Aggregate Demand Expansion

If the government is going to pursue an aggregate demand expansion with the objective of eliminating a substantial part of the disguised unemployment, it is necessary to discuss the composition of and the possible constraints on such an expansion. But before such a discussion, I want to first show that the rate of capacity utilization, as is measured in this study, does reflect the level of aggregate demand.

Capacity Utilization and Aggregate Demand

To establish the relationship between the measured capacity utilization rate and aggregate demand, I run several bivariate regressions between the measure capacity utilization rate and alternative measures of intensity of demand. The alternative measures used are the annual change of the inflation rate (the inflation rate is measured by the growth rate of the urban consumer price index), the real GDP gap (the ratio of the difference between actual real GDP and the trend real GDP over the trend real GDP), and the growth rate of nominal GDP. The regression results are presented in Table 4.3.

The measured capacity utilization rate is positively and significantly correlated with all three measures of intensity of demand. An inflation acceleration of one percentage point is associated with an increase in capacity utilization of 0.45 percentage point. There is almost a one-to-one relationship between the measured capacity utilization rate and the real GDP gap. Finally, a one percent increase in nominal GDP growth rate results in an increase in capacity utilization by 0.57 percentage point. The results confirm the belief that the measured capacity utilization rate reflects the level of aggregate demand and a higher capacity utilization rate can be achieved with aggregate demand expansion.

Composition of Aggregate Demand Expansion

An aggregate demand expansion can be led by the public or the private sector

consumption, the public or the private sector investment, or exports of goods and services. Under the influence of the Asian financial crisis, China's exports of goods barely increased in 1998. Exports growth regained some momentum in the next two years. The nominal growth rate of goods exports (in terms of U.S. dollar) was 6.1 percent in 1999 and 27.9 percent in 2000. However, if the current global economic downturn continues, it is most likely that China's export sector will grow at a sluggish pace in the near future.

Household consumption is largely a dependent variable determined by the level of income. The government may attempt to change the household sector's propensity to consume by cutting taxes on income or lowering the interest rate. But the current Chinese tax system relies heavily on indirect taxes and value added tax. According to one study, individual income tax accounts for only 3.9 percent of the total tax revenue (Xu 2000: 47). Thus, a tax cut is not likely to be effective in stimulating consumption (World Bank 1999: 18). Lower interest rate is not likely to be effective either. Consumer credit is under-developed, and the saving propensity is not likely to be reduced when there is high uncertainty of the future prospect of the economy. In addition, the expansionary effect of household consumption may be dampened if much of the increased consumption leaks out of the system through imports (Pollin 1998: 444).

Investment includes the state sector investment (investment by state owned enterprises, local governments, and the central government) and the non-state sector investment (investment by the collective and the private sectors). The non-state sector investment is primarily a function of investor confidence and expected profitability. Both confidence and profitability are likely to reflect the level of aggregate demand. Jefferson, Hu, and Singh (1999) find that the investment of town and village enterprises is more responsive to change in output level than state owned enterprises. This finding suggests that while the non-state sector investment is likely to amplify a business cycle downturn, it is not likely to lead an aggregate demand recovery.

In principle, the government may encourage private investment by cutting business taxes or lowering the cost of capital. But evidence from advanced capitalist economies suggests that lower interest rate and tax credits at best have only weak effects on private investment (Fazzari 1993; Pollin 1998: 444-445). These policies are likely to be even less effective in the Chinese context given the far less developed tax system and financial structures.

If exports, household consumption, and the non-state sector investment are not likely to play a leading role in aggregate demand expansion, then an expansion needs to be initiated by either government fiscal spending or the state-sector investment.

Financing Fiscal Expansion

The Chinese government has carried out an expansionary fiscal policy since 1998. Government deficit increased from about 1.6 percent of GDP in 1997 to 3.1 percent of GDP in 2000 (EIU 2001: 10-12). Fiscal expansion has played a decisive role in stabilizing China's economic performance in a generally gloomy global economic context. The fiscal stimulus program has financed spending on infrastructure investment, social protection, the development of western provinces, and environmental protection (World Bank 1999: 18, 33-36; EIU 2001: 23, 32).

Fiscal spending can be financed by either taxes or increase of government debt. China's government tax revenue as a share of GDP is low by international standard. The central government budgetary revenue accounts for about 5 percent of GDP, and total government budgetary revenue accounts for about 15 percent of GDP. By comparison, total government tax revenue accounts for 30-60 percent of GDP in most OECD countries (Xu 2000: 48). A study of 57 countries finds that in 1989, the share of the central government tax revenue in GDP was lower than 10 percent in only six countries, including China (Wang 1995: 48-51).

Although the state owned enterprises now account for only one-third of national output, they continue to serve as the principal tax base for the Chinese government, contributing about two-thirds of the total government tax revenue. To

increase tax revenue as a share of GDP, the Chinese government must extend its tax base into the private sector. If the Chinese government is willing and able to increase taxes on the private business sector and wealthy households, there is sufficient room for tax revenue to grow before it reaches a more reasonable share of national output.

If the growth of tax revenue is not sufficient for the expansionary purpose, then further expansion of fiscal spending must be financed by increase of government debt. Many have questioned China's fiscal sustainability and argued that the room for fiscal expansion is very limited. The current official government debt – GDP ratio is only 15 percent. But the official figure does not include implicit government liabilities, such as non-performing loans of state owned banks and social security fund deficits. When these factors are taken into account, alternative estimates put the total explicit and implicit government liabilities in the range of 60-100 percent of GDP (Xu 2000: 48; Kynge 2001).

However, a comprehensive evaluation of the fiscal position needs to take into account not only the current debt level, but also the interest rate and the expected revenue growth. For example, assume that in the long run, it is desirable for China to have the ratio of total government liabilities over GDP to be stabilized at around 60 percent. If the trend nominal growth rate of GDP is 15 percent (assume real GDP growth of 7-9 percent and some single-digit inflation), the sustainable government deficit would be 9 percent of GDP. In the 1990s, the average real interest rate on state owned bank deposits was slightly negative without discouraging the growth of household savings. Assume the nominal interest rate is 8 percent, or just enough to cover inflation, the implied interest payment on the government liabilities would amount to 4.8 percent of GDP, allowing the sustainable primary government deficit to be 4.2 percent of GDP. The government deficit now amounts to only 3 percent of GDP, and the primary deficit is about 1-2 percent of GDP. Thus, there still is room for the government to pursue deficit-financed fiscal expansion.

Financing the State Sector Investment

Government budgetary funds finance about 10 percent of the state sector investment. The rest is mainly financed by the retained earnings of state owned enterprises and borrowings from state owned banks. Since the retained earnings are not likely to improve without an increase in aggregate demand first taking place, it is apparent that the expansion of the state sector investment needs to be financed primarily by borrowings from state owned banks.

If the government borrows from state owned banks to invest in infrastructure, interest payments and the principals of the loans eventually have to be financed by the government tax revenue or new government borrowings, an issue discussed in the last sub-section. Alternatively, the government can directly borrow from state owned banks or encourage state owned enterprises to borrow from state owned banks, to invest in new or existing state owned enterprises. State owned banks can finance these loans with new deposits made by households and businesses, their retained earnings, or borrowings from the central bank. Since the central bank can make as many loans as it wishes, there is no direct financing constraint on this type of expansion. However, the growth of money supply increases the liability of state owned banks in the form of more deposits made by households and businesses. Since state owned banks have to pay interests on these deposits, in the long run, the investment in state owned enterprises needs to earn a rate of return higher than the real interest rate on the deposits.

The popular image of China's state owned enterprises is that they are generally unproductive and wasteful, and make no contribution to the economy but incurring financial losses. The fact is that, the state owned enterprises, as a whole, have made profits not losses for every year since 1949. Table 4.4 compares the rate of return of state owned enterprises with the deposit interest rate between 1993 and 1999. One measure of the rate of return is the ratio of profits over the value of equity capital. The profits are net of the losses of loss-making state owned enterprises and interest payments. The other measure is the ratio of the sum of profits and taxes over the

value of assets. The second measure is included because arguably, from the government's point of view, the returns from the investment in state owned enterprises should include not only the profits but also the taxes, since both contribute to government revenue.

No matter which measure is used, the rate of return of state owned enterprises had remained positive throughout the period. It was generally higher than the real interest rate during boom years (when the real interest rate became negative), and lower than the real interest rate during recession years. In average, both measures of rate of return are comfortably higher than the real interest rate, which averages slightly negative. Thus, despite the relatively poor performance of state owned enterprises in recent years, at least at the aggregate level they seem to be able to earn an average rate of return higher than the average real interest rate in the medium run (through a business cycle).

Other Constraints on Aggregate Demand Expansion

Expansion of aggregate demand may not be desirable if it generates strong inflationary pressure. In 1985, 1988-89, and 1993-95, China suffered from double-digit inflation. In most of these years the measured capacity utilization rates were unusually high. Inflationary pressure is likely to be strong when the economy is operating near full capacity, and is likely to be weak when there is substantial excess capacity. China has experienced deflation rather than inflation in the last few years. Thus, there is likely to be some room for aggregate demand expansion before inflation accelerates to unacceptable level.

The balance of payment problem can become another constraint on aggregate demand expansion. But in this respect, China enjoys an exceptionally favorable position compared to many other emerging markets. It has run large current account surpluses since 1994. Even if a domestic expansion together with a global economic downturn turns China's current account from black into red, the large inflows of foreign capital and a huge foreign currency reserve of \$190 billion allow China to

avoid any significant balance of payment problem in the near future.

6. Estimating the Effects of Aggregate Demand Expansion

This section discusses the likely effects of aggregate demand expansion on disguised unemployment. To establish a plausible range of aggregate demand expansion, I test the following relationships between capacity utilization and inflation:

$$(8) \pi = \beta^0 + \beta^1 Z$$

$$(9) \pi = \beta^0 + \beta^1 \pi_{-1} + \beta^2 Z$$

π is the inflation rate (measured by the urban consumer price index), and π_{-1} is the inflation rate lagged by one year, used as a proxy of inflation expectation. Z is the capacity utilization rate. The regression results are reported in Table 4.5.

For equation (9), in equilibrium, actual inflation should equal expected inflation. Given the regression results, it can be solved that if the capacity utilization rate is exactly one, the equilibrium inflation rate is going to be 16.7 percent. For equation (8), given the regression results, a capacity utilization rate of one implies an inflation rate of 12 percent.

Imagine three plausible scenarios of aggregate demand expansion, a “conservative” scenario, a “mid-range” scenario, and an “optimistic” scenario, under which the capacity utilization rate is increased by 10, 15, and 20 percent respectively from the initial state. Table 4.6 presents the likely effects on productivity and disguised unemployment under alternative scenarios.

Given reasonable assumptions, an expansion of aggregate demand and an increase in capacity utilization can result in an increase in productivity by 7.5-15 percent, and eliminate between one-quarter to one-half of the existing disguised unemployment. Both the conservative scenario and the mid-range scenario generate no more than single-digit inflation with either of the two estimates. But the

optimistic scenario results in double-digit inflation with both estimates. The conservative, the mid-range, and the optimistic scenario require a nominal GDP growth rate of 11, 20, and 29 percent respectively. To put these numbers in a context, the average annual growth rate of nominal GDP was 17.2 percent between 1981-1998, and 20 percent between 1991-1998.

The previous section argues that an aggregate demand expansion needs to be led by the government fiscal spending and the state sector investment. For the state sector investment, it has been argued that its expansion is not subject to any direct financing constraint. China's total fixed investments grew at an average annual rate of 21.1 percent between 1980 and 1998, and 25.8 percent between 1990 and 1998. I will just assume the state sector investment (excluding the part financed by the government budgetary funds) grows at an annual rate of 25 percent. I assume the government tax revenue grows about faster than the projected nominal GDP growth to allow the ratio of the government tax revenue over GDP to increase over time, and I assume the government fiscal spending to grow at the same pace as the government tax revenue. Table 4.7 presents the plausible composition of aggregate demand expansion for each projected scenario.

Under the conservative scenario, the public sector expansion by itself is almost sufficient to accomplish the desired GDP growth. Under the mid-range scenario, the public sector expansion generates 44% of the desired GDP growth. Under any realistic assumption of the multiplier effect on household consumption and the accelerator effect on private investment, the desired GDP growth can be accomplished without much difficulty. Finally, under the optimistic scenario, the private sector must grow nearly as fast as the entire economy for the desired GDP growth to be achieved.

7. Conclusion

Many economists argue that state and collectively owned enterprises are fundamentally inefficient, and suffer from "disguised unemployment." In their view,

better economic performance requires large-scale layoff of the state and the urban collective sector workers. In this paper, I argue that the productivity of state and collectively owned enterprises depends on capacity utilization and the level of aggregated demand. If the government undertakes active aggregate demand policy, by increasing the fiscal spending and the public sector investment, the performance of state and collectively owned enterprises can be substantially improved. As a result, a substantial part of the disguised unemployment can be eliminated without large-scale layoffs. Indeed, as is discussed in the previous section, under several likely scenarios, one-quarter to one-half of the existing disguised unemployment can be eliminated by aggregate demand expansion.

This author does not pretend to argue that aggregate demand expansion provides the ultimate solution to all existing problems in state and collectively owned enterprises. After all, some of the “disguised unemployment” is likely to reflect long-term structural problems rather than short-term cyclical problems. There is clearly a possibility that the productivity of state and collectively owned enterprises can be improved under alternative microeconomic institutional arrangements. But privatization is not the only possible solution. In fact, when it provides opportunity for managerial corruption and asset-stripping, it often make things worse (see section 5 and 6 of Chapter 1).

The argument is that, the macroeconomic aspect should not be ignored. As is demonstrated in this paper, at least some of the current difficulties of the state and the collective sector reflect insufficient aggregate demand rather than microeconomic inefficiency. If this is the case, then a more open minded approach of economic reform with a consideration of the macroeconomic aspect as well as social justice can lead to socially as well as economically more desirable results.

Chapter 5

Conclusion: Towards Economic Democracy

China has undergone a transition from a state socialist economy to a market economy. A central issue in the transition is the state owned enterprise reform. I have tried to address this issue from several different, but interrelated perspectives in this dissertation. Most generally, there is the question of what reform strategy should China adopt in the next stage of her development. The answer to this question depends largely on how several specific issues regarding the state owned enterprises are addressed.

The specific issues I have addressed in this monograph are as follows: Have the state owned enterprises made a positive contribution to China's rapid and sustained economic growth or have they simply acted as a drag on the Chinese economy? If the state owned enterprises have made a positive contribution, should China continue to have a large state owned enterprise sector in the future? If the state owned enterprises will continue to be an important part of the Chinese economy, and many of them are not going to be privatized, how can we improve the performance of these enterprises, so that the resources allocated to these enterprises are more efficiently employed?

In Chapter 2, I have argued that the large state owned enterprise sector has made a crucial contribution to China's macroeconomic stability and sustained economic growth and China will continue to need a large state owned enterprise sector for her economic success to be sustained in the future.

As I discuss in Chapter 2, private investment in a market economy is subject to sudden and wide fluctuations and is a major source of instability. In advanced capitalist economies, the big government sector has played a crucial role in offsetting undesirable investment fluctuations and maintaining macroeconomic stability. However, the Chinese government sector, measured by tax revenue or expenditures as a share of GDP, is relatively small compared to the international norm. In the meantime, China has a high-saving and high-investment economy. Thus, if China's large national saving were to be absorbed primarily by private investment, the Chinese government sector would be likely to be too small for macroeconomic

stability to be effectively maintained and severe economic fluctuations to be avoided.

In fact, China has a large state owned enterprise sector and most of China's national saving is absorbed by public sector investment rather than private investment. The evidence I advance in Chapter 2 suggests that public sector investment has made a positive contribution to China's macroeconomic stability. In recessions, the state owned enterprises maintain investment growth. The deficits generated by the public sector help to offset private investment shortfalls and maintain private sector profits. For the public sector to be able to generate sufficiently large deficits to prevent severe economic downturns, the public sector needs to have sufficient amount of assets and a sufficiently large regular income. In particular, Chapter 2 establishes that under a set of realistic assumptions, public sector investment needs to account for about 50 percent of the total capital formation for China to effectively maintain macroeconomic stability. The required share of public sector investment in the total capital formation implies a relatively large state owned enterprise sector.

If the state owned enterprises are going to remain an important part of the national economy, it is important that the resources allocated to these enterprises are employed with a reasonable level of efficiency. In this dissertation, I have argued that the performance of state owned enterprises can be substantially improved through a set of sensible policies and institutional arrangements.

As I discuss in Chapter 1, in the 1980s, the performance of state owned enterprises, in terms of technical efficiency and financial indicators, was comparable to that of non-state owned enterprises. However, since then the performance of state owned enterprises has deteriorated substantially. On the other hand, state owned enterprises provide important social services, such as health care, education, and pension payments to retirees, in addition to marketable goods and services. These social services need to be taken into account for the performance of state owned enterprises to be properly evaluated.

Chinese state owned enterprises suffer from distorted tax structure and unfair competition from private enterprises. While the state owned enterprises account for

about one-third of the national output, they account for about two-thirds of the government tax revenue. A substantial increase in taxes on the private business sector and rich individuals will simultaneously contribute to a more equitable distribution of income and wealth, help to level the playing ground between different ownership types, and increase the government tax revenue.

Chinese domestic and foreign private enterprises often violate labor and environmental laws. Workers in these enterprises often suffer from excessively long working hours, unsafe or dangerous working conditions, physical abuses, or other unfair treatments. Much of the apparent efficiency of these enterprises is based on the sacrifices of the workers' rights and environment. A more effective enforcement of labor and environmental laws would protect the state owned enterprises against unfair competition from these enterprises.

But even allowing for these competitive disadvantages of the state-owned enterprises, it is still the case that these enterprises can raise their productive efficiency in significant ways. Thus, in Chapter 3, I explore the relationship between workers' participation in management and the productivity performance of state owned enterprises. I performed econometric analyses, using panel data of large and medium-sized industrial enterprises in China's Henan province between 1995-98. The data were collected from a survey that this author conducted in a field research. The results suggest that workers' participation in management has large positive effects on the productivity performance of state owned enterprises.

How can workers' participation be productively extended? In fact, the Chinese enterprise law provides substantial legal power for the workers in state owned enterprises to participate in management. However, in practice, the extent to which the workers actually exercise their legal power and rights vary from enterprise to enterprise. The existing laws that promote workers' participation in management need to be supplemented by certain institutions to ensure that the workers are able to make full use of their legal power and rights. One possibility is to develop a system that allows the workers to directly participate in management-level decision-making.

For instance, the board of directors of a state owned enterprise may consist of the representatives of the owner (the government), the representatives of the workers, and the representatives of other stake-holders (consumers, community, environmental protection groups, the unemployed, etc.).

Many economists regard state-owned enterprises as inefficient in another dimension: that they are not able to lay off unneeded workers, so that these firms are saddled with high levels of labor redundancies, in other words, many state sector workers have a marginal product of labor lower than their real wage.

From the broader social perspective, these labor redundancies in the state owned sector implies a serious problem of “disguised unemployment” in the Chinese labor market. In Chapter 4, I explore this problem of disguised unemployment, and some alternative policy approaches for addressing it.

It is first important to recognize that the arrangement of disguised unemployment may involve certain social benefit that is not taken into account in explicit economic calculations. For instance, the workers that are in “disguised unemployment” may have more self-respect and dignity than those explicitly unemployed. Disguised unemployment is associated with job security. To the extent job security promotes long-term commitment among the employees and encourages the accumulation of human capital, disguised unemployment is not necessarily an inefficient arrangement.

Chapter 4 then takes up the issue of disguised unemployment and aggregate demand. The Chinese economy has suffered from insufficient aggregate demand in the last few years. At least part of the disguised unemployment in state owned enterprises is likely to result from insufficient aggregate demand and can be corrected by an active aggregate demand policy. Thus, in this chapter, I studied the relationship between productivity and capacity utilization and found that the productivity of state owned enterprises was strongly dependent upon the level of capacity utilization and aggregate demand. I estimated that an expansionary macroeconomic policy should help to raise the level of productivity in state owned

enterprises and eliminate one-quarter to one-half of the existing disguised unemployment.

The rest of the disguised unemployment is likely to result from structural problems. Other institutional reforms, such as workers' participation in management, may help to improve the microeconomic efficiency of state owned enterprises and allow more state sector workers to be efficiently employed.

The state sector has played a crucial role in China's past economic success. However, since the early 1990s, the performance of the state owned enterprises has deteriorated. While tens of millions of state sector workers have been laid off, a substantial portion of the state assets has been stripped away by corrupt bureaucrats and managers. To many people the economic reform has ceased to deliver improvement in living standards and social tensions have been steadily growing. China's economic reform has reached a crossroad.

Some believe that China should follow the strategy of neoliberalism and large-scale privatization. However, the experience of many transition and developing economies has suggested that such a strategy often results in destruction of existing assets, falling living standards, and rising inequality and social tensions. In Chapter 2, I have pointed out that in the Chinese context, with a high saving economy and a relatively small government sector, a large private sector is likely to generate serious macroeconomic instability and undermine long-term economic growth.

An alternative strategy is to maintain an active and a relatively large public sector, which has played a crucial role in maintaining macroeconomic stability and accomplishing other social goals. This alternative strategy would require the development of certain policies and institutions that promote the economic effectiveness of the state sector. These policies would include workers' participation in management, stake-holders' participation in national economic policies, egalitarian tax policies, development and enforcement of labor and environmental laws, and a macroeconomic policy committed to full employment.

Considered as a whole, these policies and institutions may be broadly included in an institutional framework that can be referred to as “Economic Democracy.”

The strategy of Economic Democracy contributes to macroeconomic stability and sustained economic growth, by allowing a relatively large public sector to operate with a reasonable level of efficiency. The commitment to full employment, an egalitarian tax structure, the development and enforcement of labor and environmental regulations, and the participation of workers and other stake-holders in economic management, help to promote the interest of the lower sections of the population and contribute to the development of a more equitable society.

The framework of Economic Democracy is not incompatible with the growth of private enterprises. On the contrary, by promoting economic and social instability, it generates an environment in which private enterprises are able to prosper around an effective and steadily growing public sector. In the long run, this arrangement is likely to generate a far more equitable and efficient growth path, even in terms of promoting the spread of private enterprises, than a system based on neoliberal-style capitalism. I hope that this dissertation has provided some understanding as to how such an alternative growth path may be pursued in China in the coming years.

Appendices

Appendix A: The Debate on China's Economic Growth Statistics

According to official GDP statistics, the Chinese economy grew at an average annual rate of 10.2 percent between 1980-95. The alternative estimate made by Maddison (1998) gives a lower growth rate, 7.7 percent. While this is 2.5 percent lower than the official rate, it still indicates an economy that grew rapidly. These growth rates are broadly consistent with data for energy consumption, non-agricultural employment, and volume of merchandise trade.

Between 1995-2000, while official real GDP grew at an annual rate of 8.3 percent, real energy consumption actually declined at an annual rate of 0.5 percent, and non-agricultural employment increased at a sluggish rate of 1.8 percent.²⁶ Rawski (2001), in a recent paper, points out many inconsistencies in recent official statistics and argues that the exaggeration contained in the official GDP growth rates has become substantially worse since 1998. Rawski estimates that the actual GDP growth rates for 1998, 1999, and 2000 were -2.0/+2.0, -2.5/+2.0, and 2.0/3.0 percent respectively.

However, Andy Xie (2002) of Morgan Stanley disagrees with Rawski and argues that China's GDP statistics are broadly consistent with data of foreign trade and household savings deposits. Using one indicator preferred by Rawski and one preferred by Andy Xie, I performed regressions of official GDP statistics and Maddison's GDP estimates respectively on energy consumption and trade volume for 1980-95, corrected for the first-order and the second-order auto-correlations. The results are used to estimate the GDP levels between 1996-2000. The regression results and the estimated GDP growth rates for 1996-2000 are reported in Table A1.1. The R-square statistics suggest that energy consumption and trade volume together can explain almost 100 percent of the total variations of GDP levels between 1980-95, measured either by official statistics or Maddison's estimates. When the regression

²⁶ The average annual growth rate of merchandise trade volume was 5.4 percent for 1996-99, before it jumped by 26.9 percent in 2000.

results are used to predict the GDP growth between 1996 and 2000, however, there is a very large discrepancy between the official and the estimated growth rates. When the regression results for official GDP statistics are used, the estimated GDP growth rate is between 1.3-3.3 percent. When the regression results for Maddison's estimates are used, the estimated GDP growth rate is between 0.7-2.2 percent.

These results suggest that for one reason or another, the relationship between official GDP statistics on the one hand, and statistics for energy consumption and trade volume on the other that seems to have existed before 1995, has broken down since then.

Appendix B: The Minskian Rule of Thumb

Minsky argues that the government sector needs to be as large as private investment to maintain macroeconomic stability. However, he did not explain in his books how this rule of thumb was derived. The following assumptions and equations attempt to make an interpretation.

Let I_{trend1} and I_{trend2} be the trend investment in stage 1 and 2. Suppose the trend economic growth rate between stage 1 and stage 2 is “g” and $(1+g) I_{\text{trend1}} = I_{\text{trend2}}$. Let I_1 and I_2 be investment in stage 1 and 2. In stage 1 investment is lower than the trend, and in stage 2 investment is higher than the trend. It is reasonable to expect that in the long run, the investment downs in recessions are approximately offset by the investment ups in expansions.

$$(A1) \quad (I_{\text{trend1}} - I_1) / I_{\text{trend1}} = (I_2 - I_{\text{trend2}}) / I_{\text{trend2}}$$

Equation A1 says that the negative investment gap in recession is to be offset by the positive investment gap in expansion. If there is a catastrophic fall of investment, the negative investment gap in stage 1 would be near 100 percent. In equation A1, this implies a positive investment gap of 100 percent in stage 2.

In the Minskian model, the profit equals the sum of investment and the government deficit. For the profit to be stable, the fall of investment in recession needs to be offset by a government deficit of an equal amount. When there is a catastrophic fall of investment, the government needs to generate a deficit as large as the trend investment.

$$(A2) \quad I_{\text{trend1}} = dT_1$$

If the government finance is to be sustainable, the deficits generated in recessions need to be offset by surpluses generated in expansions. Equation A3 is

the same as equation (8) in the text:

$$(A3) \quad dT_1 = sT_2 / (1 + i)$$

T_1 and T_2 are the government tax revenues in state 1 and 2, “ i ” is the interest rate, and “ d ” and “ s ” are the deficit and surplus ratios respectively. Stage 1 stands for recession and stage 2 stands for expansion. Suppose $(1+g)T_1 = T_2$, equation A3 can be rewritten as:

$$(A4) \quad d = s(1+g)/(1+i)$$

If the growth rate equals the interest rate, the deficit ratio equals the surplus ratio. The size of the surplus ratio depends on how vigorous the expansion is. It is reasonable to expect that the higher is the positive investment gap in stage 2, the higher the surplus ratio for the government sector is likely to be. If the government expenditures grow at the same pace as the trend output (and the trend investment), and the government revenues in expansions are designed to move in proportion to investment, the government surplus ratio in expansion is set to be the same as the positive investment gap.²⁷

$$(A5) \quad s = (I_2 - I_{\text{trend}2}) / I_{\text{trend}2}$$

Assume the economic growth rate equals the interest rate, equation A1, A4, and A5 imply equation A6:

$$(A6) \quad d = (I_{\text{trend}1} - I_1) / I_{\text{trend}1}$$

²⁷ In expansions, investment is likely to grow faster than output. On the other hand, with a progressive tax regime, the tax revenue is likely to grow faster than output as well.

That is, the government deficit ratio in recession should equal to the negative investment gap. Substituting A6 into A2, when $I_1 = 0$ (a catastrophic fall of investment), it can be established that $I_{\text{trend1}} = T_1$.

The intuition behind the above analysis is as follows. A large fall of investment requires a large government deficit to stabilize the profit. However, in the long run and in average, large falls of investment in recessions are likely to be offset by large increases in investment in expansions. Large increases in investment allow the government to run larger surpluses. The possibility of running larger surpluses in expansions in turn justifies larger deficit ratios in recessions.

Therefore, the size of the acceptable deficit ratio is likely to correspond to the size of the negative investment gap in recession. A larger fall of investment in recession implies, through the above reasoning, a large acceptable deficit ratio; and a smaller fall implies a smaller deficit ratio. Assume the acceptable government deficit ratio equals the negative investment gap (equation A6), it follows that the government tax revenue needs to be as large as investment to stabilize the profit.

**Appendix C: A Survey of the Conditions of Democratic Management by
Employees in Industrial Enterprises in Henan Province**

Following are the questions, the answers to which have been used to construct the participation index in this paper. Questions not relevant for the purpose of this paper are omitted.

1. How many times the congress of the employees' representatives meet in a year?
 - (a) Does not meet at all.
 - (b) Once.
 - (c) Two or three times.
 - (d) Four or five times.
 - (e) Six times or more.

2. How the decisions with respect to business budget, major investments and ownership changes are made?
 - (a) Made by the management.
 - (b) Primarily made by the management, but the congress of employees' representatives is consulted.
 - (c) Shared by the management and the congress of employees' representatives.
 - (d) Primarily made by the congress of employees' representatives, but the management is consulted.
 - (e) Made by the congress of employees' representatives.

3. How the decisions with respect to the distribution of wages and bonuses and the enterprise's internal rules and policies are made?
 - (a) Made by the management.
 - (b) Primarily made by the management, but the congress of employees' representatives is consulted.

- (c) Shared by the management and the congress of employees' representatives.
 - (d) Primarily made by the congress of employees' representatives, but the management is consulted.
 - (e) Made by the congress of employees' representatives.
4. How the decisions with respect to the use of the employees' benefits fund, the distribution of employees' housing, and other major issues concerning employees' welfare are made?
- (a) Made by the management.
 - (b) Primarily made by the management, but the congress of employees' representatives is consulted.
 - (c) Shared by the management and the congress of employees' representatives.
 - (d) Primarily made by the congress of employees' representatives, but the management is consulted.
 - (e) Made by the congress of employees' representatives.

Appendix D: Output, Inputs, and Capacity Utilization of Chinese Industrial Enterprises with Independent Accounts

(1) Output

Output is defined as real gross output value, which is the gross output value deflated by the producer price index of industry.

(2) Capital

Real stock of capital is constructed from the original value of fixed assets (book value of capital) by using the following formula:

$$K_T = \sum_{t=1}^T (V_t - V_{t-1}) / P_{Kt}$$

where V_t is the original value of fixed assets in year t , and P_{Kt} is the fixed investment price index in year t . For the state owned enterprises and the collectively owned enterprises, the original value of fixed assets in 1980 is assumed to be equal to the newly added fixed assets in 1980. For the other enterprises, similar assumption is made with respect to the original value of fixed assets in 1988.

This method of deflating the original value of fixed assets is widely used in the Chinese and English literature. It is the same method as that used by Lo (1997), and similar to that used by Jefferson, Rawski, and Zheng (1996), and Li and Zhong (1998). Jefferson et al. and Li and Zhong are able to exclude non-productive investment (such as employee residential buildings, employee hospitals and schools provided to employees' children) from the state sector investment. However, the relevant data are not available to this author.

The fixed investment price index is available in *The China Statistical Yearbook* since 1991. I regress the fixed investment price index between 1991-98 on the producer price index of the machine building industry and the implicit GDP deflator of the construction industry. The result is as follows: PFI =

$0.75686 * \text{MACHINE} + 0.262488 * \text{CONSTRUCTION}$, adjusted R-square is 0.9992. This equation is then used to estimate the fixed investment price index before 1991.

(3) Materials

The materials input is defined as the difference between the gross output value and the value added. The real materials input is the materials input deflated by a constructed materials input price index, which is a weighted average of the producer price index of the mining and quarrying industry (with a weight of 0.25), the producer price index of raw materials industry (with a weight of 0.5), and the purchase price index of industrial farm crops (with a weight of 0.25).

The value added of industrial enterprises with independent accounts is available since 1992. Between 1988-91, it can be calculated by adding the net output value with depreciation fund. For the collectively owned enterprises, I regress the value added between 1988-98 on the gross output value and the inverse of the gross output value (the inverse is used to control for the level of the value added in the initial year). The regression result is then used to estimate the value added between 1980-88 (the estimating equation is: $\text{VADDED} = 157.289871 + 0.255734 * \text{GOV} - 9.367822 * \text{GOVINVERSE}$, adjusted R-square is 0.9708).

The value added of all industrial enterprises with independent accounts before 1988 can be estimated by assuming that the share of all industrial enterprises with independent accounts in the China's Industrial Gross Domestic Product is the same as their share in China's gross output value of industry. The difference between the estimated value added of all industrial enterprises with independent accounts and the estimated value added of the collectively owned enterprises is then assumed to be the value added of the state owned enterprises.

(4) Labor

Numbers of staff and workers of the *entire* state, collective, and other industrial sectors can be found in *The China Statistical Yearbook*. The numbers of

staff and workers of the state, collective, and other industrial enterprises with independent accounts are estimated by assuming that the average labor productivity of the industrial enterprises with independent accounts of each type of ownership is the same as the average labor productivity of the entire industrial sector of the relevant type of ownership. The gross output value of the state, the collective, and the other industrial sector is available, allowing the calculation of these sectors' labor productivity.

(5) Capacity Utilization

There is no official measure of capacity utilization for the industrial sector. I use the ratio of the time trend of the capital-output ratio of all industrial enterprises with independent accounts over the actual capita-output ratio as a proxy. The time trend of the capital-output ratio is calculated from the following equation: $TREND = -13.734753 + 0.007466 * YEAR$, where YEAR is between 1980 and 1998.

The above data are available to reader by request.

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Tables

Table 1.1**China's Basic Economic Statistics, 1981-99**

	6th Five Year Plan (1981-85)	7th Five Year Plan (1986-90)	8th Five Year Plan (1991-95)	9th Five Year Plan (1996-2000)
Real GDP growth (Official, %)	10.7	7.9	12.0	8.3
Real GDP growth (Maddison, %) ¹	8.8	5.7	8.7	N.A.
Energy consumption growth (%)	4.9	5.2	5.9	-0.5
Non-agricultural employment growth (%)	7.2	6.3	5.0	1.8
Real merchandise trade Growth (%) ²	8.9	7.8	17.8	9.4
Inflation rate (%) ³	4.2	10.6	14.1	1.6
Trade balance (billions of U.S.\$)	-2.5	-4.3	4.5	29.9
For. direct investment (billions of US\$)	0.7 ⁴	2.9	22.8	42.7
Capital formation rate (%)	34.3	36.3	39.3	37.7
State as % of total fixed investments	67.0	64.9	61.2	52.5
State as % of gross output value of industry	71.3	57.9	45.2	31.1 ⁵

¹ Data for 1980-95 are from Maddison (1998: 157).

² Value of merchandise exports and imports deflated by U.S. producer price index of total finished goods.

³ Growth rates of urban consumer price index.

⁴ 1979-85.

⁵ 1996-99.

Sources: The State Statistical Bureau of the People's Republic of China, *The China Statistical Yearbook*, various issues.

Table 1.2**Selected Studies of the Chinese Industrial Enterprises' Dynamic Efficiency**

(Average annual growth rate of total factor productivity, %)

Author(s)	Period	State	Collective	Large and Medium ¹	Foreign
Jefferson, Rawski, and Zheng (1996) ²	1980-92	2.50	3.43		
	1980-84	2.24	2.80		
	1984-88	3.68	4.52		
	1988-92	1.58	2.98		
Lo (1997), Table 4.2 ³	1980-88	1.54	2.23	3.38	
	1978-92	1.72	1.89	3.76	
	1978-94	2.19	4.01	4.03	
Jefferson, Rawski, Wang, and Zheng (2000)	1980-96	1.72	3.93		
	1980-84	2.08	3.11		
	1984-88	3.78	5.19		
	1988-92	2.11	3.13		1.11
	1992-96	-1.11	4.29		0.67

¹ Most of which are state owned enterprises² For collective enterprises, revised calculations are used.³ The output of all ownership sectors is deflated by the same price deflator.

Table 1.3**Financial Performance of Chinese Industrial Enterprises**

		1986-90	1991-93	1994-97	1998-2000
Ratio of profits and taxes on assets (%)	State	18.2	10.3	5.9	5.5
	Non-state	17.1	12.4	7.1	7.4
Gross rate of return on assets ¹ (%)	State	12.7	6.4	3.7	4.2
	Non-state	13.8	10.2	6.0	6.8
Net rate of return on assets ¹ (%)	State	8.4	2.9	1.3	1.6
	Non-state	9.2	6.1	3.2	3.7
Rate of return on equity ² (%)	State	N.A.	N.A.	3.8	4.2
	Non-state	N.A.	N.A.	8.7	9.5

¹ Ratios of gross and net profits on the value of total assets, gross and net of depreciation. The data for depreciation are available for 1985-91. The average ratios of depreciation to net value of fixed assets for these years are used to estimate the depreciation for the other years.

² Ratio of profits (net of depreciation) over equity capital.

Source: The State Statistical Bureau of the People's Republic of China, *The China Statistical Yearbook*, various issues.

Table 2.1**Total Government Expenditures as a Share of GDP, 1880-1996 (%)**

	1880	1913	1938	1950	1973	1992	1996
France	11.2	8.9	23.2	27.6	38.8	51.0	54.7
Germany	10.0	17.7	42.4	30.4	42.0	46.1	49.7
Japan	9.0	14.2	30.3	19.8	22.9	33.5	36.6
Netherlands	N.A.	8.2	21.7	26.8	45.5	54.1	50.9
United Kingdom	9.9	13.3	28.8	34.2	41.5	51.2	42.3
United States	N.A.	8.0	19.8	21.4	31.1	38.5	36.7
Average	10.0	11.7	27.7	26.7	37.0	45.7	45.1

Sources: The table is directly adopted from Baker, Epstein, and Pollin (eds.) (1998: 16, Table 11), which acquired data from Maddison (1995: 65, Table 3-5) and IMF, *International Financial Statistics*, March 1998.

Table 2.2**Average Annual Growth Rate of Real GDP, 1870-1999 (%)**

	Small Government Era		Big Government Era	1980s	1990s
	1870-1913	1870-1939	1950-1994	1980-90	1990-99
France	1.6	1.5	3.6	2.3	1.7
Germany	2.8	2.5	4.1	2.2	1.5
Japan	2.3	3.0	6.4	4.0	1.4
Netherlands	2.2	2.4	3.5	2.3	2.7
United Kingdom	1.9	1.6	2.4	3.2	2.2
United States	3.9	3.2	3.2	3.0	3.4
Average	2.5	2.4	3.9	2.8	2.2

Sources: The data for the small and big government era are from Maddison (1995). Data for 1980s and 1990s are from World Bank, *World Development Report* 2000/2001.

Table 2.3

Average Annual Growth Rate of Real per Capita GDP, 1870-1999 (%)

	Small Government Era		Big Government Era	1980s	1990s
	1870-1913	1870-1939	1950-1994	1980-90	1990-99
France	1.5	1.4	2.8	1.8	1.2
Germany	1.6	1.6	3.5	2.1	1.1
Japan	1.4	1.9	5.5	3.4	1.1
Netherlands	0.9	1.0	2.5	1.7	2.1
United Kingdom	1.0	0.9	2.0	3.0	1.9
United States	1.8	1.4	2.0	2.1	2.4
Average	1.4	1.4	3.1	2.4	1.6

Sources: See Table 3.

Table 2.4

China's Aggregate Demand Composition, 1980-99

(As % of GDP)

Year	Household	Government 1	Government 2	Central Government 1	Central Government 2	State Investments 1	State Investments 2	Non-state Investments	Inventory Change	Net Exports
1980	50.9	27.0	N/A	14.7	N/A	16.4	N/A	3.6	6.0	-0.3
1981	53.1	23.2	N/A	12.8	N/A	13.6	8.1	6.0	6.7	0.2
1982	52.2	22.4	35.8	11.9	16.8	15.4	10.3	7.0	4.9	1.7
1983	52.4	23.2	37.6	12.5	18.4	15.7	10.1	7.9	4.9	0.8
1984	51.3	23.7	39.3	12.5	19.0	16.5	10.7	9.0	4.8	0.0
1985	52.2	22.8	38.4	9.0	16.3	19.1	14.5	9.8	8.5	-4.2
1986	51.1	21.8	37.3	8.3	15.3	20.5	16.0	10.3	7.4	-2.5
1987	50.6	19.2	34.8	7.2	14.2	20.8	16.6	11.4	4.9	0.1
1988	51.9	16.9	31.5	5.7	11.9	20.5	17.6	11.8	5.9	-1.0
1989	51.8	17.1	32.4	5.4	11.9	17.1	14.8	9.7	10.7	-1.1
1990	49.7	16.8	31.6	5.5	11.3	16.3	14.2	8.4	9.3	2.8
1991	48.5	15.9	30.4	5.1	11.6	17.5	15.7	8.8	7.4	2.9
1992	48.2	14.5	28.6	4.5	11.1	21.3	19.9	10.0	5.1	1.1
1993	45.5	13.5	17.3	3.8	4.5	23.0	21.6	14.9	5.8	-2.0
1994	44.6	12.4	16.1	3.8	4.4	20.6	19.5	15.9	5.1	1.4
1995	46.1	11.7	15.6	3.4	4.0	18.6	17.6	15.6	6.1	1.7
1996	47.1	11.6	17.2	3.1	4.5	17.6	16.7	16.0	5.2	2.1
1997	46.5	12.3	15.9	3.4	3.6	17.5	16.6	15.8	4.4	3.8
1998	46.7	13.7	17.4	4.0	4.2	19.5	17.9	16.5	2.4	3.9
1999	47.8	16.0	N/A	5.0	N/A	19.3	17.1	16.9	1.2	2.7

Source: *China Statistical Yearbook 1999*.

Household: Household consumption.

Government 1: Total government budget expenditures.

Government 2: Total government budget and off-budget expenditures.

State Investments 1: Total state sector fixed investments.

State Investments 2: Total state sector fixed investments excluding those financed by government budgetary funds.

Nonstate investments: Total non-state sector fixed investments.

Inventory change: Changes in inventories.

Net exports: Net exports of goods and services.

Table 2.5**Public Sector Investment and Macroeconomic Stability, 1986-99**

	(1)	(2)	(3)	(4)	(5)
Year	Ann. growth rates of state investments	Ann. growth rates of non-state inv.	Rel. cyclical stance of state inv. ¹	GDP gap ²	Ann. change of inflation rates ³
1986	23.7	20.7	3.0	1.6	-4.9
1987	17.8	29.0	-11.2	3.3	1.8
1988	23.3	29.1	-5.8	4.6	11.9
1989	-7.0	-7.6	0.6	-0.8	-4.4
1990	6.3	-4.5	10.8	-6.3	-15.0
1991	24.4	22.9	1.5	-6.8	3.8
1992	48.1	37.3	10.8	-3.1	3.5
1993	44.1	99.4	-55.2	0.1	7.5
1994	21.3	44.3	-23.0	2.6	8.9
1995	13.3	22.8	-9.5	3.3	-8.2
1996	10.2	19.6	-9.5	3.0	-8.0
1997	9.0	8.6	0.4	2.1	-5.7
1998	17.4	10.0	7.4	0.2	-3.7
1999	3.8	6.7	-2.9	-2.3	-0.7
Standard Deviation	14.7	26.2			
	<i>Correlation Coefficient between (3) and (4) = -0.352</i>				
	<i>Correlation Coefficient between (3) and (5) = -0.478</i>				

¹ (3) = (1) – (2).² The ratio of the difference between actual real GDP and trend real GDP to trend real GDP.³ Inflation rates are measured by the rates of change of the urban consumer price index.Sources: *China Statistical Yearbook 1999*.

Table 2.6**Simplified China's Flow of Funds Account, 1997**

(Billions of Yuan)

	Gross Capital Formation	Capital Transfer	Net Acquisition of Financial Assets ¹	Saving ²
Non-financial businesses	2145.8	-212.8	-905.0	1055.0
Financial institutions	19.6	-0.1	9.3	28.8
Government	232.5	212.9	-30.0	415.3
Households	447.9	0.2	1078.6	1526.7
Rest of the world	0	-0.2	-196.1	-196.3
Total	2845.8	0	-43.2 ³	2802.6

¹ Net acquisition of financial assets is the difference between income (revenue) and expenditures (including investment and consumption). It is the "net lending" of a sector to the rest of the economy.

² Saving is the difference between income (revenue) and consumption. The difference between saving and net acquisition of financial assets is the investment expenditures of a sector.

³ Statistical discrepancy.

Sources: *China Statistical Yearbook 1999*.

Table 2.7**Deposit and Lending Real Interest Rates, 1985-97 (%)¹**

Year	Deposit Rates			Lending Rates	
	Sight deposits	3 year time deposits	Value-guarantee deposits ²	1 year working capital loans	3-5 year capital construction loans
1985	-9.02	-3.98	N/A	-0.78	-2.22
1986	-4.12	1.28	N/A	4.12	5.56
1987	-5.92	0.92	N/A	0.02	1.46
1988	-17.82	-12.42	0	-7.08	-5.64
1989	-13.42	-3.16	0	-7.26	-4.20
1990	0.86	8.78	0	5.26	6.70
1991	-3.30	3.18	0	2.44	3.34
1992	-6.80	-0.32	N/A	1.84	2.74
1993	-12.95	-5.82	0	-13.02	-10.14
1994	-21.85	-12.76	0	-8.52	-5.64
1995	-13.65	-4.56	0	-2.84	0.22
1996	-6.82	-0.60	0	7.18	8.80
1997	-1.12	5.18	N/A	10.38	11.73
Average	-8.92	-1.87	1.57 ³	-0.64	0.98

¹ Nominal interest rates were uniformly set by the People's Bank of China (China's central bank). If the nominal interest rate changed in a year, the rate that was effective for the largest proportion of the year is used. Deposit rates are deflated by the urban consumer price index, and lending rates are deflated by the producer price index of industry.

² Value-guarantee deposits were instituted by the People's Bank of China in the relevant periods. The interest rates on value-guarantee deposits were calculated so that the total nominal interest rate paid offset official inflation rate. Value-guarantee deposits are presented for a year if for any period of the year value-guarantee deposits were available.

³ The average of the higher of 3 year time deposit rates and value-guarantee deposit rates.

Sources: Lardy 1998: 108; *China Statistical Yearbook*, various issues.

Table 2.8**Investment Behavior of State and Non-State Owned Enterprises, 1982-97**

(Dependent variable: annual growth rate of real gross stock of fixed capital)

Dependent Variable	State (dK/K) _t	Nonstate (dK/K) _t	Nonstate (dK/K) _t	State (dI/I) _t	Nonstate (dI/I) _t	Nonstate (dI/I) _t
Intercept	0.102 (12.945)	0.146 (4.040)	0.146 (5.833)	0.098 (1.475)	0.003 (0.015)	-0.024 (-0.132)
(dQ/Q) _t	-0.146 (-1.824)	-0.000 (-0.002)		-0.998 (-1.259)	-0.249 (-0.206)	
(dQ/Q) _{t-1}	0.076 (0.951)	0.169 (1.218)	0.169 (1.283)	1.521 (1.920)	1.776 (1.510)	1.700 (1.583)
Ar(1)	-0.090 (-0.290)	0.174 (0.510)	0.174 (0.546)	-0.580 (-2.362)	-0.416 (-1.464)	-0.414 (-1.528)
Adjusted R-square	0.036	-0.037	0.047	0.265	0.060	0.135
D-W statistic	1.915	1.636	1.636	1.735	1.845	1.867

T-statistics are in parentheses.

Table 2.9**Alternative Scenarios of Macroeconomic Stabilization**

	Low fluctuation	Midrange fluctuation	High fluctuation
Cumulative GDP gaps in expansion	5%	10%	20%
Cumulative public sector cyclical surpluses in expansion ¹	10%	20%	40%
Acceptable public sector cyclical deficits in recession ¹	10%	20%	40%
Fall of private investment that can be offset (without a fall of exports)	12%	24%	48%
Fall of private investment that can be offset (assume net exports fall by 1% of GDP)	6.4%	18.4%	42.4%
Fall of private investment that can be offset (assume net exports fall by 2% of GDP)	0.9%	12.9%	36.9%

¹ As percentage of the public sector regular income.

Assumption 1: GDP gap is defined as in Table 2.5. The cumulative GDP gaps in expansion for midrange fluctuation are assumed to be similar to the actual cumulative GDP gaps between 1993-97.

Assumption 2: The public sector gross profits (as defined by Minsky) is assumed to be 50 percent of the state owned enterprises' value added. The public sector value added moves in proportion to actual GDP. The public sector expenditures (wages and investment) move in proportion to trend GDP.

Assumption 3: Equation A4 (in Appendix), ignoring the economic growth rate and the interest rate.

Assumption 4: Public sector regular income = 120% of private investment; private investment = 18% of GDP

Table 3.1**The Distribution of Large and Medium-Sized Enterprises Across Industries**

Industry	Sample Enterprises	All Enterprises
Coal Mining and Dressing	14	40
Petroleum and Natural Gas Extraction	1	2
Nonferrous Metals Mining and Dressing	7	19
Nonmetal Minerals Mining and Dressing	0	2
Food Processing	9	46
Food Manufacturing	4	11
Beverage Manufacturing	7	50
Tobacco Processing	3	13
Textiles	35	93
Garments and Other Fiber Products	1	5
Leather, Furs, Down and Related Products	0	14
Timber Processing, bamboo, cane, palm fiber and straw products	0	3
Furniture Manufacturing	0	1
Papermaking and Paper Products	6	32
Printing	3	13
Petroleum Processing and Coking	1	7
Chemical Raw Materials and Products	29	129
Medical and Pharmaceutical Products	9	42
Chemical Fiber	4	11
Rubber Products	4	15
Plastic Products	5	16
Nonmetal Mineral Products	20	98
Smelting and Pressing of Ferrous Metals	4	17
Smelting and Pressing of Nonferrous Metals	7	16
Metal Products	4	18
Ordinary Machinery	12	69
Special Purpose Equipment	26	77
Transport Equipment	8	37
Electric Equipment and Machinery	17	46
Electronic and Telecommunications Equipment	2	14
Instruments, Meters, Cultural and Office Machinery	4	12
Other Manufactures	2	3
Electric Power, Steam and Hot Water	18	63
Production and Supply of Gas	2	3
Production and Supply of Water	7	13
Total number of enterprises	275	1050
Coefficient of Correlation = 0.921		

Table 3.2
Financial Indicators of the Sample Enterprises, 1995-98
(thousand Yuan, except for number of employees)

	1995	1996	1997	1998
Average number of employees	2778	2633	2628	2419
Average sales per employee	64.1	64.3	74.3	62.4
Average value added per employee	19.8	21.0	23.8	22.7
Average profit and taxes per employee	8.1	7.2	7.9	5.7
Average total assets per employee	99.5	112.2	139.5	146.1

Table 3.3
Financial Indicators of Large and Medium-Sized Industrial Enterprises, 1998

(thousand Yuan, except for number of employees)

	Sample Enterprises	All Enterprises (random sample)
Average number of employees	2419 (5294)	1545 (2854)
Average sales per employee	62.4 (76.9)	65.8 (102.5)
Average value added per employee	22.7 (37.8)	21.5 (40.1)
Average profit and taxes per employee	5.7 (21.3)	4.8 (23.2)
Average total assets per employee	146.1 (150.1)	135.9 (201.3)

Standard deviations are in parentheses.

Table 3.4

Distribution of the Returned Answers to the Question:

“How many times does the congress of employees’ representatives meet in a year?”

Answer	Number of Firms	Percentage
Does not meet at all	5	1.8
Once	74	26.9
Two or three times	182	66.2
Four or five times	13	4.7
Six times or more	1	0.4

Table 3.5

Distribution of the Returned Answers to the Question:

“How are the decisions with respect to business budget, major investments, and ownership changes made?”

	Number of Firms	Percentage
Management	10	3.6
Primarily by management	160	58.2
Shared by management and employees	63	22.9
Primarily by employees	22	8.0
Employees	20	7.3

Table 3.6

Distribution of the Returned Answers to the Question:

“How are the decisions with respect to the distribution of wages and bonuses and the enterprise’s internal rules and policies made?”

	Number of Firms	Percentage
Management	9	3.3
Primarily by management	133	48.4
Shared by management and employees	77.5	28.2
Primarily by employees	24.5	8.9
Employees	31	11.3

Table 3.7

Distribution of the Returned Answers to the Question:

“How are the decisions with respect to the use of the employees’ benefits fund, the distribution of employees’ housing, and other major issues concerning employees’ welfare made?”

	Number of Firms	Percentage
Management	14	5.1
Primarily by management	102	37.1
Shared by management and employees	81.5	29.6
Primarily by employees	29	10.5
Employees	48.5	17.6

Table 3.8**Participation and Performance: Individual Index Analysis**

Coefficients on individual participation variables, 1995-98 pooled

Index number ¹	The index is intended to measure:	Sales per employee	Value added per employee	Profit and taxes per employee	Adj. profit and taxes per emp.
1	How active the congress of emp. representatives is	0.092 (3.73)	0.063 (2.27)	0.085 (2.09)	0.013 (1.24)
2	Participation in business and investment decisions	0.086 (3.57)	0.050 (1.85)	0.079 (1.98)	0.017 (1.73)
3	Participation in wage distri. and internal rules	0.115 (4.75)	0.089 (3.24)	0.138 (3.42)	0.025 (2.48)
4	Participation in benefits and housing distribution	0.035 (1.42)	0.018 (0.64)	0.061 (1.48)	0.014 (1.33)
Number of Observations		1019	982	820	1019

T-statistics are in parentheses.

¹ Same as the survey question number, see Appendix.

Table 3.9

Correlation Matrix of Individual Participation Indices

	Index 1	Index 2	Index 3	Index 4
Index 1	1.000	0.126	0.082	0.071
Index 2		1.000	0.680	0.617
Index 3			1.000	0.788
Index 4				1.000

Table 3.10**Principal Component Analysis of Participation Indices**

Individual index number	The index is intended to measure:	Eigenvectors	
		Participation 1	Participation 2
1	How active the congress of employees' representatives is	0.113	0.991
2	Participation in business and investment decisions	0.549	0.003
3	Participation in wage distri. and enterprise's internal rules	0.594	-0.090
4	Participation in benefits and housing distribution	0.578	-0.104
Proportion of variation explained		0.603	0.246
Cumulative proportion			0.849

Table 3.11

Ownership and Participation

Mean of the participation indices, stated in multiples of the sample standard deviation

	Participation 1	Participation 2
State owned	3.142	3.578
Collective owned	2.962	3.769
Cooperative	2.931	4.477
Shareholding	3.049	3.510
Foreign	2.463	4.330
Hong Kong	2.390	3.718
Other	2.296	4.327
All sample enterprises	3.090	3.628

Table 3.12A**Participation and Productivity: Principal Component Analysis**

Intercepts and coefficients on industry dummy variables are not reported, 1995-98

pooled¹

Independent variables	Sales per employee	Value added per employee	Profit and taxes per employee
Observations	1019	982	820
Total assets per employee	0.652 (15.65)	0.671 (13.88)	0.820 (11.65)
Employment	0.063 (2.15)	0.003 (0.10)	0.086 (1.71)
<i>Participation1</i>	<i>0.103</i> <i>(4.18)</i>	<i>0.068</i> <i>(2.46)</i>	<i>0.113</i> <i>(2.80)</i>
<i>Participation 2</i>	<i>0.082</i> <i>(3.26)</i>	<i>0.056</i> <i>(1.96)</i>	<i>0.067</i> <i>(1.59)</i>
DUM98	-0.417 (-6.67)	-0.253 (-3.54)	-0.417 (-3.93)
DUM97	-0.274 (-4.32)	-0.237 (-3.31)	-0.271 (-2.61)
DUM96	-0.096 (-1.54)	-0.078 (-1.12)	-0.125 (-1.26)
Adj. R-square	0.510	0.449	0.480

T-statistics are in parentheses.

¹ Coefficients on ownership dummy variables are reported in Table 3.12B.

Table 3.12B**Ownership and Productivity**

Regression results continuing from Table 3.12A

Independent variables	Sales per employee	Value added per employee	Profit and taxes per employee
Collective	0.347 (3.55)	0.426 (3.63)	0.606 (3.45)
Cooperative	0.519 (3.87)	0.342 (2.29)	0.374 (1.74)
Shareholding	0.438 (6.13)	0.309 (3.87)	0.425 (3.69)
Foreign	-0.255 (-0.86)	-0.255 (-0.77)	1.465 (2.29)
Hong Kong	-0.150 (-0.66)	0.541 (2.13)	0.314 (0.84)
Other	0.952 (3.20)	0.566 (1.71)	0.564 (1.25)

T-statistics are in parentheses.

Table 3.13A**Participation and Productivity in State Owned Enterprises**

Intercepts and coefficients on industry dummy variables are not reported, 1995-98

pooled¹

Independent variables	Sales per employee	Value added per employee	Profit and taxes per employee
Observations	1019	982	820
Total assets per employee	0.622 (14.99)	0.643 (13.18)	0.788 (11.14)
Employment	0.069 (2.38)	0.005 (0.16)	0.010 (1.97)
<i>Participation 1</i>	<i>0.120</i> <i>(4.46)</i>	<i>0.077</i> <i>(2.50)</i>	<i>0.158</i> <i>(3.55)</i>
<i>Participation 2</i>	<i>0.132</i> <i>(4.78)</i>	<i>0.082</i> <i>(2.61)</i>	<i>0.139</i> <i>(2.94)</i>
DUM98	-0.406 (-6.62)	-0.246 (-3.47)	-0.416 (-3.96)
DUM97	-0.272 (-4.37)	-0.234 (-3.30)	-0.278 (-2.71)
DUM96	-0.098 (-1.61)	-0.080 (-1.16)	-0.136 (-1.38)
Adj. R-square	0.530	0.434	0.465

T-statistics are in parentheses.

¹ Coefficients on ownership dummy variables and ownership-participation interaction variables are reported in Table 3.13B.

Table 3.13B

Participation and Productivity in Non-State Owned Enterprises

Regression results continuing from 3.13A

Independent variables	Sales per employee	Value added per employee	Profit and taxes per employee
Ownership:			
Collective	0.415 (4.03)	0.477 (4.03)	0.691 (3.94)
Cooperative	0.537 (3.15)	0.238 (1.24)	0.392 (1.41)
Shareholding	0.421 (5.90)	0.314 (3.89)	0.398 (3.41)
Ownership*PAR1:¹			
Collective	0.136 (1.10)	0.050 (0.36)	-0.155 (-0.78)
Cooperative	-0.364 (-2.48)	-0.248 (-1.50)	-0.748 (-3.06)
Shareholding	-0.173 (-2.52)	-0.073 (-0.93)	-0.218 (-1.93)
Ownership*PAR2:¹			
Collective	-0.368 (-3.62)	-0.241 (-2.06)	-0.495 (-3.06)
Cooperative	-0.177 (-0.85)	0.094 (0.40)	-0.313 (-0.98)
Shareholding	-0.213 (-2.49)	-0.125 (-1.30)	-0.283 (-2.08)

T-statistics are in parentheses.

¹ Coefficients stand for the *differences* in the effects of participation on productivity between each type of non-state owned enterprises and the state owned enterprises.

Table 3.14
Testing the Relationships between
the Participation Variables and Other Independent Variables

Coefficients on industry and dummy variables and intercepts are not reported,

1995-98 pooled

	Participation 1	Participation 2
Total assets per employee	-0.078 (-1.42)	-0.002 (-0.04)
Employment	0.113 (2.95)	-0.041 (-1.09)
Collective	-0.123 (-0.91)	0.098 (0.74)
Cooperative	-0.268 (-1.53)	0.492 (0.172)
Shareholding	-0.048 (-0.51)	-0.036 (-0.39)
Foreign	-0.251 (-0.65)	1.182 (3.11)
Hong Kong	-0.737 (-2.48)	-0.013 (-0.05)
Other	-0.692 (-1.78)	0.624 (1.64)
Adj. R-square	0.177	0.190

T-statistics are in parentheses.

Table 4.1
China's Urban Unemployment, 1990-97

	Registered Unemployment (thousand)	Registered Unemployment Rate (%)	Unemployed Laid Off Workers (thousand)	Actual Unemployment Rate (%)*
1990	3,832	2.5		
1991	3,522	2.3		
1992	3,639	2.3		
1993	4,201	2.6		
1994	4,764	2.8	3,000	4.6
1995	5,200	2.9	4,090	5.2
1996	5,528	3.0	5,910	6.2
1997	5,700	3.1	13,660	10.5

* Ratio of the sum of the registered unemployed and unemployed laid off workers to the urban labor force.

Sources: ZGFB, 1998, p. 467; Yang, Y., 1997, pp. 218-221; Liu and Gao, 1999, pp. 299-304. The Chinese State Statistical Bureau provides statistics of registered unemployment rates in the urban sector. A registered unemployed person is one who makes registration at the government office as unemployed. Workers who are "laid off" (*xiagang*) from state and collectively owned enterprises are technically not considered to be unemployed. There are no official statistics of laid off workers. But some economists have made estimates of numbers of laid off workers in recent years. These estimates are available in Liu and Gao (1999) and Yang (1997).

Table 4.2
Productivity Growth and Capacity Utilization

Chinese Industrial Enterprises with Independent Accounts, 1981-98

Dependent Variable:	State (1981-98, N = 17)	Collective (1981-98, N = 17)	Other (1989-98, N = 9)
Productivity Growth			
INTERCEPT	0.040 (1.499)	-0.035 (-1.129)	0.041 (1.163)
CAPITAL	0.121 (0.458)	0.834 (2.591)	0.299 (2.733)
MATERIALS	0.323 (4.146)	0.366 (1.783)	0.618 (7.660)
LABOR	-0.680 (-2.193)	0.295 (1.686)	-0.121 (-1.396)
CAPACITY	0.747 (4.547)	0.787 (2.367)	0.375 (2.085)
AR(1)	-0.375 (-1.214)	0.400 (1.383)	0.520 (1.069)
Adj. R-square	0.828	0.903	0.857
D-W Statistic	2.099	2.036	1.465

T-statistics are in parentheses..

Table 4.3
Capacity Utilization and Aggregate Demand

(1981-98, N = 17)

Dependent Variable	Capacity Utilization Rate	Capacity Utilization Rate	Capacity Utilization Rate
Intercept	0.831 (2.961)	0.833 (3.640)	0.785 (7.988)
Change in inflation rate	0.453 (2.984)		
GDP gap		1.013 (1.673)	
Nominal GDP growth			0.569 (2.287)
AR(1)	0.895 (4.215)	0.882 (4.735)	0.818 (4.220)
Adj. R-square	0.667	0.550	0.637
D-W Statistic	2.161	1.662	2.008

T-statistics are in parentheses.

Table 4.4
Rate of Return of State Owned Enterprises and Deposit Interest Rate
1993-99

	Rate of Return of State Owned Enterprises (%) ¹		Deposit Interest Rate (%) ²	
	Profits / Equity	(Profits + Taxes) / Assets	Nominal	Real ³
	1993	7.70	7.54	10.28
1994	6.72	7.48	12.24	-12.76
1995	4.10	6.05	12.24	-4.56
1996	2.24	5.19	9.40	-0.60
1997	2.09	4.92	8.28	5.18
1998	1.96	4.50	4.95	5.55
1999	3.26	5.07	2.70	4.00
Average	4.01	5.82	8.58	-1.29

¹ State owned industrial enterprises with independent accounts.

² 3 year time deposit rate. If the nominal interest rate changed in a year, the rate that was effective for the largest proportion of the year is used.

³ Nominal interest rate less the growth rate of urban consumer price index.

Source: *China Statistical Yearbook*, various issues.

Table 4.5
Capacity Utilization and Inflation

(1981-98, N = 17)

Dependent Variable	INFLATION	INFLATION
INTERCEPT	-0.257 (-0.903)	-0.377 (-2.101)
EXINFLATION		0.637 (1.402)
CAPACITY	0.375 (1.211)	0.435 (2.230)
AR(1)	0.587 (2.085)	0.192 (0.318)
Adj. R-square	0.306	0.431
D-W	1.636	2.026

T-statistics are in parentheses.

Table 4.6**Alternative Scenarios: Effects of Aggregate Demand Expansion**

	Conservative	Mid-range	Optimistic	Assumption Applied ¹	
	Scenario	Scenario	Scenario		
ΔCapacity utilization	10%	15%	20%		N.A.
Capacity utilization	85%	90%	95%	(1)	Initial Z = 0.75
Nominal GDP growth	11.4%	20.2%	28.9%	(2)	Z = 0.785 + 0.57gdp
ΔProductivity	7.5%	11.25%	15%	(3)	Δy/Δ Z = 0.75
%ΔEffective employment	8.6%	12.8%	17.1%	(4) and (5)	labor elasticity of output = 0.11
ΔDisguised unemployment ²	6.5%	9.6%	12.8%	(6)	Initial disguised unemp. rate = 25%
%ΔDisguised unemp.	-26%	-38.4%	-51.2%		Same as above
Inflation 1	6.3%	8.2%	10.1%	(7)	Table 5
Inflation 2	-1.7%	4.4%	10.6%		Same as above

¹ For details of the assumptions applied, see Assumptions of Table 6.

² As a percentage of the total employment.

Assumptions of Table 4.6

Assumptions:

- (1) Initial capacity utilization rate = 0.75. The measured capacity utilization rate in 1998 was 0.76.
- (2) $Z = 0.785 + 0.57 \text{ gdp}$, where Z is the capacity utilization rate, and gdp is the growth rate of nominal GDP (regression results, Table 3).
- (3) $\Delta y/\Delta Z = 0.75$, where y is productivity (regression results, Table 2).
- (4) The marginal product of labor increases by the same proportion as productivity, as a result of higher capacity utilization.
- (5) In 1998, total workers' compensation accounted for 11.2 percent of the gross output value of state owned industrial enterprises with independent accounts. Assume labor elasticity of output is constant and equals 0.11, a one percent increase in labor input results in a 0.88 percent fall in the marginal product of labor. After the initial increase in the marginal product of labor, if real wage does not change, effective employment should increase until the marginal product of labor falls to its previous level. It follows that a one percent increase in productivity allows for a 1.14 percent increase in effective employment. (I did run regression of the state sector workers' real compensation on the rate of capacity utilization, controlling for the capital-labor ratio. The coefficient was actually negative, although not statistically significant.)
- (6) Initial disguised unemployment rate = 0.25; and initial effective employment rate = 0.75 (both rates are ratios over the total employment in the state and the urban collective sector).
- (7) Inflation 1 and Inflation 2 are estimated with regression results for equation (8) and equation (9) respectively, reported in Table 5.

Table 4.7

Alternative Scenarios: Composition of Aggregate Demand Expansion

	Conservative	Mid-range	Optimistic	Assumption
	Scenario	Scenario	Scenario	Applied
Nominal GDP growth	11.4%	20.2%	28.9%	N.A.
Δ TAX	16.4%	25.2%	33.9%	(1)
Δ FISCAL	16.4%	25.2%	33.9%	(2)
Δ STATEINV	25%	25%	25%	(3)
Total GDP growth generated by the public sector	7.2%	8.8%	10.4%	(4)
Additional GDP growth to be generated	4.2%	11.4%	18.5%	N.A.
The required growth rate of the rest of the economy	6.5%	17.5%	28.5%	N.A.

Assumptions:

- (1) The growth rate of the government tax revenue (Δ TAX) = the growth rate of nominal GDP + 5 percent.
- (2) The growth rate of the government fiscal spending (Δ FISCAL) = the growth rate of the government tax revenue.
- (3) The growth rate of the state sector investment (Δ STATEINV) = 25%.
- (4) The government fiscal spending accounts for 18 percent of GDP, and the state sector investment (excluding the part financed by the government budgetary funds) accounts for 17 percent of GDP.

Table A1.1**Regression Analyses of GDP Levels, Energy Consumption and Trade Volume**

(1980-95)

Dependent variable	Lnofficial	Lnofficial	LnMaddison	LnMaddison
Intercept	-10.072 (-6.421)	-6.893 (-4.215)	2.161 (1.586)	4.849 (3.777)
Lnenergy	1.242 (6.975)	0.849 (4.359)	0.975 (6.374)	0.648 (4.309)
Lntrade	0.211 (2.865)	0.403 (4.593)	0.127 (2.087)	0.279 (4.272)
Ar(1)	0.531 (3.069)		0.551 (3.788)	
Ar(2)		-0.038 (-0.283)		0.105 (0.993)
Adj. R-square	0.998	0.998	0.998	0.998
D-W statistics	1.340	1.690	1.589	1.817
Estimated GDP growth (1996-2000)	1.3%	3.3%	0.7%	2.2%

*T-statistics are in parentheses.

Source: The State Statistical Bureau of the People's Republic of China, *The China Statistical Yearbook*, various issues.

Figures

Figure 4.1

