CHINA'S INDUSTRIAL RESTRUCTURING IN THE TWENTY-FIRST CENTURY[1]

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Since the start of reform and opening-up, China's national economy has been developing at an unprecedented and sustained high rate. China's industrial structure is upgrading in the course of industrialisation, but there are still structural problems due to the economic system and geographical disparities. Deflation in China after the Asian financial crisis made such structural distortions an even more pressing issue. China needs a clear understanding of the existing problems and the challenges to readjustment for the twenty-first century in order to optimise the industrial structure and put national economic development on a healthy path at a sustained, fast rate.

The first part of this chapter reviews the changes in China's industrial structure over the past two decades. The second part discusses the major problems with China's current industrial structure and the third part describes the expected challenges in the twenty-first century. The last part gives some policy suggestions for industrial restructuring in the coming century.

CHANGES IN INDUSTRIAL STRUCTURE OVER THE LAST TWO DECADES

Changes in Three-sector Structure

After China launched reforms and opened its doors to the outside world, the process of industrialisation apparently accelerated. From 1979 to 1998 GDP increased at an average annual rate of 9.7 percent. Primary industry grew at 5.1 percent per year on average whereas the secondary and tertiary industries grew at average rates of 12.0 and 11.2 percent, respectively. The different growth rates of the three sectors resulted in striking changes in China's industrial structure. These changes largely followed the evolutionary rule that governs industrialisation of all countries in the medium-term, that is, the share of value-added of primary industry decreases, whereas the shares of secondary and tertiary industries increase. In China, from 1978 to 1998 the primary sector fell from 28.1 percent of GDP to 18.4 percent while the share of the tertiary sector rose from 23.7 to 32.9 percent (Table 10.1).

In several ways these changes in industrial structure clearly reflect state policies and the government's strong influence over economic activity. First, the contribution of cultivation to total agricultural output value decreased dramatically. In 1979, under the policy that emphasised self-reliance in grain supply, crop cultivation contributed as much as 80 percent of agricultural output, compared to animal husbandry which accounted for 15.0 percent, forestry, 3.4 percent, and fisheries, 1.6 percent. By 1998, however, cultivation represented a mere 58.0 percent of primary sector value added while the shares of animal husbandry, forestry, and fisheries had risen to 28.6, 3.5, and 9.9 percent respectively. Farmers' control over agricultural production decisions increased and they could tailor their output to the market.

Second, the shares of light and heavy industry have become more rational. In order to relieve the severe shortage of consumer goods at the end of the 1970s, government policy gave top priority to light industry, and consequently its share of secondary sector output rose significantly, from 43.1 percent in 1978 to 50.2 percent in 1982. Industries producing consumer commodities developed swiftly in all parts of the country, and by the end of the 1980s China had largely eliminated the quota system for consumer goods. At present, daily necessities, by and large, tend to be over-supplied. Since the beginning of the 1990s, the government has spent more on basic industries and infrastructure facilities and the heavy industrial sector has resumed its development momentum (Table 10.2).

Third, the tertiary sector, including finance, insurance, and other service industries is increasing dramatically. Since the 1980s the government has attached much importance to this sector, which is the largest contributor to value added and employs the greatest number of workers. Within the tertiary sector the shares of transportation, telecommunications, commerce slipped, while the share of the finance and insurance industries increased (Table 10.3).

Changes in Ownership

Since China's reform and opening-up began in the late 1970s, the government has adopted a series of proactive policies to encourage and support the development of the non-public economy. This has brought great changes in the ownership structure of the economy.

Public Economy

The public economy's place in the national economy has diminished over the last two decades, although it still far outweighs the non-public economy's share. In 1997 the public economy, which includes state- and collective-owned enterprises, accounted for just over three-fourths of GDP, although this was 23.3 percentage points lower than its share in 1978 (Table 10.4).[2] Output of state-owned enterprises amounted to 3,129.6 billion yuan (including 486 billion yuan attributed to partially state-owned enterprises) and the output of collective-owned enterprises was 2,538 billion yuan (including 165.7 billion yuan produced by partially collective-owned enterprises).[3] The output of state-owned enterprises fell from 56.2 percent of total GDP in 1978 to 41.9 percent in 1997 and the output of collective-owned enterprises dropped from 42.9 percent to 33.9 percent. Despite this diminished role, the public economy retains absolute preponderance in basic natural monopoly industries such as railways, post and telecommunications, water, electric power, coal, and gas as well as in such sectors such as civil aviation, finance, insurance, and education.

Non-public Economy

The fast-growing non-public economy, which includes private Chinese-owned as well as foreign-owned companies and companies based in Hong Kong, Macao, or Taiwan, has become an important part of the national economy. It accounted for almost one-fourth (24.2 percent) of output in 1997 compared to under one percent in 1978 (Table 10.4). Not only has the total amount of output by the non-public enterprises increased significantly, but also non-public enterprises account for a

significant share of output in many industrial sectors. The non-public economy contributed over half (53.8 percent) of total value added in the wholesale and retail trade and restaurant industries in 1997. The industries with the next largest output contributions by the non-public economy output were agriculture (27.5 percent) and manufacturing (21.2 percent). Even in the transportation and post and telecommunications industries, where state and collective enterprises' presence is greatest, the non-public economy contributed more than 10 percent of industry output.

The distinctive feature of the change in ownership in China has been the shift from a single type of ownership—by the state—to a system with various types of ownership. Such diversity is conducive to effective allocation of social resources, to competition among enterprises, and to improved economic efficiency.

Changes in Employment Structure

Since 1978 employment in China has been expanding through three main channels:

- vigorous development of the tertiary sector in size and area;
- structural readjustment of ownership so that collective and private economies have absorbed a great number of workers;
- adherence to market-oriented reform with market levers to allocate labour.

In 1998 employment stood at 699.57 million persons, up 74.2 percent (401.52 million) since before the reform and opening-up began in 1979. Employment in cities and townships increased even more dramatically. In 1998 employment in cities and townships (206.78 million people) was 117.3 percent above the level 1978. The employment mix changed in two significant ways.

Rapid Growth of Secondary and Tertiary Sector Employment

Employment in the secondary and tertiary sectors grew very fast. In 1978, 70.5 percent of total employment was in the primary sector, 17.3 percent in the secondary sector and 12.2 percent in the tertiary sector. By 1998 the primary sector share had dropped to 49.8 percent, while the share of the secondary sector had risen to 23.5 percent and the share of the tertiary sector had more than doubled to 26.7 percent (Table 10.5).

Rapid Increase in Non-public economy Employment

Employment outside of the public economy increased rapidly after the public economy was established as the leading sector in a system with several coexisting sectors. The non-public economy quickly absorbed a growing number of workers. By the end of 1998, joint-stock economic entities employed 4.1 million workers, economic entities with investment from foreign business, Hong Kong, Macao, or Taiwan employed 5.87 million, and private and household entities employed 78.24 million. The increase in non-public economy employment was even more apparent in cities and townships (Table 10.6).

In a nutshell, China's industrial structure changed significantly during the two decades of reform and opening-up that accelerated the industrialisation and transformation from a socialist planned

economy to a market-oriented economy which brought the economy to a new stage of development.

MAJOR PROBLEMS IN THE EXISTING INDUSTRIAL STRUCTURE

While restructuring has effectively reduced industrial disparity in China over the past two decades, the industrial structure today is still far from complete compared with that of other economies at a similar stage of development and it has not reached the targets for domestic economic growth and reform.

Reliance of Agriculture on the Natural Environment and Resource Constraints

In the late 1970s introduction of the contract responsibility system that linked remuneration to output was the beginning of the shift from a socialist planned economy to a market-oriented economy. This reform set productive forces loose, greatly boosting agricultural output and the rural economy. As a basic industry, agriculture has played an important role in sustaining the stable and healthy development of the national economy. However, China's agricultural sector—with individual households as the typical production unit and grain as the major product—relies too heavily on the natural environment and it is constrained by the available natural resources.

There are three principal problems. First, basic agricultural infrastructure is inadequate and the capacity to withstand disaster is diminishing. Although the state has stepped up efforts to support agriculture, funds earmarked for basic agricultural facilities are limited. Many such facilities operate above capacity, thus straining their ability to cope with natural disasters. The second problem is that the amount of arable land has decreased drastically in recent years because of urbanisation and industrialisation. From 1990 to 1995 the total amount of land under cultivation decreased 455,000 hectares. China's currently has only 0.08 ha per capita of arable land, roughly one-third the world average. The third problem is that the condition of land resources and the ecological environment is deteriorating as a result of heavy reliance on chemical fertilisers and pesticides to increase grain output.

Over-capacity in Low Value Added Processing and Similarity in Industrial Structure among Regions

As economic reforms decentralised decision-making and gave local governments and enterprises more autonomy over investment, the general processing industry developed very quickly, at an average 21.6 percent per year from 1990 to 1995. With a growth rate 7.2 percentage points higher than the growth rate of such basic industries as energy and raw materials, general processing has reached a state of excess capacity. According to the Third General Survey of Industries, in 1995 more than half of the 900 major industrial products was turned out by enterprises that were operating below 50-percent capacity. Capacity utilisation was only 43.4 percent among manufacturers of washing machines, 34.5 percent for manufacturers of industrial bearings, and 13.3 percent for makers of photographic film. At the same time that the processing industry has surplus capacity, high-tech and high-quality processed items are in short supply and demand has to be met by imports.

Excess capacity in low value added processing is manifested in the lack of geographical

specialisation and duplication of industrial activities in many locations around the country. For example, according to the Third General Industrial Survey, in 1997 TV sets were produced in 29 different provinces and regions, refrigerators and washing machines were made in 23 different areas, and items such as textiles, plastics, bicycles, motors, and chemical fibres were produced in more than 20 different locations. According to one estimate, the industrial composition of the eastern, central, and western parts of China is correlated as closely as 93.5 percent, and the correlation is even higher among cities and regions within provinces.

Slow Growth of the Tertiary Sector and Burgeoning Sectors

The growth of the tertiary sector has been decelerating since the 1990s. The average growth rate for 1991-95 was 10 percent per year, which is not only below the 17.4 percent annual growth rate of the secondary sector but also lower than the 12 percent annual average growth of GDP during the same period. China is falling behind other countries in the tertiary sector's share of value-added in GDP. At 32.8 percent in 1998, the tertiary sector's share in China was 10 percentage points or more below the share in other Asian countries at similar levels of development, including India (42.1 percent), Thailand (49.7 percent), Malaysia (43.8 percent), and Indonesia (41.4 percent).

Furthermore, China's tertiary sector still focuses on traditional commerce and service trade. There are three main reasons why China lags far behind the developed countries in finance, insurance, information, consulting, and technology. First, industrialisation in China is still at the stage when the secondary sector is expanding and the market for tertiary products is sluggish. Second, the government still exercises control over or monopolises certain emerging segments of the tertiary industry. Third, some industries in the tertiary sector require a high level of knowledge, service, and management, which China cannot yet provide.

Delayed Progress in Industrial Technology

China's industries are technologically backward and productivity is low, across-the-board in primary, secondary, and tertiary sectors. Only 30.3 percent of economic growth during the 1978-90 period came from technological progress contributed and around 35 percent in the 1990s. In comparison, 50 to 70 percent of the growth of developed countries during the 1980s was due to technological progress.

China's slow progress in industrial technology is mainly due to two factors. One is the stagnant scientific and technological system. In China, basic and applied research are divorced from commercial production and there is a low rate of application of scientific and technological achievements. The other is the lack of spending on scientific and technological research. In 1997 China invested 39.4 billion yuan, or 0.6 percent of GDP, in R&D far below the share in developed countries and in newly industrialised economies such as Korea (2.79 percent in 1996) and Singapore (1.35 percent in 1996). Besides, scientific and technological input is not directed toward enterprises. In 1997 only 42.9 percent of China's total R&D expenditures went to enterprises, well below the 60

percent average for developing countries.

Over-diversification of the State-owned Economy

Although non-state economies have made remarkable gains over the past two decades, the pattern of state involvement extending to all sectors remains essentially unchanged from the traditional planned economy. The state's limited capital is diluted among too many enterprises and industries, with over 60 percent of the state's current operating capital in such competitive industries as manufacturing, construction, trade, and restaurant and beverages. According to the Third General Industrial Survey, 63 percent of the total value of fixed assets of independent-accounting industrial enterprises is in large-sized enterprises and 35 percent is in small and medium-sized enterprises. Thus, the state invests more than one-third of the its assets in numerous small and medium-sized enterprises, while its does not invest sufficiently in many sectors for which government should be responsible, such as infrastructure, education, and high technology.

Inefficient Industrial Structure

Inefficiency of China's industrial structure is seen in two main aspects: enterprises are too small and co-ordination among industries is too limited. Only a few of the existing state-owned enterprises have attained the minimum economic scale required by modern technology. This is true even in such leading industries as automobiles, steel, chemicals, and other industries that apparently have scale economies. As a result, state-owned enterprises are not competitive either at home or abroad. According to statistics for 1997, as much as 56 percent of total capital investment went to small-scale capital construction projects. For example, recipient iron and steel plants and cement plants had average production capacity of 34,000 tons and 88,000 tons respectively, and the annual output of recipient carmakers was below 10,000 vehicles. Moreover, there is a lack of co-ordination among industries. The propensity of state-owned enterprises to be vertically integrated and autonomous deprives the economy of the benefits of an efficient division of labour and co-ordination among various manufacturing industries. Instead, state-owned enterprises compete excessively with each other, and this further weakens their international competitiveness.

CHALLENGES OF INDUSTRIAL RESTRUCTURING IN CHINA IN THE NEW CENTURY

Economic Globalisation and Entry into the WTO

The world economy is rapidly moving in the direction of globalisation and regional conglomeration, and this trend will accelerate in the twenty-first century. After two decades of reform and opening-up, China is integrating with the world economy. Investment from abroad amounts to US$40 billion or more per year, and reliance on foreign trade ((imports + exports)/GDP) approaches 40 percent. China's entry into the WTO will create a relatively stable external environment for economic development, induce co-operation and participation in the international division of labour, protect rights and interests through multilateral dispute settlement mechanisms, and broaden enjoyment of the advantages of liberal international trade and investment. From analysis of a

sectoral input-output model the Development Research Centre of the State Council estimates that China's entry into the WTO will boost economic growth. In the long run, liberal trade and investment will help optimise the distribution of resources, upgrade industry, and improve welfare for the whole nation by allowing full use of both foreign and domestic markets. At present, though, China is a developing country with wide disparities among sectors and regions and a yet incomplete market mechanism. The WTO requirement to open the domestic market means that certain industries will face the pressure of external competition for the first time. If it must open its markets too widely, too quickly, China faces the possibility of many bankruptcies of factories in less competitive sectors and resulting high unemployment. For this reason, the government's active approach to negotiating WTO entry aims to co-ordinate the timing of the liberalisation of trade and investment as much as possible with the restructuring of industry. This means that China will have to address the structural economic problems discussed above during the early years of the new century.

Population and Employment Pressure

With the world's largest population, China has a huge number of workers, and ensuring adequate employment opportunities and an appropriate employment structure are constant problems. Natural population growth creates continual pressure to expand employment. The labour force increased an average of 12.5 million people per year in the first five years of the 1990s and it is expected that the increase was 14.5 million people per year in the second half of the decade. According to official estimates the labour force will increase 13 million per year on average in the first 10 years of the twenty-first century.

Disguised unemployment or under-employment adds to employment pressure. Vigorous development of township enterprises and increased agricultural productivity have created a huge surplus of rural labour. From 1979 to 1998 more than 240 million rural labourers flocked to towns and cities for jobs. Surplus rural labour is expected to reach 165 million in 2000 and to surpass 300 million people in 2010. Moreover, continuing enterprise reform and restructuring in cities will certainly result in a great number of workers being laid off from SOEs. Thus, at the start of the twenty-first century, China faces employment pressures arising from population growth and industrialisation, on one hand, as well as pressure to increase capital density as a channel to improve the country's economic efficiency and competitive edge, on the other. It will be a difficult task to address the needs of both the capital-intensive and labour-intensive economies.

Resource and Environmental Constraints

Population growth and acceleration of urbanisation and industrialisation are straining China's resources and environment in six areas.

- Accelerating desertification. Currently, 27.3 percent of China's total land area is desert. The increase in desert area drastically reduces useable land area and soil fertility, depletes the natural environment, and destroys conditions for agricultural production.
- Worsening soil erosion. Areas of soil erosion make up 38.2 percent of China's total land area.

- Decreasing forest resources. Cutting and consumption far in excess of new growth are drastically reducing forest resources.
- Diminishing water resources. With only 2,300 cubic meters of fresh water per capita China's resources are only one-fourteenth the world average. Eighteen provinces and regions, with 30 percent of China's land and 60 percent of the population, are on the verge of severe water shortage.
- Deteriorating air quality. The major source of air pollution is coal, which makes up more than 75 percent of energy consumption. Smoke dust and sulphur dioxide account for as much as 90 percent of total emissions.
- Depleting mineral and energy resources. Mines and deposits of some major energy resources that support industrialisation are in short supply, and some are even on the verge of exhaustion.

Intensive operation and inefficiency are the reasons for China's too rapid consumption of resources and its heavy pollution of the environment. According to one survey, 70 percent of pollution originates from the secondary sector, and this sector will continue to develop as China proceeds to industrialise. Balancing industrialisation with effective utilisation of resources and protection of the environment poses a severe challenge for readjusting China's industrial structure in the next century. Failure to address these issues properly will have a direct impact on the sustainable development of the national economy.

POLICY CHOICES FOR INDUSTRIAL RESTRUCTURING IN THE TWENTY-FIRST CENTURY

Strategic Reshaping of State-owned Economy

In 1998, based on two decades of experience with reform and opening-up, the Chinese government adopted special measures to reshape the state-owned economy and deepen the reform of state-owned enterprises (SOEs). These measures illuminated the strategic direction for industrial restructuring in the twenty-first century. This direction can be summarised as follows:

- Reshaping the state-owned economy should be integrated with industrial upgrading and carried out under the principle of "dos and don'ts, advances and withdrawals". The state-owned economy must remain dominant in certain major industries and key areas and at the same time gradually withdraw from competitive sectors. Specifically, the state-owned economy will hold a controlling position in areas that: 1) involve state security (arms manufacture, coinage); 2) are natural monopolies (railways and electric power); 3) provide important public goods and services (ports, expressways); and 4) are backbone or key industries (information technology and high-tech industries). In other sectors and areas, concentration and capital reorganisation and restructuring can improve the quality of state-owned economic entities. The government will in principle not inject any more investment into competitive industries.
- Deepening SOE reform will involve:

  Continuing efforts to move toward a modern enterprise system, to step up privatisation of state-owned enterprises, to actively explore and test effective models for management of state-owned assets, to turn medium and large-sized SOEs into independent, market-oriented legal entities.

  Improving SOEs' mix of assets and liabilities and gradually reducing the social burdens on SOEs as macroeconomic and financial conditions permit.

Accelerating technological progress and industrial upgrading of SOEs and revamping traditional industries by introducing advanced technology and market-oriented operating mechanisms.

Continuing strategic reorganisation of SOEs to make the most of the market mechanism to cultivate large-scale enterprises and complexes, while relaxing control over small and medium-sized enterprises.

The strategic reshaping of the state-owned economy has determined the orientation of industrial restructuring at the macro level, and the reform of SOEs has provided the micro-foundation for industrial restructuring. Overall, the state-owned economy is expected to increase in absolute size in terms of value added, as SOEs become more efficient and better managed. However, the state-owned economy's share of the national economy will decrease, and its presence in different industries will be determined on a more rational basis.

The withdrawal of the state-owned economy from competitive areas has created a rare opportunity for the non-public economy. China's practice has proven that non-public economic entities, especially private entities, are sources of high growth and absorbing surplus labour. Although the non-public economy has developed remarkably in the last two decades, it has not yet reached its full potential. In 1998 the National People's Congress adopted a revised draft of the Constitution that established the status of private economic entities. In the next century non-public, and especially private, economic entities will expand greatly and become an important force for industrial restructuring and upgrading.

The government must take several steps to create an adequate environment for the non-public economy. First, it must strengthen the legal system. The government should accelerate adoption of legislation regarding private economic matters so that the legitimate rights and interests of private enterprises have legal protection. Second, the government should improve the competitive environment by putting private enterprises on an equal footing with SOEs. It should allow private enterprises more room to operate and expand, and treat them the same as other economic bodies in such matters as personnel, financing, taxation, land use, and importing and exporting. Third, the government administrative system for private economic entities should be changed from the current multi-department system to a single-level administration. Fourth, the government should provide for a system of pension, unemployment, and health and medical care services that is independent of enterprises.

Positive Stance toward Continued Opening-up

Opening-up to the outside world is one of China's long-term state policies. At the beginning of the 1990s China instituted large cuts in import duties, lowering the total tariff level to 17 percent. It reduced the number of items under non-tariff restriction from 1,530 to around 500, of which 146 are the electrical machinery category. This is roughly similar to the level of tariff protection enjoyed by producers in Japan in the early 1970s. The government has undertaken to further readjust the tariff structure downward to 10 percent by the year 2005.

Given the ongoing economic and technological globalisation, the Chinese government is fully aware that it cannot restructure industry with the country's doors closed. It intends to actively pursue the current open policy. In order to attract more foreign investment, encourage import of advanced technologies and equipment, heighten the utilisation of foreign capital, and boost industrial restructuring and technological progress, the government has recently formulated some new measures. These measures are designed to encourage foreign investors to develop technology and innovation and expand local procurement; to give greater financial backing to foreign-funded enterprises; to encourage foreign business people to invest in the central and western areas; and to further improve the management of and service to foreign-funded businesses.

China's strategic economic restructuring and deepening of SOE reform represent an unprecedented opportunity for foreign investors. Domestic demand for foreign funds is surging. Strategic restructuring of the state-owned economy aims to concentrate state-owned assets in a few key sectors while withdrawing them from most other industrial sectors. This withdrawal may involve either transfer of physical assets or sale of equity. It is estimated to that the ongoing reorganisation of SOE capital (assets) will require a total of 2 to 2.6 trillion yuan. Domestic sources alone cannot provide such a huge amount of funds, and foreign investment can be an important supplement. There are significant opportunities for foreign investment in the industries from which the state-owned economy is withdrawing (including general manufacturing and a considerable portion of the commercial and service sector), in the transfer of SOE equity, and in the reform of small and medium-sized SOEs, which are currently reorganising through merger, leasing, contractual operation, auction, and joint-stock co-operation. Such foreign investment typically takes one of five forms: full acquisition, majority ownership, purchase of a small number of shares, operation on a contract or lease basis, or establishment of a proprietary business after the state withdraws from the sector. Full acquisition and majority ownership by foreign investors are only permitted in sectors from which the state has already withdrawn.

The environment for foreign investors will continue to improve. Establishing a modern enterprise system and clearly defining property rights will make it feasible for foreign investors to acquire SOEs. Adopting a comprehensive social security system will address concerns over the social and employment consequences of allowing foreign businesses to acquire SOEs. The financial condition of SOEs will improve as their asset-liability mix adjusts and their social burden is reduced. All of these changes will reduce the costs and risks faced by foreign investors, and this in turn will increase the expected and realised gains from investment.

Cultivation of Talent and Technological Innovation

Faced with fierce international competition and domestic resource constraints, the government has come to understand that the only way to achieve industrial restructuring is through technological upgrading and accelerated scientific advances. On the one hand, existing high-technologies must be adopted to renovate and upgrade traditional industries and on the other, development of new

technologies and industries must be accelerated. Specifically, this approach includes the following five points:

- First, the pace of the scientific and technological revolution in agriculture should be advanced to speed up innovation and popularisation of key technologies. China must rely upon technological innovation in agriculture including breakthroughs in agricultural gene projects, ecological resources, and water saving farming methods, to solve the problem of feeding the more than one billion Chinese people in the next century.
- Second, new equipment, technology, craft, and management know-how should be widely applied to infrastructure, basic industries, and processing industries. To compete in domestic and international markets, traditional industries must integrate electronic information technologies and new materials in order to develop new, higher quality products with added value.
- Third, the scientific content of the tertiary sector should be increased. Development of such new service sectors as e-commerce and e-media and the quick and wide application of new technology to telecommunications, banking, consulting, and trade should be promoted.
- Fourth, the application of technology to critical problems of sustainable development including resource development and utilisation, ecological preservation, and environmental protection should be intensified. At the same time the production of clean energy and related technologies and industries should be developed extensively.
- Fifth, high-tech industries should be vigorously developed to cultivate new sources of economic growth. Top priority should be given to industries that have production applications or market potential and those that use Chinese intellectual property and have strong development potential, such as fibre-optic information, software, ecological engineering, and new energy and materials.

Technological innovation in these key areas and application of scientific and technical achievements to production will raise China's overall technological level, its national strength, and its international competitive edge. To accomplish these goals, the government will have to

- Intensify efforts to reform the science and technology system. It should enable enterprises to engage in technological innovation to improve their capacity to upgrade, and it should turn the majority of scientific and technological institutions into enterprises and speed the application of their achievements to production as much as possible.
- Encourage the rapid development of a pool of talented people with the spirit of scientific and technological innovation.
- Earmark more funds for science and technological development, provide financial support and favourable fiscal treatment to enterprises, cultivate a capital market to support the development of high-tech industries, and gradually establish a venture capital mechanism and expand venture capital funds for science and technology.
- Encourage civil scientific and technology enterprises, which are uniquely effective in translating scientific and technological advances into practical applications. By the end of 1998, there were 70,000 such enterprises in China, with a total staff 4 million.

Increasing the Role of Enterprises and the Market

With the inertia from China's planned economic system, industrial restructuring in the 1980s was accomplished mainly by administrative means and force of the plan. Under the socialist market economy that is taking shape since the late 1990s industrial restructuring has come to depend more on

the market mechanism in three ways. First, the number of entities making investment decisions has diversified and the government has relaxed restrictions on the activities of investors and left investment decisions largely up to economic means. Second, the conditions of demand and supply for the most part determine what and how much an enterprise should produce. Third, the pricing system has been greatly improved so that prices are market-driven, and the price signal has become an important lever regulating demand and supply.

As industrial restructuring has come to be guided mainly by market forces rather than by central planning, the government has been replaced by enterprises as the main restructuring body. Changing the industrial structure depends more upon the investment activities of enterprises, the depth and speed of their technological innovation, and the incomes and demand of urban and rural residents. As a matter of fact, in recent years, the speed of development in competitive industries and the merger or bankruptcy of enterprises are no longer determined by administrative and planning authorities but by market demand and supply as well as by the competitive strength of individual enterprises. With strategic reshaping of the national economy and continued reform of SOEs and government organisations, enterprises and the market mechanism will play an even greater role in industrial restructuring in the twenty-first century.

Government Role in Industrial Restructuring

In a market economy, enterprises are the main body to engage in industrial restructuring but this does not deny a role for government. Its role is primarily to direct investment and provide enterprises with favourable systems, environment, and policy. At the same time, although rescue of failing industries is difficult and the social cost of restructuring is rather high, the government can still support and rectify in cases of market failure. The Chinese government's role in industrial restructuring in the twenty-first century will be largely through fiscal and financial policy.

Fiscal Policy

In keeping with the state industrial policy and strategic development program, the government will continue policies favourable to investors, and it will try to increase input in basic industries and infrastructure facilities such as agriculture, energy, transportation, essential raw and processed materials, and water conservation projects. These industries generally require a large amount of long-term investment with relatively low return. Although they are critical to sustaining economic development, they will not attract civil capital without special policy support. Therefore, to improve the basic living conditions for investors and residents and to realise sustainable and stable economic growth these sectors require government fiscal input. When there are many different types of investors and state financial resources are limited, government expenditures are a way to attract and channel social funds to infrastructure construction. Apart from direct investment, the government can channel enterprises' surplus funds to this sector through such other incentives as interest rate discounting, tax reduction, and accelerated depreciation.

Financial Policy

At present, household savings deposits amount to 6 trillion yuan and enterprise deposits to 3 trillion yuan. China has a significant accumulation of financial assets with 6 trillion yuan in household savings deposits and 3 trillion yuan in enterprise deposits. Moreover, the market value of stocks has reached 10 percent of GDP. It should implement policies to direct these financial assets to support industrial restructuring and upgrading. Key state industries should have access to long-term financing, while the capital markets should allocate financing to new and improved industrial technologies based on the efficiency and cost of various projects. Furthermore, China should explore ways to allow venture capital funding of industrial upgrading and high-tech development. High-tech industrial development should have access to venture capital and stock market funding, and financial risk should be reduced in order to enable small and medium-sized high-tech enterprises to realise sustained investment and development.

Notes

1. I am indebted to Mr. Zhang Xiaoji for many valuable and constructive suggestions.

2. The public economy includes enterprises that are partially or wholly state- or collective-owned.

3. The other owners include foreign firms and entrepreneurs from Hong Kong, Macao, or Taiwan.

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TABLE 10.1
Total Value Added and Distribution by Sector, 1978-98

	GDP	Share of GDP Value Added from: Primary Sector	Secondary Sector	Tertiary Sector
	100 million yuan	%	%	%
1978	3,264	28.1	48.2	23.7
1981-85 avg.	6,445	31.4	44.2	24.4
1986-90 avg.	14,510	26.2	43.2	30.6
1991-95 avg.	37,625	20.9	46.9	32.2
1998	79,396	18.4	48.7	32.9

Source: *China Statistical Yearbook* 1980-99.

TABLE 10.2
Light and Heavy Industry Contribution to Industrial Sector Output, 1978-98

(Percent)

	1978	1982	1990	1995	1998
Light industries	43.1	50.2	49.4	47.3	49.3
Heavy industries	56.9	49.8	50.6	52.7	50.7

Source: China Statistical Yearbook 1980-99.

TABLE 10.3
Composition of Tertiary Sector Value Added, 1978-97

(Percent)

	1978	1980	1990	1995	1997
Transportation and communication	20.1	21.2	19.7	17.0	16.5
Commerce	30.9	22.1	24.4	27.5	26.7
Finance, insurance	9.0	9.0	21.2	19.4	19.7
Real estate	5.7	5.9	5.6	5.9	5.5
Other	34.3	41.8	29.0	30.2	31.6

Source: *China Statistical Yearbook* 1980-99.

TABLE 10.4
Composition of Output by Type of Ownership, 1978 and 1997

(Percent of GDP)

	1978	1997
Public economy	99.1	75.8
State-owned enterprises	56.2	41.9
Mixed ownership enterprises in which state holds controlling share	n.a.	6.5
Collective-owned enterprises	42.9	33.9
Mixed ownership enterprises in which collectives hold controlling share	n.a.	2.2
Non-public economy	0.9	24.2
Total	100.0	100.0

Note: State- and collective-owned enterprises may be owned jointly with foreign firms or entrepreneurs from Hong Kong, Macao, or Taiwan. Output of those in which the state or collective has a controlling share is counted under the public economy. The non-public economy includes individuals and households as well as share-holding corporations and enterprises funded by foreigners or by entrepreneurs from Hong Kong, Macao, or Taiwan.

Source: *China Statistical Yearbook*.

TABLE 10.5
Total Employment and Distribution by Sector, 1978-98

	Total Employment	Share of Total Employment in:		
		Primary Sector	Secondary Sector	Tertiary Sector
	100,000 people	%	%	%
1978	4,015.2	70.5	17.1	12.2
1980-85 avg.	4,670.5	65.8	19.3	14.8
1986-90 avg.	5,552.9	60.1	21.9	18.0
1991-95 avg.	6,637.5	56.2	22.3	21.6
1998	6,995.7	49.8	23.5	26.7

Source: *China Statistical Yearbook* 1980-99.

TABLE 10.6
Distribution of Urban Employment by Economic Sector, 1978 and 1998

(Percent)

	Share of Urban Employment in:			
	State- and Collective-owned Enterprises	Share-holding Corporations	Enterprises funded by foreigners, Hong Kong, Macao, or Taiwan	Individual and Household Enterprises
1978	99.8	n.a.	n.a.	0.2
1998	79.6	2.0	2.8	15.6

Source: *China Statistical Yearbook* 1980-99.