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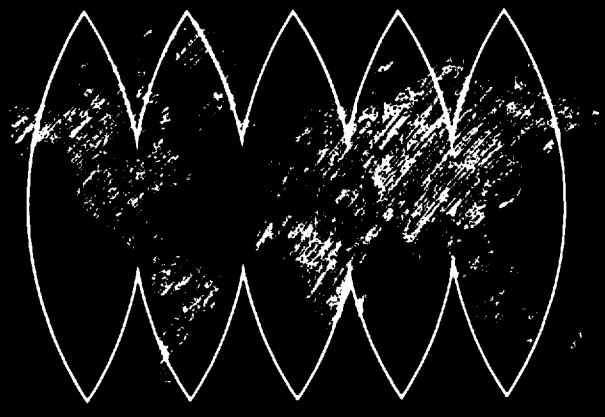
Industrial development review



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People's Republic of
CHINA

Managing investment-led growth

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PREFACE

This Industrial Development Review of the People's Republic of China has been prepared by UNIDO as part of its research programme to provide surveys and analyses of the industrial development process at the country level. It represents the latest issues of a series of sales publications intended to provide a service to those within UNIDO and other international agencies concerned with industrial policy, planning, project development and implementation, and to be a ready source of information for governments, investors, industrialists, entrepreneurs, policy-makers, international organizations, aid agencies, academics, and research institutes.

The Reviews have two separate but interrelated objectives: they are designed to facilitate and promote the activities of UNIDO, as well as to serve as an informative and analytical document for the international industrial community. The analyses contained in the Reviews are intended to support the technical assistance programming for industry by providing industry-specific analysis which may serve as an input to programming activities and as a basis for informed discussions. The Reviews are also designed to accommodate the needs of a wide readership in the international community associated with industry, finance, trade, business, research and government, laying the groundwork for undertaking in-depth analyses of specific aspects of industrial development trends, policies and strategies.

Chapter I presents the macroeconomic context of industrialization with a focus on the industrial policy environment. Chapter II reviews the manufacturing sector at the aggregate level, and examines, *inter alia,* its structure and growth performance, employment trends, productivity, contribution to foreign trade, and environmental issues. Chapter III surveys individual branches of manufacturing industry, and provides detailed surveys of their resource base and recent trends as well as assessing their investment and trade prospects for the future. A set of industrial statistics is presented in Annex A including selected performance indicators of China's top 100 foreign-funded companies.

This Review was prepared on the basis of information available in May 1996.

EXPLANATORY NOTES

References to dollars ($) are to United States dollars, unless otherwise stated.

Dates divided by a slash (1994/95) indicate a fiscal year or a crop year. *Dates* divided by a hyphen (1994-1995) indicate the full period, including the beginning and the end years.

In tables:
Totals may not add precisely because of rounding.
Two dots (..) indicate that data are not available or not separately reported.
A dash (-) indicates that data are not applicable.

The following *abbreviations* are used in this publication:

ATPC	Association of Tin Producing Countries
CCP	Chinese Communist Party
CFETC	China Foreign Exchange Trading Centre
CGD	consolidated government deficit
CITIC	China International Trust and Investment Corporation
CNPC	China National Petroleum Corporation
CNOOC	China National Offshore Oil Corporation
COEs	collectively owned enterprises
CSSC	China State Shipbuilding Corporation
EC	European Community
EU	European Union
FDI	foreign direct investment
FECs	foreign exchange certificates
FIEs	foreign invested enterprises
FTCs	Foreign Trade Corporations
GATT	General Agreement on Tariffs and Trade
GNP	gross national product
GDP	gross domestic product
IMF	International Monetary Fund
ITA	International Tin Agreement
MFN	Most Favoured Nation
MOFERT	Ministry of Foreign Economic Relations and Trade
MOFTEC	Ministry of Foreign Trade and Economic Cooperation
MVA	manufacturing value-added
NTBs	non-tariff barriers
PBC	People's Bank of China
SEZs	Special Economic Zones
SINOPEC	China National Petrochemical Corporation
SOE	state-owned enterprise
TCA	Textiles and Clothing Agreement
TFP	total factor productivity
TVEs	township and village enterprises
UK	United Kingdom of Great Britain and Northern Ireland

UNCTAD	United Nations Conference on Trade and Development
US	United States
USA	United States of America
USDA	United States Department of Agriculture
USSR	Union of Soviet Socialist Republics
WTO	World Trade Organization

BASIC INDICATORS

BASIC INDICATORS I: THE ECONOMY

Population (1994)	:	1,191 million
Annual growth rate of population (1980-1993)	:	1.4 per cent
Labour force (1993)[a/]	:	707 million
GDP (1993)	:	$425,611 million
GNP per head (1993)	:	$490

Growth of GDP[b/] (Percentage) :

1987	1988	1989	1990	1991	1992	1993	1994
11.6	11.3	4.1	3.8	9.3	14.2	13.5	11.8

Structure of net material product (Percentage) :

	1987	1991	1992	1993
Agriculture	33.87	31.82	29.10	25.78
Industry	45.76	46.52	49.41	52.49
Construction	6.84	6.09	7.43	8.38
Other	13.53	15.57	13.96	13.35

Exports (1995)	:	$125,691 million
Principal exports ($ billion, 1995)	:	Textile and textile articles (36.2), clothing (21.6), footwear (6.6), electrical machinery (19.0), chemicals and products (11.9), foodstuffs and tobacco (11.2), mineral fuels (5.3)
Main destinations of exports (1995, percentage)	:	Hong Kong (24.1), Japan (18.8), USA (16.1), Republic of Korea (4.7), Germany (3.9), Singapore (2.3), Taiwan Province of China (2.1), Netherlands (2.1)
Imports (1995)	:	$110,591 million
Principal imports ($ billion, 1995)	:	Non-electrical machinery (27.6) electrical machinery (19.4), chemicals (18.3), textiles and textile articles (15.8), iron and steel (8.0), vehicles and equipment (5.4), mineral fuels (5.1)
Main origins of imports (1995, percentage)	:	Japan (22.0), USA (12.2), Taiwan Province of China (11.2) Republic of Korea (7.8), Hong Kong (6.4), Germany (6.1), Russia (2.9), Singapore (2.6)
Current-account balance (1995)	:	$15,000 million
International reserves (1995)	:	$76.2 billion[c/]
Outstanding external debt (1995)	:	$98.2 billion[d/]
Debt service ratio (1994)	:	9.1 per cent

Consumer price change[e/] (Percentage) :

1991	1992	1993	1994	1995
3.4	6.4	14.7	24.1	17.0

Exchange rate (Rmb equivalents to $1) :

5.3	5.5	5.8	8.6	8.3

Source: UNIDO, Industrial Development Reviews Information Base.

a/ *World Development Report 1995* (Washington, 1995).
b/ Based on GDP indices (1978=100).
c/ End-November 1995, EIU estimate.
d/ EIU estimate.
e/ Based on overall consumer price indices (1978=100).

BASIC INDICATORS II: THE MANUFACTURING SECTOR

Manufacturing value-added (1993) : $187,852 million[a/]

MVA per head (1993) : $159.72[a/]

Manufacturing employment (1993) : 45.676 million persons

Growth of manufacturing output[b/] (Percentage) :

1987	1988	1989	1990	1991	1992	1993	1994
13.2	15.3	5.1	3.4	13.7	21.8	20.9	18.0

Structure of MVA (Percentage) :

	1988	1990	1993
Food, beverages and tobacco	13.53	14.54	12.77
Textiles and clothing	13.96	14.79	13.19
Wood products	1.30	1.06	1.33
Chemicals	19.51	20.04	16.06
Metals	9.59	9.55	14.28
Machinery and transport equipment	29.51	28.00	29.13
Other	12.60	12.02	13.24

Share of manufactured exports in total exports (1994, percentage) : 84.0

Structure of industrial exports (1993, percentage) :
Textiles and clothing (40.05)
Machinery and equipment (25.93)
Chemicals (10.83)
Food, beverages and tobacco (8.61)
Other (14.58)

Share of manufactured imports in total imports (1993, percentage) : 90.34

Structure of industrial imports (1993, percentage) :
Machinery and equipment (52.49)
Basic metals (15.71)
Chemicals (14.79)
Textiles and clothing (10.58)
Other (6.43)

Industrial production indices of manufactured goods (1980=100)[c/] :

	1985	1990	1991	1992	1993
Cement	182.8	262.6	316.3	386.0	460.7
Motor vehicles	196.7	231.2	321.3	479.8	584.1
Steel	126.1	178.7	191.3	218.0	241.3
Tyres	168.1	280.0	343.8	452.3	557.7

Source: UNIDO, Industrial Development Reviews Information Base.

a/ Current prices.
b/ Based in index of manufacturing output (1978=100).
c/ Based on physical volume of production from the State Statistical Bureau of the People's Republic of China. *China Statistical Yearbook 1994.*

BASIC INDICATORS III: INTER-COUNTRY COMPARISON OF SELECTED INDICATORS[a/]

Indicator	Unit	**China**	Brazil	India	Mexico	Pakistan
Population (mid-1993)	Million	1,178.4	156.5	898.2	90.0	122.8
Area	Thousand square km	9,561	8,512	3,288	1,958	796
GNP per head (1993)	$	490	2,930	300	3,610	430
Average annual rate of inflation (1980-1993)	Percentage	7.0	423.4	8.7	57.9	7.4
Private consumption (1993)	Percentage of GDP	51	79	66	75	74
Gross domestic investment (1993)	Percentage of GDP	41	19	24	22	21
Gross domestic savings (1993)	Percentage of GDP	40	21	24	16	12
Exports of goods and services (1993)	Percentage of GDP	24	8	11	13	16
Energy consumption per capita (1993)	Kg of oil equivalent	623	666	242	1,439	209
Food industry (1992)	Percentage of MVA	13	15	12	24	..
Textiles and clothing (1992)	Percentage of MVA	13	11	15	5	..
Machinery and transport equipment (1992)	Percentage of MVA	27	22	25	25	..
Chemicals (1992)	Percentage of MVA	12	14	14	17	..
Other industries (1992)	Percentage of MVA	35	38	35	30	..
Manufactured exports to OECD countries (1993)	$ million	72,115	10,126	12,214	35,317	3,588
Current-account balance (1993)	$ million	-11,609	-637	-315	-23,393	-3,327
Gross international reserves (1993)	$ million	27,348	31,747	14,675	25,299	1,995
External debt (1993)	$ million	83,800	132,749	91,781	118,028	26,050
Debt service ratio (1993)	Percentage	11.1	24.4	28.0	31.5	24.7

Source: World Bank, *World Development Report 1995*, Washington DC, 1995.

a/ Data for China may not correspond to those cited elsewhere in this report because of different sources.

SUMMARY

In the late 1970s China embarked on economic reform. The reform started with the effective dismantling of collective agriculture and the simultaneous opening of the economy to trade and foreign direct investment, at first in selected locations and then spreading throughout the country. Later in the 1980s, and more cautiously, reforms began to be extended to the urban state-owned industrial sector. Stimulated by the removal of prohibitions, large numbers of enterprises of hybrid ownership sprang up, both in the towns and in the countryside. Often of a very small size, these range from formally "private" (often family-run) to various kinds of joint ownership, including joint ventures involving foreign investment and wholly foreign-owned enterprises. They range across a broad spectrum of mainly light industrial and service activities. Those in favourable locations, particularly along the comparatively well-developed eastern seaboard and especially in Guangdong province, often process for re-export products shipped in via Hong Kong.

As well as diversity, the reform process has brought in train significant devolution of decision-making and resource allocation powers. The managers of enterprises of all kinds have been given far greater powers to decide on output, pricing and remuneration. In the case of the many thousands of formerly collective or state-owned enterprises under the control of provincial and sub-provincial governments, it is the local authority rather than the central government ministry in the capital which has the most important influence on their day-to-day running and survival in an atmosphere of increasing competition.

Although it is far advanced, the reform process is by no means complete. There still exist many thousands of state-owned enterprises (as many as 50,000 at current estimates) which run at a loss. The progressive but not complete lifting of price controls has caught many in a trap in which they face rising input prices which cannot be recovered in sales. Many others are technically bankrupt and many also produce goods that no longer find buyers in the increasingly sophisticated domestic market. Yet the social welfare functions that state-owned enterprises fulfil are seen as being of vital importance for the maintenance of social stability and there is a deep-seated fear of the consequences of introducing eastern European-style shock therapy to the Chinese economy.

Reform has only just begun to touch the financial sector in China and there is ample scope for financial expansion. An important obstacle to the much-needed introduction of market-based interest rates is the fact that many of the state-owned enterprises which depend on the state-owned banks for their working capital are already unable to make payments of interest and principal on their debts. As a result many of them depend on direct or indirect subsidies from the central government for their continued existence. The need to subsidize state enterprises, together with the large infrastructure needs generated by the pace of economic development, is placing a continuing strain on state finances. Although it no longer borrows directly from the central bank to fund its budget deficit, the state relies on central bank lending to the financial system to fund a large part of the public-sector deficit more broadly defined, a deficit that is rising as a proportion of gross domestic product (GDP). In light of the inability of the banks to pay market deposit rates, the state has had also to subsidize the rates of interest paid to the public for their deposits lest a disintermediation crisis prompts a sudden withdrawal of funds from the banking system, which would lead to the need for massive injections of liquidity and fuel already significant inflationary pressures. The control of inflation, with its worrying social consequences, is therefore the current priority of economic policy but the absence of effective monetary instruments makes it essentially reliant on administrative controls.

Chapter I identifies three cycles of reform that have characterized the Chinese economy during over 15 years: rapid growth in demand accompanied by the eruption of inflation, followed by measures to cool the economy, leading in turn to renewed reform and rapid growth in demand. It notes how, as the cumulative effects of the reform process have taken hold, it has become more difficult for the central government to reimpose macroeconomic order and eliminate inflation by resorting to its traditional administrative means, because an increasing proportion of the economy lies outside the scope of direct state influence.

As well as diversification and decentralization, the most important change in the structure of the Chinese economy that has accompanied reform has been its marked opening to the outside world. From an insignificant place for the first 30 years after 1949, China has risen rapidly up the world trade ranking to 11th place in 1995. Much of this growth in trade can be attributed to the processing of goods coming into and leaving China via Hong Kong. The need to modernize plant and infrastructure, as well as the processing trade, has generated a large demand for imports. Although the most recent years have seen a surplus, China has experienced trade and current-account deficits during most of the years of the reform period. To finance these deficits and to help fund the central government budget deficit, China has become a significant borrower on international markets, as well as being in receipt of large amounts of multilateral and bilateral aid and concessional funding. It has also attracted very large amounts of foreign direct investment, mainly from the Chinese diaspora. Chapter I concludes with an analysis of the current mix of economic policies that are being applied to ensure continued, sustainable growth and curb inflation. It gives the broad outlines and priorities of the Ninth Five-Year Plan, 1996-2000, and identifies the current thrust of fiscal and financial sector reform. Among the most likely immediate changes is the imminent move to convertibility of the currency on current accounts, which is necessary to further China's aim of joining the World Trade Organization. The issue of reform of the state-owned industrial sector, meanwhile, has once again moved to the fore and moves to bring market disciplines to bear on increasing numbers of state-owned enterprises have been mapped out.

The introductory survey of the macroeconomic context and policy environment presented in Chapter I is followed in Chapter II by a survey of the manufacturing sector. This analyses the sector in terms of its growth and structural change, employment, productivity, investment patterns, the role of township and village enterprises, industrial location, regional concentration, environmental impact, trade and technical cooperation.

Development of the Chinese manufacturing sector is shown to have been extensive since 1949, with the emphasis on achieving the maximum degree of self-sufficiency across the range of products considered desirable. Until the reform era the emphasis was on the development of heavy industry, a bias that was corrected only in the early 1980s, after which the growth of manufacturing value-added (MVA) accelerated in response to the incentives provided by reforms. Since 1992 in particular MVA has grown at an impressively rapid rate. The distribution of MVA by share has remained stable, not just because of the extensive development of industry before the 1980s but also because of the influence of the transformation of ownership patterns during the reform period, which has seen many thousands of new entrants at the lower end of the value-added scale. The changing pattern of employment mirrors these trends. Manufacturing employment has grown fast, and the rapidly growing manufacturing labour force has found work outside the sphere of state-owned enterprise as labour mobility has increased. The female participation rate has been and remains high in international terms and there is evidence to suggest that demand for unskilled and semi-skilled female labour from the export-oriented township and village enterprise sector is particularly strong, because such labour is cheap.

The ratio of MVA to gross output has remained fairly stable since 1980, although with a slight tendency to fall. Although price distortions affect this ratio, its failure to rise reflects also the very much greater degree of competition that has characterized the Chinese economy since reforms began. Labour productivity, while fluctuating considerably by branch of manufacturing, has been boosted overall by the reforms and incentives introduced since 1980 and it has been the collective sector that has set the pace for the growth of total factor productivity. Profitability is heavily skewed by ownership, with the heavy industrial state-owned sector being most vulnerable to losses.

The public sector, which includes the state-owned and collective sectors, is still the pre-eminent source of investment, just as it still dominates ownership. But the share of manufacturing in investment by state-owned enterprises has tended to fall, because of the need to invest in infrastructure and because of a propensity to engage in the kinds of "non-productive" investment (such as construction of housing for employees) that the state is seeking to curb. Heavy industry has traditionally taken the lion's share of state-owned enterprises' investment. The investment of the collective sector in light industrial activities, though substantial, is poorly recorded in the available data. Foreign investment has been playing a small but growing role, consisting notably of funds from Hong Kong and Taiwan Province of China being invested in processing industries in the south-east of China which are low in domestic value-added but employ large numbers of workers.

The rapid flowering of township and village enterprises under various forms of ownership is addressed in terms of their growing share of total industrial output, exports and employment. Their close dependence on state-owned enterprises is recognized and their need to address issues of quality and scale is noted. The wide dispersion of manufacturing, which has been intensified by the efforts of local governments to foster industrial enterprises within their areas of jurisdiction to the extent possible, is also noted. Although differing factor endowments (and pre-reform history) have produced a concentration of industry in Shanghai and other urban centres, the pattern has shifted during the 1980s and 1990s so that the share of the national gross industrial output of previously unindustrialized provinces such as Guangdong and Fujian has risen markedly in response to inflows of foreign investment.

Environmental considerations are beginning to make an impact on industrial policy in China, which is in receipt of aid and technical assistance from international agencies. An urgent programme is being implemented with the assistance of UNIDO within the framework of Agenda 21 to ensure the environmental sustainability of China's industrialization process.

As China has sought to modernize, so the share of capital goods in its imports has risen from 25 per cent in 1975 to over 40 per cent in the mid-1990s. But this trend is now being counterbalanced by the rapid rise in imports of goods for processing, which show up on both sides of the trade account. Exports are now dominated by manufactures, which accounted for almost 90 per cent of the total in 1995. Textiles and clothing (especially clothing) and machinery and equipment are the most important export categories. China's trade is heavily oriented towards the developed world and a few of the most advanced economies of Asia. Much of this trade goes through Hong Kong and there are considerable differences in the measurement of trade flows as a result of this. The US and Chinese measurements of China's trade surplus with the USA in 1995 differed by a factor of nearly 5. This complicates an already complex economic relationship between China and the USA, which is China's most important export market, causing difficulties in the process of negotiating China's entry to the World Trade Organization.

Chapter III presents industrial branch profiles with an overview of the resource base, recent production trends and the constraints and prospects of a range of industrial commodities produced in China. These include the following broad categories: food products; textiles and garments;

leather and footwear; wood and wood products; pulp and paper; petroleum refining; petrochemicals; fertilizers; pharmaceuticals; non-metallic mineral products; iron and steel; non-ferrous metals; non-electrical and electrical machinery; transport equipment; electrical appliances and electronics; toys and handicrafts. Brief summaries of the key findings relating to each branch are given below.

Food products

Grain

Grain production has long been the most important agricultural activity in China, the main staples being rice, wheat and maize. Following the introduction of agricultural reforms in 1978 there has been a gradual shift away from grain production, leading to a decline in the grain sown area and an expansion of cash crops such as fruit and vegetables. Given the rising population and the constraints on any significant increases in grain production, the self-sufficiency of China in grain production has been called into question. The government has tried to counter this trend by prioritizing agriculture in its Ninth Five-Year Plan and encouraging foreign investment in this sector. Rice is mainly consumed as a grain and maize is used for animal feed while wheat is processed into bread, flour and noddles. Given the increasing popularity of baked foods, foreign companies have already moved into bread- and biscuit-making but there is still ample scope for foreign investment in this sector.

Sugar

Sugar processing has not been able to keep pace with growing demand. Rising living standards, higher expectations of a more varied diet and the expanding beverages industry will increase the demand for sugar. Considerable investment is needed, however, to increase the yields of sugar cane and sugar beet.

Tobacco

China is the world's largest producer and consumer of tobacco products. International companies view China, with its more than 300 million smokers, as an enormous potential market, particularly within the context of declining sales in the developed countries. Well-known cigarette manufacturers such as R.J. Reynolds and Rothmans International have already started joint production in China. Given rising standards of living and changing consumer preferences there is considerable scope for foreign investment in this sector.

Fruits, vegetables and beverages

Since 1985 the output of fruit and vegetables has risen dramatically, which in turn has stimulated the canning industry and exports of canned food. However, any further expansion of the canning sector will require substantial domestic and foreign investment.

The main beverages in China are alcoholic drinks such as beer, spirits and wines and non-alcoholic drinks such as juices, carbonated drinks and mineral water. Whilst alcoholic beverages production has more than doubled since 1985, the expansion of beer production has been particularly rapid. By 1994, over 40 joint-venture breweries had been set up or were under negotiation. Given that China is likely to become the world's largest beer market by the year 2000, there is considerable scope for foreign investment. Foreign companies have also started joint production of wine. As for carbonated drinks, both Pepsi and Coca-Cola have already established joint ventures. Mineral

water production is dominated by local producers, but foreign companies are starting to enter this potentially lucrative market.

Meat, dairy and fish products

China ranks as a leading world producer of pork and poultry production and consumption has increased rapidly since 1985. Pork is the major meat produced and consumed domestically. As fast-food restaurants continue to expand, an increasing demand for beef and poultry can be expected. Chains such as McDonalds and Kentucky Fried Chicken already have branches in major cities and there is still considerable room for further foreign investment in this sector.

China is not a major producer of dairy products and relies on imports for 40 per cent of its needs. Foreign companies have begun to enter this market, producing products such as infant formula, milk powder, ice-cream and yoghurt. Given that demand for dairy products is likely to increase in the next decade, there is significant scope for foreign investment in this sector.

China is a net importer of fresh, frozen and chilled fish. However, its exports of fresh, frozen and salted crustaceans as well as exports of fish, crustacean and mollusc products and preparations far outweigh imports. While the Ministry of Agriculture aims at addressing the technological constraints on the processing of aquatic output, there are considerable openings for foreign investment.

Textiles and garments

Textiles were China's most important manufacturing export before the 1978 economic reforms, and still generate about one-tenth of its export earnings. The textile industry in China has been sustaining losses for several years, as a result of rising prices for cotton and intensifying world market competition. The structural weaknesses in the industry are now being addressed by measures including technological upgrading and relocation of textile production to cotton-growing areas. Synthetic materials are becoming more important in the production of textiles in China with the continuing growth of China's petrochemical industry. Reorganization of the industry will become even more pressing with the gradual phasing out of the Multi-fibre Arrangement following the successful completion of the Uruguay Round negotiations. There will be a gradual expansion of quotas under the phase-out period, but the expansion will be slow, and China cannot benefit from this quota expansion until it joins the World Trade Organization. Markets in the USA and EU are likely to become even more competitive in the same way as non-quota markets in the Middle East already are, with a consequent reduction in export unit values.

Garments are now China's largest manufacturing export earner, and their development has been greatly facilitated by the proximity of Hong Kong, which has provided expertise in marketing, design and quality control, as well as direct foreign investment. Garment production in the world economy has remained highly labour-intensive, and low wages generate more of a competitive advantage to Chinese garment production than in the case of the textile industry. Despite increased competition in the world market for garments, China's garment exports have continued to grow. World competition will further intensify as quotas are progressively phased out in major markets with the ending of the Multi-fibre Arrangement, and this will give China an opportunity to gain market share from less efficient competitors. In the longer term, rapid economic growth in China, particularly in the south of the country, may eventually push up real wages and partly erode China's competitive advantage, although migration to the south exerts a countervailing pressure on wages.

Leather and footwear

One of China's most rapidly growing export sectors in the 1990s has been the leather and footwear industry. A key factor in this expansion has been the sourcing of sports shoes in China by major manufacturers operating with foreign investors in Hong Kong and Taiwan Province of China. However, the relocation of footwear factories from Hong Kong and Taiwan Province to China is now largely complete and the phenomenal growth in footwear production and exports is unlikely to continue at the same rate. There is some evidence that foreign investors in China are diversifying from shoes to other leather products, and this provides scope for further export expansion. International buying groups prefer a range of choice in sourcing and subcontracting production, in order to minimize risk. China's low labour costs, however, are unlikely to attract investment away from other important locations such as Indonesia. China already has large market shares in product segments in the USA and the EU, but protective measures will limit growth. There is a glut in shoe factories in China, although the domestic market is increasingly providing an outlet for some of the cheaper ranges of footwear which previously were mainly exported.

Wood, wood products, pulp and paper

China is not self-sufficient in sawnwood production, wood-based panels, mechanical and chemical wood pulp or paper and paperboard. The rapid pace of industrialization has constrained the area devoted to timberwood and demand is likely to continue to outweigh domestic supply over the next decade, providing opportunities for foreign exporters to China.

Petroleum

China has been an oil exporter since the 1960s but became a net oil importer for the first time in 1993. China's demand for oil is likely to continue to be ahead of domestic production; imports of crude oil are likely to rise and exports to fall. Domestic production costs have been rising and there is considerable excess labour in the state-run oil industry. The government has expanded the number of areas in which foreigners can invest, and foreign participation will be important both as a source of investment for exploration and development and as a source of technology to reduce production costs. Foreign investment will be important in providing both capital and technology to increase refining capacity. While much interest has been shown by foreign companies, their experience has been frustrating, particularly with regard to domestic market access.

Petrochemicals

Production of petrochemicals is still small by world standards, and China is making vigorous plans to develop petrochemical production and encourage more inward foreign investment. At present China's petrochemical industry, long shielded from foreign competition by import tariffs and artificially low petroleum prices, faces pressures to become more efficient. The country's industrial growth in the late 1990s will require increasing quantities of petrochemicals, such as plastics for toy and shoe exports and for the automotive industry, as well as synthetic fibres for the textile and garment industries.

Fertilizers

Although China is the world's largest producer of chemical fertilizers, it still has to rely on imports to meet its needs. China is a net importer of nitrogenous fertilizers but a net exporter of

phosphate fertilizers. The government has granted preferential policies to this sector but raw materials shortages and low technological capacity are continuing constraints.

Pharmaceuticals

China is self-sufficient in most pharmaceuticals, including antibiotics, analgesics, cardiovascular and other medicines. Imports are limited to those medicines which are based on biotechnology and the most recent research techniques. China exports over 83 per cent of its vitamin C production, accounting for almost 20 per cent of the world market. There is strict control over imports and foreign investment in this sector has been tightly restricted to new, high-tech drugs. Several joint ventures have already started operation, producing low-level technology drugs such as cold remedies, antibiotics and de-worming agents. Traditional Chinese medicine is also a growing area and the government is encouraging foreign investment in the form of joint ventures in this sector.

Non-metallic mineral products

China is likely to remain a major producer of a wide range of minerals, a dominant exporter of barite for the oil industry and a significant though minor exporter of magnesite. Rising domestic demand in the construction industry has seen large increases in the output of cement, bricks and gypsum. Foreign investment is being welcomed to improve the efficiency of cement production.

Iron and steel

China is the world's second largest steel producer next to Japan, yet its output is characterized by its low quality. Increasing domestic demand for high-quality steel and high-quality steel products has led to rapid rises in imports in the 1990s. The government is attempting, however, to expand exports and control imports. Given the centrality of the coal industry to iron and steel production, the Ninth Five-Year Plan foresees a greater role for foreign investment in the technical renovation of this industry.

Non-ferrous metals

In the 1990s China has been a large net importer of copper and aluminum, a very large net exporter of tin and a net exporter of lead and zinc. China's demand for non-ferrous metals has been increasing rapidly, particularly for copper and aluminium. Foreign investment is being encouraged, and serious attempts are being made to increase production of metals in short supply.

Non-electrical and electrical machinery

The non-electrical machinery industry at present suffers from fierce import competition, and many machinery enterprises have been making losses, including those making machine tools. Attempts are being made to increase international competitiveness, by concentrating resources on the top 100 enterprises, setting up manufacturing research and technology development centres, and by giving enterprises greater freedom to approach prospective foreign investors. There is a serious shortage of electric power in China, and demand for power-generating equipment, a major output of the electrical machinery sector, is likely to expand.

Transport equipment

The Chinese government expects the output of motor vehicles to double to 3 million vehicles per year by 2000. By then, most local vehicle requirements will be met by domestic production, although substantial exports are not yet in prospect. Demand for vehicles will be stimulated by

China's high rate of growth of GDP and very low vehicle ownership per head of population. Nevertheless, private ownership of cars will remain small, given that consumer incomes are low and car prices very high by world standards. Passenger car and commercial vehicle production is likely to concentrate on a small number of efficient producers. Rapid growth should follow in the automotive components sector, too, as the domestic market for vehicles expands and as more joint ventures are established to serve the needs of foreign investors in vehicles. China faces the threat of import competition when it eventually joins the World Trade Organization and the current high tariffs on vehicles have to be reduced. Incomes in China are fast rising to levels which will support mass ownership of motorcycles, making it the largest market for motorcycles in the world. Motorcycle export prospects are limited by poor quality, though this is changing as foreign investors enter and start to use China as a regional production base. China already has mass ownership of bicycles, and output has stabilized. There is scope for expansion of more upmarket items, particularly mountain bikes, as consumer incomes continue to rise and more foreign investment is attracted. China's bicycle exports are already substantial, but its export growth prospects suffered a blow in 1993 when the EU imposed provisional anti-dumping duties against China's bicycle exporters. In shipbuilding, China aims to enlarge its share of the world market from its 1994 share of around 5 per cent to 10 per cent by the year 2000.

Electric appliances and electronics

Aware that the development of household appliances, television sets, computers, telecommunications and software industries hinges crucially on the electronics sector, the government has sought since the early 1980s to promote this sector through structural reform, foreign investment and technology imports. China relies on imports for the bulk of its integrated circuits and is actively seeking foreign investment in this subsector.

Since the early 1980s China has begun to promote the development of the computer industry. Focusing on the domestic production of low-end products, it relies on imports for high-end equipment such as mainframes and mini-computers. Its exports are limited to computer components such as floppy discs, monitors and printer heads. Large transnationals such as Hewlett-Packard have begun to invest in China's computer, information technology and telecommunications industries. Particularly lucrative has been the joint-venture production of digital switching equipment although the Ministry of Posts and Telecommunications is discouraging further foreign investment in this sector. However, foreign investment is being sought for the development of optical fibre cable networks and other telecommunications construction projects. Foreign companies have already begun to set up software joint ventures, with Microsoft dominating the market.

Toys and handicrafts

China is the world's largest producer of toys. It is a net exporter of toys, taking one-third of the market in the USA, two-thirds in Italy and one-fifth in Japan. The export sector is dominated by foreign investors.

I. THE MACROECONOMIC AND INDUSTRIAL POLICY ENVIRONMENT

A. RECENT ECONOMIC TRENDS

Developments to 1978: The priority of industrialization

From the inception of the People's Republic in 1949, China's growth performance can be divided into three broad phases. The first, from 1949 to 1978, marks the pre-reform era. Of this period, the first three years were marked by the achievement of control over the economy by the new state and the restoration of order. Most economic analysis starts with the first of (to date) nine five-year plans, that of 1953-1957. This saw the economy collectivized and the Soviet aided and inspired programme of large-scale heavy industrialization begun. In 1958 the Great Leap Forward was launched, with the objective of accelerating the transition to socialism. The results of this voluntarism coincided with a serious drought, led to famine, chaos and widespread loss of life, and disrupted implementation of the Second Five-Year Plan (1958-1962). The withdrawal of Soviet aid and the departure of hundreds of Soviet technicians in 1962 added to the government's difficulties. A period of consolidation, culminating in the start of preparation of the Third Five-Year Plan (1966-1970), was interrupted by a period of turmoil described as the Cultural Revolution (1966-1976). During this period, although the apparatus of planning and bureaucratic control over the economy broke down in many areas, agricultural output was not seriously disrupted. Order was restored from the early 1970s. Efforts to restore the planning system that had existed in the late 1950s coincided with the introduction of reform after the 11th plenum of the Central Committee in 1979, first in the agricultural sector and later in industry.

Decisions on economic policy were almost totally politicized for most of this 30-year period, although there were brief periods of pragmatic adjustment. Despite poor management and misallocation of resources, national income per head grew by an annual average of 4 per cent in real terms in 1952-1982. Net material product at constant 1970 prices rose by 5.8 per cent a year in 1952-1979, with a bias towards industry reflected in a growth rate of 12.3 per cent compared with growth of only 2.7 per cent for agriculture.[1/]

The thrust of development policy for most of this long period was industrialization, and the high degree of international isolation after 1962 meant that the establishment of thousands of industrial enterprises was achieved essentially by extracting the maximum surplus from agriculture. This had implications for the level of incomes and of consumption. Political and defence considerations reinforced the industrialization drive. Because of the fear of invasion from the former Union of Soviet Socialist Republics, lines of communication were developed far from the relatively advanced eastern coastal area, which was starved of investment. Industrial facilities, especially comparatively technologically advanced units, were often located inland, far from their markets and far from their

sources of inputs. During the Cultural Revolution, when political control from the centre was weakened, the autarkic tendencies of provincial and local level governments were reinforced. The relative neglect of nationwide communications systems helped to inhibit the growth of inter-provincial markets and trade; virtually all the provinces developed a wide range of industrial activities, often without regard to optimizing resource allocation. The result was an economy in 1979 in which industry accounted for 40 per cent of production.[2/]

1979-1990: Agriculture and manufacturing

As is well known, the return of Deng Xiaoping to political prominence ushered in a period of dynamic growth as productive forces, hitherto restrained by the socialist system, were unleashed by reform. Stimulated by the progressive lifting of controls on decisions about land use, coupled with a large rise in procurement prices for grain and industrial crops, agricultural output rose by an annual average of 5.5 per cent in the twelve years 1979-1990.[3/] While the rate of growth of grain output slowed in the latter part of this period (3.2 per cent for the whole twelve years, compared with 5 per cent a year in the six years to 1984),[4/] the overall rate of agricultural growth was held up by the rapid growth in output in the specialist sideline activities that were now permitted. Market prices for above-quota grain and the products of sideline activities were progressively decontrolled, providing another stimulus to producers, especially those who could access markets. This was the era in which peasant incomes boomed and when well-publicized cases of peasants becoming rich by concentrating their efforts on income-maximizing output were quite commonplace. The rapid growth of agriculture during this period led to a slight rise in its contribution to national income, up from 32.8 per cent in 1978 to 34.8 per cent in 1990.

Manufacturing, meanwhile, grew by 9.3 per cent a year in annual average terms over the same period, taking its share of GDP (at current prices) from a high 41 per cent in 1979 to a still substantial 33.6 per cent in 1990. Rapid growth in manufacturing output was stimulated by a number of factors associated with reform:

- an emphasis on light industry, including consumer goods, to satisfy pent-up demand and absorb labour; the share of light industry in the gross value of industrial output rose from 43.1 per cent in 1979 to 47.1 per cent in 1985 and peaked at 49.4 per cent in 1990;[5/]

- the progressive (but not complete) lifting of controls over the allocation of inputs, the output mix, prices and other areas of decision-making so that all enterprises moved closer to the market;

- tolerance of the flowering of enterprise forms other than the paradigm state-owned enterprise (SOE), owned by the state and responsible to a central ministry or to the local government: collective and even private enterprises flourished during the 1980s, which saw the first waves of what would become a torrent of foreign capital, much of it invested in labour-intensive manufacture for export;

- the establishment of China's first export processing zones in 1980. Four of these were set up along the south-east coast, near Guangdong and Hong Kong. Known as special economic zones (SEZs), they were so successful in attracting investment, especially from the Chinese diaspora, that 14 coastal cities along the eastern seaboard were designated to offer special terms for export-oriented foreign investment in 1984, and by the late 1980s virtually all provinces and large cities were competing to attract foreign capital.

The inflow of foreign investment was accompanied by the lifting of barriers to many imports. At the same time, an 11 per cent annual average rise in the wages of those in paid labour, and the rapid increase in rural incomes that resulted from rural reform, helped to stimulate a boom in consumer demand. As imports became more accessible, so the competition they offered to domestic producers helped stimulate better quality domestic output.

Overall growth in the period 1979-1990 was an impressive 8.7 per cent a year. By the end of the period, manufacturing accounted for 33.6 per cent of GDP, agriculture for 27 per cent and the services sector, still relatively underdeveloped, for only 31.4 per cent (all at current prices, see Table I.1).

Table I.1. Distribution of GDP by sector of origin, 1979, 1985 and 1990
(Percentage of total at current prices)

	1979	1985	1990
Agriculture	31.5	29.7	27.0
Industry[a/]	47.9	45.2	41.5
of which:			
Mining	1.4	1.3	1.3
Manufacturing	40.6	37.1	33.6
Services	20.7	24.8	31.4
Private consumption	59.5	56.6	53.2
Public consumption	8.9	8.5	9.5
Gross domestic investment	33.3	38.4	33.2
Exports	8.7	10.4	19.1
Imports	10.7	14.4	15.0

Source: World Bank, *China Macroeconomic Stability in a Decentralized Economy*, 1995, p. 175.

a/ Including construction and utilities.

1979-1990: Reform and austerity

The period 1979-1990 set a cyclical pattern that continues to characterize the Chinese economy: the unleashing of demand (especially investment demand at the local level) produces overheating, creating a surge in demand for credit and putting pressure on a price regime that remains distorted. The first of the post-reform booms was import-led; as investment (measured by gross domestic fixed investment) soared, reaching a peak growth rate of 30 per cent in real terms in 1984-1985, imports grew by over 40 per cent and the current account plunged into deficit. Two years of controls on investment and import curbs in 1986-1987 slowed the overall growth rate and stemmed the rise in the current account. Investment and consumption ballooned once again in the following year (1988), which was a period of price reform, and inflationary pressure built up. This time a consumer spending boom added to the inflationary pressure; the overall retail price index rose by 18.5 per cent in 1988 and by 17.8 per cent in 1989.

There followed a sharp, policy-induced and largely administered curb on domestic demand. Credit to the industrial sector, especially the collective and privately-owned enterprises that had mushroomed outside the biggest cities (the so-called township and village enterprises, TVEs) was

squeezed. Overall retail price inflation fell rapidly, to 2.1 per cent in 1990. Many collectives were unable to find working capital and were forced to close. The rate of growth of manufacturing slowed from nearly 16 per cent in 1988 to 4.9 per cent in 1989[6/] and 2 per cent in 1990. The result was an overall GDP growth rate of only 4.1 per cent in 1989-1990: fixed investment fell by 6.4 per cent in 1990. Imports, in national accounts terms, fell by a real 12.7 per cent in 1990, helping the current account to move into a substantial surplus of $12 billion.

1990-1995: Another growth spurt

The most recent years, coinciding with the period of the Eighth Five-Year Plan (1991-1995), have been a period of unprecedentedly fast growth. In 1992 the period of relative austerity and retrenchment ushered in to curb the overheating of 1988/1989 came to a definite end. China's paramount leader, Deng Xiaoping, went on a famous tour of the southern provinces and inspected the special economic zones (SEZs) of Shenzhen, just over the border from Hong Kong. His well-publicized words of praise for SEZs and for the economic achievements of the south-eastern seaboard, particularly the rapidly growing, export-oriented Guangdong province, signalled a renewed commitment to reform, to decentralization of decision-making and to rapid growth. In the aftermath of the collapse of the Soviet Union and the demise of the socialist regimes of eastern Europe, elements within the Chinese Communist Party (CCP) had become convinced that the only way forward was to hasten and deepen reform. This conviction was signalled anew at the third plenum of the 14th Party Congress in November 1993, which called for the creation of a "socialist market economy" and adopted a comprehensive and ambitious plan to complete the process of reform.

The result of this renewed enthusiasm for speedy growth was, on the supply side, another burst of growth in industrial output, with the momentum increasingly coming from the revitalized collective, private and foreign-invested sectors, many of whose enterprises were producing for export. Accordingly, the growth rate of industrial output accelerated from 12 per cent in 1985-1990 to 14.2 per cent in 1990-1995. Agriculture, meanwhile, started to suffer from diminishing returns, as the easy gains consequent upon the effective decollectivization of land and freeing of prices and market use were exhausted. The diversification of activities in the countryside continued, with many peasant families maximizing their incomes by engaging in so-called specialized sideline activities and often abandoning the production of grain. Total agricultural growth was little changed between the seventh and eighth plans, but the rate of growth of grain output has stagnated (grain output in 1995 was 465 million tonnes; only 4 per cent above the 1990 figure of 446.2 million tonnes; it fell in 1994 by 2.4 per cent to 445.1 million tonnes) and there is concern as to whether China can produce enough staples to feed itself.

In demand terms the spurt of growth over the years 1990-1995 was investment-led. Within an overall growth rate of 11.3 per year fixed investment grew by 19.3 per cent, contributing a 48 per cent share of the incremental gross domestic product. This investment hunger, particularly pronounced at the level of local and provincial governments, has proved extremely difficult for the central government to moderate.

Reflecting in large part the progressive opening of the economy to investment from and trade with the outside world from 1978, intensified after 1992 by the very rapid growth in the output and exports of the non-state owned and especially the foreign-invested sectors, exports and imports have grown rapidly. Their growth was especially fast during the five years 1990-1995, when the volume of exports is estimated by the Economist Intelligence Unit to have grown by 19 per cent

per year. Imports, meanwhile, grew by nearly 20 per cent a year in annual average terms over the same period.

In 1993, recognizing that the economy was overheating, the government instituted a 16-point austerity programme. The aim was to curb overheating by largely administrative and selective controls on bank lending and cut back investment demand and excessive industrial output growth. Controls on foreign trade were also tightened. The programme has had limited impact. Although imports were successfully curbed in 1994, restoring the trade account to surplus, growth has remained rapid and investment has been slow to respond. The squeeze on lending was temporarily abandoned at the end of 1993 for fear of its effects on loss-making enterprises, and has only been partially reimposed since then. Unlike in the previous boom-bust cycle, the role of foreign-invested enterprises in the economy has become more apparent. Despite the very rapid growth of imports during 1990-1995 the trade account has generally been in surplus, with the exception of 1993, a year of exceptionally strong import demand and diversion of exports to the domestic market. This surplus has been due in part to the increasing share of exports from foreign-invested enterprises.

The difficulty which the government has had in curbing demand is illustrated by the slow response of the inflation figures to the measures designed to cut inflation. Bad weather has played a part in this, as have price reform measures. Together these have helped to raise the price of food, especially grain, prices of which rose by 51 per cent in 1994.[7/] Overall retail price inflation averaged 14.8 per cent in 1995, after the introduction of price freezes and a concerted attempt to ensure satisfactory supplies. Overall GDP growth slowed in 1995, to 10.2 per cent;[8/] investment growth slowed to a still-rapid 11 per cent in that year; the volume growth of exports was 20.1 per cent and growth in imports was 12 per cent, leading to very large trade and current-account surpluses.

Inflation and its causes

Inflation, previously suppressed in the pre-reform era of fixed prices, has been a persistent feature of the reform period, intensifying after price reform began to gather pace in the mid-1980s. There are a number of factors at work which cause inflationary pressures:

- the unleashing of pent-up demand for consumer goods;
- persistent investment hunger exacerbating shortages of raw materials and boosting demand for credit;
- bottlenecks in the transportation and distribution networks causing mismatched supply and demand;
- excessive expansion of the monetary base as a result of a growing consolidated public-sector deficit being financed, at least in part, by borrowing from the central bank: while the government has managed to curb excessive growth in central expenditure, it has found it difficult to curb the spending of lower-level administrations, and as the public sector's command of resources has shrunk the central government's share of total revenues has also declined relative to provincial and local administrations, making it difficult despite the introduction of tax reforms in 1994 to widen the tax base, while the investment spending of the central government (and even more of sub-central governments) has been rising rapidly;
- selective and progressive decontrol of prices causing new distortions;

- inflationary expectations among the general public causing an unwillingness to hold money in the banking system and intensifying the squeeze on liquidity;
- a tendency for total earnings to rise quite rapidly in real terms combined with a diminished willingness to hold cash balances;
- periodic scarcities of foods and grain, caused by poor harvests and distribution problems.

Not all these factors have operated at the same time or to the same degree, but a mix of several of them has generally been present, with the result that spurts in growth have been accompanied by rising inflation which has then been repressed (more or less) by the reimposition of price controls, in 1988-1989 and again in 1993-1995. As Table I.2 shows, inflation in the overall retail price index started to accelerate into double figures in 1988-1989. It fell sharply in 1990-1991 before starting to rise again. Measured by the consumer price index inflation peaked for the first time in 1988, reaching 18.8 per cent, before cooling measures, including the selective imposition of price controls, helped to reduce the rate to only 3.1 per cent in 1990. Thereafter it started to accelerate again, peaking once more at 24.1 per cent in 1994. The reduction in the rate of inflation to an estimated 18 per cent[9/] that occurred during 1995 took place against a policy backcloth of austerity. Known as the "16-point programme", this consisted of a stabilization package introduced in mid-1993 which aimed to cool what was clearly an overheating economy. In effect the programme amounted to little more than the imposition of selective credit and price controls. Once again the chief reason for the abatement in inflation was the reimposition of controls on prices, especially on food price rises which had been responsible for much of the inflation in late 1994. For this reason, the retail price index (which excludes services) is estimated to have risen by less than consumer prices, as the freeze on food prices took effect.

Table I.2. Inflation indicators, 1985-1995, selected years
(Preceding year = 100)

	1985	1986	1988	1989	1990	1991	1992	1993	1994	1995
Overall retail price index	108.8	106.0	118.5	117.8	102.1	102.9	105.4	113.2	121.7	139.7
Overall consumer price index	109.3	106.5	118.8	118.0	103.1	103.4	106.4	114.7	124.1	138.2
Urban	111.9	107.0	120.7	116.3	101.3	105.1	108.6	116.1	125.0	146.0
Rural	107.6	106.1	117.5	119.3	104.5	102.3	104.7	113.7	123.4	144.5

Sources: *China Statistical Yearbook 1995;* State Statistical Bureau, 1995 Communiqué.

Currency alignments

For most of the 1980s China operated what amounted to a policy of parallel exchange rates: an "official" rate was used for the imports of some state-owned enterprises (thereby giving them a considerable subsidy against the world market price of the goods in question), and was offered to

foreign residents and to tourists who bought foreign exchange certificates (FECs) and used them instead of renminbi. But the rapid and irreversible opening of trade and investment links made it impossible to seal off the national currency from market pressures, and a growing amount of foreign trade was carried out at a more market-based swap rate at centres where foreign investors would trade renminbi. An illegal parallel market also developed. At the end of 1993 the swap and official rates were merged and the FECs were abolished. A rudimentary interbank market has been established, but most currency trading is still done on the swap market. The merger of the exchange rates amounted to a devaluation against the US dollar of 50 per cent (Rmb 5.8 = $1 to Rmb 8.6 = $1; see Table I.3). But the renminbi strengthened against a weak US currency during 1995. Very large inflows of foreign exchange in the 1990s, in the form of foreign investment and export earnings, help to explain the strength of the currency despite a wide inflation differential. Fear of a run on the renminbi in the event of convertibility has faded and there are plans to effect this reform before 1998.

However, full convertibility on the capital account will have to wait until the stock and debt markets are sufficiently mature. In the meantime, the real appreciation of the renminbi that has occurred since 1993 must be a concern in the light of the need to maintain competitiveness.

Table I.3. Average annual exchange rates, 1985-1995
(Renminbi per dollar)

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
Annual average	2.94	3.45	3.72	3.72	3.76	4.78	5.32	5.51	5.76	8.62	8.35

Sources: International Monetary Fund, *International Financial Statistics;* EIU.

External payments

In the early years of the reform period trade grew very fast, as China began to catch up after the years of international isolation experienced during the Maoist era. In 1978-1985 merchandise exports rose by 13 per cent per year and imports by 16.6 per cent, the faster growth in imports being mirrored in the national accounts.

After 1985, exports grew even more rapidly (exports by 15.2 per cent a year and imports by 2 per cent), the faster growth in exports being the result of austerity policies in 1989-1990 which squeezed imports hard. As imports, driven by the needs of the modernization drive and by the capital and input requirements of the rising number of export-oriented foreign-invested enterprises, tended to outpace exports, trade tended to be in deficit except when the authorities imposed import curbs. Since 1990, export growth has been greatly boosted by the shipments of foreign-invested enterprises, whose sales now make up nearly a third of total exports. After a sizeable deficit in 1993, a year when domestic demand was running exceptionally strongly (and hence diverting exports), the trade account returned to surplus in 1994-1995 after the latest in a series of periods of import restraint (see Table I.4).

The current account of the balance of payments is driven by the trade balance. Typically, China runs a small surplus on the services account (due to a surplus on travel) and a modest deficit on

the income account (because large inflows of debt and direct investment have created concomitant outflows of interest, dividends and profits which are larger than the returns on China's sizeable foreign assets).

Financing the generally small current-account deficits that have occurred has not been a problem for China, which has been the recipient of aid and concessional lending on a fairly large scale and is now the single largest borrower from both the World Bank and the Asian Development Bank. As well as concessional multilateral and bilateral funding, China has in recent years become a significant borrower from commercial lenders and has issued international bonds. It has also allowed selected state-owned enterprises to raise capital on the Hong Kong and New York markets, as well as permitting limited foreign investment (in dollars) in domestic stocks.

Table I.4. Current accounts, 1987-1995, selected years

	1987	1988	1990	1991	1992	1993	1994	1995
Current account (million $)	461	-3,637	11,878	13,083	6,278	-11,702	6,532	15,000
Current-account balance as % of GDP	0.0	1.0	3.1	3.2	1.3	-2.0	1.2	2.0
Merchandise exports	34,734	41,054	51,519	58,919	69,658	75,659	102,561	125,691
Merchandise imports	-36,395	-46,369	-42,354	-50,176	-64,385	-86,313	-95,271	-110,591
Trade balance	-1,661	-5,315	9,165	8,743	5,273	-10,654	7,290	15,100
Invisibles inflows	5,413	6,327	8,872	10,698	14,844	15,583	22,357	27,121
Interest, profits and dividends	1,027	1,504	3,069	3,793	5,655	4,437	5,854	7,318
Other services	4,386	4,823	5,803	6,905	9,189	11,146	16,503	19,804
Invisibles outflows	-3,676	-5,233	-6,314	-7,000	-14,781	-17,710	-23,074	-28,013
Interest, profits and dividends	-1,191	-1,630	-1,962	-2,879	-5,367	-5,696	-6,873	-8,248
Services	-2,485	-3,603	-4,352	-4,121	-9,414	-12.014	-16,201	-19,765
Invisibles balance	1,737	1,094	2,558	3,698	63	-2,127	-717	-892
Inward transfers	223	439	252	683	978	1,182	874	1,950
Outward transfers	162	145	-97	-41	-36	-103	-915	-700
Net transfers	385	584	155	642	942	1,079	-41	975

Sources: IMF, *International Financial Statistics;* EIU estimates.

Meanwhile, foreign direct investment (FDI) has surged from nothing to amounts of over $30 billion a year in the early 1990s, when China became the largest recipient of FDI in the world. It is true that much of this comes from the overseas Chinese diaspora, and Hong Kong is by far the largest source. Some of the money apparently flowing in from Hong Kong in the form of FDI is actually a reverse flow of money that was originally domestic but found its way out of China and back in, in search of the tax incentives offered to foreign investment, in a process known as "round tripping". This has helped to swell the sizeable capital-account surpluses that China has run even in years of current-account surplus. The surpluses have also helped to swell the foreign exchange reserves, which had reached $75.4 billion by the end of 1995. They have thus been a source of inflationary pressure.

MACROECONOMIC TRENDS

Fig. I.A. Growth of GDP and manufacturing output, 1987-1994
(Percentage)

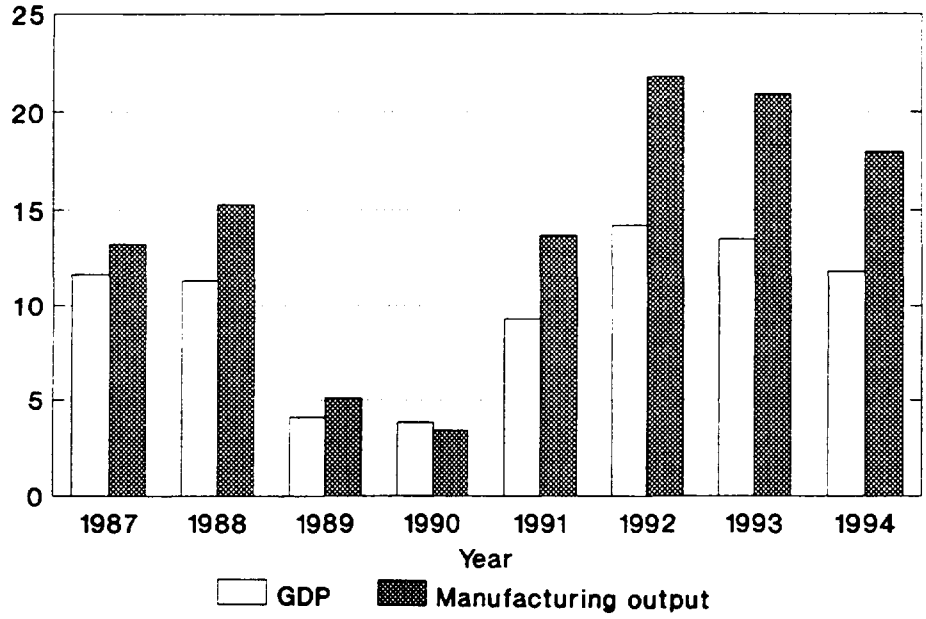


Fig. I.B. Structure of net material product by sector of origin, 1987 and 1993
(Percentage)

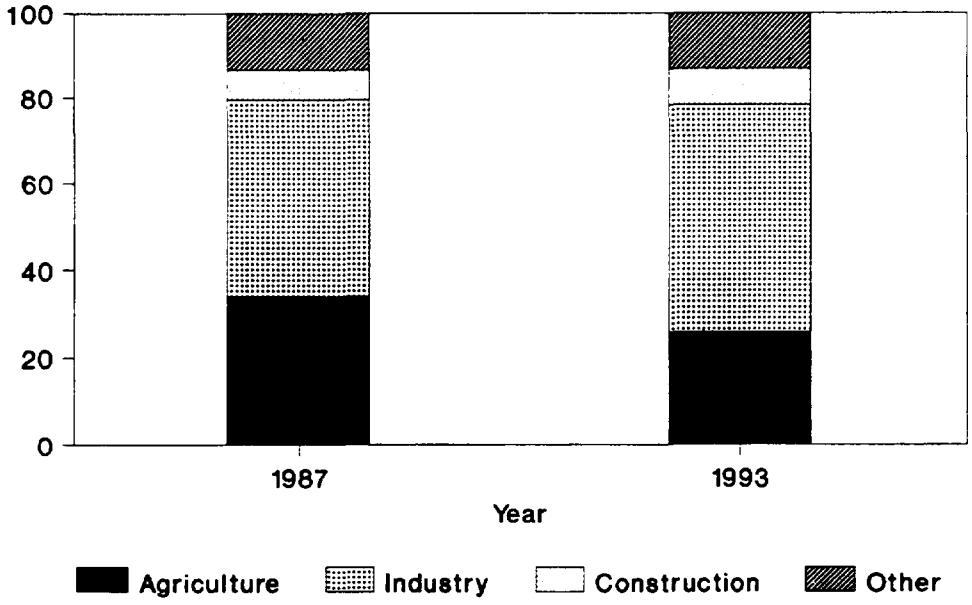


Fig. I.C. Exports, imports and trade balance, 1990-1995
($ billion)

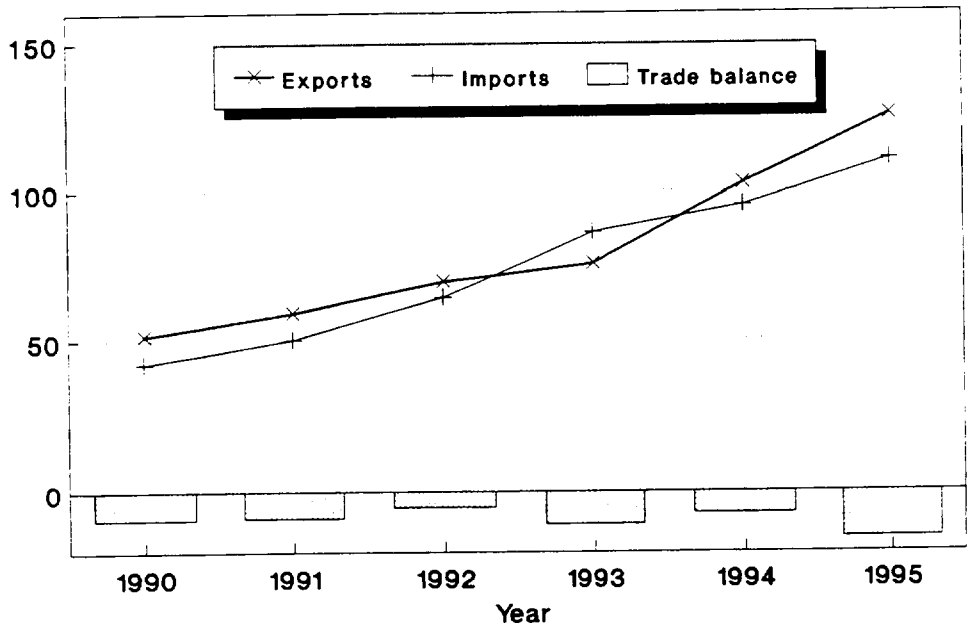


Fig. I.D. Inward and outward invisible transfers, 1990-1995
($ million)

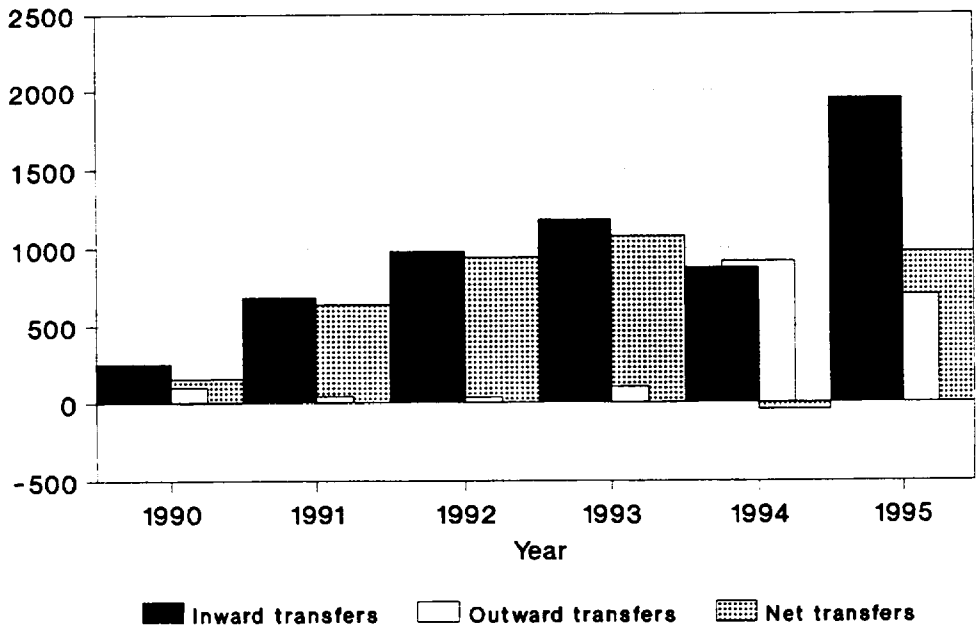


Fig. I.E. Foreign exchange reserves, 1991-1995
($ billion)

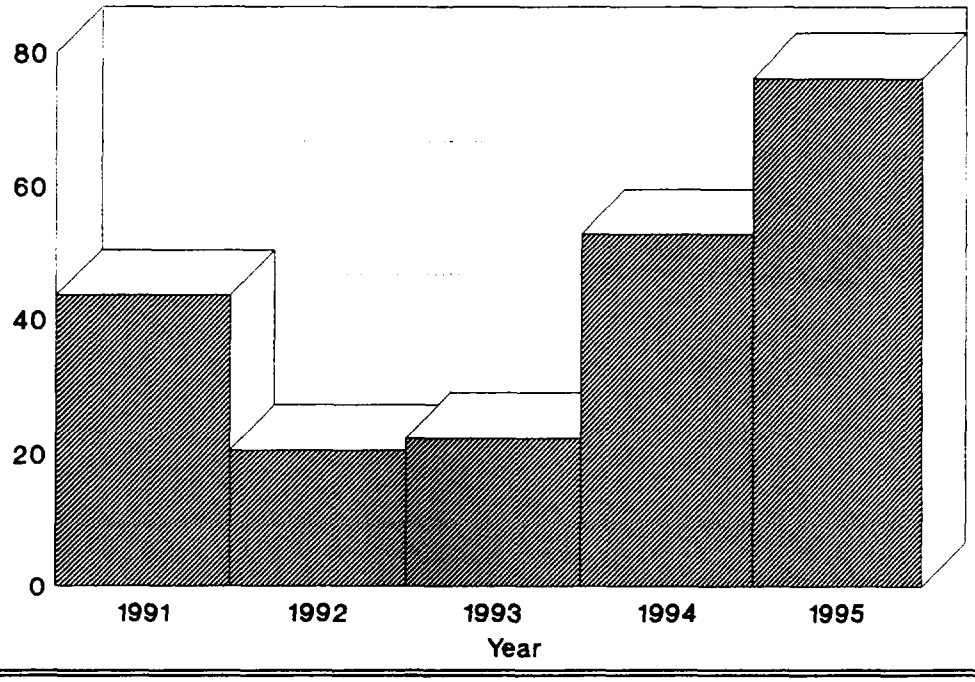


Fig. I.F. Total debt, including undisbursed, 1991-1995
($ billion)

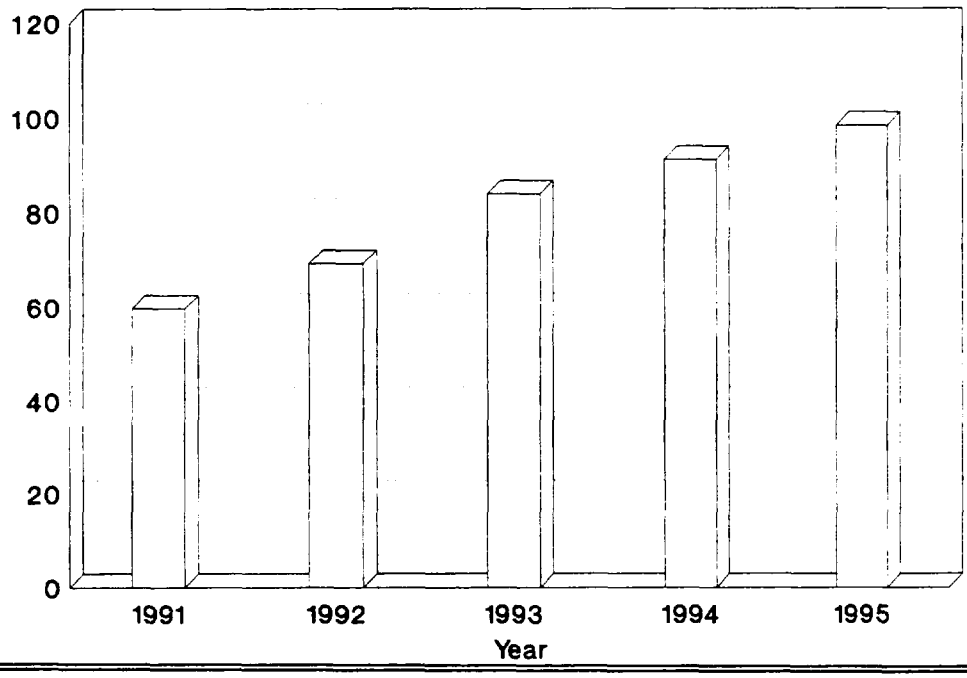


Fig. I.G. Exchange rate, 1991-1995
(Rmb equivalents to $1)

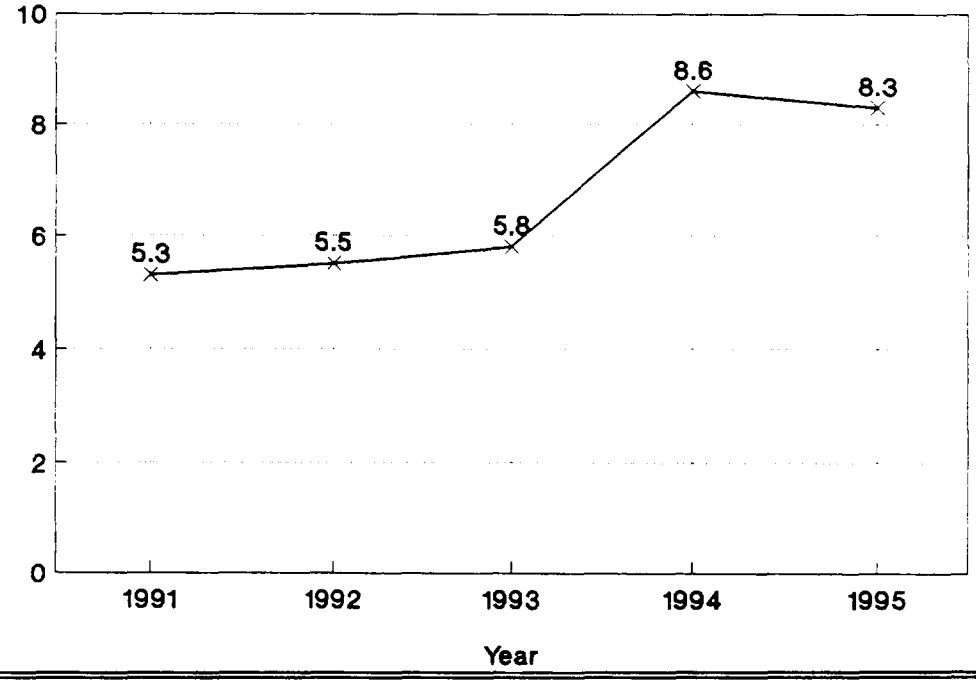
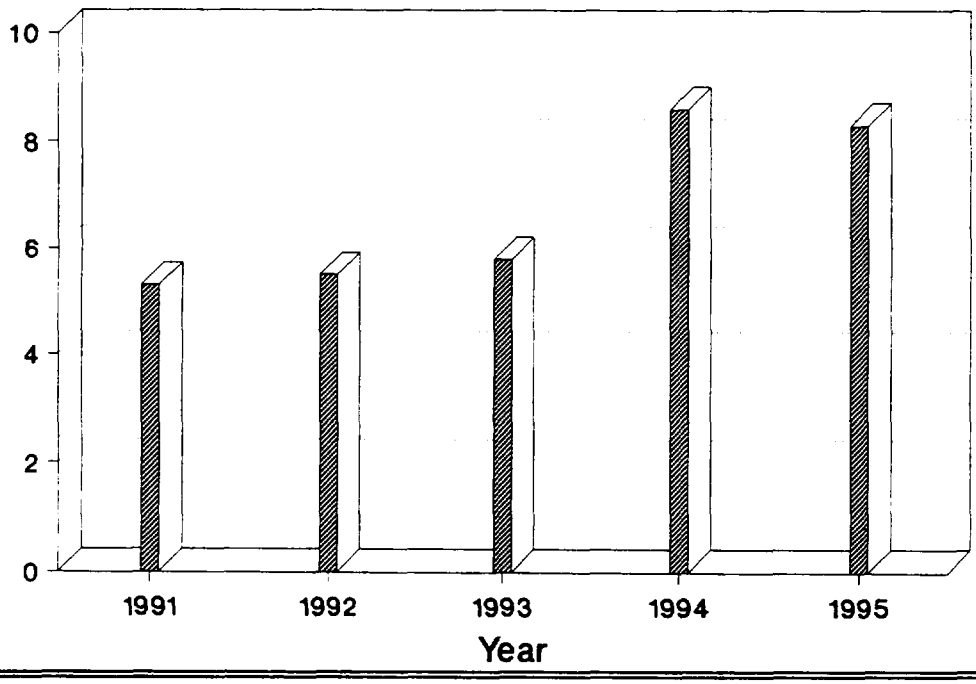


Fig. I.H. Consumer price change, 1991-1995
(Percentage)



B. ECONOMIC STRUCTURE

The physical environment

China, with a land area of 9.6 million square kilometres, is slightly larger than the USA and occupies similar latitudes. Its land frontiers total around 20,000 km and its coastline about 14,000 km. China lays claim to large parts of the South China Sea.

Its size, location and geography have endowed the country with a wide variety of natural resources. It can produce many different agricultural items and has substantial fishery resources. It possesses significant amounts of a large number of mineral resources, including rare earths, the range and extent of which have yet to be firmly quantified. Development of these resources is complicated by the fact that they tend to be located far from the sources of demand, often in the arid and inhospitable north-western regions of the country where population is sparse and infrastructure is lacking. Despite the wide range of resources available, the pressures of population and intensive agricultural and industrial development on the land and on the environment mean that in per head terms China is not well endowed.

The demographic base

China's greatest resource and arguably its greatest challenge are one and the same: its population. This reached an estimated 1.2 billion at the end of 1995, confirming China's place as the country with the largest population in the world by a wide margin.

The population, which is overwhelmingly of ethnic Chinese (or Han) descent, is not evenly distributed, being concentrated in the fertile and relatively well-developed river valleys along the eastern seaboard and in the province of Sichuan in the west. Population density varies from as high as 2,159 persons per square km in overcrowded Shanghai[10/] to fewer than 10 per square km in the remote and barren Qinghai and Xinjiang in the west. The national average was 120 per square km in 1990.

Despite the very rapid rates of growth that have occurred in the recent past the population remains, by Chinese classifications, overwhelmingly rural. From 17 per cent of the total in 1970 the urban population (defined as the population with permanent residence in areas under city or town administration) had risen to only 29 per cent of the total in 1990;[11/] this compares with urbanization rates of 20 per cent and 26 per cent for India, which has been growing much less rapidly. Clearly this moderate rise in the urbanization rate owes much to policies designed to limit urban-rural migration, which are now breaking down under the strain of very much more rapid growth in employment opportunities in the towns and an increasing scarcity of land and employment in the countryside. Large numbers of people moved from the countryside to the towns without official sanction in the 1990s. They do not feature in the statistics for urban areas.

Due to a stringent compulsory family planning policy, which has been in effect (although not always vigorously enforced) since the early 1980s, the crude birth rate fell from 33 per thousand in 1970 to 19 per thousand in 1993,[12/] during which period the crude death rate remained stable at 8 per thousand. The average annual rate of population growth is estimated at 1.4 per cent in 1980-1993, down from 1.8 per cent in the period 1970-1980.

Although the one child policy has been credited with "averting" as many as 200 million births during the 1980s, the population issue is regarded as one of the country's key long-term challenges. Past peaks in the fertility rate mean that it will be some time before the age profile of the population changes sufficiently to alleviate the need to find employment for a labour force that will be growing by about 7 million a year in the 1990s. This problem is being intensified by the lack of opportunity on the land and by the fact that large parts of the country's industrial and urban sectors are heavily overmanned at a time when many enterprises are trying to improve their financial position by limiting labour costs.

The population is relatively well-educated and nourished. Life expectancy at birth was 69 years in 1993. Basic health care is widely available, although increasingly at a cost to the user. The illiteracy rate in 1990 was low by the standard of other low-income economies, at 27 per cent. The relevant age group was fully enrolled in primary education in 1992. Where China compares less favourably with other countries is in the proportion enrolled in tertiary education; this doubled to 2 per cent between 1980 and 1992, but compares poorly with other low-income economies such as Bangladesh (4 per cent).[13/]

Agriculture, forestry and fishing

Traditionally the most important sector in terms of employment, agriculture (defined to include forestry, animal husbandry and fishing) employed 327 million people in 1994, 75 per cent of a total rural "social labour force" of 436.5 million, itself representing 71 per cent of a total of 614.7 million employed.[14/]

However, the rapid growth of other sectors of the economy during the 1980s and 1990s means that the share of agriculture in GDP fell from an estimated 37 per cent in 1980 to just under 22 per cent in 1994.[15/] This change reflects the fact that, although China is a less industrialized country than was the former Soviet Union,[16/] resources have nevertheless traditionally been channelled towards the creation of an industrial base and the later part of the reform period has been no exception. During the very early years of the reform period, a time when family farming was reintroduced and procurement prices for grain and other agricultural products were raised sharply, agriculture grew fast (by 8.2 per cent a year on an annual average basis in 1980-1985). Thereafter its growth rate slowed as the easy gains from the reversion of decision-making and revenue rights to individual families were exhausted. Agriculture grew by an annual average of 3.8 per cent a year in the period 1985-1995.[17/] The need to accelerate the growth of agriculture in general, and to fulfil the conflicting goals of ensuring self-sufficiency in staples and providing enough feedstock for the animal-based diet, is a major concern. It seems to be an ambitious target to produce 500 million tonnes of grains in 2000, up from around 450 million in the mid-1990s. China already imports grain on a fairly large scale (9 million tonnes in 1994 according to customs figures) and fears have been raised that, unless it can improve the efficiency of its use of agricultural inputs (especially water and chemical nutrients), reduce the waste of crops already harvested and slow the diversion of land to other uses, its appetite for imports might become large enough to drive up world prices sharply.

Mining and energy

China has substantial reserves of minerals, including coal and oil, and is an important exporter of several, including tungsten, antimony, tin and mercury. China is self-sufficient (but only just) in energy and is potentially an exporter on a large scale of numerous minerals, if commercial

exploitation of reserves proves viable. Having relied on crude oil exports to generate a substantial proportion of its foreign exchange earnings in the 1980s, China is no longer a net exporter of oil, and could become a substantial importer in years to come.

Mining plays a small role in the economy as a whole, accounting for under 1.5 per cent of GDP.

Manufacturing

Manufacturing has been the engine of growth for the Chinese economy for many years. Ever since the formation of the People's Republic in 1949, the thrust of government policy has been the creation of a diversified industrial base. Until the 1980s the aim was for China to be virtually self-sufficient across the range of sectors selected. Since then there has been a conscious effort to produce for export. In 1980-1985 manufacturing grew by 9.6 per cent a year, taking its share of GDP from 21.1 per cent to 30.5 per cent. Over the period 1985-1995 the estimated annual average rate of growth in manufacturing was 12.4 per cent, and its share of GDP reached 31.3 per cent in 1993 according to World Bank estimates. By 1994 manufactures accounted for 84 per cent of total exports, up from 49.7 per cent in 1980, and the exports of enterprises with foreign investment were a remarkable 28.7 per cent of total exports.[18/]

Chinese definitions break down GDP into primary, secondary and tertiary sectors. Secondary industry includes industry and construction. Within the former category are mining, manufacturing and utilities. On a 1978 base industry grew by 11.1 per cent a year in 1980-1985 and by 13.2 per cent a year in 1985-1995.[19/] As the role of industry in the economy has grown, so has its share of employment. In 1993, of the total labour force known as the "social labour force" of 602.2 million, 107.1 million were defined as being employed in industry, 17.8 per cent of the total (17.1 per cent in 1990; 16.7 per cent in 1985; 15.8 per cent in 1980).

Transport and communications

In the pre-reform era transport and communications were a neglected area, the priority under Mao Zedong being to construct a system that was adequate for purposes of defence and to foster political cohesion. The autarkic tendencies of provincial governments were reinforced by a poor communications system, which consisted chiefly of a technologically backward railway network that was dominated by the need to transport coal. Although every province is connected to the railway system except Tibet, three-quarters of the new railways added since 1949 were built to the west of the north-south Beijing-Guangzhou route. The system which serves the eastern seaboard is therefore heavily congested. Railways still dominate the transport network, carrying 37 per cent of cargo by tonne-kilometre and 42 per cent of passengers by passenger-kilometre in 1994. Over 40 per cent of freight by volume was accounted for by coal and coke. Many new railways are under construction (some with foreign investment), including a new north-south route. Extension, further electrification and double tracking of the system are proceeding.

The number of vehicles on the roads had reached 9.4 million by the end of 1994, and has been rising by 14.3 per cent a year since 1990. The length of the road network had reached 1,117,800 km by the end of 1994, but had only been rising by 2 per cent a year during 1990-1994. Spending on roads is a government priority: 1,729 separate highway projects were listed as being under construction during 1994,[20/] but this cannot keep pace with demand and congestion, a feature of Chinese roads, as elsewhere in the region. The paved percentage of the highway system has risen to 89.3 per cent, up from 73 per cent in 1978.[21/] In 1994 a privately-built and financed

toll road from Shenzhen to Guangzhou opened, cutting the journey time from Hong Kong significantly.

Inland waterways are an important source of transport although, as with roads, most of the network is located in the south and east of the country. The northern waterways are subject to silting and low water levels in the spring and winter, and the waterways of north-east China are icebound for half the year. The ambitious plan to link the five major rivers (the Yangtze, Pearl, Huai, Yellow and Han) has moved a step forward with the beginning of work on the controversial Three Gorges dam project on the Yangtze in Sichuan province at the end of 1994.

Developing and modernizing China's ports is another priority: a major investment programme is under way to improve facilities at existing ports (especially Qinhuangdao, Tianjin and Shanghai) and to build new facilities. A new port is being built in Fujian to facilitate direct trade with Taiwan Province of China. In 1993 19 new deep-water berths opened, but the growth of trade is such that congestion is still a problem. In July 1994 the port for the Shenzhen SEZ opened at Yantian. This was also built with private (Hong Kong) funding and has the potential to be a huge container port on a scale to rival Hong Kong, through which some 40 per cent of China's trade still goes.

Civil aviation is undergoing a boom, with passenger-kilometres and tonne-kilometres growing at over 20 per cent a year in 1990-1994. The aviation system was reformed in 1988 with the Civil Aviation Administration of China becoming the national regulator. Over 30 independent airlines now exist and China is a major buyer of aircraft. Many foreign airliners operate routes to China under reciprocal agreements. National airports are expanding rapidly.

Telecommunications links between major centres and with the outside world are now well established and communications are only a problem in remote areas, although private telephones are still a rare privilege and the process of renting a telephone line can be protracted in cities where the number of foreign-owned offices and residences is growing rapidly. China has acquired satellite telecommunications technology. In 1994 China's first commercial satellite, APSTAR 1, owned by an international consortium, was launched.

Banking and finance

The banking and financial systems in China are still evolving. With the central bank, the People's Bank of China (PBC), at the apex, the formal domestic banking system has three tiers: state-owned specialized banks; commercial banks; and local international trust and investment corporations. There are also numerous official and informal credit cooperatives, often operating in the countryside and generally charging and paying market-clearing interest rates, unlike the formal financial sector where interest rates are regulated and are generally negative in real terms. The state-owned specialized banks are:

- the Industrial and Commercial Bank (which administers industrial and commercial credits, primarily to state-owned industry, and takes deposits from the urban public);
- the China Investment Bank (under the Ministry of Finance, which channels foreign capital from various sources);
- the People's Construction Bank (which lends funds to capital construction projects, partly with budgeted allocations);
- the Agricultural Bank (which is a lending and deposit-taking institution for the rural sector);

- the Bank of China (which handles foreign exchange transactions and manages the reserves).

The lending of many of these banks is dominated by the needs, including the working capital needs, of state-owned enterprises, to which they lend at below-market rates of interest which are also often below the deposit rates offered to the public. To prevent a massive drain on funds from the banks and a severe disintermediation crisis, the government now subsidises term deposits to keep the rate of interest positive. The banks meanwhile generally make a loss on the non-subsidized portion of the interest spread and are further hampered by the fact (recently admitted by the People's Bank of China) that as much as 20 per cent of their assets are of dubious value. A key aim of the reform programme is to move these banks towards the market and they are being encouraged to be much more selective in their lending, both as a demand-curbing measure and to make them more competitive. Their role of long-term, low-interest lending to key enterprises and projects (so-called policy lending) is being assumed by three new banks set up in 1994: the National Development Bank, the Import and Export Credit Bank and the Agricultural Development Bank.

The commercial banks form the second tier of the system; they include the CITIC Industrial Bank (owned by the China International Trust and Investment Corporation), the Huaxia Bank (owned by Capital Iron and Steel) and seven others. Generally owned by the large state-owned enterprises, they have also been subject to government-imposed lending quotas but are much freer to operate within the quotas and financially much sounder than the state-owned banks.

The regional international trust and investment corporations are administered by state and local governments or by specialized banks. They have been subject to various crackdowns by the central government, including a prohibition on local governments using them as vehicles for foreign borrowing.

Foreign banks are allowed to operate representative or joint-venture branch offices, and a United States investment bank has formed a joint venture with the People's Construction Bank to create an international investment bank.

The flow of funds through this system is uneven and not optimal; since mid-1993 restrictions on the amount of lending permitted have been in force as one means of demand management, but it has been possible to evade these by resort to the informal lending sector. In 1996 an interbank market is to be set up, which will be a step towards liberalizing interest rates and creating a more rational financial market.

Stock markets were opened in Shanghai and Shenzhen in 1991, offering at first debentures and more recently shares in state-owned and collective enterprises. The number of exchanges is growing and the markets are very active and very volatile, reflecting the limited opportunities which the public have to invest their savings. By the end of 1994 about 40 million Chinese citizens owned shares and in March 1995 new restrictions on the launch of A shares were announced, to dampen volatility and enhance central government control. Chinese nationals invest in the stock markets by the purchase of A shares, to which foreigners are not allowed access. In 1992 B shares were created for offer to foreigners. Like A shares, they are denominated in renminbi, but prices and transactions are made in US dollars in Shanghai and in Hong Kong dollars in Shenzhen. At the end of 1994 there were 34 companies with B shares traded in Shanghai and Shenzhen. A number of premier rank enterprises have raised capital abroad, mainly in Hong Kong, where 17 so-called H shares are listed, and in New York.

Services

China, as a socialist country, has traditionally tended to neglect the development of the service sectors, although the large scale of the state has meant that government services play a significant role in the economy. Since the mid-1980s, however, services have both diversified and grown rapidly. Large numbers of individuals are now self-employed or working in family units in the service sectors, and demand for a whole range of services previously not widely available has blossomed as personal incomes have grown. The introduction of a five-day week in 1995 has stimulated leisure spending, and travel and inward tourism to China has become a significant earner of foreign exchange; the travel account on the balance of payments is typically in surplus by around $1 billion.[22/] Measured by Chinese statistics (which divide GNP between primary, secondary and tertiary industry and further break tertiary industry down between transport, posts and telecommunications and commerce, leaving another half of tertiary industry unaccounted for), the contribution of tertiary industry to current price gross national product was 21.4 per cent in 1980 (of which commerce was 4.7 per cent), rising to 31.2 per cent in 1990 (of which commerce was 7.6 per cent) and 31.8 per cent in 1994 (commerce 9 per cent).

Demand structure of GDP

A breakdown of gross domestic expenditures by categories shows that investment had reached 40.8 per cent of the current price total by 1994,[23/] up from 35.2 per cent in 1990. Consumption, meanwhile, had fallen to 57.3 per cent from 62.1 per cent. This reflects the investment hunger that has characterized China during the reform period and also the fact that overall state investment has been high and rising in the 1990s, even in 1993-1995 in a period of "austerity" when attempts were made to curb investment, especially by local governments and in construction and real estate.[24/] The need to invest in infrastructure to sustain rapid overall growth has helped to keep state investment high. Since the 1980s the external sector has played a growing role; the share of exports of goods and services in the total current price GDP was more than 10 per cent after 1980. It rose to over 20 per cent in 1991 and 24 per cent in 1993.[25/] Imports have behaved similarly, reaching 19.9 per cent of GDP in 1992.

External trade and payments

China has risen from nowhere before 1980 to rank 11th in the world trade league in 1994. In 1980 its exports were worth $18.2 billion; in 1994 they were worth $121 billion. During this period the share of manufactures in total exports rose from 49.7 per cent in 1980 to 83.7 per cent in 1994, while the share of the exports of foreign-invested enterprises in the total jumped from 1.1 per cent in 1985 to 28.7 per cent in 1994.[26/] The share of the total exports that are in fact re-exports is higher than the above figures would suggest, since not only the exports of foreign-invested enterprises but also those of many Chinese enterprises consist of processed goods using parts or components either supplied by or bought from foreign companies. The contribution of foreign-invested and processed exports to the annual increment in exports is out of proportion to their contribution to output.

Reflecting the large and growing re-export trade as well as the continuing needs of the modernization drive, imports are also dominated by manufactures (85.7 per cent in 1994), a high proportion of which are intermediates such as chemicals, textiles (11 per cent of 1994 imports), base metals (11.5 per cent) and other products that are inputs to re-exports.

Again reflecting the importance of processing, a large part of China's trade (26.8 per cent of exports and 8.2 per cent of imports in 1994) goes through Hong Kong. Of the exports to Hong Kong, a large but unknown share ends up in the USA and Taiwan Province of China, which took 17.8 per cent and 1.8 per cent respectively of Chinese exports in 1994 according to official Chinese customs figures, and which each supplied 12.1 per cent of Chinese imports. Other important trade partners include Japan (17.8 per cent of exports and 22.7 per cent of imports in 1994), the EU (12.1 per cent of exports and 14.6 per cent of imports) and the Republic of Korea (3.6 per cent and 6.3 per cent).[27/]

Until 1990 the trade account was generally in deficit, but the sharp squeeze on imports in 1989-1990 combined with the spurt in exports from foreign-invested enterprises in the same year brought the trade account into surplus. The deficit of 1993 was wiped out by another export boom in 1994, stimulated by the devaluation of that year. As noted above, the current account has been driven by developments on the trade account. Even in those years when there has been a fairly large current-account deficit in nominal dollars, most recently in 1993 when it was $11.7 billion, as a proportion of GDP the deficit was only 2 per cent (see Table I.4).

China's financing requirement (defined as the current-account deficit plus principal repayment obligations) has therefore been generally modest as a share of GDP, peaking at $18 billion in 1993. Debt has, however, been rising quite rapidly, the total reaching $100.5 billion at the end of 1994,[28/] up from $52.6 billion at the end of 1990. But it is foreign direct investment (subject to the caveat about round-tripping mentioned above) that has accounted for the dramatic rise in China's inflows of foreign capital in the period since 1990. Actual (as opposed to contracted) inflows of foreign direct investment started to rise very rapidly in 1991 and exceeded $30 billion in 1994 (see Table I.5). There have also been limited inflows of portfolio investment. But net capital inflows have been much smaller. Not only have the amounts of inward foreign direct investment been exaggerated by "round-tripping" via Hong Kong, but outward foreign direct investment has been larger than reported in the official balance-of-payments data. In the years of rapid foreign direct investment growth since 1990, increases in the foreign exchange holdings have been higher than net capital inflows[29/] so that capital formation in China has been entirely domestically funded.

Table 1.5. Foreign direct investment used, 1979-1994
($ billion)

1979-83	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	Total
1.8	1.3	1.7	1.9	2.3	3.2	3.4	3.5	4.4	11.0	27.5	33.8	95.8

Source: *China Statistical Yearbook 1995*, p. 554.

C. THE POLICY ENVIRONMENT

Overview

When the Chinese Communist Party (CCP) won control of the country in 1949 it set about the process of industrialization on the lines of the Soviet model. Although this was increasingly

modified to suit the particular circumstances prevailing in China (and to accord with the opinions of Mao Zedong), it embodied the typical Soviet bias towards heavy industry and against consumption. A major difference in the Chinese case was the very low level of integration with other economies that resulted from a bias against foreign trade and against the accumulation of debt, intensified after the shock induced by the withdrawal of Soviet aid in 1960. Another feature of the Chinese experience was the fact that, despite the existence of a comprehensive planning system whereby the allocation of output quotas and the necessary inputs to fulfil annual plans took place within the framework of the Five-Year Plans, a sizeable share of the economy remained outside the scope of the central government's planning apparatus. This was partly because of the considerable autonomy developed (and consolidated) at the local level during the chaotic years of the Cultural Revolution (1966-1976).

When the leadership under Deng Xiaoping began to institute economic reforms after the third plenum of the eleventh Central Committee of the CCP in 1978, it was quite clear to them that the reforms would have to be designed to secure the support of the maximum number of the élite at the local level, lest a disgruntled officialdom provide a constituency for the opposition that was bound to surface.

Seen in this context it is not surprising that the reforms began with agriculture, where opposing vested interests were few and where the vast majority of those affected had everything to gain, at least at the early stages, from the reintroduction of family farming. The early agricultural reforms, once introduced experimentally in Sichuan province, could then be extended fairly swiftly across most of China. The same held true with respect to attracting foreign trade and investment ties. Elsewhere the process had to be gradual, one of "crossing the river by feeling for the stones underfoot". Reform of the industrial sector, the price system, the financial sector and the taxation system, as well as streamlining the public sector, are processes in which there are many losers. Accordingly, the conduct of policy in these areas has been cautious. Within a generally reforming (i.e. marketizing) secular trend there have been occasions, most recently in 1995, when macroeconomic policy has appeared to revert to the administrative means (quotas, rations, price controls) associated more with socialism than with the "socialist market economy " which is the official goal of economic development (see above) but whose precise contours are unclear.

Essentially, the ongoing and incomplete industrial/urban reform agenda was laid down in 1984, when a programme of "urban" reform was announced. This had five main strands:

- all urban (in this context state-owned) enterprises would be responsible for their own profits and losses and would operate in the marketplace, with capital to be provided by the commercial banks and inputs and outputs to be distributed commercially;
- the government would gradually abandon its control of most enterprises;
- pay would be determined competitively and workers would be on fixed-term contracts;
- price subsidies would be abolished and prices and wages allowed to find their own level;
- the "collective" and private sectors of the economy would be encouraged to develop and state ownership would diminish.

Essentially the reforms envisage the creation of a three-tier economy, consisting of state-owned and directed, collective and individual (or private) sectors in which the influence of the authorities would become more indirect as the size of the enterprise diminished. The most strategic areas of activity, such as energy and transport, would remain mostly state-directed, although flexibility would be introduced in cases of very large investment needs. A much more market-oriented environment would operate in other areas, including agriculture. The small-scale collective or private sector would operate almost entirely outside the scope of state directives.

A good deal of progress has been made towards these goals, especially those with a focus on freeing areas of activity from the direct control of the state. But it has been easier to change the managerial framework of enterprises than to address the more fundamental problems of overmanning, inefficiency, backward technology, lack of economies of scale and so forth (see below). Thus the role of the individual enterprise managements has been greatly enhanced vis-à-vis that of party secretary; many enterprises are now producing for profit, outside the control of central government ministries, and generally operating in a manner which would be recognized internationally as commercial. But at the same time enterprises remain burdened with responsibilities that keep their fixed costs high: education, health, housing and pensions for staff. Also, the limited progress made on price and financial sector reform has perpetuated, and in some cases has worsened, distortions in the market for the output and the costs of the inputs of some enterprises, while enhancing the profits of others. Because of official reluctance to allow the closure of large numbers of enterprises deemed uneconomic, which has forced the state to continue to subsidize the sector directly and indirectly, many state-owned enterprises have been able to maximize investment and spending on wages within the context of a "soft budget" constraint. Of the 102,000 enterprises under state control in 1994,[30/] 31 per cent are officially recognized as making a loss and this loss would presumably be far greater in the absence of subsidies and without cheap credit from the state banks.

The constraints of the gradualist reform process have also contributed to a cyclical pattern, in which the introduction of reform or other stimulus has stimulated both output and demand, but the attendant rise in inflation has led to the subsequent reimposition of controls.

The planning framework

Since 1953 China has followed the practice of drawing up Five-Year Plans, supplemented by annual targets for the economy. There are also ten-year and even longer-term goals, but they are less specific. Discussion and negotiation of these plans behind the scenes is a protracted and complex process, currently refereed by the State Planning Commission. The plans, both five-yearly and annual, are typically the result of a complex process of aggregation involving many participants and culminating in the finalization of a complex, multivariate input-output model for most economic sectors. Under the influence of the reforms, especially after the mid-1980s, "mandatory" planning has increasingly been supplanted by "guidance". This means that most targets are negotiated between the individual enterprise and the relevant ministry in the capital or local government. A similar negotiating process establishes the amount of grain or other agricultural product that an individual farming family agrees to produce for public procurement, usually at a pre-determined price. By 1995 the proportion of key raw materials allocated by the state had fallen to 46.8 per cent in the case of steel (from 77 per cent in 1979), 25.9 per cent of timber (from 85 per cent). 43.5 per cent of coal (from 58.9 per cent) and only 13.6 per cent of cement (from 35.7 per cent).[31/] Although there have been occasions when the state has found it necessary to intervene more directly in the allocation of inputs, for example at periods of acute shortage of key raw materials, the trend has been towards an ever-diminishing role for the central government in the direct control of the economy. This has been the natural consequence of the

disproportionate growth of the "non-state" sectors and their rising contribution to total industrial output.

However, the still large share of state-owned units in total investment, 56.9 per cent in 1994,[32/] gives the state an important role in resource-allocation, and virtually all the large-scale infrastructure projects are state-funded. The State Planning Commission has tended to strengthen its role in policy formulation since 1989-1990, when many of the informal think-tanks grouped around the leadership were disbanded. The planning process is still of considerable importance, therefore, in balancing the claims of conflicting priorities and establishing a consensus on the macroeconomic priorities.

Because of the very fast growth of the Chinese economy under reform, plan targets have generally been exceeded by a wide margin. The annual average growth target for the seventh plan (1986-1990) was 7.5 per cent against an actual figure of 8.9 per cent. The target for the eighth plan (1991-1995) was for annual average growth of only 6 per cent; the actual growth was 10 per cent.

The ninth plan, still in draft form, envisages an annual growth rate of around 8-9 per cent, more realistic than previous plans and consistent with the long-established goal of quadrupling 1980 GDP by 2000 and doubling it again ten years later. Among its other aims, presented in the form of a "Proposal for Formulating the Ninth Five-Year Plan (1996-2000) for National Economic and Social Development and the Long-Term Target for the Year 2100", are:

- a commitment to the continuance of the "dominant position of the public sector": state-owned and collectively-owned assets should predominate in total gross social assets;
- strengthened control by the central government over the macroeconomy;
- a reconcentration on rural development, with a view to increasing agricultural output and achieving a better regional balance of growth, which has previously been disproportionately concentrated along the eastern seaboard of the country where most of the foreign direct investment has taken place;
- inflation to be contained below the real rate of GDP growth;
- further reform of the state-owned industrial sector, especially those 1,000 key enterprises of which 800 account for 63 per cent of SOE output: this will involve encouragement of mergers, conversion of some outstanding debt into government-held equity and some write-off of debt;
- inland regions receiving a greater proportion of state-allocated investment and foreign investors being "encouraged" to locate in such regions;
- although still being encouraged, foreign investment being increasingly "guided" into those areas deemed most suitable: foreign-invested enterprises will increasingly be accorded "national" treatment;
- the need to reform and develop the financial sector is explicitly recognized.

Fiscal policy

After 15 years of reform, the ability of central government to use fiscal policy as a means of macroeconomic control has been considerably diminished. Apart from 1985, in each year since 1979 the national budget (which aggregates the total budgetary revenue and expenditure of all levels of administration) has been in deficit, a deficit which was running at an average of 2.3 per cent of GDP in 1987-1994.[33/] This reflects the process of reform; budgetary revenues' share of GDP has been in decline because of the fall in contributions from SOEs, traditionally the mainstay of government revenues, from 20 per cent of GDP in 1978 to below 4 per cent in 1992. The fall in SOE contributions accounted for 80 per cent of the total decline in the revenue to GDP share over this period, and occurred because the granting of greater autonomy to SOEs led to the separation of enterprise accounts from the government. A reduction in the monopoly profits of some SOEs as a result of reform, leading to greater competition and lower prices, also played a part in this process.

Decentralization has been an integral feature of the reform process, and there is strong evidence to suggest that the devolution of authority to lower levels of government has impeded revenue mobilization by creating situations of conflicting loyalties. The central government does not collect taxes other than excises, a task which is left to local governments which then remit funds to the centre according to a variety of negotiated revenue-sharing arrangements.[34/] This has given local governments considerable control over the implementation of tax policy, and they have often been less than totally zealous about tax collection to avoid having to share resources with the centre. Revenues from indirect taxes, which have not risen as a share of GDP, possibly because local governments have been granting ad hoc exemptions, have been surprisingly stagnant. To recoup revenues forgone as a result of ad hoc exemptions, local governments have resorted to the imposition of levies which have swollen "extrabudgetary" funds, not all of which are legal. The result of all this is that the share of the central government in total revenues after tax sharing has dwindled from 59 per cent in 1978 to 41 per cent in 1993.[35/]

The deficit, meanwhile, is larger than it appears. The World Bank argues that[36/] a more accurate representation of government activities is provided by the concept of the consolidated government deficit (CGD). This consists of the fiscal (i.e. budget) deficit plus the part of central bank lending to the financial system that finances the government-directed expenditure of the SOEs (i.e. their welfare expenditure). This lending, the World Bank argues, is a major source of inflationary pressure. Defined as the sum of the budget deficit and the net policy lending of the People's Bank of China, the CGD is estimated to amount to between 5 and 6 per cent of GDP. It has been kept up not just because of the need to make subsidized working capital loans to "priority" enterprises, but also by the need to sustain the large amount of investment that is channelled through loans to state-owned enterprises or used for rural or social sector development.[37/]

The decline in the share of central government revenues mentioned above has also contributed to a larger CGD, because local governments generally have a higher propensity to spend and because the central government has found it necessary to resort increasingly to the financial system to fund its priority spending. Since 1994 the central government has been able to finance the whole state deficit by issuing bonds and borrowing abroad.[38/] But its overall expenditure has been rising while its budgetary expenditure has fallen in proportion to GDP, as have revenues. This represents a failure to control overall expenditure that results from decentralization (leading to an upsurge in investment by local governments) and from the fact that total operating subsidies (implicit and explicit) to SOEs have not been curbed, although subsidies explicit in the budget have been falling.

There is also a problem associated with extrabudgetary funds. Local governments have been collecting many ad hoc levies and spending the proceeds, boosting total state expenditure. Nor is control over the official investment process via the State Planning Commission and the Construction Bank adequate.

What is needed to regain control over the CGD and curb the inflationary borrowing from the Central Bank is a strengthening of control from the centre, over both revenues and expenditure. The World Bank has called for a combination of administrative recentralization on the one hand and greater economic decentralization on the other. By the former is meant central control of the tax administration and an enhanced resource mobilization capacity for the central government. The November 1993 "Fifty Articles" envisaged the creation of a reformed national tax administration, where bargaining is replaced by transparent rules. Attempts are being made to increase tax revenues. The major measures, implemented in 1994 are:

- a streamlining of the tax system, reducing the number of taxes on industry and commerce from 32 to 18 by:
  - broadening and restructuring VAT;
  - unifying and restructuring the enterprise income tax;
  - restructuring the personal income tax;
  - abolishing or merging various minor taxes;
  - expanding the resource tax;
- reorganization, as of 1 July 1994, of the tax administration into a National Tax Service and a Local Tax Service, the National Tax Service to collect all central and shared taxes.

The effect of these measures, which are in the early stages of implementation, is as yet unclear. Revenues in 1994 were higher than budgeted, but this was largely the result of higher than expected growth that year.[39/] Expenditure was also higher but by a lesser margin, so that the total deficit was Rmb 115 billion, less than the Rmb 129.2 billion projected when the budget was presented. The tendency to grant exemptions, for example to foreign-funded enterprises and joint ventures, has continued.[40/] The revenue-enhancing effects of the reform will therefore take time to show through and the improved collection mechanisms that the new administration heralds will not be in place until the system is staffed and the staff are trained. Eventually, however, the taxation system should become more transparent and more efficient. More taxes are likely to be introduced, notably on property and personal income.

Monetary policy

The fiscal problems faced by the central government, exacerbated by the need to subsidise the state-owned industrial sector, have hampered the effective reform of the financial sector. A persistent feature of the Chinese system remains the fusion of the fiscal and monetary roles of the state. The large CGD, which has been financed by the central bank, has meant that monetary policy has been subordinated to fiscal imperatives. The People's Bank of China (PBC) has no effective independence and is subject to the State Council (or cabinet). As noted, from 60 per cent to 80 per cent of the PBC's lending is for policy loans which are essentially government expenditure.

Traditionally, the annual credit plan has been the chief instrument of monetary policy. It is compiled annually in accordance with directives established by the State Council for growth in the

major macroeconomic variables, after the putting together of sectoral and local needs. It is implemented, after being approved by the State Council, by means of credit ceilings set for the main banks. (Ceilings for non-bank financial institutions are part of an indicative credit plan.) These ceilings cover different kinds of credit, and are also disaggregated by province using estimated increases in bank deposits and the previous year's performance as guidelines. Provincial ceilings are not revealed by the centre. The quotas are allocated by the head office of the PBC to the head office of the relevant bank, leaving the PBC branch network in a supervisory role. Funds can be transferred by the PBC when provincial branches of the banks have unused lending quotas but not funds. (Banks can also seek funds in the growing interbank market.)

Decentralization (especially as manifested in the investment hunger of local governments), poor coordination and the emergence of informal and unofficial financial activity have combined to render the annual credit plan ineffective as a way of controlling credit. The rapid pace of financial broadening and deepening and a poor regulatory system have given rise to the diversion of funds to unintended uses, and the availability of alternative financial assets, formal and otherwise, has rendered the system prone to disintermediation crises.

In addition to the above problems, which tend to weaken the administrative power of the authorities to control growth in credit by quota and the use of reserve requirements, interest rates do not reflect the market. The soft budget constraints of SOEs have made it impossible to use interest rates as an effective method of financial intermediation in the formal sector, and interest rates have been changed infrequently and are generally negative in real terms. Interest rates on deposits have been adjusted upwards several times to help combat disintermediation. But the state banks cannot afford to pay attractive interest rates to depositors when they cannot earn positive interest spreads on their own assets. To prevent disintermediation the central bank has been paying, since March 1994, an inflation rate subsidy on maturity on deposits of three years and above. The rate is fixed monthly. Treasury bonds issued in 1994 and 1995 have also been paying positive real interest rates and were easily disposed of as a result.

Monetary policy is therefore heavily constrained. To curb excessive growth of liquidity and also investment demand it has been official policy to restrain the lending of the state banks as part of a 16-point programme to cool the economy introduced in July 1993. As discussed above, this has been of limited effect. The needs of SOEs for cheap working capital have not diminished and indeed in some cases have increased because of the chain of unpaid enterprise debts that has built up. The state itself has continued to borrow from the central bank to finance policy lending, creating further reserves. Thus liquidity has gone on increasing. Money supply growth has been running at over 30 per cent since 1992, and total loans outstanding have grown by an annual average of 20 per cent a year during 1990-1994. Meanwhile a very large unofficial financial sector has emerged, where the rates of interest are truly market-based, which undermines the attempt to curb the growth of credit in the formal sector. Reform of the financial system is a key priority and various changes are being contemplated. These include:

- strengthening the People's Bank of China by means of a new law which aims to make the PBC more autonomous and curb its role in credit allocation;
- reorganizing the branch network of the PBC along regional, not provincial, lines to decrease the susceptibility of the network to pressure from local governments;
- introduction of a new payments system which will reduce the number of settlement accounts held by banks and make it possible to close many PBC branches below the county level;

- creation of a national interbank market;
- clarification of the relationship between banks and non-bank financial institutions and reform of the supervision function;
- establishment of policy banks to separate this kind of lending from commercial activities;
- increased use of the issue of government securities and the creation of a securities market across a range of maturities;
- interest rate reform.

Not all these changes will be introduced rapidly. They represent challenges in reconciling competing interests and conflicting goals. Reform of the financial system would have consequences for the management of public-sector finances and for the funding of SOE activities. But there is no doubt that the government has recognized that the financial system will have to change if monetary policy is to become a meaningful macroeconomic tool.

Price policy

Price policy in China since 1978 has pursued two not always compatible goals: a gradual lifting of state controls over the prices of most products, and the maintenance of price stability for consumers, especially in agricultural staples.

Price reform, by which is meant the removal of the distortions caused by administered prices, started in the early 1980s. By 1992 the proportion of prices set by the government in the retail sector had fallen from 97 per cent in 1978 to 10 per cent; for agricultural and sideline products it fell from 94.4 per cent to 15 per cent; for production materials it fell from 99.7 per cent to 20 per cent.[41/]

Within the picture of an overall freeing of prices, however, the prices of certain key commodities (grain, coal, oil, rail freight) remain subject to some regulation, generally only over the portion of output that is still covered by the planning mechanism. In these cases there is both an official and a free-market price. In the case of grain, this is partly because the historical legacy of keeping the price paid by urban consumers low has meant both careful control of the procurement price and a high degree of government subsidy. Procurement by the state still accounts for a significant part of the harvest, which is bought at contracted prices. In the case of key raw materials prices, continued price control has reflected a general scarcity which has meant that the government has traditionally not only set prices but also overseen allocation, favouring key SOEs.

A secular trend towards the decontrol of prices is now well established, although there are still significant policy-induced distortions. Import prices are influenced by a tariff regime which keeps the prices of some imports artificially high to protect domestic producers; these include potassium fertilizer, polystyrene, and selected high-technology consumer products. Within agriculture, export prices for some commodities (notably maize and rice) are kept artificially low to benefit domestic consumers. By the early 1990s, however, the domestic price of wheat (both planned and free market) was close to import parity. The authorities have been able, in the case of certain commodities such as tungsten, for which China is a price maker on the international market, to use taxes and licences to help raise the export price relative to the domestic price and thereby to

maximize the foreign exchange gained.[42/] When China becomes a member of the World Trade Organization, such policies will be more problematic.

After 1992 economic overheating exacerbated inflation and the pace of price reform slowed. In the 16-point programme announced in July 1993 price reform was frozen, the price of coal used in power generation and washed coal having been deregulated in January of that year.[43/] During the first half of 1993 prices for crude oil and steel products were liberalized, and in the spring the grain coupon system was abolished and grain prices were liberalized. In 1994 food prices, under the influence of shortfalls and higher costs for farmers, rose sharply. The surge in prices at mid-year led the government to reintroduce subsidies, price controls and even rationing in some cities. Food prices contributed substantially to the 24.1 per cent rise in the national consumer price index in 1994.[44/] Controls are not likely to be lifted until fears about inflation have eased.

Trade policy

Despite progressive measures to liberalize, simplify and streamline it, China's trade regime remains complex and comparatively regulated, with tariff and non-tariff barriers a prominent feature. A Foreign Trade Law was promulgated in 1994, but it was couched in very broad terms. During 1995 a number of enabling regulations designed to foster the country's overriding aim of joining the World Trade Organization were announced, including cuts in tariffs. With the exception, in general, of foreign-invested enterprises, trade is still conducted within the framework of the planning mechanism under the supervision of the Ministry of Foreign Trade and Economic Cooperation (MOFTEC), previously the Ministry of Foreign Economic Relations and Trade (MOFERT). Trade is generally carried out through the mediation of foreign trade corporations (FTCs), national and provincial, which work to contracted goals.

Before 1984 trade was highly centralized, and in the pre-reform days the plan was driven by the need to export enough to meet the foreign exchange needs generated by import requirements. After the decentralization of the trade system in 1984 the plan for foreign trade became more export-driven, with imports being scaled in accordance with export earnings. Export targets were split into command and guidance plans, with the command plan fixed quantitatively and applied to specific products. The guidance plan, which comprised two categories of products defined according to which FTCs could handle them, contained only value targets.

Imports were divided into mandatory essential imports of raw materials, imports of other raw materials, spare parts and plant for key projects, and the rest, which were covered by a licensing system and were not centrally financed. Like exports, products were divided into two categories according to which FTCs could handle them. FTCs incurred losses under this system as they bore the difference between domestic and international prices.

In 1988 and 1991 the system was reformed; contracts signed with MOFERT by provincial administrations and national FTCs specified the value of foreign exchange to be earned, the amount to be remitted to the government and the domestic subsidy to be provided to cover losses. In 1991 the contracts became annual (rather than for three years as previously) and the targets were set on a bottom-up basis. Fiscal subsidies on domestic currency losses were formally abolished, at least on exports. Meanwhile the government set about trying to reduce the burden that resulted from subsidies for losses on imports by seeking to close the gap between domestic and international prices for key imports.[45/]

The key feature of the reforms has been the scaling down of the plan. The mandatory plan for exports has been eliminated, although the state retains control through canalization and licensing of a few goods that are still classified by category. Although the plan has remained more important for imports, because of a perceived need to protect domestic industry and to conserve foreign exchange, the number of goods subject to categorization had fallen to 20 in 1992. Meanwhile the number of FTCs has grown rapidly.

Like other developing countries, China uses tariffs, taxes and non-tariff barriers (NTBs) on imports and to a lesser extent on exports as a policy tool. NTBs include controls, canalization, the trade plan and the export and import licensing systems. Tariffs are not an important source of government revenue.[46/] The desire to join the World Trade Organization means that China is following a policy of progressive relaxation of trade barriers and lifting of tariffs.

In 1992, the average unweighted tariff rate was 43 per cent (up 5 per cent from the rate reported in 1986), and when weighted by the value of trade in each category at world prices the tariff rate was 32 per cent.[47/] Products considered to be essentials, such as cereals, animal feed and raw materials, have low tariffs; manufactured finished goods carry high tariffs. Textile yarns and fabrics and vehicles carry high tariffs because of the importance of protecting domestic production.

Average tariff rates in China are, according to the World Bank, "relatively high by international standards",[48/] but it should be noted that there are many exemptions, especially for exporters. In 1992 the trade weighted average was the third highest of a number of developing countries (after India and Pakistan). As well as being high, China's tariffs are highly dispersed but they are coming down. In 1992 and again in 1995 there were substantial reductions in tariffs. In April 1996 another set of reductions will come into force, the aim being to reduce the average tariff rate from 35.9 per cent to 23 per cent in an effort to move towards the 15 per cent rate allowed under WTO rules for developing countries. As the rates move down, so the government has decided to remove some of the exemptions currently enjoyed; for example, from April 1996 new ventures with foreign investment will lose the right to import equipment and raw materials free of tariffs.

The overall impact of the tariff and NTB regime on the economy is to raise the price of final consumer goods relative to intermediates and thereby to afford a high degree of protection to domestic producers of consumer goods. This helps to reinforce some of the distortions in the industrial sector which will be discussed below. The impact of membership of the WTO will therefore be favourable to Chinese industry; according to the World Bank the removal of some of the trade-induced distortions would foster a more rational industrial structure.[49/]

Internal trade, discouraged by the autarkic policies encouraged in the pre-reform era which led to a widely dispersed industrial development structure in which each province sought to produce as wide a range of goods as possible, has been stimulated by reforms and by the greater economic specialization that has accompanied liberalization. However, some local governments seek to erect internal trade barriers both to collect taxes on cross-provincial trade and to protect local producers.

Economic reform itself has also tended to reduce internal trade in some goods. The relatively developed eastern seaboard, which is the springboard of export-oriented manufacturing, is becoming more closely linked to regional trading partners than to the interior of China. This is exemplified by the low domestic value-added in many assembly operations; in 1991 imports for processing represented 77 per cent of the value of processed exports.[50/] The current tariff structure exacerbates this because it allows "relatively high cost production of intermediate inputs to continue for the domestic market"[51/], encouraging exporters to favour imported

intermediates. Exemptions on import duty for export processing have been so important that the value of exports associated with concessional imports had reached 64 per cent of the value of manufactured exports in 1993.

Foreign exchange policy

Between 1980 and 1984 two exchange rates operated. The official rate depreciated slowly against the US dollar on a managed float. There was also a secondary rate which was used internally by FTCs. In January 1985, in response partly to arguments that the two-tier rate represented an export subsidy, the two rates were merged. In 1986 foreign exchange swap centres were set up, primarily to allow foreign-invested enterprises to dispose of excess foreign exchange and acquire renminbi. The swap rate was generally below the official rate and reflected more the realities of the market while the official rate, typically of such rates, tended to overvalue the currency. In January 1994 the government took the bold step of abolishing the distinction between official and swap rates. The third, tourist rate, whereby foreign visitors received foreign exchange certificates (FECs) for their currency and used them to buy goods and services which could not be bought using renminbi, was also abolished at the same time. This represented a devaluation from the official rate of Rmb 5.8 = $1 to the prevailing swap rate of Rmb 8.7 = $1, a change of 50 per cent for those who had previously used the official rate. The rate is now set by the central bank with reference to the rate established on the previous day by the banks operating as members of the China Foreign Exchange Trading Centre in Shanghai (CFETC), itself linked to other centres and swap markets across the country.

Chinese and foreign enterprises alike acquired wide-ranging *de facto* powers to engage in foreign trade and accumulate foreign exchange in the late 1980s and early 1990s, and the authorities became concerned that progress towards convertibility of the currency would be undermined by the potential volatility that decentralization of foreign exchange management had introduced. There has traditionally been a fear that unrestricted access to imports would engender an import boom that would itself prompt an unstoppable run on the currency. While this did not happen, even in 1993 when import growth was exceptionally strong, there has been official concern at widespread evasion of regulations on foreign exchange movement which are evident in the size of the errors and omissions item in the balance of payments.

In the last two years a dual-track approach to the issue of foreign exchange management has been adopted. On the one hand, as part of its commitment to reform, the government has made it clear that full convertibility is the ultimate goal. Steps towards this have been taken and the currency is now broadly convertible on current account. At the same time the authorities have sought to strengthen their control over the foreign exchange markets by obliging all enterprises which conduct business in foreign exchange to use officially designated channels. Thus, since the unification of the exchange rate in January 1994 all Chinese enterprises (including FTCs) must surrender their foreign exchange earnings to state banks, and those authorized to import must present the correct documentation before being permitted to buy the necessary foreign exchange. This replaces a system whereby exporting enterprises were able to retain a proportion of their export earnings, the amount retained being defined according to the type or location of the enterprise or the commodity in question. Those with the authority to retain foreign exchange (i.e. possessing a retention quota) could also trade the quotas or use them to buy foreign exchange for approved imports. Meanwhile controls on the foreign exchange flows of foreign-invested enterprises were tightened and the bureaucratic procedures made more complex.

Despite a large inflation differential, for example with the USA, the currency has been stable since the unification of the exchange rate. This stability, which has seen basically no change in the annual average exchange rate of the renminbi against the US dollar in 1994-1995, is at least partly the result of the boom in inflows associated with rapidly rising exports and foreign investment flows, which have helped to swell the foreign exchange reserves sufficiently to defend the renminbi in the event of a run on the currency. They had reached $64.2 billion at the end of June 1995, up from $33 billion at the end of June 1994.

However, despite the stability of the renminbi, achievement of full convertibility of the currency is still some way off. Regulations covering movement on the capital account are still in place and are likely to continue in force until such time as the authorities decide that China's highly volatile fledgling stock markets and commodity exchanges are sufficiently mature to allow direct foreign participation. Meanwhile regulations on the outward flow of profit remittances by foreign-invested enterprises remain in force, the enterprise being permitted to remit only to the extent that it holds sufficient funds in its foreign exchange account or is able, under the rules introduced in early 1994, to purchase any additional foreign exchange needed from the designated foreign exchange banks.[52/]

Human resource development

China has the largest population in the world and must feed 20 per cent of the world's people on less than 10 per cent of the available arable land. In addition, China is comparatively poorly endowed with all kinds of capital other than human resources.[53/] The World Bank, in a preliminary attempt to rank countries by wealth, places China near the bottom of the scale at number 31 out of a total of 192 countries surveyed. Of China's wealth, moreover, 77 per cent is ascribed to human resources.

In the light of the pressure placed by its high population on its limited resource endowment China has, since the 1970s, conducted an active campaign to limit fertility.[54/] This campaign took on a harsher form in the 1980s, when the planners devising the economic targets for the first decade of reform concluded that it was necessary to limit the population to 1.2 billion by the year 2000.

A system of incentives to meet, and penalties for exceeding, the limit of one child per family in the cities and the countryside was introduced in 1979, complete with quotas which local officials were responsible for meeting. Evasion was widespread, however, and the programme was reconsidered in 1984 when modified population control guidelines that were easier to implement were issued. The modification allowed the birth of a second child in rural families under certain conditions and opened the way for a number of province-specific allowances to be introduced. The result was a rising crude birth rate (officially underreported) and higher numbers of total births. Once the target of 1.2 billion for 2000 had been officially abandoned, a more realistic and enforceable policy allowing two children in families in rural areas where the first-born was female was introduced in 1988. It is now officially accepted that the population in 2000 will be 1.231 billion.[55/] This represents an annual average growth rate of 0.9 per cent in the years 1993-2000, down from 1.8 per cent in 1970-1980 and 1.4 per cent in 1980-1993, and compares with an average of 1.8 per cent for all low-income countries projected for 1993-2000.

In terms of health and nutrition, the achievements in improving life expectancy and providing health care facilities (with the exception of the years of great famine of the early 1960s), have been impressive. At 69 years, life expectancy in China compared favourably in 1993 with the average

of 62 for low income developing countries. Food availability, at 2,600 kcal daily per head in 1990,[56/] is not far off the level in Japan, although this national average conceals pockets of below average supply in the arid north-west and the wet but drought-prone south-west.

Health care facilities are available on an impressive scale for a country of China's level of wealth; in 1993 there were 1,060 persons per physician compared with 1,500 in 1970, and basic health care was available to most of the population at little or no cost.[57/] It should be noted, however, that the falling share of the central government in public expenditure and its reduced ability to mobilize national resources are placing harsh limits on growth in welfare and education provision.

The resource constraint is of particular concern in the field of education, which has enormous needs to recover from decades of neglect, especially marked during the chaos of the Cultural Revolution. Efforts to popularise primary education have been comparatively successful; the enrolment rate in 1993 was not only well up on the 1970 level (121 per cent compared with 89 per cent in 1970), but also well above all other low income developing countries, although there was a worrying tendency for pupils to drop out of primary school to work on the land, exacerbated by the introduction of fees since the transfer of responsibility for primary education to local governments.[58/] The result is, as noted above, a comparatively low illiteracy rate. China's secondary enrolment ratio, at 51 per cent in 1993, had risen from 24 per cent in 1970 and compared favourably with other developing countries. But the tertiary enrolment ratio is small. At 2 per cent in 1993, it compares poorly with south Asian countries in particular and large developing countries in general. The result is a shortage of scientific and engineering skills. There are also serious problems with the quality of teaching; salaries and morale are low and the standing of teachers is not high, making it difficult to recruit and keep able staff.

The problems are well recognized. A decision to reform the educational structure was taken in 1985, with a view to extending the reach of education (targets were set for specific regions) and imparting a more vocational bent to secondary and tertiary education.[59/] A National Programme for Educational Reform and Development has been laid down in an attempt to improve the situation. Additional investment is promised and higher pay for teachers is envisaged. Of senior high schools nationwide, the proportion of vocational schools is to reach 60 per cent by 2000. Efforts are also being made to expand the availability of training opportunities and mobility for those already in the workforce and to establish functioning labour markets. Numerous plans exist to enhance the quantity and quality of personnel skilled in science and technology.

Environmental policies

Against the background of an inexorable rise in the population of China to 1.231 billion by 2000 and a need to increase the living standards of this population despite the pressure on the environment generated by an increase in consumption of resources per head, the issue of environmental degradation in China is acknowledged to be serious. Put very simply, China is suffering form land degradation, shortages of water, deforestation and a severe rural energy shortage which is a source of land loss and a cause of large-scale emissions of air pollutants. The attainment of modernization goals by 2000 would require emplacement in just one decade of a variety of productive capacities equivalent to total national outputs of such populous nations as India or Indonesia, or of such industrialized economies as Japan or Canada.

Since the beginning of the 1980s there has been much debate inside China about the issue of environmental degradation and about the environmental consequences of development projects such as the enormous Three Gorges dam on the upper reaches of the Yangtze river in western

Hubei province. A set of environmental laws was enacted in the first half of the 1980s, and efforts to conserve the natural environment were stepped up. The government has placed the issue of control of population growth at the forefront of its environmental concerns.[60/] It has also, particularly in the 1990s, acknowledged the international dimension of concern over national environmental degradation and has embraced the concept of sustainable development. It participated in the Rio summit held in 1992 and in the UN Conference on Environment and Development. It has established a National Environmental Plan and identified action areas.

In 1994 China published its Agenda 21, giving the broad outlines of its policies in the context of sustainable development, and these are being built in to the targets in the Ninth Five-Year Plan (see above). Agenda 21 covers a broad spectrum including growth targets, economic policies, legislation, resource mobilization, education and social services, agriculture and rural development, industry, transport and communications, energy and natural resources, and combating and preventing degradation.

A problem related to the issue of macroeconomic stabilization is that the *de facto* administrative control of the central government has been heavily eroded by 15 years of decentralization and by the emergence of local-level corporatism in China. Local governments, whose interests are closely bound up with the success of the enterprises under their jurisdiction, may not perceive an interest in enforcing compliance with regulations that would limit their scope. Non-compliance is a serious problem in both rural and urban areas. In some areas, indeed, compliance with the goals of sustainable development policies is an unthinkable luxury in the face of the struggle to subsist. A recent multi-agency study involving the World Bank, UNDP and Chinese institutions with support from the Global Environment Facility, notes the importance of establishing a regulatory system that is suited to a market economy and recommends the adoption of market-based incentives to encourage the use of clean technologies and the introduction of fines for pollution that match or exceed the costs of clean-up. It also notes the need for the existing regulations to be "more strictly and uniformly enforced".[61/]

D. INDUSTRIAL POLICY

Overview

As discussed above and in Chapter II, Chinese industrial policy before the reform era was based on two principles: (1) the creation of a state-owned and directed industrial base that would ensure national self-sufficiency in the output of the range of goods desired, with a heavy bias towards capital-intensive, heavy industry; and (2) the location of such enterprises with reference to considerations of defence and other non-economic criteria. The share of industry in national income accordingly rose from 20 per cent in 1952 to 49 per cent in 1978. Meanwhile virtually each province sought to acquire production capacity across a broad spectrum of products in order to be as self-sufficient as possible in terms of output, and each enterprise sought to maximise its own autonomy by bringing as many functions as possible (such as repairs and even production of inputs) within its own control. Large-scale enterprises, under the control of the relevant ministry or the provincial authorities, had all their inputs procured by and their output disposed of by the state. They were burdened with social welfare responsibilities, such as the obligation to provide employment for the children of their employees, as well as the provision of housing, education and health facilities. There was therefore a tendency for staff numbers to rise. By the end of the

1970s many such large enterprises were seriously overmanned and inefficient. Their profitability and technological level depended on decisions which they could only influence tangentially.

Industrial policy as it affected large-scale enterprises showed a high degree of continuity during the pre-reform era. But there was another, specifically Chinese dimension to pre-reform industrial policy that helped to lay the basis for the changes that came later. In 1979 the Ministry of Agriculture renamed the 1.5 million "commune and brigade enterprises" under its authority as "township and village enterprises".[62/] These had sprung up in the countryside in the 1950s and continued to develop, slowly but steadily. They produced across a broad spectrum of industrial output, including coal mining, fertilizers, cement, iron and steel and power, as well as light industrial products and consumer goods based on inputs from agriculture. The motivation for their establishment was to provide employment for surplus labour and to maximise the returns to the units that controlled them. This took the form of "exporting" consumer goods and other products to nearby centres of population and providing goods locally. Many of these enterprises were inefficient, being small-scale and wasteful of resources.[63/] But by the mid-1970s about half the total output of nitrogen, cement, and much farm machinery was being produced by these small plants.[64/] Wasteful and inefficient as many of these enterprises may have been, they served as the institutional model for their more dynamic successors, the collective township and village enterprises under the control of local governments that are responsible for a large measure of the economic dynamism of China in the 1990s.[65/]

During the 1970s, when they flourished under the relatively pragmatic economic management that generally prevailed after the Cultural Revolution (1966-1976), the number of commune-run enterprises (whose output was reclassified from agriculture to industry after 1985) rose from 44,700 in 1970 to 1.8 million in 1979.[66/] Their number was 909,500 in 1990 and just over 1 million in 1994.[67/] A proportion of these enterprises listed as "collective", of which TVEs are a subset, are known to be private enterprises sheltering under the state-owned umbrella for prudential reasons. Privately-owned enterprises began to appear in the early 1980s, lumped into a category that also included enterprises with foreign investment and various other forms of joint ownership. By 1994 the categories had become much more numerous (see Chapter II).

The industrial reforms

The decision to reform the industrial sector was made in the early 1980s, since when a number of changes have been introduced on a step-by-step basis to move China's industrial sector closer to the market. As with the agricultural reforms, however, a continued commitment to the concept of a socialist ownership system has placed limits on the extent of the reforms. The process of decentralization, which has greatly reinforced the powers and prerogatives of lower order administrations who are themselves highly interventionist in approach to economic management, has also placed limits on the development of the market.[68/] Although local governments are on the whole supportive of the enterprises under their jurisdiction,[69/] their necessarily particularist standpoint may induce them to enforce ad hoc policies (such as various extra-legal taxes and charges and levies on trade between localities) which are inimical to the wider goals of industrial policy. Since the early 1980s the economic power of local governments has grown, building on the administrative powers that accrued to them in the pre-reform era.

Box I. Industrial reforms: a brief chronology

1979: Law on joint ventures; price liberalization starts in agriculture

1980: Fiscal autonomy to local governments; special economic zones created; private income tax introduced

1981: Individual enterprises encouraged in urban centres

1982: Price liberalization of industrial products starts; patent law and trademark law enacted

1983: SOEs begin to be taxed instead of turning over profits; bank lending to SOEs begins to replace allocations from budget; collective enterprises are encouraged; People's Bank of China begins to assume some of the functions of a central bank

1984: 14 coastal cities are opened; director-responsibility system and "above plan" pricing and production autonomy introduced; TVEs created

1986: Labour contract system replaces virtual lifetime employment for urban new recruits

1988: SOE contract responsibility system begins; on the basis of negotiated multiyear contracts, managers' (and sometimes workers') rights of control and obligations to the state defined; regulations on private enterprises published; enterprise and bankruptcy laws passed

1989: Regulations on mergers, joint-stock companies and commercialization of banks

1990: Copyright law enacted

1991: Delegation of direct foreign trade rights to (some) SOEs; beginning of pensions and housing reform; encouragement of enterprise groups and corporatization, whereby the state's ownership rights take the form of shares managed by state asset administration bureaux and state asset investment companies and the firm has management autonomy

1992: Deng's southern tour; new operating mechanism and 14 autonomous rights to SOEs give SOE managers authority to "use and dispose of the property entrusted to them by the state for management and business purposes"; phasing out of production targets and price controls; patent law and trademark law revised

1993: Principle of "socialist market economy" replaces "socialist commodity economy"; decision of third plenum on establishing modern enterprise system; promulgation of a competition law; new accounting standards introduced

1994: Foreign exchange reform; fiscal and tax reform; implementation of company law

1995: New commercial banking law; People's Bank of China law; provisional regulations guiding foreign investment; insurance law; move to a five-day week; legislation to regulate the securities and debt markets; draft of Ninth Five-Year Plan.

The 1993 decision

The current goals of industrial policy at the macro level are summarized in the *Decision on Issues Concerning the Establishment of a Socialist Market Economic Structure* issued after the third plenum of the 14th Party Congress.[70/]

The major goals identified are:

- a "modern enterprise system" covering corporate structure, governance and management and fully separating the state's exercise of ownership and the enterprise's exercise of legal person property rights;
- diversified ownership forms;
- competition on equal terms between different ownership forms;
- better macroeconomic and monetary policy tools, including provision for the central bank to become fully independent and to manage money supply and credit and interest rates through open market operations;
- an expanded capital market and financial system in which the specialized banks become commercial and three policy banks are established;
- labour market and human resource development to be improved and a national social security system created;
- development of the services sector;
- enhancement of the taxation and income distribution system;
- further liberalization of trade and foreign investment;
- greater attention to science and technology;
- creation of an appropriate, market-oriented legal system;
- formulation of specific sectoral plans for key industries.

Implementation of this ambitious plan is bound to be slow, as is clear from the discussion above. Bringing both the SOEs and the banks closer to the market is a difficult and necessarily gradualist process. In addition, as also discussed above, there is a need to ensure compliance from local-level participants with changes that may appear to be against local interests. Since the announcement of the blueprint the tackling of inflation has taken priority, but there have been some moves towards enterprise reform on an experimental basis.

One such experimental reform is that known as "10,000-1,000-100-10". This, introduced in 1994, provides that:

- 10,000 large SOEs will implement the new accounting standards, new ways of valuing assets and all the 14 autonomous management rights within two years;

- 1,000 large SOEs will implement the new state asset administration regulations within two to three years and will delegate their assets to a supervisory committee which will strive to increase their value;

- 100 large and medium SOEs are to be fully corporatized within two years under the company law;

- ten municipalities are to undertake comprehensive enterprise and social reforms, including provision for bankruptcy and divestiture from SOEs of social services. The number of municipalities was later extended to 18. The reforms will focus on the SOEs under the control of the municipal governments.[71/]

Investment policy

Traditionally the state has been behind decisions about the allocation of investment. Before the reform era the share of investment in GDP was high.[72/] The effect of the reforms and of the rapid growth of the 1980s and 1990s was to raise this further; in constant 1990 prices it was usually over 30 per cent of GDP after 1979 and was over 35 per cent in 1988-1989 and 1993-1994, years of extremely fast growth. It has typically been fluctuations in the growth rate of investment which have driven overall growth in the economy. For example, in 1985 gross fixed investment contributed no less than 94 per cent of the GDP growth of 12.9 per cent; in 1993 it contributed 54.8 per cent of the 13.4 per cent growth.

While most investment has continued to be public-sector investment, its composition has changed markedly during the reform era. First, the budgeted capital expenditure of the government (on national definitions) as a percentage of total GDP fell from 10.6 per cent in 1980[73/] to under 4 per cent in 1992-1993. It also fell as a percentage of total expenditure: from 32.3 per cent in 1980 to 22.3 per cent in 1993. Of total state investment, the shares of the central and local government have remained fairly constant over the years for which disaggregated data are available; the central government has been responsible for about 40 per cent of the spending, local government for 60 per cent.[74/]

The effect of reform and decentralization on investment patterns shows up dramatically from the sources of the funds. Of the total Rmb 1,637 billion ($190 billion at the 1994 average exchange rate of Rmb 8.6 = $1) recorded as being invested in 1994,[75/] of which 56.9 per cent was invested in state-owned units, a mere 3.2 per cent came from state appropriation (i.e. funds allocated under the budget) (see Table I.6). The share raised by domestic borrowing, from the formal banking sector, was 22.6 per cent. Fully 48.9 per cent of the funding fell into the category of "self-raised funds". These could include retained earnings of various kinds as well as funds raised unofficially on local capital markets or allocated by local governments, which play an active role in overseeing the fortunes of the state-owned enterprises under their jurisdiction.[76/]

Of the total invested by state-owned enterprises, Rmb 932.2 billion, the sum provided by budget appropriation, fell significantly in 1994 compared with preceding years. While the proportion funded by the banking sector has remained around 24 per cent, that provided from "self-raised funds " rose from 40.4 per cent in 1985 to as much as 51 per cent in 1994.[77/]

Table I.6. Investment statistics by ownership, 1994

	Rmb billion	Percentage share
Total	1,637.0	100.00
of which:		
State-owned units	932.2	56.95
Collective	266.5	16.28
Individuals	197.1	12.04
Joint-owned	10.0	0.61
Shareholding	57.0	3.48
Foreign-funded	128.0	7.82
Overseas Chinese-funded[a/]	43.0	2.63

Source: *China Statistical Yearbook 1995*, p. 137.

a/ Investment from Hong Kong, Macau or Taiwan Province of China.

The central government's control over investment has thus been eroded from two sides; both the banking sector and the budget are diminishing in importance as a source of investment funds. This explains the difficulty that the authorities have had since 1993 in reining in the growth rate of investment. Of course on a wider definition of government spending, as discussed above, the state, especially the central government, has a larger role through the policy loans it funnels to enterprises via the banking system, often to fund capital expenditure. Not only has the central government sought to control growth in investment, by means of directives and by seeking to control the provision of credit, it has also sought to curb investment in what it considers "unproductive" projects, such as the construction of buildings, which raise overall demand for raw materials in scarce supply. Success has been limited; the growth rate of total investment in nominal renminbi in 1994 was 31.4 per cent, with a 42.2 per cent rise in spending on real estate in that year.

The growth of overall investment has thus become a function of a complex set of relationships between the different levels of state government and the local financial institutions, formal and informal. The informal market in capital is well developed, as has been the case in other east Asian countries which have rationed or sought to channel the supply of credit, with the relevant interest rates positive in real terms and reflecting risk/return relationships.

Meanwhile the investment priorities of the state have tended to become concentrated in physical infrastructure and social sector fixed capital. The State Planning Commission acts as the coordinating agency for central government investment, which is carefully planned and monitored. Foreign aid and borrowing plays a part in financing such investment, nearly 40 per cent of which is in infrastructure; of the remainder, over 20 per cent is in primary energy and over 10 per cent is in scientific research and "other" categories. Of the remainder the bulk is concentrated in industrial sectors where there are large economies of scale, for the most part so-called "heavy" industry. The more competitive sectors of the economy are thus the preserve of local governments and of enterprises under various forms of ownership, including foreign-invested enterprises.

Ever since the passage of the legislation allowing the establishment of joint ventures, and the setting up of the first four special economic zones in 1980, foreign investment has played a growing role in the Chinese economy. A desire to obtain access to foreign technology and capital on a scale larger than could otherwise be afforded lay behind the decision to open enclaves to foreign investment on preferential terms. From relatively modest beginnings foreign investment inflows grew fast in the late 1980s, especially after 1992 when China became the largest destination in the world for foreign funds. The share of foreign investment (including loans and direct investment) in total fixed investment in 1994 reached 10.8 per cent[78/] and was valued at Rmb 177 billion ($20.6 billion).

Since the early 1980s an array of incentives has been in place to attract foreign capital.[79/] These include preferential taxation, industry-specific and regional incentives, and export incentives and zones. The trend has been towards a progressive and incremental removal of barriers to foreign investment. Foreign investors have been allowed into many areas of operation but there have been limits placed on their entry into selected areas, such as the domestic financial and retail sectors. A complicated system of approvals is in place, with the level of consenting authority depending on the size, location or nature of the planned investment.

The kinds of investment allowed have diversified; these now range from Sino-foreign equity joint ventures to cooperative ventures, wholly-owned foreign enterprises, joint-stock companies and limited liability companies.[80/] There are also various kinds of agreement covering the processing and assembly of foreign inputs, sometimes involving foreign investment.

The result of this new freedom has been a burgeoning of often small-scale, export-oriented enterprises along the eastern seaboard and especially in Guangdong province, to which a large number of Hong Kong-based companies have moved their manufacturing, mainly because of the advantages offered by lower labour costs. As noted above, the exports of foreign-invested enterprises had reached nearly a third of the total in 1994, although it should be noted that their import content is often high and that the linkages with the rest of the economy are limited. There have also been numerous examples of high-technology investment from Western transnational companies, many of which now have operations in China. These too have tended to be concentrated along the eastern seaboard.

Both to further China's application to join the World Trade Organization and to help address the problem of a relative lack of investment in the interior of China, policies towards foreign investment are currently being reviewed. In 1995 the government clarified its thinking on the question of incentives for investment. The taxation and incentive regimes for foreign and domestic investment are eventually to be unified in accordance with WTO requirements, although there will be elements of "grandfathering" built into future changes in the regime to protect existing investors. In June 1995 the government published provisional regulations guiding foreign investment with three main categories:

(1) sectors in which the state would like more foreign investment: agriculture in general; infrastructure; power; mining; high-technology; and energy and environmental conservation;

(2) sectors from which foreign investment is barred: areas generally banned by most countries because they are dangerous, wasteful or severely polluting; news media; and futures trading;

(3) sectors in which foreign investment is still permitted, but not actively sought: areas where the technology has already been imported and where domestic capacity is considered adequate; and the services sector. Some projects in this category may be approved at the provincial level: these include cars, vans, nuclear power equipment, colour television sets and some transport projects. Others need the approval of the relevant central ministry: these include air transport, retail and wholesale trade; banking and other financial services; legal counselling; and precious stones and minerals.

As well as seeking to steer foreign investment into desired projects, the intention is also to guide investment into the underdeveloped west and north-west of the country.

These regulations will help to increase the transparency of the investment regime, if not its automaticity.[81/] The lack of transport and other infrastructure in the remote west and north-west means that it may be difficult to attract much foreign investment there. In addition, Chinese planners are aware that, as the cost base in the east of the country rises and shortages and bottlenecks continue, China will face increasing competition from other locations as an investment destination.

NOTES TO CHAPTER I

1/ World Bank, *China: Socialist Economic Development,* Washington DC, 1983, p. 72.

2/ China defines industry to include mining, timber, agricultural processing, the manufacture of industrial products, utilities, and the repair of industrial products.

3/ In national accounts terms at 1990 prices; see World Bank, *China: Macroeconomic Stability in a Decentralized Economy*, Washington DC, 1995, p. 173.

4/ *Ibid.*, p. 201.

5/ World Bank, *China: Socialist Economic Development* and *China: Macroeconomic Stability in a Decentralized Economy*, p. 203. For 1979 data, see *China Statistical Yearbook 1993.*

6/ World Bank, *op. cit.*, p. 178.

7/ *China Statistical Yearbook 1995*, p. 234.

8/ EIU Country Report, *China, Mongolia,* 1st quarter 1996.

9/ EIU Country Forecast, *China,* 4th quarter 1995.

10/ EIU Country Profile, *China, Mongolia,* 1992-93.

11/ World Bank, *World Development Report*, 1995.

12/ *Ibid.*

13/ *Ibid.*

14/ *China Statistical Yearbook 1995,* p. 83 and pp. 329-30.

15/ World Bank, *China: Macroeconomic Stability in a Decentralized Economy*, Washington DC, 1995; and EIU.

16/ According to the World Bank, *World Development Report,* 1982, 62 per cent of GDP was generated by industry in the Soviet Union in 1980 and industry provided 45 per cent of total employment. This compares with figures of 47 per cent and 17 per cent respectively for China.

17/ World Bank, *China: Macroeconomic Stability in a Decentralized Economy,* Washington DC, 1995; and EIU estimates.

18/ Lardy, N. R., "The Role of Foreign Trade and Investment in China's Economic Transition", *China Quarterly,* 144, December 1995.

19/ *China Statistical Yearbook 1995*, p. 32.

20/ *Ibid.*, p. 154.

21/ *Ibid.*, p. 467.

22/ International Monetary Fund, *Balance of Payments Statistics Yearbook*, Part 1, 1993, p. 150.

23/ *China Statistical Yearbook 1995*, p. 36.

24/ Naughton, B., "China's Macroeconomy in Transition", *China Quarterly*, 144, December 1995.

25/ World Bank, *China: Macroeconomic Stability in a Decentralized Economy*, Washington DC, 1995, p. 175.

26/ Lardy, N. R., "The Role of Foreign Trade and Investment in China's Economic Transformation", *China Quarterly*, 144, December 1995.

27/ *China Statistical Yearbook 1995*, pp. 538-551.

28/ EIU Country Risk Service, *China*.

29/ Lardy, N. R., *op. cit.*

30/ *China Statistical Yearbook 1995*, p. 375.

31/ World Bank, *China: Between Plan and Market*, 1990.

32/ *China Statistical Yearbook 1995*, p. 137.

33/ The deficit has been restated to conform with IMF *Government Financial Statistics Manual*. World Bank, *China: Macroeconomic Stability in a Decentralized Economy*, Washington DC, 1995; EIU estimates.

34/ World Bank, *China: Macroeconomic Stability in a Decentralized Economy*, Washington DC, 1995, p. 108.

35/ *Ibid.*, p. 32.

36/ *Ibid.*, p. 24.

37/ Much of this spending, it should be noted, is undertaken at a local level. In the five years 1988-1992, for example, an average 42.9 per cent of the total fixed investment by central and local government was undertaken by central government and 57.1 by local governments. In 1992 government (central and local) investment accounted for 59 per cent of total investment. The portion of it indirectly funded by central bank policy lending comes on top of this already large amount. See World Bank, *China: Macroeconomic Stability in a Decentralized Economy*, Washington DC, 1995, p. 212.

38/ EIU Country Report, *China, Mongolia,* 2nd quarter 1994, 2nd quarter 1995.

39/ *Ibid.*

40/ Their sales tax will be "grandfathered" for five years.

41/ World Bank, *China Updating Economic Memorandum: Managing Rapid Growth and Transition,* June 1993, p. 50.

42/ World Bank, *China Foreign Trade Reform,* 1994.

43/ EIU Country Report, 1st quarter, 1993, p. 17, 3rd quarter 1993, p. 18.

44/ The weights in the index are not published, so the specific proportion contributed by food prices cannot be ascertained.

45/ World Bank, *China Foreign Trade Reform,* Washington DC, 1994, pp. 26-28.

46/ *Ibid.*, p. 48.

47/ *Ibid.*, p. 50.

48/ *Ibid.*, p. 55.

49/ *Ibid.*, p. 78.

50/ *Ibid.*, p. 12.

51/ *Ibid.*, p. 60.

52/ EIU, *Investing, Licensing and Trading Conditions Abroad: China,* 1995.

53/ Serageldin, I., *Sustainability and the Wealth of Nations,* World Bank, Washington DC, September 1995.

54/ Smil, V., and Sharpe, M.E., *China's Environmental Crisis: an Inquiry into the Limits of National Development,* New York, 1993.

55/ World Bank, *World Development Report 1995.*

56/ Smil, V. and Sharpe, M. E., *op. cit.*, p. 79.

57/ World Bank, *World Development Report 1995.*

58/ *Ibid.*

59/ *China's Agenda 21; White Paper on China's Population, Environment, and Development in the 21st Century,* Chapter 6.

60/ State Family Planning Commission under the State Council.

61/ *China Issues and Options in Greenhouse Gas Emissions Control: Summary Report of a Joint Study Team from the National Environmental Protection Agency of China, the State Planning Commission of China, United Nations Development Programme,* World Bank, December 1994.

62/ Wang, H., *Industrialization and Economic Reform in China,* New World Press, Beijing, 1995.

63/ Perkins, D. H., ed., *China: Small-Scale Industry in the People's Republic of China,* London, University of California Press, 1977, pp. 158 and 178.

64/ Nolan, P., and Ash, R. F., "China's Economy on the Eve of Reform", quoted in *China Quarterly,* 144, December 1995.

65/ Jean, C. O., "The Role of the Local State in China's Transnational Economy", *China Quarterly,* 144, December 1995.

66/ *China Statistical Yearbook 1984,* p. 193.

67/ The number fell in the recession of 1989-1990 because of the credit squeeze; in 1989 there were 955,900 enterprises in the category; also note difficulties with data.

68/ World Bank, *China Internal Market Development and Regulation,* December 1994.

69/ Jean, C. O., *op. cit.*

70/ Broadman, H. G., *Meeting the Challenge of Chinese Enterprise Reform,* World Bank Discussion Papers, 1995.

71/ This is being monitored by the State Economic and Trade Commission. The cities are: Changchun (Jilin); Harbin (Heilongjiang); Shenyang (Liaoning); Baoji (Shaanxi); Qingdao (Shandong); Taiyuan (Shanxi); Tangshan (Hebei); Tianjin; Zibo (Shandong); Bengbu (Anhui); Changzhou (Jiangsu); Shanghai; Wuhan (Hubei); Chengdu (Sichuan); Chongqing (Sichuan); Liuzhou (Guangxi); Zhuzhou (Hunan).

72/ According to the World Bank, *China: Socialist Economic Development 1983,* Volume I, *The Economy, Statistical System and Basic Data,* the ratio of investment to GDP rose from about 23 per cent in 1957 to 31 per cent in 1979.

73/ World Bank, *China: Macroeconomic Stability in a Decentralized Economy,* Washington DC, 1995, p. 198.

74/ *Ibid.*, p. 211.

75/ This is almost certainly a large understatement; many investments go unrecorded, especially those which fall outside the purview of state control; see *China Statistical Yearbook 1995,* p. 137.

76/ Jean, C. O., *op. cit.*

77/ *China Statistical Yearbook 1995,* p. 141.

78/ *Ibid.*, p. 137.

79/ EIU, *Investing, Licensing and Trading Conditions Abroad: China*, 1995.

80/ *Ibid.*, p. 20.

81/ EIU Business Report, *China*, 4th quarter 1995.

II. THE MANUFACTURING SECTOR

A. GROWTH AND STRUCTURAL CHANGE

Growth

China's industrial base has broadened and deepened considerably since the inception of the People's Republic. At the beginning of the planning period, in 1952, there were many key industrial products which the country did not produce, or which were manufactured in very small quantities (see Table II.1). As discussed in Chapter I of this report, the focus of industrial policy during most of the pre-reform era concentrated on the extensive development of a broadly based industrial structure which was designed to bring about the maximum possible level of national self-sufficiency in the desired range of products. The industrialization and resource allocation policies were influenced by defence considerations in terms of location of strategic enterprises. They were also influenced, especially during the 1970s, by the devolution of considerable authority over investment and other decisions concerning industrial policy to provincial and lower levels of government from the relevant industrial ministries located in Beijing.

As the economy recovered from years of war and in a period of relative pragmatism in policy-making, industry (which includes mining and utilities) grew by 18 per cent during 1952-1957 in terms of gross output.[1/] Its rate of growth (on an index 1949=100) then slowed to 9.5 per cent annually in 1955-1977, a period which encompassed the years of economic disruption caused by the Great Leap Forward, the withdrawal of Soviet aid, the Cultural Revolution and the subsequent recovery in the 1970s. The impressive growth in industrial output, which was 11.1 per cent a year over the whole period 1952-1979, was led by heavy industry.[2/]

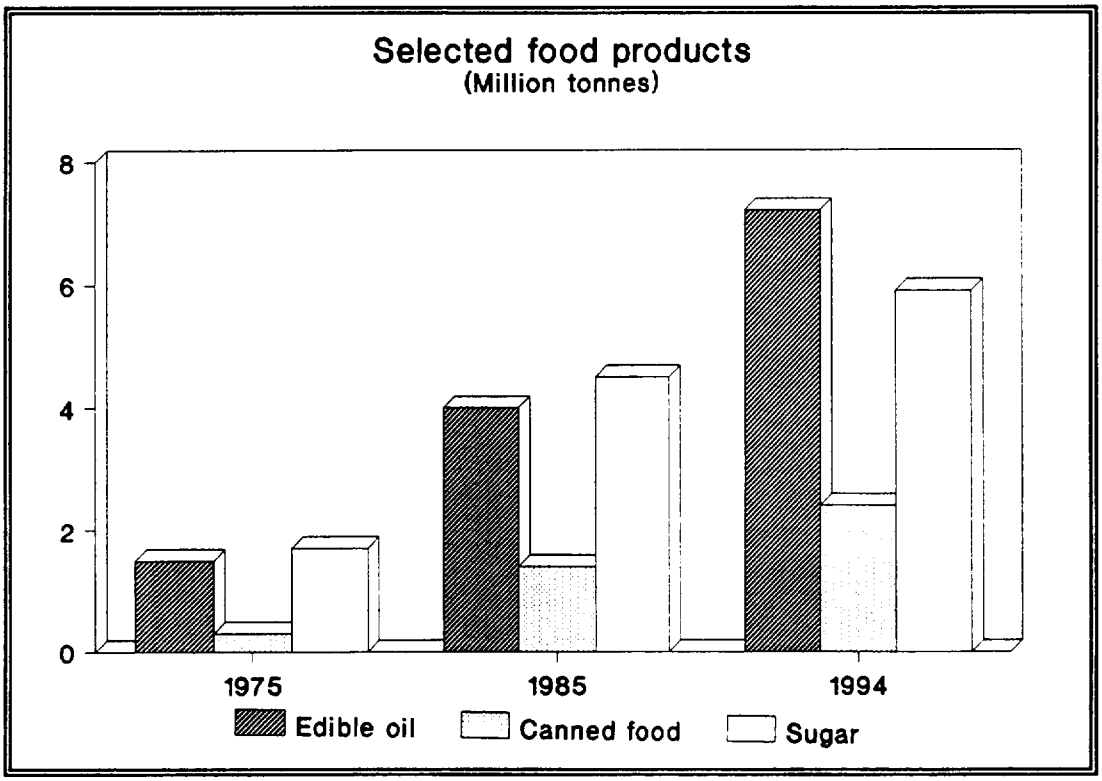
In 1979 heavy industry used nearly 83 per cent of the fixed assets of industry and produced nearly 62 per cent of its net output; its share of industrial employment was just over 58 per cent of a total of about 63 million, including the brigade industries that were the precursors of township and village enterprises (TVEs), and it generated 60 per cent of the profits and taxes from total industry. The return on capital was higher in light industry (light industry yielded Rmb 47.7 in profits and taxes for every Rmb 100 invested compared with a corresponding yield for heavy industry of Rmb 19.1), and the share of profits and taxes in net output[3/] is thought to have been slightly higher in light industry as well. However, net output per employee was 15 per cent higher in heavy industry, which produced higher profits and taxes per worker. Although they produced a total of Rmb 99.41 billion in profits and taxes, as many as 23 per cent of all state industrial enterprises made losses in 1979.[4/]

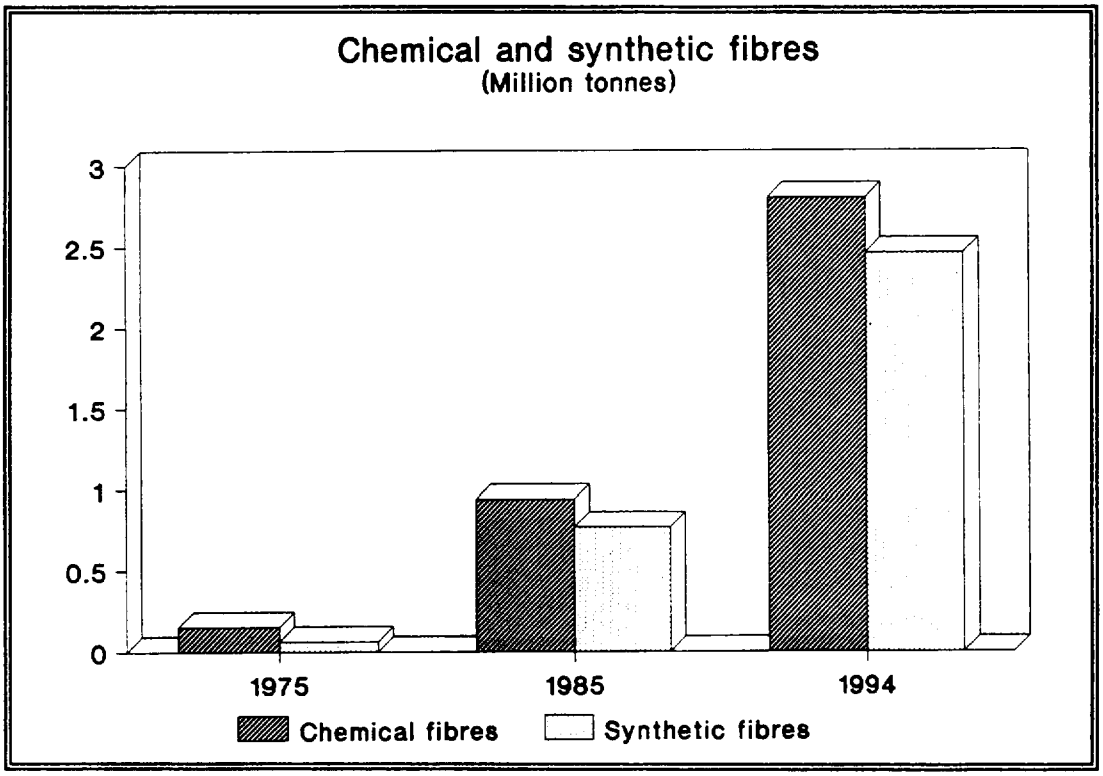
Table II.1. Industrial output, key statistics, 1952-1994, selected years

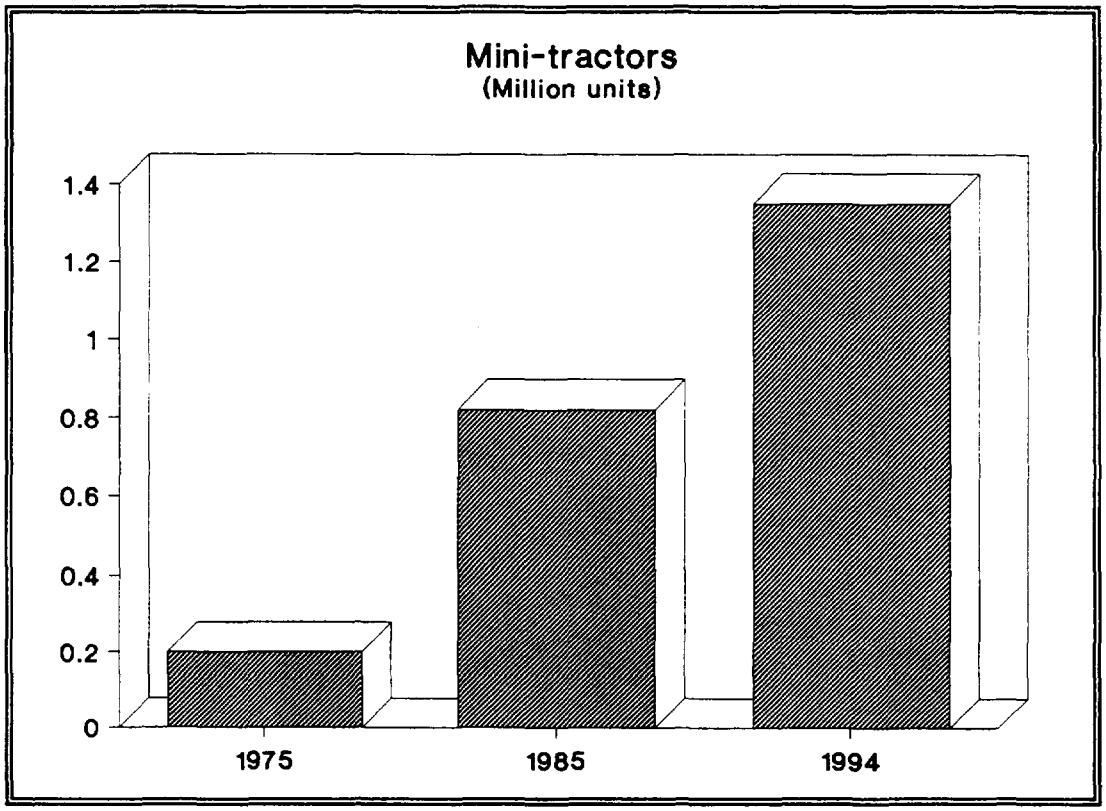
Product	Unit	1952	1965	1970	1975	1980	1985	1990	1994
Chemical fibres	Thousand tonnes	..	50.1	100.9	154.8	450.3	947.8	1,654.20	2,803.3
Synthetic fibres	Thousand tonnes	..	5.2	36.2	65.7	314.1	770.6	1,434.30	2,467.2
Yarn	Thousand tonnes	656	1,300	2,052	2,108	2,926	3,535	4,626	4,895
Silk	Thousand tonnes	5.6	9.1	16.7	23.1	35.4	42.2	56.6	106.4
Machine-made paper and paperboard	Thousand tonnes	370	1,238	2,410	3,410	5,350	9,110	13,720	21,380
Sewing machines	Thousand	66	1,238	2,352	3,567	7,678	9,912	7,610	8,612
Bicycles	Thousand	80	1,838	3,688	6,232	13,024	32,277	31,416	43,649
Watches		..	1,083	3,581	8,090	14,108	54,471	75,597	477,768
Synthetic detergents	Thousand tonnes	..	30	93	223	393	1,005	1,514	2,170
Salt	Thousand tonnes	4,950	11,470	11,090	14,810	17,280	14,790	20,230	29,960
Sugar	Thousand tonnes	450	1,460	1,350	1,740	2,570	4,510	5,820	5,920
Edible vegetable oil	Thousand tonnes	980	1,390	1,030	1,560	2,220	4,010	5,440	7,230
Canned foods	Thousand tonnes	13	122	193	351	572	1,425	1,571	2,473
Beer	Thousand tonnes	..	90	160	270	690	310	692	14,150
Cigarettes	Thousand cases	2,650	4,780	7,830	9,920	15,200	23,700	32,980	34,320
Household refrigerators	Thousand	..	3	5.2	18	49	1,448.1	4,630.6	7,681.2
Washing machines	Thousand	..	..	..	..	245	8,872	6,626.8	86,135
Colour TVs	Thousand	..	..	..	2.9	32.1	4,352.8	10,330.4	6,891.5
Coal	Million tonnes	66	232	354	482	620	872	1,080	1,240
Crude oil	Thousand tonnes	440	11,310	30,650	77,060	105,950	124,900	138,310	146,080
Electricity	Billion kWh	73	676	1,159	1,958	3,006	4,107	6,212	9,281
Pig iron	Thousand tonnes	1,930	10,770	17,060	24,490	38,020	43,840	62,380	97,410
Rolled steel	Million tonnes	0.135	12.23	17.79	16.2	27.2	36.9	51.5	84.3
Ferro-alloys	Million tonnes	0.0017	0.339	0.595	0.769	0.994	1.494	2.442	3.361
Coke	Million tonnes	2.89	13.33	23.3	36.8	43.43	48.02	73.28	114.77
Cement	Million tonnes	2.86	16.34	25.75	46.26	79.86	145.95	209.71	421.18
Plate glass	Thousandweight cases	1.98	5.99	9.28	12.62	24.99	49.42	209.71	421.18
Timber	Million cu.metres	12.33	39.78	37.82	47.03	53.59	63.23	55.71	66.15
Sulphuric acid	Million tonnes	0.19	2.34	2.91	4.85	7.64	6.76	11.97	15.36
Chemical fertilizers	Million tonnes	0.39	1.73	2.43	5.25	12.32	13.22	18.8	22.73
Chemical pesticides	Million tonnes	0.002	0.193	0.321	0.422	0.537	0.211	0.228	0.29
Plastics	Million tonnes	0.002	0.097	0.176	0.33	0.898	1.234	2.27	4.014
Alternators	Million kW	0.64	4.05	14.56	27.99	25.7	34.84	35.28	59.46
Metal cutting machines	Million	0.014	0.04	0.14	0.18	0.14	0.167	0.134	0.206
Motor vehicles	Million	..	0.0265	0.047	0.14	0.222	0.437	0.514	1.37
Tractors	Thousand	..	9.6	31.9	78.4	97.7	45	39.4	66.3
Mini-tractors	Thousand	..	3.6	514	209.4	217.9	822.5	1,101.4	1,355.1
Internal combustion engines	Million kWh	0.029	2	5.4	17.29	18.69	40.83	54.02	121.81

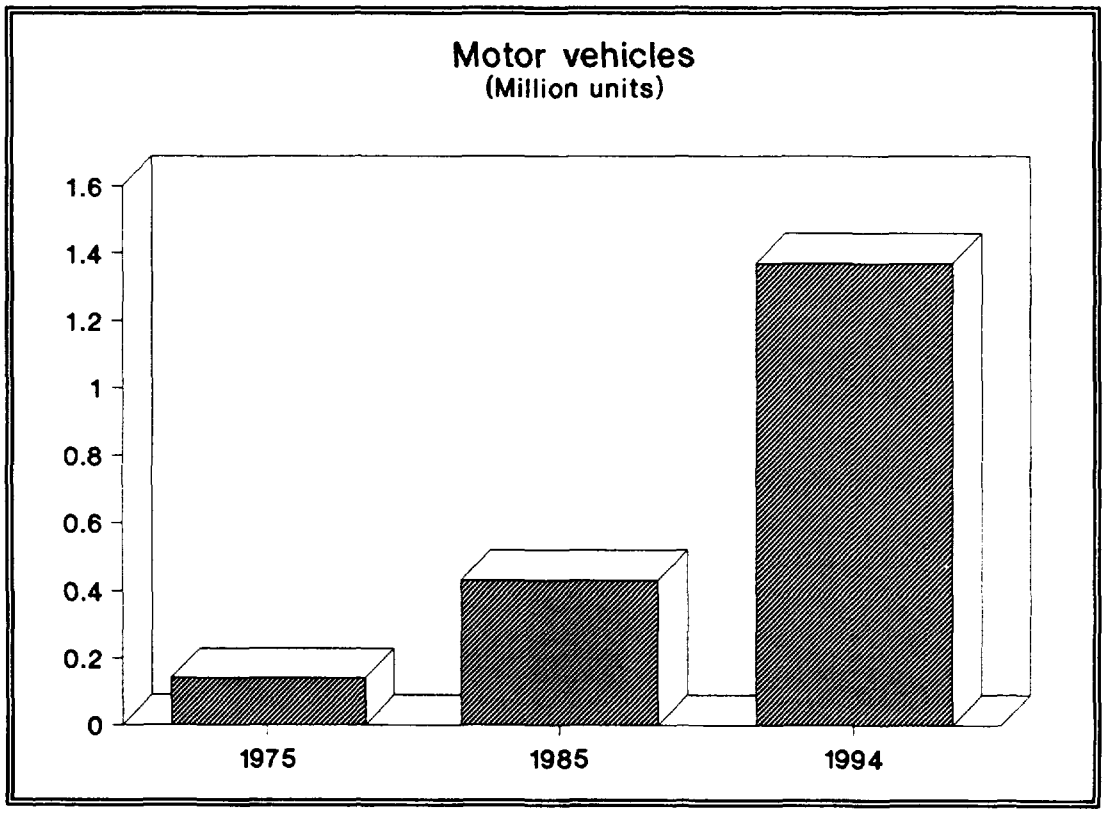
Source: *China Statistical Yearbook 1995.*

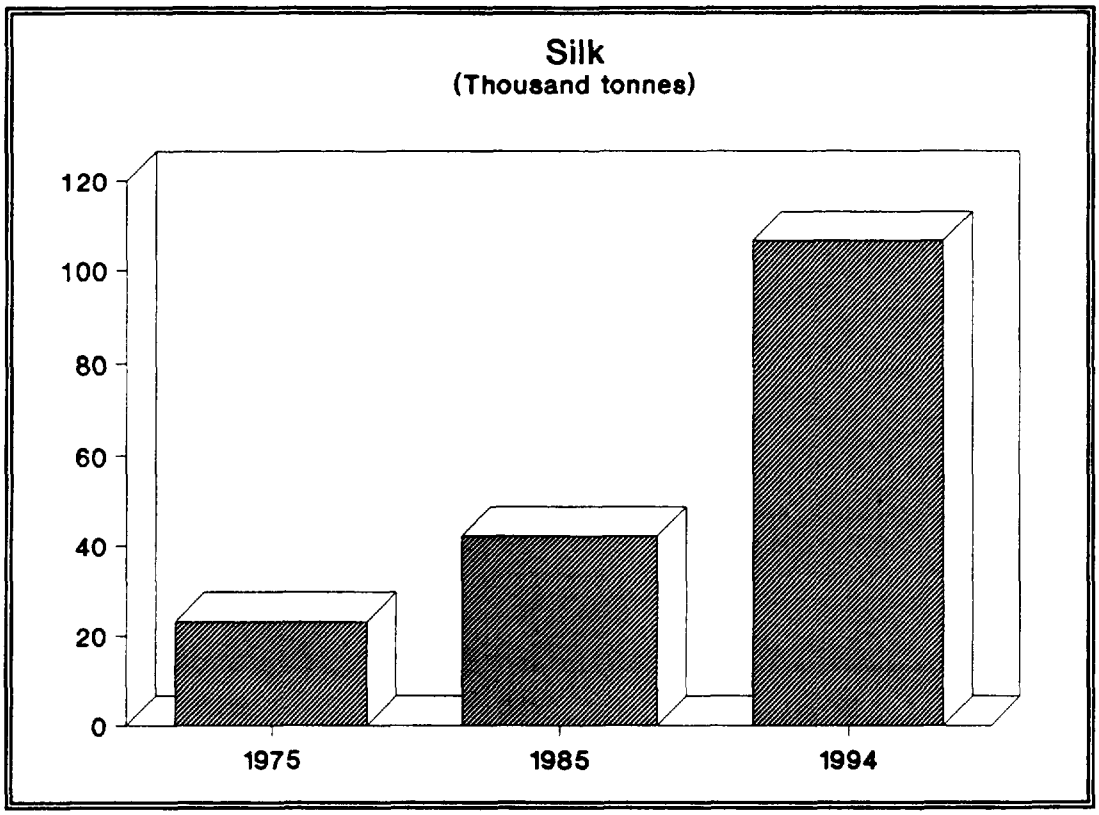
Fig. II.A. Production of selected industrial products, 1975, 1985 and 1994

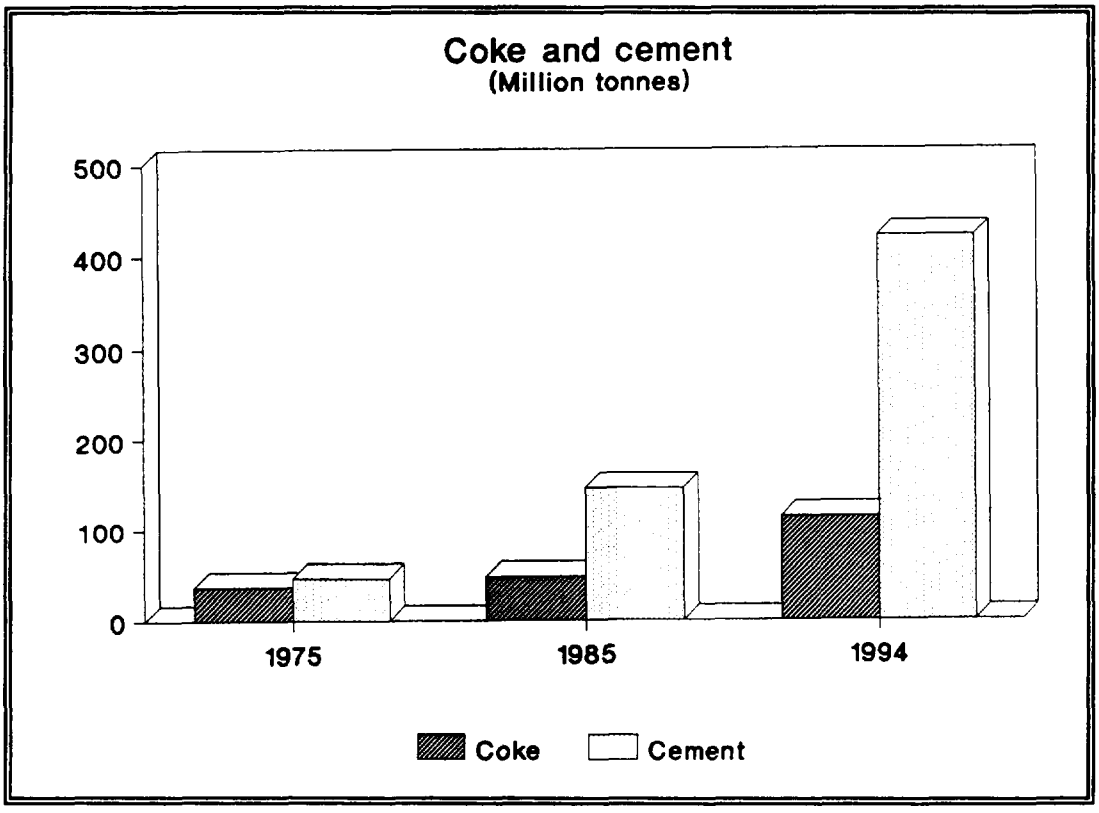


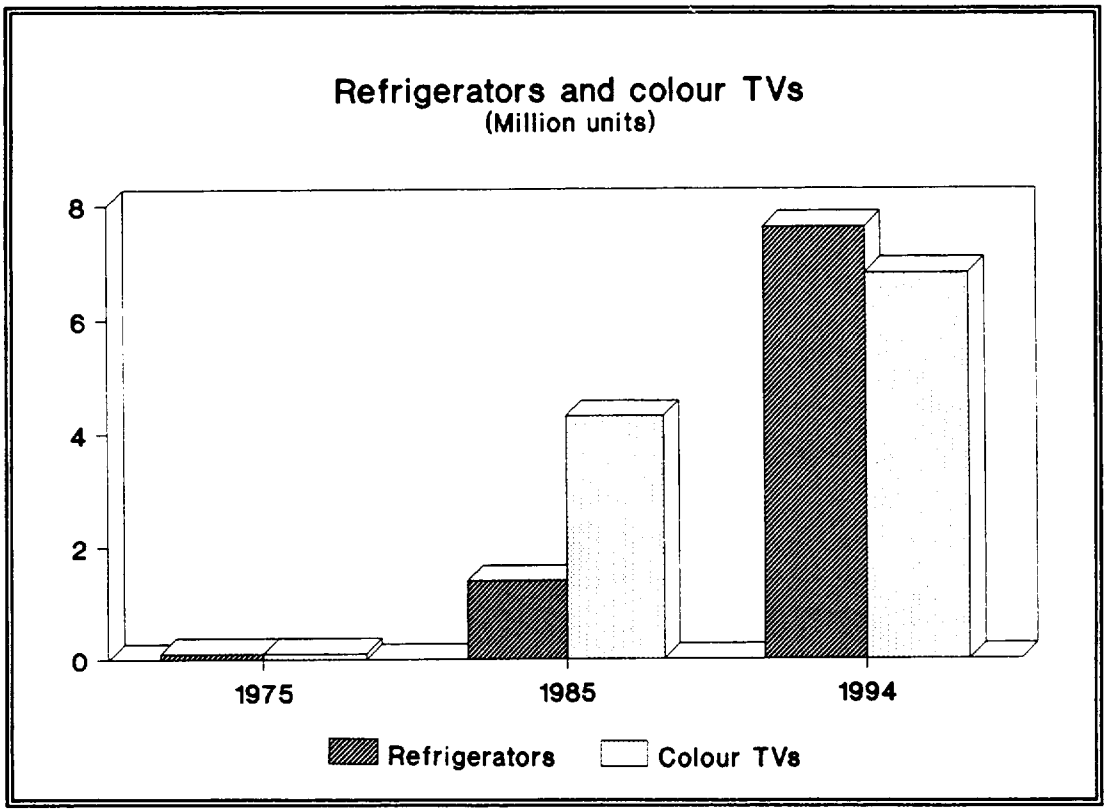


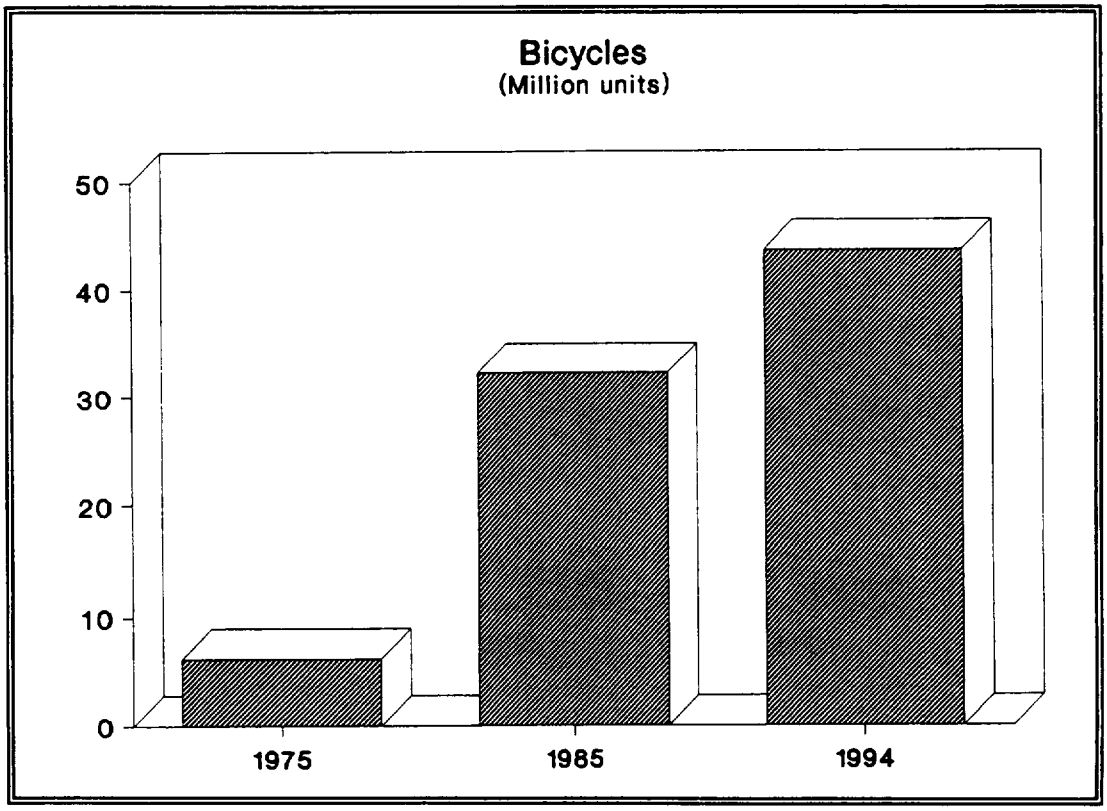












After the introduction of the enabling reforms from 1980 onwards, there was an acceleration in the growth of gross industrial output, which averaged 12.6 per cent in 1980-1990 and rose to 24 per cent in 1990-1994.[5/] In the recession that took place in 1989-1990 as a result of measures to cool the economy introduced in the autumn of 1988 (see Chapter I above) gross industrial output growth slowed; from 21 per cent in 1988 its growth rate fell to 8.5 per cent in 1989 and 7.8 per cent in 1990. Thousands of TVEs closed down or operated below capacity in this period.

UNIDO data for manufacturing value-added (MVA) for the period 1980-1993 (see Table II.2) show total MVA grew by 8.4 per cent per year in the first half of the 1980s, a period in which there was rapid growth in the output of TVEs. The growth of MVA in 1985-1990 was held back by the recession of 1989-1990. After the resumption of rapid growth following Deng Xiaoping's southern tour in January 1992 MVA growth took off dramatically, reaching an annual average growth rate of an unprecedentedly high 27.2 per cent in 1990-1993.

Table II.2. Growth of manufacturing value-added, 1980-1993
(Constant 1980 Rmb; annual average percentage growth rates)

ISIC	Product	1985-1990	1990-1993
311	Food products	3.94	38.36
313	Beverages	5.80	25.13
314	Tobacco	9.43	3.50
321	Textiles and leather footwear	1.88	15.99
322	Wearing apparel, not footwear	2.77	39.19
323	Leather and substitutes	2.39	41.19
331	Wood and cork, not furniture	-6.14	49.84
332	Furniture and wood fixtures	-4.98	21.92
341	Paper and products	2.65	8.72
342	Printing, publishing etc.	-1.15	27.08
351	Industrial chemicals	7.00	8.92
352	Non-industrial chemicals	2.47	27.77
353	Petroleum refineries	-8.59	26.11
352	Miscellaneous petroleum and coal	4.29	29.96
355	Rubber	-1.57	8.91
356	Plastics	3.68	27.34
361	Pottery and earthenware	5.09	16.15
362	Glass and products	-6.31	12.06
369	Non-metallic mineral products	-2.92	46.24
371	Basic iron and steel	-0.32	51.48
372	Basic non-ferrous metals	0.91	30.08
381	Metal products, not machinery and equipment	0.44	32.90
382	Non-electrical machinery	-4.50	20.70
383	Electrical machinery and apparatus	1.47	26.89
384	Transport equipment	-3.82	46.40
385	Professional and scientific equipment	-6.18	36.15
390	Other	2.18	28.14
MVA average		0.63	27.21

Source: UNIDO, Industrial Development Reviews Information Base.

Structural change

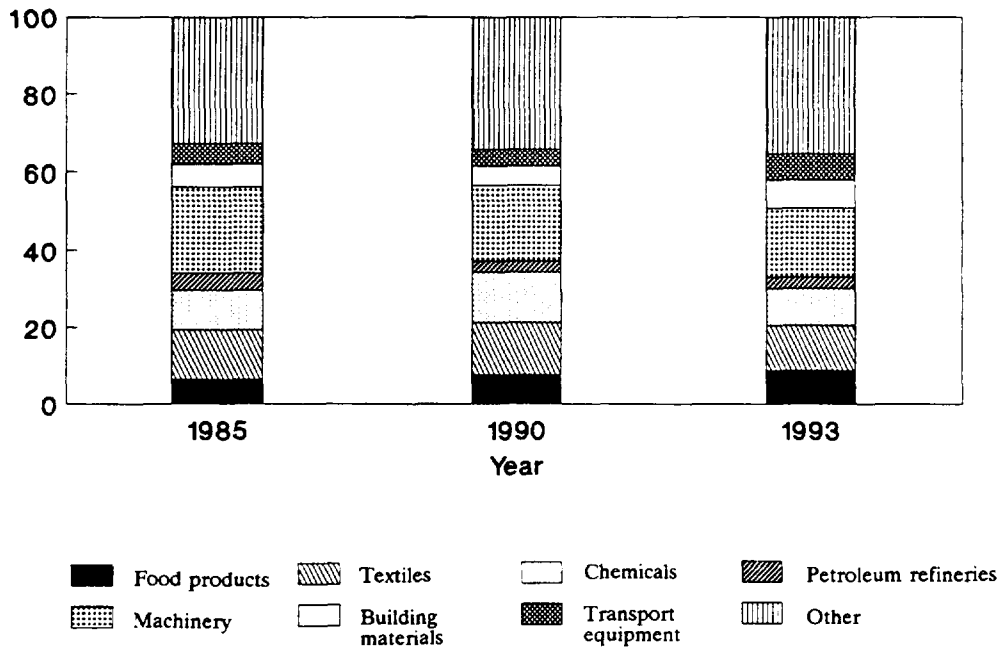
Data from before the reform era show that China already produced a wide range of industrial products by the end of the 1960s, but that it was rather slow to start production of consumer durables such as refrigerators, domestic washing machines and colour televisions, which were not produced in significant quantities before the 1980s (see Table II.1). MVA data from UNIDO showing the share of total MVA generated by various manufacturing subsectors suggest a broad stability in the composition of manufacturing value-added (Table II.3), reflecting the wide range of manufacturing branches already in place by 1980.[6/] Nevertheless the data do support the argument that Chinese manufacturing industry has begun to move up the value-added ladder while at the same time the bias towards heavy industry and against consumer goods has been corrected. For example, within the textiles and clothing branches, clothing has seen very rapid growth, much of it export-led, and its share of total MVA rose from 1.99 per cent in 1980 to 3 per cent in 1993, while the share of textiles fell from 14.3 per cent to 8.8 per cent over the same period. Reflecting the rise in disposable incomes, especially in urban centres, during the period since 1980 the production of foodstuffs has risen very fast, and it went on rising during 1985-1990, when many branches registered declines in the annual average growth of MVA. Transport equipment is an area which has received considerable emphasis throughout the reform decade, when several large transnational automotive corporations established manufacturing ventures in China. Accordingly, the share of transport equipment in MVA rose from 4.3 per cent in 1990 to 6.4 per cent in 1993.

Table II.3. Structure of manufacturing value-added by subsector, 1985, 1990 and 1993
(Per cent of total at 1980 prices)

ISIC	Product	1985	1990	1993
311	Food products	4.30	4.97	6.31
313	Beverages	2.13	2.67	2.57
314	Tobacco	4.71	6.89	3.90
321	Textiles and leather footwear	10.80	11.41	8.78
322	Wearing apparel, not footwear	2.12	2.34	3.00
323	Leather and substitutes	0.94	1.05	1.40
331	Wood and cork, not furniture	0.76	0.56	0.88
332	Furniture and wood fixtures	0.65	0.50	0.45
341	Paper and Products	1.97	2.16	1.40
342	Printing, publishing etc.	1.23	1.15	1.14
351	Industrial chemicals	7.38	9.73	6.34
352	Non-industrial chemicals	3.03	3.38	3.43
353	Petroleum refineries	4.54	3.01	2.95
354	Miscellaneous petroleum and coal	0.19	0.23	0.24
355	Rubber	1.95	1.78	1.16
356	Plastics	1.69	1.92	1.93
361	Pottery and earthenware	0.57	0.69	0.53
362	Glass and products	1.07	0.80	0.56
369	Non-metallic mineral products	5.69	4.87	7.20
371	Basic iron and steel	7.58	7.28	11.87
372	Basic non-ferrous metals	2.27	2.27	2.41
381	Metal products, not machinery and equipment	3.27	3.26	3.68
382	Non-electrical machinery	14.23	11.21	9.68
383	Electrical machinery and apparatus	8.07	8.25	8.18
384	Transport equipment	5.33	4.34	6.45
385	Professional and scientific equipment	1.29	0.93	1.13
390	Other	2.23	2.35	2.40
TOTAL		100.00	100.00	100.00

Source: UNIDO, Industrial Development Reviews Information Base.

Fig. II.B. Structure of manufacturing value-added by subsector, 1985, 1990 and 1993
(Percentage)



There has been a burgeoning of different kinds of ownership during the reform decade. In 1979 the state-owned industrial sector, whether directly under the control of the relevant industrial ministries and leading organizations or under some combination of central and regional/local control or locally controlled,[7/] produced 81 per cent of gross output at 1970 prices. The collective sector, by contrast, produced only 19 per cent. By 1994 the situation had changed radically. State-owned enterprises produced only 34 per cent of gross output; collectives accounted for 41 per cent. Within the collective sector there has been a flowering of TVEs, both rural and urban. Together TVEs accounted for a third of total industrial output in 1994. New categories of ownership have also appeared in response to the more liberal economic climate. In 1994 private (individual or family-owned) enterprises produced 11 per cent of gross industrial output and those in the "other" category, which include foreign-invested enterprises (FIEs), produced 13.5 per cent of total gross industrial output.[8/]

The practice whereby people from peasant families "leave the land but not the countryside, enter the factory but not the city"[9/] has led to the creation of very many small-scale, labour-intensive and capital-scarce industrial enterprises. Their entry on to the industrial scene in such large numbers has tended to subdue the appearance of movement up the value-added scale in aggregate MVA statistics.

There is no doubt that many of the large state-owned enterprises have become more efficient and technologically up-to-date during the period since 1980. The greater competition engendered by reform has stimulated improved practices and closer attention to the market throughout Chinese industry.[10/] However, as discussed in Chapter I, the process of reform has itself created losers among state-owned enterprises and the gradualism with which the government has approached the process of reform has, by perpetuating the dependence of many SOEs on subsidies, helped to limit the ability of the central government to exercise macroeconomic control. Estimates of the losses being made by SOEs vary; press reports commonly assert that at least 40 per cent of them make losses.[11/]

The losses of state-owned enterprises are sizeable, especially in heavy industry. Sectors such as coal mining, ferrous metals mining and processing, food manufacturing, textiles, paper making, chemical fibres, rubber, building materials, and gas production and supply were recorded as loss-making in 1994.[12/] A recent study reports that in all sectors (industry, agriculture and services) the number of loss-making enterprises under the budget reached 41.4 per cent in the last quarter of 1995. Of the Rmb 75 billion in losses for all sector SOEs in 1994 (2.4 per cent of GDP), Rmb 45.3 billion were posted by industrial sector SOEs (1.4 per cent of GDP).[13/]

B. INDUSTRIAL EMPLOYMENT

Quantitative trends

The share of agricultural employment has been falling during the reform era. From nearly 73 per cent of the total "social labour force" in 1980 the proportion employed in agriculture, forestry, animal husbandry and fishery had fallen to 54 per cent in 1994. The total social labour force was growing by 2.7 per cent a year in 1980-1994, a period in which employment in agriculture grew by 0.9 per cent a year, employment in manufacturing expanded by 3.5 per cent a year and the share of manufacturing employment in the total rose from 14.6 per cent to 15.6 per cent. Employment in the service sectors that were fostered by the reforms, especially commerce and finance, grew rapidly although they both represented a very small share of total employment by the end of the period, reflecting China's still comparatively underdeveloped service sectors, which are nevertheless growing rapidly. Non-electrical machinery accounted for 16 per cent of manufacturing employment in 1993, followed by textiles and leather footwear (15 per cent), industrial chemicals (11 per cent), electrical machinery and apparatus (8 per cent), transport equipment (7.4 per cent), and food products (7 per cent) (see Table II.4).

Nearly three-quarters of the labour force was still defined as rural in 1990 and the figure was little lower in 1995.[14/] The number of persons employed (and the share of the workforce) in collective industries fell between 1990 and 1994 despite continued rapid growth in the share of output provided by collectively-owned enterprises (COEs), from 18 per cent in 1979 (at 1970 prices) to 34.5 per cent in 1990[15/] and over 40 per cent in 1994. This fall may reflect greater success in shedding excess labour from the collective sector, where enterprises also carry less welfare responsibilities than do SOEs and have a greater ability to hire temporary and even "floating" workers. The share of workers in TVEs and in private enterprises rose. The proportion of workers employed in foreign-invested enterprises also climbed sharply as the inflow of foreign investment accelerated in the period 1990-1994, but to a still marginal 0.66 per cent of the total.

Table II.4. Structure of manufacturing employment, 1993
(Percentage)

ISIC	Product	1993
311	Food products	6.85
313	Beverages	2.47
314	Tobacco	0.63
321	Textiles and leather footwear	14.98
322	Wearing apparel, not footwear	0.36
323	Leather and substitutes	0.55
331	Wood and cork, not furniture	0.61
332	Furniture and wood fixtures	0.07
341	Paper and products	2.74
342	Printing, publishing etc.	2.04
351	Industrial chemicals	10.97
352	Non-industrial chemicals	2.93
353	Petroleum refineries	1.13
354	Miscellaneous petroleum and coal	0.53
355	Rubber	1.66
356	Plastics	0.53
361	Pottery and earthenware	0.42
362	Glass and products	1.25
369	Non-metallic mineral products	4.40
371	Basic iron and steel	7.47
372	Basic non-ferrous metals	2.01
381	Metal products, not machinery and equipment	1.14
382	Non-electrical machinery	15.85
383	Electrical machinery and apparatus	8.25
384	Transport equipment	7.40
385	Professional and scientific equipment	1.88
390	Other	0.88
TOTAL		100.00

Source: UNIDO, Industrial Development Reviews Information Base.

Labour mobility

Before the reform period labour mobility was severely limited; urban labour force entrants were assigned permanent jobs in SOEs or collectives and rural urban migration was forbidden. During the 1980s firms were allowed to hire temporary migrant workers. In 1983 a new labour contract system was introduced under which all new recruits to an enterprise must sign contracts which specify the job term and the conditions of employment and terms of renewal or cancellation of the contract. This enhanced flexibility for enterprises to reject unsuitable recruits. It was promulgated nationally in 1986 and is eventually intended to cover all workers. In 1994 26 per cent of SOE workers and 20 per cent of urban collective workers were covered by such contracts, while 45.6 per cent of workers in "other" units were on contracts. Wages were linked more closely to performance from 1978, at first through the bonus system. In 1985 a "floating wage" system was introduced, which linked a share of remuneration to various indicators. In 1988 the concept of linking remuneration to efficiency was introduced and the share of remuneration from bonuses and incentives was allowed to rise. Managerial incentives and penalties were also brought in, alongside greater autonomy.

Under the Optimal Labour Reorganization scheme, introduced during 1985-1987, each work unit was permitted to undergo reorganization, including redeployment and retraining and shedding of excess labour. In 1992, the SOE reforms (see Chapter I, Box I.) gave enterprises the right to hire and fire and to raise or cut wages. In 1993 regulations stipulating the terms and conditions of lay-offs were issued and SOEs were given tax incentives to set up service subsidiaries to occupy some of their excess labour. At the same time state enterprises have been obliged to support labour service companies set up to help redundant workers to find new work. In 1992 the Economic and Trade Office under the State Council announced that 1.4 million urban workers had been made redundant and there has been a lot of anecdotal evidence for labour-shedding, mainly of administrative and ancillary workers. The central government has announced the aim of shedding a quarter of its 34 million employees in three years. Companies are still obliged to hire their blue-collar workforce in their home localities, and enterprises' effective autonomy in the area of labour shedding is subject to the interference of local level government bodies, which all regard the provision of employment as a key priority. The permanent residence registration system, under which it is difficult to change from rural to urban status (although possible for a fee), is another hindrance to labour mobility.[16/] A new labour law, standardizing and rationalizing the various reforms to date, was enacted in January 1995.[17/] The law inaugurates a new social welfare programme; it relieves SOEs of some of their previous welfare obligations and codifies the imposition of social security levies on workers and employers to help establish a safety net that is independent of the enterprise.

Educational background and skill levels

Despite China's impressive achievements in the field of primary education and the reduction of illiteracy, the relative neglect of tertiary education during the pre-reform era has left the country with an acknowledged skill shortage. National efforts are being made to improve the skill levels of the workforce and, as discussed above, to extend access to vocational and academic education. No comprehensive breakdown of the educational status of the industrial labour force is available, although the majority have had primary education. The majority of the training schools aimed at enhancement of skills are run by enterprises and these, as discussed above, face many demands on their resources. The central government is also constrained as to funds to spend on education and training, and during the reform era it has tended to reduce the amount of expenditure on state-run R&D institutes in favour of encouraging enterprises to set up their own R&D divisions.[18/]

Despite these difficulties China has recorded some impressive achievements in human resource development during the last 15 years. For example, the number of staff in state-owned units who are classified as qualified engineers has risen by 5.5 per cent a year during the 15 years 1980-1994.[19/] The commitment to provision of on-the-job training was reinforced in the 1995 Labour Law which obliges employers to operate a vocational training scheme for staff. Among the specialist groups of which there is an acute present and potential shortage of personnel are graduates of business schools (China produces only around 200 international-standard Master of Business Administration graduates each year) and lawyers.[20/]

The role of women

Before 1949 there were strong barriers, especially in rural areas, to the participation of female labour and the Communist Party has consistently striven, with considerable success, to remove these. The rights of women to participate in labour and to receive equal pay for equal work are enshrined in the constitution. As in other Socialist countries, the participation rate of women in

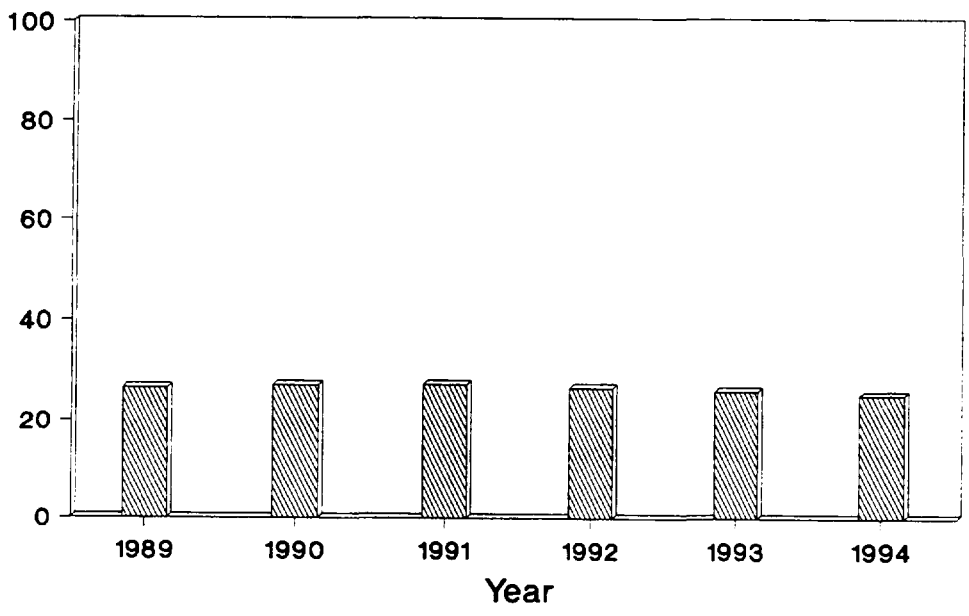
the labour force is high in both rural and urban areas, where the provision of crèches and schooling for children has helped to encourage women to join the labour force. The female share of the labour force has remained stable; from 42 per cent in 1970 it rose to 43 per cent in 1993. This compares with an average for middle-income countries of 32 per cent in 1992 and for low-income economies of 36 per cent in 1993.[21/]

Table II.5. Female employment in manufacturing, 1989-1994

	1989	1990	1991	1992	1993	1994
Total employed (million)	85.5	86.2	88.4	91.1	93.0	96.1
of which:						
Females (million)	22.9	23.5	24.2	24.4	24.2	24.3
Females (per cent)	26.78	27.26	27.38	26.78	26.02	25.29

Source: China Statistical Yearbook 1995, pp. 94 and 98.

Fig. II.C. Share of females in manufacturing employment, 1989-1994
(Percentage)



In urban areas a relatively late age of marriage and strenuous fertility control have underpinned this high participation rate. In rural areas the opening of other opportunities for employment has enhanced the importance of female labour on the land and in sideline activities, and young

women are also an important source of cheap and unskilled labour for TVEs. Many peasant women seek employment as maids in towns and cities. In 1990, according to census data, women made up 46.1 per cent of that part of the labour force which is categorized as rural and 45.5 per cent of the rural workforce which was employed in urban areas. Of the "rural workforce employed in industry in urban areas" women formed 49.2 per cent, and they accounted for 42.1 per cent of the rural labour force engaged in industry in rural areas (46.1 per cent of the total in 1990). Despite this undoubted extension of the range of economic opportunities open to rural women, doubts have been expressed about whether the overall status of women in the countryside has been enhanced during the reform era.[22/]

Meanwhile the share of women in the manufacturing labour force is well below the female share of the total employed labour force as reported above. As Table II.5 shows, the female percentage of those employed in manufacturing has remained at around 26 per cent since 1988 (the first year for which such data are available) and has tended if anything to fall. In light of the ample anecdotal evidence for the employment of large numbers of women in TVEs along the eastern seaboard, it would seem probable that these figures may understate female employment in manufacturing.

C. PRODUCTIVITY AND PERFORMANCE

Output

Data in the UNIDO database covering the share of MVA in gross output show that value-added as a percentage of total manufacturing gross output has remained fairly stable since 1980, fluctuating around 30 per cent and tending, if anything, to fall. At the aggregated level this is a relatively low ratio, suggesting that manufacturing in China has a high physical input cost structure. Price distortions still affect this ratio, as discussed in Chapter I, and the process of partial price reform has further influenced the relative costs and relative profits of different branches of industry. This tendency to fall is not surprising in the environment of intensifying competition which has replaced the monopolistic system of the pre-reform era. While many of the branches of manufacturing have recorded MVA/gross output ratios around the average, food products have tended to be below average, reflecting the high input costs and controls on ex-factory pricing. Tobacco, a major source of government revenue through profits tax, has tended to have a high MVA/gross output ratio. Other branches where the ratios have tended to be higher than the average include non-metallic minerals (cement), basic iron and steel, and petroleum refining. Many branches, especially raw materials in the heavy industrial sectors dominated by SOEs, have seen a substantial fall in the ratios over time, again reflecting the impact of price reform and liberalization on the profitability of hitherto sheltered sectors.

Labour productivity

It is an acknowledged fact that the reforms introduced over the last 15 years have helped to increase labour productivity, which has been growing particularly rapidly in the collective sector but has also been rising at a fairly rapid pace in the overmanned state sector.

Data for the annual average rate of growth of MVA per worker (see Table II.6) show, as could be expected, quite wide fluctuations by branch within an overall picture of growth. Similarly, data

showing the fluctuations around an overall average for manufacturing display a wide variation in labour productivity. Food products and textiles, petroleum products, glass, industrial chemicals and non-electrical machinery have tended to display below-average levels of labour productivity. Tobacco, clothing, leather, furniture, petroleum refineries and metal products have been well above the average for all manufacturing. The explanation for these differentials is unclear, although the case of tobacco can be explained by the very low price of inputs and high end prices which the state controls, while products such as clothing are among those where domestic value-added is being stimulated by strong growth in exports.

Table II.6. Growth in MVA per worker by branch, 1980 and 1993
(Rmb; annual average change at 1980 prices)

ISIC	Product	1980 MVA/worker	1993 MVA/worker	Percentage change
311	Food products	4,687.02	9.048.88	5.19
313	Beverages	4,792.50	10,483.19	6.21
314	Tobacco	33,187.50	58,765.52	4.49
321	Textiles and leather footwear	6,440.21	5,648.98	-1.00
322	Wearing apparel, not footwear	30,380.43	83,859.76	8.12
323	Leather and substitutes	8,478.26	25,248.00	8.76
331	Wood and cork, not furniture	6,644.27	13,167.86	5.40
332	Furniture and wood fixtures	15,690.38	55,941.18	10.27
341	Paper and products	5,126.39	4,968.00	-0.24
342	Printing, publishing etc.	2,586.21	5,368.82	5.78
351	Industrial chemicals	7,522.95	5,473.85	-2.42
352	Non-industrial chemicals	6,923.91	11,479.10	3.97
353	Petroleum refineries	14,377.27	23,326.25	3.79
354	Miscellaneous petroleum and coal	3,745.45	4,537.19	1.49
355	Rubber	10,024.62	6,367.11	-3.43
356	Plastics	14,476.92	36,729.17	7.42
361	Pottery and earthenware	1,372.12	13,384.21	19.15
362	Glass and products	1,672.22	4,226.32	7.39
369	Non-metallic mineral products	5,299.68	16,076.20	8.91
371	Basic iron and steel	3,995.32	15,951.03	11.24
372	Basic non-ferrous metals	8,013.10	11,845.65	3.05
381	Metal products, not machinery and equipment	6,123.40	32,598.08	13.73
382	Non-electrical machinery	2,599.91	5,828.45	6.41
383	Electrical machinery and apparatus	13,554.23	9,511.67	-2.69
384	Transport equipment	3,207.30	8,846.15	8.12
385	Professional and scientific equipment	5,405.41	5,770.93	0.50
390	Other	1,790.30	26,947.50	23.19
TOTAL		**5,220.02**	**9,753.96**	**4.93**

Source: UNIDO, Industrial Development Reviews, Information Base.

In terms of total factor productivity recent research suggests improved growth as a function of reforms. As Table II.7 shows, it has been the collective sector that has set the pace of growth in total factor productivity, with TVEs leading the way. The much less flexible state sector, with its far higher fixed costs, has nevertheless managed to bring about a rise in the rate of growth of total

factor productivity (TFP). But, as with labour productivity, the rate of growth of TFP appears to be slowing in the state sector, which is finding it harder to allocate resources to productive investment as it faces an increasingly hard budget constraint.[23/]

Table II.7. Estimated rates of annual productivity growth in Chinese industry, 1984-1992
(Per cent)

	1984-1988	1988-1992
Total factor productivity		
State sector	3.0	2.5
Collective, of which:		
Urban and township	5.9	4.9
TVEs	6.6	6.9
Real labour productivity		
State sector	6.2	4.7
Collective, of which:		
Urban and township	7.0	13.8
TVEs	14.4	17.7

Source: Jefferson, G. H., and Rawski, T. G., "Enterprise Reform in Chinese Industry", *Journal of Economic Perspectives*, Vol. 8, Number 2, Spring 1994, pp. 47-70.

Profitability

Reliable estimates for enterprise profitability in China are problematic. On the one hand, as already noted, restating the accounts of state-owned enterprises (SOEs) according to internationally acceptable accounting standards would in many cases make their positions look worse. On the other hand there is evidence to suggest that many Chinese enterprises conceal their profits, as indeed is indicated by the continuance in business of thousands of SOEs which are acknowledged to be loss-making and not all of which can be subsidized.

Data from the UNIDO database showing the share of gross profit in MVA by industrial branch suggest a broadly rising share across most branches. Once again food products, textiles and industrial chemicals are exceptions.

In general it is SOEs in the heavy industry sector, which are heavily overmanned and the output prices of which are controlled, that make the biggest losses.[24/] But the total losses of loss-making enterprises have been rising rapidly under the influence of the austerity measures introduced to curb demand in 1993 (see Chapter I). Total losses of Rmb 48.3 billion were recorded by SOEs in 1994, up from Rmb 45.2 billion in 1993. This does not represent a real increase in the context of high inflation, and the ratio of total losses to the total pre-tax profits of SOEs has been coming down gradually (from 22 per cent in 1990 to 16.7 per cent in 1994), but losses of this magnitude nevertheless represent a serious challenge to industry and government and it may be difficult to reduce them further without some of the radical measures that have been avoided to date.[25/]

D. INVESTMENT PATTERNS

The public sector remains the predominant source of industrial investment within the investment of all SOEs, just as it dominates the ownership of Chinese industry. As noted in Chapter I, industrial investment is SOEs has remained high despite their losses by virtue of access to subsidized credit from the banking sector, the informal credit market and their own funds. It was just over 20 per cent in 1985, rose to 35.6 per cent in 1990 and fell back to 19 per cent in 1994 (see Table II.8). This reflects two trends: increasing investment in infrastructure projects by the public sector, which therefore depresses the manufacturing share of the total, and a propensity by enterprises to invest in the construction of buildings and other facilities for the use of staff. This latter trend is one which the central government has been seeking to curb since it first introduced macroeconomic cooling measures in 1993. It has also sought to curb the overall growth rate of fixed investment. Success in these aims has been made more difficult by the vastly increased autonomy of local governments in their capacity as controllers of all but the 2,000 to 3,000 very large SOEs.[26/]

Table II.8. Investment in manufacturing by SOEs, 1985, 1990 and 1994
(Per cent of total, Rmb billion)

Year	Total	Manufacturing	Per cent
1985	107.4	22.3	20.76
1990	107.4	38.2	35.57
1994	643.7	121.6	18.89

Source: China Statistical Yearbook 1995, p. 146.

In national accounts terms, therefore, fixed investment has not been particularly responsive to various measures designed to restrain its growth. From over 20 per cent in 1993-1994 its growth in 1995 is estimated to have been about 11 per cent. A breakdown of investment in 1994 by various categories shows a typical spread: 39 per cent of the total spent was on "capital construction", i.e. new capacity, and 17 per cent on updating existing plant; 11.5 per cent was on real estate of various kinds. Only 3 per cent of the funding came from the central budget, while nearly 50 per cent come from retained funds; 25 per cent was spent on equipment, and 63 per cent on construction and installation.

Data available up to 1989 showing the share by sector of the investment by SOEs in industry presented in Table II.9 (broadly defined) show how heavy industry has taken the lion's share of investment by SOEs in that period. In particular, investment in power has risen consistently as the SOE sector has sought to address bottlenecks in this area. Investment in the light industrial sectors of food and textiles, which are increasingly the domain of the collective sector (in particular TVEs), has fallen as a share of the total. In the 1990s, a period in which the role of the collective and private sectors in small-scale light industrial activities has increased greatly, the trends depicted in Table II.10 will have intensified.

Table II.9. Investment by SOEs by subsector, 1981-1989
(Per cent of total)

	1981	1982	1983	1984	1985	1986	1987	1988	1989
Metallurgical	12.7	16.5	15.0	13.7	11.7	10.2	11.6	11.7	10.9
Power	18.6	17.7	20.4	22.5	24.2	30.0	30.6	30.1	32.2
Coal	10.7	11.5	14.2	16.1	12.3	10.9	8.7	7.8	8.6
Petroleum	12.9	9.7	10.3	9.0	7.4	7.3	8.6	10.6	11.4
Chemical	8.8	9.9	10.7	10.5	12.0	11.1	12.3	12.5	10.6
Machine building	11.3	10.4	9.5	8.9	10.6	7.9	7.3	7.0	7.7
Forestry	3.1	3.0	2.3	2.1	1.5	1.4	1.4	1.1	1.1
Building materials	4.1	4.5	5.0	4.9	6.1	6.0	5.0	4.0	3.4
Textiles	9.2	8.1	6.1	5.3	4.6	5.1	4.5	4.4	5.2
Food	4.3	5.4	4.0	3.5	3.9	4.2	4.5	3.6	3.5
Paper making	0.9	0.6	0.6	0.6	0.8	0.8	0.8	0.8	0.7
Other	3.4	2.7	1.9	2.9	4.9	5.1	4.7	6.4	4.7
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: World Bank, *China Updating Economic Memorandum: Managing Rapid Growth and Transition*, 1993.

Foreign investment has played a small but growing role in investment in China since the early 1980s (see Table II.10). Various forms of foreign investment, including 100 per cent ownership, are now permitted, and the authorities have sought to maintain China's relative competitiveness as an investment location by regularly updating the concessional tax regime and incentives in place. The result was a steady and growing inflow of funds in the 1980s which became a flood after 1992. A cumulative total of $95.8 billion in direct foreign investment inflows had been recorded up to 1994. As discussed in Chapter I, however, this figure is almost certainly overstated by a large margin.

There have of course been some well-publicized mega-projects. Famous pioneering projects have included the investment by Occidental in the Antaibao coal mine at Pingshuo in Shanxi and the large-scale investment by automobile companies such as Volkswagen in Shanghai and General Motors in Beijing, all in the 1980s. Most major transnational companies have committed funds to China and most premier brand names can now be found there. Despite this, most of the projects with foreign investment are on a small scale. The average investment value per project in 1994 for industrial projects was $909,000.[27/] This reflects the fact that a very large share of the direct foreign investment flowing into China comes from companies in Hong Kong (or via Hong Kong from Taiwan Province of China) and goes into export-oriented, small-scale manufacturing projects. There is also a large amount of investment from these sources in real estate and property development projects, which the central government wishes to discourage because of the inflationary impact they have on the demand for and prices of key raw materials and their wasteful use of agricultural land. Such projects accounted for 39.3 per cent of the value of direct foreign investment in 1994 despite the fact that it has been official policy to discourage them for several years.[28/]

Data on foreign investment by origin are presented in Table II.11. They show how the bulk of foreign investment has found its way into those provinces that, from the early 1980s by the establishment of special economic zones, sought to attract funds from nearby Hong Kong and Taiwan Province of China. Thus Guangdong province had absorbed 32.2 per cent of the total invested by the end of 1994 and Fujian, which traditionally has close ties to Taiwan Province of China, took another 10.24 per cent. During the 1990s, in the wake of the decision to promote the

Fig. II.D. Foreign direct investment, 1983-1994
($ billion)

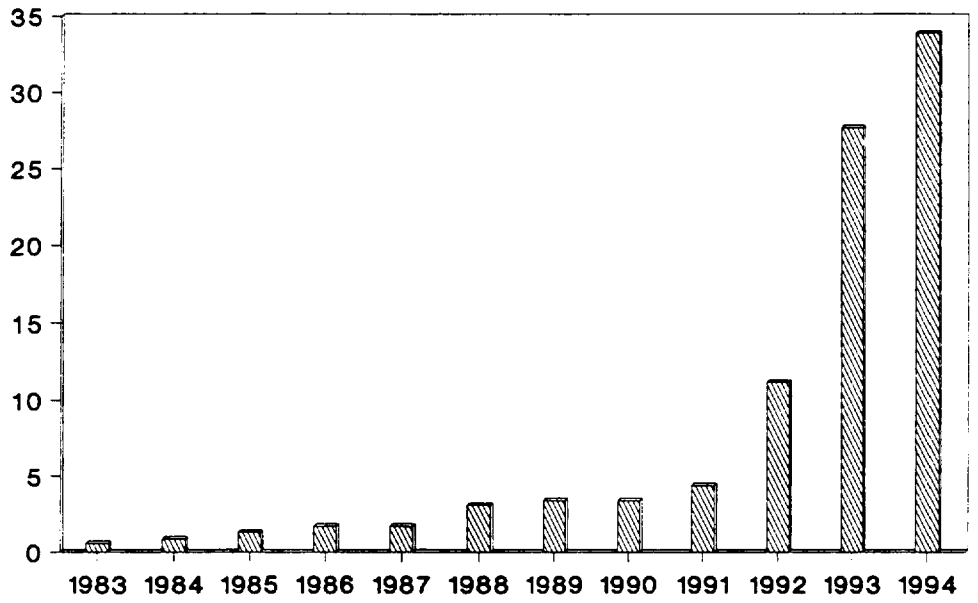


Fig. II.E. Foreign direct investment by origin, 1994
($ billion)

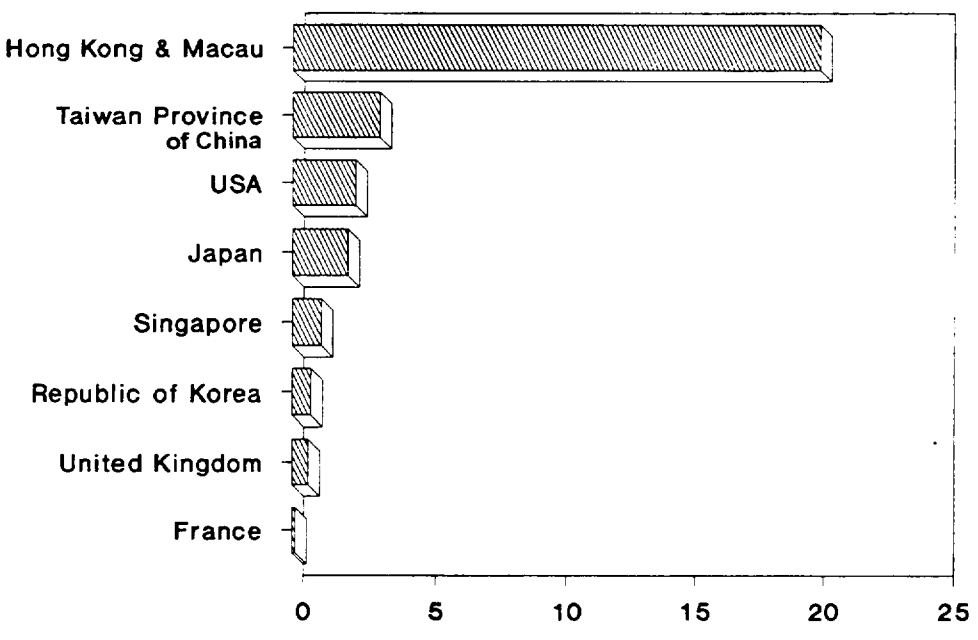


Table II.10 **Foreign investment, 1983-1994**
($ million)

	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	Total	Per cent
TOTAL	577	885	1,321	1,742	1,783	3,150	3,437	3,436	4,426	11,292	27,771	33,946	93,766	100.00
Beijing	76	35	89	150	106	503	320	279	245	350	667	1,372	4,192	4.47
Tianjin	12	23	64	135	133	61	31	37	133	108	614	1,015	2,366	2.52
Hebei	5	10	56	51	10	19	44	44	57	113	397	523	1,329	1.42
Shanxi	-	-	1	-	5	7	10	3	4	54	86	32	202	0.22
Inner Mongolia	3	-	3	7	5	6	4	11	2	5	85	40	171	0.18
Liaoning	8	15	26	48	91	131	126	257	362	516	1,279	1,440	4,299	4.58
Jilin	-	3	5	24	7	10	100	18	32	75	275	242	791	0.84
Heilonjiang	1	1	4	25	14	69	57	28	21	72	232	347	871	0.93
Shanghai	11	42	109	149	214	233	422	174	145	494	3,160	2,473	7,626	8.13
Jiangsu	10	31	51	46	86	126	127	134	219	1,463	2,844	3,763	8,900	9.49
Zhejiang	2	8	27	25	36	44	54	49	92	240	1,032	1,144	2,753	2.94
Anhui	-	-	3	35	3	28	9	14	11	55	258	370	786	0.84
Fujian	16	51	119	63	55	145	348	320	471	1,424	2,874	3,713	9,599	10.24
Jiangxi	-	7	10	9	5	9	9	8	19	100	208	262	646	0.69
Shandong	3	4	36	66	65	90	163	186	216	1,003	1,874	2,552	6,258	6.67
Henan	-	-	8	11	14	64	46	11	38	53	305	387	937	1.00
Hubei	-	-	8	12	26	22	29	32	47	203	541	602	1,522	1.62
Hunan	2	3	31	28	3	13	23	14	25	133	437	331	1,043	1.11
Guangdong	400	650	651	863	737	1,251	1,323	1,582	1,943	3,701	7,556	9,463	30,120	32.12
Guangxi	6	23	31	49	45	21	53	36	32	182	885	836	2,199	2.35
Hainan	-	-	-	-	-	117	95	103	177	453	707	918	2,570	2.74
Sichuan	19	8	29	32	24	40	13	24	81	112	571	922	1,875	2.00
Guizhou	-	1	10	12	-	14	14	11	16	20	43	64	205	0.22
Yunnan	-	-	2	4	6	8	8	7	4	29	97	65	230	0.25
Tibet	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Shaanxi	3	7	16	37	73	112	97	47	32	46	234	239	943	1.01
Gansu	13	-	1	1	-	2	-	1	5	-	12	88	123	0.13
Qinghai	-	1	-	-	-	3	-	-	-	1	3	2	10	0.01
Ningxia	-	-	-	-	-	-	1	-	-	-	12	7	20	0.02
Xinjiang	-	2	11	14	18	5	1	5	-	-	53	48	157	0.17

Sources: World Bank, *China: Macroeconomic Stability in a Decentralized Economy,* Washington DC, 1995; *China Statistical Yearbook 1995.*

Table II.11. Foreign direct investment by origin, 1983-1994
($ million)

	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	Total	Per cent
Hong Kong and Macau	473	748	956	1,329	1,809	2,428	2,342	211	2,579	7,706	17,445	20,332	58,358	62.24
Taiwan Province of China	..	..	..	..	..	..	..	..	472	1,053	3,139	3,391	8,055	8.59
USA	83	256	357	326	271	244	288	461	331	519	2,068	2,491	7,695	8.21
Japan	186	225	315	263	267	598	408	520	610	748	1,361	2,086	7,587	8.09
Singapore	..	..	..	..	..	..	..	..	58	121	492	1,177	1,848	1.97
United Kingdom	11	98	71	35	14	47	29	20	38	39	221	689	1,312	1.40
Republic of Korea	..	..	..	..	..	..	..	..	..	120	381	726	1,227	1.31
France	35	20	33	44	17	32	12	23	12	47	141	193	609	0.65

Sources: World Bank, *China: Macroeconomic Stability in a Decentralized Economy*, Washington DC, 1995; *China Statistical Yearbook 1995.*

growth of Shanghai at the centre of an economic hub stretching up the Yangze river, foreign investment began to flow into Shanghai in large quantities while at the same time there was, as part of this "second wave" of foreign investment, an upsurge in interest in the adjoining province of Jiangsu.

As with Guangdong province, much of this investment is in export-oriented, labour-intensive manufacturing of low-technology consumer goods.

Looked at by source (Table II.11) the data tell the same story. Fully 62.24 per cent of the foreign investment absorbed by the end of 1994 came from Hong Kong and Macau, and another 8.09 per cent came from Taiwan Province of China. The USA and Japan, with $7.7 billion and $7.6 billion respectively, were the next largest sources of investment.

E. TOWNSHIP AND VILLAGE ENTERPRISES (TVEs)

Many of the collective industries in China fall into the category of TVEs.[29/] TVEs accounted for 30.5 per cent of national gross industrial output in 1994, and employed 19.55 per cent of the employed labour force. In 1990-1994 TVEs accounted for 31 per cent of total state revenue and one-third of exports.[30/] While TVEs are vulnerable in the current economic climate of austerity, especially to shortages of working capital (as they were in 1989-1990 when thousands were forced to close or operate below capacity), they are also robust and can respond flexibly to the changing needs of the market. A sample survey in the second quarter of 1995 suggested that 75 per cent of their output was up to national standards of quality, an achievement which has been aided by their absorption of $15.7 billion in foreign investment in around 30,000 enterprises.[31/] Their factor and labour productivity growth has been impressive, while their share of the gross output of many industrial branches is high. In 1994, village-run enterprises employed on average 40 persons; township enterprises employed 82.[32/] This compares with an average of around 2,200 workers for the around 14,000 large and medium-sized SOEs and about 190 for SOEs classified as small.

As noted by various studies, the competition which the entry of TVEs has imposed on SOEs has been beneficial.[33/] But TVEs are to an extent dependent on SOEs for inputs, markets and cost advantages which are being eroded. There are also issues surrounding their long-term potential, in terms both of their inability to benefit from economies of scale and their comparatively low quality, which will become increasingly pressing in the light of the rapidly growing sophistication of Chinese markets. Issues of ownership, especially the relationship between TVEs and the local governments which control and protect them, will become more pressing if there is consolidation of TVEs on any significant scale.

F. INDUSTRIAL LOCATION

As noted in Chapter I above, it was deliberate policy to disperse industry during the pre-reform era.[34/] The reforms have also tended to encourage dispersion of industrial activity, as most local-level governments have sought to optimise their revenue-generating and job-creating potential by encouraging the establishment of industrial enterprises within their jurisdictions. The result is a low and falling eight-firm concentration ratio in China, where the process of consolidation and merger to create optimal scale enterprises has hardly begun. Table II.12 demonstrates the same

Table II.12. Share of output of industrial products by province, 1994
(Percentage)

Product	Beijing	Tianjin	Hebei	Shanxi	Inner Mongolia	Liaoning	Jilin	Heilonjiang	Shanghai	Jiangsu	Zhejiang	Anhui	Fujian	Jiangxi
Synthetic fibres	2.63	6.64	4.23	2.21	0.28	12.75	2.79	9.09	23.46	55.26	18.85	1.50	3.46	2.69
Yarn	1.40	2.69	7.66	1.44	0.39	3.72	0.96	1.01	6.54	13.41	4.81	4.30	1.44	2.07
Silk	-	-	0.09	0.47	-	3.10	-	-	0.38	-	30.92	0.44	0.09	1.22
Machine-made paper and paperboards	0.98	1.45	7.68	1.90	0.70	3.85	2.60	2.42	1.88	5.29	7.22	2.78	4.10	1.70
Sewing machines	0.01	1.54	0.05	1.10	-	0.04	0.01	0.03	42.89	8.01	14.29	2.57	0.15	-
Bicycles	0.10	11.07	0.45	0.01	0.02	4.37	0.11	0.01	19.04	14.23	13.76	2.38	2.90	0.91
Watches	0.54	1.26	0.11	0.05	-	0.84	0.24	0.04	3.69	0.93	0.18	0.27	7.70	0.16
Synthetic detergents	3.38	4.46	1.68	4.44	0.60	1.60	0.98	1.12	10.45	9.40	1.60	6.37	0.39	1.59
Salt	-	7.42	13.49	0.01	3.57	9.21	-	-	-	9.66	2.55	0.54	2.28	1.23
Sugar	-	-	0.18	1.06	3.10	0.64	0.50	3.44	-	-	0.08	-	3.09	1.53
Edible vegetable oil	0.62	1.81	3.53	1.44	1.72	4.50	3.03	6.36	1.67	9.03	2.92	8.27	2.09	2.48
Canned foods	0.23	0.57	7.07	1.02	0.15	3.05	0.39	0.53	1.58	3.50	13.59	4.15	12.92	1.54
Beer	5.08	0.38	7.16	0.68	1.90	7.63	4.82	6.96	1.77	4.93	9.01	3.46	5.68	2.05
Cigarettes	0.41	0.70	3.44	0.64	0.87	1.17	1.78	2.27	2.74	2.24	2.21	5.51	2.42	1.34
Household refrigerators	0.86	0.51	-	-	-	1.59	2.23	0.06	14.44	3.01	6.21	15.73	-	2.88
Washing machines	1.83	5.92	-	3.12	-	2.28	1.85	-	16.64	7.27	7.79	7.59	-	-
Colour TVs	4.15	4.76	0.50	0.07	1.81	1.09	0.52	1.26	7.87	12.41	3.88	1.49	9.47	1.94
Coal	0.81	-	5.48	26.13	4.92	4.44	2.02	6.21	-	2.02	0.08	3.31	0.81	1.85
Crude oil	-	4.09	3.49	-	0.31	10.28	2.27	38.34	-	0.71	-	-	-	-
Pig iron	7.13	1.55	10.69	13.77	3.38	13.08	0.96	0.76	9.73	2.02	0.77	3.93	0.75	1.54
Rolled steel	7.33	3.70	7.44	2.21	3.17	14.08	1.04	1.15	13.63	8.00	1.98	3.25	0.94	1.54
Ferro-alloys	1.06	0.27	2.06	5.66	1.65	7.17	8.71	0.24	6.55	1.69	3.71	0.42	0.94	2.10
Coke	3.21	1.46	6.08	37.28	2.71	6.94	1.00	1.56	5.70	1.47	0.38	2.46	0.33	1.55
Cement	1.26	0.42	6.38	2.46	0.74	4.49	1.52	1.58	0.90	7.33	6.41	3.89	2.62	2.15
Plate glass	4.44	1.95	12.92	1.44	3.30	10.89	1.92	4.67	5.58	3.43	2.54	1.93	1.24	0.46
Timber	0.07	-	0.74	0.49	7.56	1.84	8.53	18.61	-	1.06	3.60	4.26	8.65	4.06
Sulphuric acid	0.60	0.51	4.48	3.20	0.59	6.24	0.80	0.50	2.26	9.74	2.82	7.34	1.80	3.38
Chemical fertilizers	0.42	0.69	6.65	3.73	0.79	3.48	1.37	1.80	1.14	6.74	3.26	8.63	2.08	1.40
Chemical pesticides	1.28	9.69	6.03	0.45	-	4.10	0.83	0.52	3.10	21.76	14.76	1.97	3.00	1.59
Plastics	9.57	4.05	2.38	0.56	0.43	10.47	1.97	7.22	14.15	12.86	2.03	1.27	1.55	0.85
Alternators	2.78	1.55	5.11	3.42	0.73	8.80	1.02	2.19	13.10	18.39	4.23	2.57	2.38	2.14
Metal cutting machines	4.02	0.39	2.03	0.44	0.19	8.43	0.77	1.21	6.59	16.66	24.84	3.05	1.26	2.37
Motor vehicles	10.75	8.98	1.76	0.18	0.02	2.36	13.83	1.77	8.60	9.51	1.47	2.73	0.24	3.31
Tractors	-	12.63	-	-	-	0.86	1.93	-	26.34	1.71	4.28	-	-	0.21
Mini-tractors	0.35	-	7.46	0.90	0.33	0.62	3.15	2.43	-	15.97	4.69	10.74	3.75	1.03
Int.combustion engines	9.36	2.49	0.54	0.36	0.02	7.73	2.27	1.20	3.87	26.17	3.35	2.91	1.14	2.28

(Continued)

Table II.12. (Continued)

Product	Shandong	Henan	Hubei	Hunan	Guangdong	Guangxi	Hainan	Sichuan	Guizhou	Yunnan	Tibet	Shaanxi	Gansu	Qinghai	Nigxia	Xinjiang
Synthetic fibres	9.83	4.89	2.63	2.19	20.95	1.80	1.24	4.87	0.41	0.39	-	1.94	1.52	-	9.74	0.40
Yarn	11.44	7.19	9.26	3.22	3.07	1.45	0.04	3.47	0.47	0.72	-	3.18	0.39	0.13	0.06	4.04
Silk	5.08	1.22	1.22	0.09	3.85	1.69	-	20.77	0.09	0.47	-	1.13	-	-	-	0.38
Machine-made paper and paperboards	11.30	12.67	2.62	3.46	9.66	3.45	-	5.42	0.48	1.50	-	0.01	-	-	-	-
Sewing machines	2.25	1.75	0.51	2.34	15.27	2.88	-	0.03	-	0.94	-	3.22	0.02	-	-	-
Bicycles	4.04	4.71	2.88	0.61	15.44	2.37	-	0.25	-	0.28	-	0.07	-	-	-	-
Watches	1.30	0.29	0.20	0.15	79.30	1.14	-	1.46	-	-	-	0.13	-	-	-	-
Synthetic detergents	9.18	5.45	6.83	2.59	11.44	2.28	0.25	5.77	0.05	3.79	-	0.93	1.46	0.47	0.66	1.00
Salt	25.16	-	5.58	1.85	0.92	0.38	-	8.75	-	1.34	-	0.36	0.22	3.09	-	1.33
Sugar	0.02	-	0.16	1.12	20.82	37.10	4.37	1.91	0.21	13.66	-	0.07	1.65	-	0.50	4.96
Edible vegetable oil	12.75	6.29	7.38	3.82	5.99	1.06	0.03	5.45	1.10	0.38	-	1.19	1.01	0.25	0.29	3.65
Canned foods	7.95	3.36	2.54	1.55	6.38	10.52	5.75	7.23	0.06	0.47	-	0.87	0.28	0.01	0.10	2.62
Beer	13.54	4.34	3.91	1.39	5.62	1.43	0.01	4.03	0.39	0.53	-	1.08	0.91	0.19	0.22	0.88
Cigarettes	6.76	8.62	6.41	7.40	4.57	2.94	0.32	6.06	5.97	17.80	-	3.96	0.84	0.09	0.09	0.38
Household refrigerators	8.15	6.72	0.15	3.28	24.21	0.01	-	0.94	0.67	0.46	-	7.35	0.51	-	-	-
Washing machines	9.63	-	1.87	-	22.59	-	-	4.63	0.94	0.43	-	1.87	3.70	-	-	-
Colour TVs	4.30	0.95	0.57	0.17	26.76	0.32	0.18	11.85	0.15	0.36	-	2.80	0.25	-	-	0.10
Coal	6.29	7.74	0.97	3.95	0.73	0.97	-	7.10	4.11	2.10	-	2.98	1.69	1.69	0.24	1.13
Crude oil	21.15	4.71	0.60	-	3.31	0.02	-	0.12	-	0.10	-	1.03	1.07	0.77	0.08	7.92
Pig iron	4.45	2.83	6.41	2.15	1.29	0.89	0.03	6.10	1.25	1.77	-	0.84	1.17	-	0.05	0.71
Rolled steel	2.88	2.68	7.74	2.01	2.69	1.00	0.05	6.26	0.66	1.65	-	0.66	1.02	0.44	0.08	0.69
Ferro-alloys	0.73	2.29	2.40	8.16	0.17	5.20	-	8.07	9.39	5.22	-	1.47	5.23	4.82	4.22	0.44
Coke	3.31	3.16	3.45	1.87	0.48	0.45	-	6.00	3.26	2.80	-	1.25	0.80	0.01	0.31	0.74
Cement	12.03	7.13	3.61	4.74	11.92	4.06	0.33	5.90	1.10	2.05	-	2.18	1.23	0.15	0.33	1.06
Plate glass	6.42	13.45	2.09	4.28	6.01	1.81	-	2.12	0.34	1.40	-	2.14	2.52	-	0.29	0.42
Timber	2.18	2.58	2.34	4.76	4.39	5.63	0.74	7.08	1.13	6.62	-	1.56	0.89	0.11	0.07	0.44
Sulphuric acid	5.84	4.53	7.01	5.47	6.38	2.57	0.12	10.01	0.77	5.25	-	2.85	3.87	0.17	0.46	0.46
Chemical fertilizers	7.32	8.35	6.93	5.62	2.37	1.68	0.02	10.15	2.36	4.62	-	2.62	1.49	1.25	1.52	1.52
Chemical pesticides	6.72	2.14	6.28	8.66	2.62	1.45	-	2.10	0.34	0.21	-	-	0.55	-	-	-
Plastics	12.34	2.31	1.64	1.15	5.18	0.49	-	2.36	0.16	0.29	-	0.45	2.92	0.05	0.68	0.51
Alternators	5.57	4.03	2.54	4.51	4.49	1.24	-	2.94	0.20	1.10	-	1.81	2.31	-	0.50	0.35
Metal cutting machines	7.85	0.63	2.47	1.07	3.39	1.74	-	3.15	0.39	3.63	-	1.89	33.90	0.39	0.77	0.10
Motor vehicles	1.10	1.13	13.15	1.08	1.72	5.24	0.22	7.73	0.27	1.89	-	0.94	-	0.01	0.12	0.01
Tractors	22.70	6.85	-	-	-	-	-	-	-	-	-	-	0.21	-	0.43	-
Mini-tractors	17.74	11.53	0.30	2.10	3.34	0.35	0.35	0.35	0.35	0.35	-	0.35	0.35	0.35	0.35	0.35
Int.combustion engines	6.39	3.94	1.46	4.54	0.81	8.55	-	7.95	0.41	2.02	-	0.12	0.02	-	0.10	-
TOTAL GROSS OUTPUT	10.69	4.47	3.93	2.50	9.37	1.80	0.21	5.25	0.60	1.23	0.01	1.31	0.85	0.16	0.20	0.77

Source: *China Statistical Yearbook 1995*, pp. 408-415.

point. Virtually all provinces produce a range of industrial products and there is only limited evidence for concentration to address what might be termed provincial comparative advantage.

This is mostly in resource-based products such as coal, oil and salt, which are only found in some provinces. Products like beer, chemical fibres, yarn, indeed most of the basic raw materials and inputs for industry and the daily necessities for the population, are produced across a wide range of provinces. This is one of the reasons for provincial barriers to trade, which remain a problem. The more competitive atmosphere that has resulted from the removal of administrative entry barriers has prompted provincial and lower-level governments to attempt to protect their own, less competitive enterprises where possible.

G. REGIONAL CONCENTRATION

Despite the high degree of dispersion noted above, different factor endowments and the legacy of pre-1949 history have encouraged some industrial specialization. Traditionally the provinces along the eastern seaboard, especially Liaoning, Shandong, Beijing, Tianjin and Shanghai, were the locus of early efforts to establish a modern industrial base, and foreign investment played an important if unwelcome part in early industrialization efforts in the treaty ports and concessional areas that were ceded to foreign powers at various stages during the second half of the 19th century. After the victory of the Communists in 1949 there was a deliberate effort to spread industrial facilities inland. Nevertheless Shanghai, with gross industrial output per head of Rmb 5,321, still produced 12.9 per cent of the total gross industrial output with a population of 1.2 per cent of the total in 1979.[35/] Other overproducers in output per head were Liaoning, Beijing, Tianjin, Jiangsu and Shandong, which produced a total of 27.8 per cent of national output. Various factors during the 1980s and 1990s have produced a shift in this pattern. The three provinces of Shanghai, Jiangsu and Shandong together still produced nearly a third of national gross industrial output (29 per cent, see Table II.12). Two important structural changes have influenced the regional distribution of industry, however. The first is the opening of China to foreign investment from the early 1980s. The areas which were opened first, namely the special economic zones of Guangdong and Fujian and then the 14 coastal cities, have attracted the most foreign investment (as discussed above) and much of the output has been for export. In 1994 Guangdong and Fujian provinces, which as noted above had between them received over 40 per cent of the cumulative direct foreign investment in China, produced 12.59 per cent of total gross industrial output, up from only 6.1 per cent in 1979.[36/] (It is worth noting that by no means all of the 11,414 foreign-funded enterprises that the 1995 *China Statistical Yearbook* records for Fujian (3,135) and Guangdong (8,279) are engaged in industry.) Other provinces whose share of total output has risen are Shandong (to 10.75 per cent from 6.5 per cent) Jiangsu (to 12.8 per cent from 8.4 per cent) and Zhejiang (to 7.6 per cent from 3.3 per cent), all of which have been comparatively successful in attracting foreign investment. By contrast the share of Liaoning has fallen (from 9.1 per cent to 6 per cent), while Sichuan's share has remained virtually unchanged at about 5 per cent. The former is a province where there has traditionally been a large share of heavy industry. The latter contains one centre of heavy industry, Chongqing on the upper Yangtze. Both are attracting more foreign investment than in the past, but neither has a large share of the total.

The other important determinant of the changing share by province of industrial output is the number of TVEs and other forms of enterprise that have sprung up in the reform era. A breakdown of TVE numbers by province is not available, but it is known that the spatial distribution of industrial and other non-agricultural activities is highly uneven,[37/] a phenomenon

which is causing widening inequality between and within provinces. Because rural industries are dependent on urban areas for information, technology and markets they are liable to develop more rapidly and prosperously in rural areas which are in fairly close proximity to urban centres. There is ample evidence for this being the case in China.

H. ENVIRONMENTAL ISSUES

As noted in Chapter I, environmental pollution is recognized to be a serious problem in China.[38/] Industry is by far the largest single source of pollution, and the environmental legislation and regulation in place recognises and seeks to address this. There are, however, problems with enforcement of a system that relies on administrative command rather than incentives and which lacks the personnel to enforce the command. Compliance with environmental regulation by non-state firms is also hard to enforce. Many TVEs are run by managers whose remuneration is linked closely to short-term profits. TVEs change their product lines frequently and may be reluctant or unable to purchase the relevant anti-pollution equipment each time. Many local governments, understandably, accord job provision a higher priority than prevention of pollution. The most polluting industrial processes were forbidden in the 1970s, when it was also forbidden to transfer production of products which involve poisonous or dangerous substances to rural areas without installing effective pollution control equipment. But many harmful processes such as electroplating and tanning are carried out in rural areas without effective pollution control.

Over the years, UNIDO has acquired a wealth of experience in China through the provision of technical assistance in support of industrial pollution abatement. Many UNIDO projects have addressed directly the urgent need to reduce emissions of atmospheric pollutants, particularly emissions arising from the use of coal in energy generation. UNIDO has also helped Chinese scientists and engineers to address the need to recycle industrial and post-consumer wastes and to reduce the discharge of industrial and municipal wastes to surface watercourses.

Specialized capacity in all major industrial subsectors is enabling UNIDO to provide assistance to Chinese industry with the introduction of pollution prevention technologies. UNIDO's technology experts are facilitating transfer of the new, low pollution and low energy-intensive technologies and processes essential to China's efforts to redirect its development on to a sustainable path.

In cooperation with the Administrative Centre of China's Agenda 21, the UNIDO delegation to a high-level round tables conference convened by the Chinese authorities in July 1994 identified 16 priority projects where China could benefit from UNIDO's experience and expertise. In 1995 UNIDO assisted the Chinese authorities in formulating these projects, focusing on, among other things, sustainable industrial development policies and cleaner industrial production.

I. TRADE IN MANUFACTURES

Imports

The continuing need to import grain (mainly because of the difficulty of transporting grain in sufficient quantities to areas of mass consumption) and the requirements of the modernization

drive dominated the pattern of Chinese imports in the 1980s. The latter phenomenon is evident from the large share of manufactures in total imports as shown in Table II.13. Within this, the share of capital goods in the total has risen from 25.4 per cent in 1975 (when China's trade with the outside world was a fraction of current levels) to nearly 40 per cent from 1985-1993. But the share of capital goods is showing signs of decline (to 36.9 per cent in 1993 from 39.1 per cent in 1985) for two reasons. One is the rising, although still small, share of consumer goods in total imports. More important is the impact of the establishment of thousands of enterprises, especially in the 1990s, which are engaged in processing and finishing goods imported via Hong Kong. Such goods show up on both sides of the trade account, mostly as manufactures, and their domestic value-added is low. In 1991[39/] as much as 77 per cent of the value of processed exports was represented by imports; in that year imports for processing were valued at $25 billion, fully 39 per cent of total merchandise imports.

These trends are evident from Table II.14 which shows a rising share in manufactures imports for machinery and equipment. It also shows a rising share for textiles and clothing and for basic metals, which would be somewhat surprising in the absence of a significant re-export sector.

Table II.13. Share of manufactures in total imports, 1975-1993, selected years
(Percentage)

	1975	1980	1985	1990	1993
All manufactures	74.2	62.4	86.1	86.4	90.3
Capital goods	26.4	24.1	39.1	38.5	36.9
Processed food	1.6	1.4	1.4	3.5	1.7

Source: UNIDO, Industrial Development Reviews, Information Base.

Table II.14. Composition of manufactured imports by major product category, 1975-1993, selected years
(Percentage)

	1975	1980	1985	1990	1993
Processed foods	2.2	2.2	1.7	4.1	1.9
Textiles and clothing	1.9	7.2	5.0	13.4	10.6
Wood and furniture	0.01	0.1	0.2	1.4	1.1
Paper, printing and publishing	1.61	3.8	1.9	1.7	1.8
Chemicals	15.6	17.9	10.8	17.0	14.8
Non-metallic minerals	0.15	0.4	0.6	0.6	0.7
Basic metals and iron and steel	39.1	23.1	24.1	7.5	15.7
Machinery and equipment	39.5	45.1	54.9	52.1	52.5
Miscellaneous products	-	0.3	0.8	2.2	1.0

Source: UNIDO, Industrial Development Reviews, Information Base.

Exports

Exports have grown extremely rapidly during the reform era, as discussed in Chapter I. China now ranks 11th in the world in terms of its share of world trade. During the 1980s petroleum products (mainly crude oil to Japan) were the single largest foreign exchange earner by value. They accounted for 25 per cent of the value of exports in 1985, but their share had fallen to 5 per cent in 1992 and China is now a net importer of oil products, as its own demand has risen fast while supply has not kept pace. The share of manufactured exports in the total has meanwhile been rising steadily, as shown in Table II.15, reaching almost 90 per cent in 1993.

Part of this success is the result of the export effort of rural industry. A significant proportion of the total rise in exports is the result of the exports of foreign- invested enterprises,[40/] which accounted for 27.5 per cent of total export value in 1993, up from 12.5 per cent in 1990. In 1991 the total value of processed exports (mainly, but not exclusively from foreign-invested enterprises) was $32.4 billion, 45 per cent of total merchandise exports in that year.[41/]

Table II.16 shows that textiles and clothing have retained a significant share of China's overall exports. Although their share of a rapidly rising total fell between 1985 and 1993, their volume was growing very fast. The share of machinery and equipment rose most markedly during the period 1985-1993, from 9.6 per cent to 25.9 per cent. This category includes the many consumer goods and electronics that China is exporting, both as domestic exports and in the form of re-exports.

Table II.15. Share of manufactures in total exports, 1975-1993, selected years
(Percentage)

	1975	1980	1985	1990	1993
All manufactures	65.2	67.6	63.5	84.8	89.9
Capital goods	2.7	2.3	2.6	38.5	36.9
Processed food	22.8	12.9	9.4	9.7	7.7

Source: UNIDO, Industrial Development Reviews, Information Base.

Main markets and suppliers

In 1993 nearly a quarter of China's exports went to Hong Kong, but much of this represented goods that are re-exported to third markets, especially the USA. The World Bank estimates that of the $32.9 billion exported to Hong Kong in 1990 as much as $29 billion went to third markets, of which the USA accounted for 36 per cent.[42/] Arriving at an accurate figure for China's total exports to the USA is complicated by this process, because the USA now counts as imports from China the full value of goods that currently pass through the hands of Hong Kong enterprises with manufacturing establishments across the border and are shipped to Hong Kong, where a large re-export margin is added, before being re-exported.

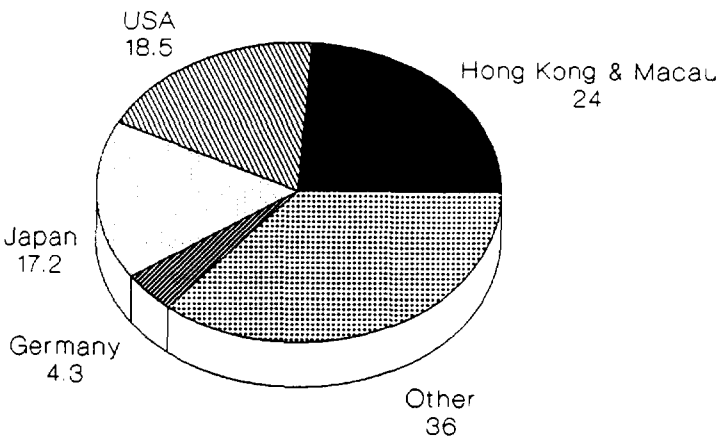
Other important export destinations include Japan and the European Union, and more recent regional trade and investment partners including the Republic of Korea, Singapore and Taiwan Province of China.

Table II.16. Composition of manufactured exports by major product category, 1975-1993, selected years
(Percentage)

	1975	1980	1985	1990	1993
Processed foods	35.0	19.2	14.9	11.5	8.6
Textiles and clothing	30.4	37.5	45.8	36.2	40.0
Wood and furniture	1.0	1.4	0.9	1.1	2.0
Paper, printing and publishing	1.0	1.0	0.6	0.4	0.5
Chemicals	10.2	20.8	17.5	11.8	10.8
Non-metallic minerals	3.5	2.7	1.4	2.2	1.7
Basic metals and iron and steel	3.7	3.1	1.8	3.4	2.3
Machinery and equipment	9.9	9.2	9.6	27.3	25.9
Miscellaneous products	5.1	5.2	7.3	6.1	8.0

Source: UNIDO, Industrial Development Reviews, Information Base.

Fig. II.F. Destinations of exports, 1993
(Percentage)



As Table II.17 shows, Japan (the source of most of China's imports of capital goods) is the most important supplier. Taiwan Province of China ranked second in 1993, reflecting the very rapid build-up of its direct investment in China and the associated imports, followed by the USA (a major supplier of grain as well as other goods), and Hong Kong. Although the Russian Federation has once again become a significant trading partner in recent years, China's trade is oriented towards the advanced markets of OECD countries and the rapidly growing economies of North-east and South-east Asia.

Table II.17. Main trading partners, 1993

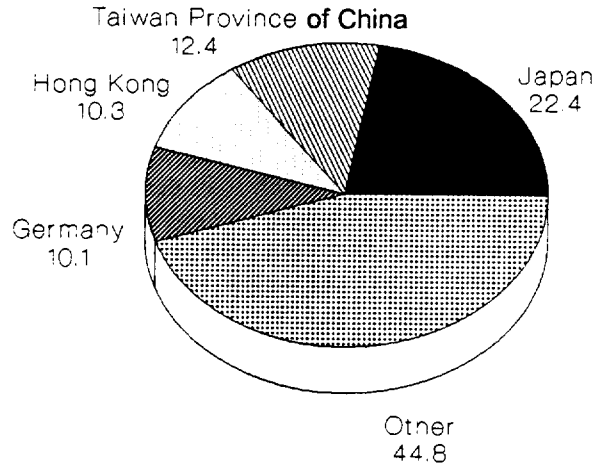
	$ million	Per cent of total
Exports to:		
Hong Kong and Macau	22,063.9	24.0
USA	16,964.0	18.5
Japan	15,779.4	17.2
Germany	3,968.5	4.3
Korea, Republic of	2,860.2	3.1
Russia	2,691.8	2.9
Singapore	2,245.0	2.4
UK	1,928.6	2.1
Netherlands	1,608.8	1.8
Taiwan Province of China	1,461.8	1.6
Imports from:		
Japan	23,253.3	22.4
Taiwan Province of China	12,933.1	12.4
USA	10,688.1	10.3
Hong Kong	10,472.7	10.1
Germany	6,039.8	5.8
Korea, Republic of	5,359.9	5.2
Russia	4,987.4	4.8
Italy	2,737.4	2.6
Singapore	2,645.6	2.5
Australia	1,949.0	1.9

Source: China Statistical Yearbook 1995.

Trade relations with the USA

In the 1990s China's important trade relationship with the USA has been complicated: by politics (such as the events of 1989 in Beijing and the relationship between the USA and Taiwan Province of China); by the issue of intellectual property rights; and by the size and measurement of bilateral trade flows. The difficulties encountered in this relationship have spilled over into the negotiations that China has been pursuing since 1986, at first for what is regarded as its "re-entry" into the GATT, and lately for its accession to the World Trade Organization that came into being in 1995. Although it is probable that the matter of China's WTO entry will be resolved by compromise during 1996, the sheer size of the bilateral trade and investment relationship between China and the USA means that disputes are bound to arise.

Fig. II.G. Origins of imports, 1993
(Percentage)



In 1994 the president of the USA, Bill Clinton, decided to delink China's human rights record from the annual renewal of China's Most Favoured Nations (MFN) status in the USA. This status has to be renewed annually under the Jackson-Vanick amendment of the 1974 United States Trade Act and the process of its annual renewal has been fraught with controversy since 1989. In October 1992 the USA and China reached agreement after nearly a year of negotiations resulting from a US investigation under the Super 301 provisions of the Omnibus Trade Act into what the USA regarded as excessive import restrictions in China and its violation of US intellectual property rights. The agreement provided for the removal of 90 per cent of China's non-tariff barriers and the reduction of tariffs: i.e., the number of quantitative restrictions would be reduced to 240 by 2000 from 1,250 in 1992. China also agreed to introduce far greater transparency into its trade regime. After this agreement, broadly speaking, the USA has pursued the issue of the nature of China's trade regime in the context of the protracted negotiations for China's WTO entry.

Meanwhile, however, an equally, if not more, intractable issue has come to the fore in Sino-United States economic relations. This is the willingness (and ability) of the Chinese government to enforce prohibitions on the abuse of intellectual property rights. The USA argued that China's first ever copyright law, promulgated in 1991, was defective because it did not cover products made outside China and did not provide for proper patenting. In 1992, around the time of the trade agreement referred to above, China agreed that it would stiffen its protection of intellectual property. But the issue has become more contentious, with the USA arguing that China was either unwilling or unable to enforce its laws. In February 1995, after threat and counterthreat had been traded, the two countries reached agreement on a timetable to tackle the widespread counterfeiting activity that was flourishing in southern China and to take a number of steps to enforce the protection of intellectual property. One year later, in the context of a deterioration

in bilateral relations across board, the USA was insisting that no improvement had occurred despite well-publicized closures of pirate CD factories by China.

A problematic aspect of the economic relationship between China and the USA is the sheer size of the trade flows. It should be noted that the USA, with $8 billion, or 8.2 per cent, of total foreign direct investment in place in China by the end of 1994, is an important high-technology investor in China. This sets the context of acrimonious exchanges about China's trade regime, US insistence on safeguards and guarantees surrounding China's status as a WTO member and gives rise to accusations of US bullying by the Chinese side. As Table II.18 shows, the Chinese and US figures for two-way trade are at odds, and by a margin far wider than could be accounted for by normal cif/fob and timing differences. Both countries agree that China has moved into surplus in its trade with the USA. But the USA puts its bilateral deficit with China at around $35 billion in 1995 (annualized 11-month figures), second in size only to its deficit with Japan. Chinese data, by contrast, put the Chinese surplus at only $7.4 billion. A large part of the difference between the US and Chinese figures arises because the entrepôt trade profits made by Hong Kong (and Taiwan Province of China) businessmen in transshipping goods processed in China to the USA are counted by the USA as Chinese exports to the USA. Chinese trade statistics show these as exports to Hong Kong. A large proportion (45 per cent in 1991) of exports consists of products that have been processed in China from imported inputs, of which a considerable part are themselves the exports of foreign-invested enterprises. Many of these represent investment from Hong Kong, Taiwan Province of China and increasingly the Republic of Korea and Singapore, which have gone to China in search of cheaper costs, especially labour costs. The large trade surplus that China has accumulated with the USA to some extent represents a shift of trade from these investor countries and is thus the result of shifting patterns of comparative advantage within the Asia-Pacific region rather than, as sometimes suggested by US commentary, predatory trading practices by China.

Persistent problems in the Sino-US trading relationship have spilled over into the process of negotiations for China's accession to the GATT/WTO, which have been going on since 1987. China was an original GATT signatory in 1947 but was withdrawn by the Nationalist Government on Taiwan Province in 1950; if it were to join the WTO on the basis of reacceding, then the USA would no longer be able to invoke Article 35 of the WTO which allows a member to opt out of the granting of rights to a new member; nor would the USA be able to invoke the Jackson-Vanik amendment of the 1974 Trade Act under which MFN status for China has to be approved every year. China still claims that its accession should be on the basis of rejoining, but the USA is most unlikely to agree to this despite the announcement in November 1995 of a whole series of trade liberalization measures to take effect from April 1996. These would have the effect of lowering the average tariff on 4,000 (out of 6,000) lines from 35.9 per cent to 22-23 per cent. This amounts to advance implementation of part of its GATT/WTO offer and follows agreement in 1995 on setting out the areas of its trade regime that would need to be overhauled before accession.

The issue of China's accession or reaccession to the GATT/WTO is further complicated by another sticking point, which is whether it should join with the status of a developing country, which would allow it extra time before meeting deadlines on opening its trade, particularly agricultural trade. The USA argues that the sheer size of China's exports renders such a status unsuitable. Other major trade partners, such as the EU and Japan, tend to follow the USA's lead in this respect and have also benefited from the USA's initiative on intellectual property rights. Eventual agreement, which should take place in 1996-1997, will probably make the question of developed or developing country status a matter of individual sectors. Some, such as automobiles, electronics and chemicals, will be given developing country time-scale periods of adjustment. Others, such as textiles, which are highly protected, will have to become more open upon entry.

In return for making its trade system more transparent, moving to eliminate the role of planning in trade, introducing current-account convertibility, lowering tariffs and tariffying non-tariff barriers, China will receive far easier access to trade privileges. It will probably remain subject, however, to transitional reviews of its implementation of policy, but there will be scope to ease bilateral tension by use of the WTO's dispute resolving mechanisms.

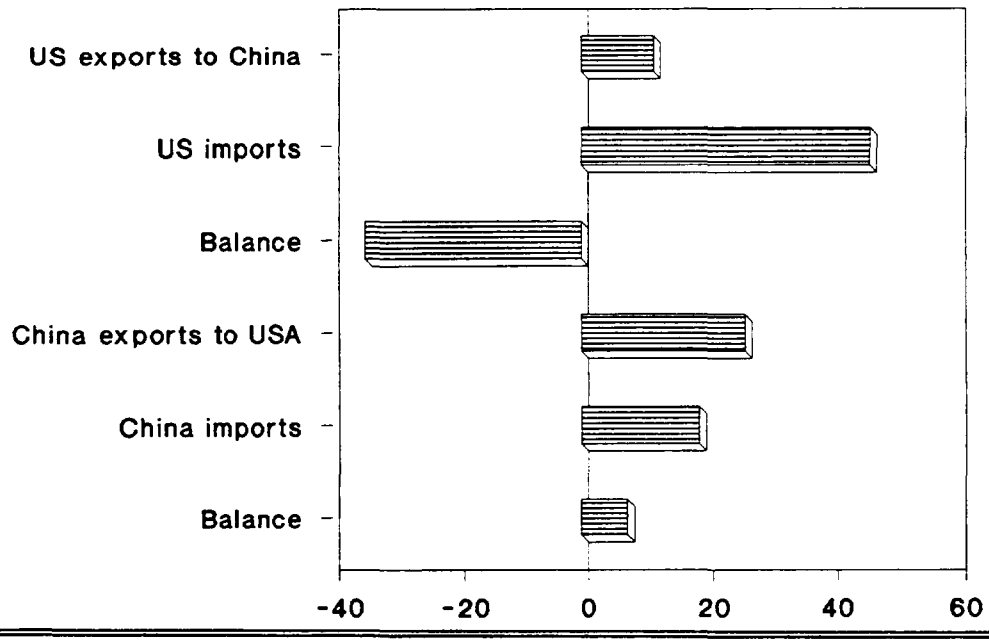
Table II.18. Trade flows between the USA and China, 1990-1995
($ billion)

	USA			China		
Year	Exports to China	Imports from China	Balance	Exports to USA	Imports from USA	Balance
1990	4.8	15.2	-10.4	5.2	6.6	-1.4
1991	6.3	19.0	-12.7	6.2	8.0	-1.8
1992	7.4	25.7	-18.3	8.6	8.9	-0.3
1992	8.8	31.5	-22.7	17.0	10.7	6.3
1994	9.3	38.8	-29.5	21.5	14.0	7.5
1995[a/]	11.5	46.3	-34.8	26.2	18.8	7.4

Sources: US Commerce Department; China Customs Statistics.

a/ First 11 months at an annual rate.

Fig. II.H. Trade flows between the USA and China, 1995
($ billion)



J. THE ROLE OF TECHNICAL COOPERATION[43/]

Development assistance from both multilateral and bilateral sources has increased dramatically since 1979 in response to the open door policy and reform efforts fostered by the government of China. The vast majority of external resources were spent to help China modernize the country's industries, transportation, and communications infrastructure. Priority areas for UNDP assistance include poverty alleviation, employment generation and migration, sustainable agricultural and rural development, macroeconomic and enterprise reform, natural resources development, environmental protection, pivotal industries, energy efficiency and conservation, basic health, and education.

Despite the great success of the early reform period in mitigating poverty, poverty alleviation remains a formidable challenge. Amid the rapid transformation of the Chinese economy there has been a proliferation of different kinds of pockets of poverty across different regions in China: chronic poverty in the remote, resource-poor regions; temporary poverty resulting from natural disasters; poverty stemming from personal misfortune such as illness or injury; poverty associated with joblessness; and poverty resulting from exposure to market forces. External assistance is needed to support government initiatives to combat poverty.

One of the principal causes of poverty is unemployment. Unemployment in China is the product of a race between the increasing demand for labour from fast economic growth on the one hand, and the burgeoning supply of labour from the redundant workforces in agriculture and the state enterprises on the other. A huge residue of surplus labour was left behind by the collective era. External support could be very useful in the form of assistance to employment promotion, further encouragement of TVEs, and other forms of collective and private-sector endeavour.

China's greatest environmental challenges at present concern the atmosphere and water supply. The framework drawn up by the Chinese government for dealing with the environment and sustainable development is *China's Agenda 21: White Paper on China's Population, Environment and Development in the 21st Century* adopted by the State Council in March 1994. The document made China the first industrializing country to promulgate a comprehensive national plan for sustainable development as mandated by the Agenda 21 statement adopted by the 1992 UN Conference on Environment and Development in Rio de Janeiro. Substantive capacity building is needed to achieve the goals of sustainable industrial development. Complying with ecological norms entails a significant reduction in the energy and material intensity of industrial production in order to turn out competitively priced, high quality goods. Through the informed and judicious use of raw materials and energy, industry and industrial technologies can contribute to the improvement of life without burdening the environment. External technical cooperation inputs could play a significant role in harmonizing international standards for various industrial products. The standards of energy and material efficiency should be taught at enterprise level with the aid of advances being made in the area of computers and communications. International organizations should collect substantive information on eco-efficiency in industrial production on disaggregated products and disseminate such information to enterprises, with a view to reducing significantly the material and energy intensity of production as well as to complying with the norms of industrial ecology. UNIDO is actively involved in the implementation of a number of projects that facilitate the use of cleaner production technologies and sustainable industrial development (see Section H above).

Reforming state enterprises is one of the crucial areas requiring substantive external assistance. In China state enterprises continue to remain the principal producers of energy, transport,

technology, equipment and major raw materials. A number of state enterprises are beset by an array of problems as many operate with obsolete technology. Faced with the emerging competitive pressures for efficiency gains, many are burdened with debt and redundant workers. China's approach has been to reform the state enterprises rather than privatize them. Reform has been aimed at separating government functions from enterprise management and at creating conditions for enterprises to operate in a competitive environment as independent business units. Because of the implications of state enterprise reforms for workers in general and human resource development in particular, substantive external technical cooperation inputs will need to be directed to state enterprise restructuring. International organizations could play a significant role in dovetailing the experiences of successful cases of enterprise restructuring in other economies in transition with their counterparts in China.

NOTES TO CHAPTER II

1/ World Bank, *China: Socialist Economic Development,* Volume 2, *The Economic Sectors: Agriculture, Industry, Energy, Transport, and External Trade and External Trade and Finance,* Washington DC, 1983, p. 116.

2/ China has traditionally divided industry into two major categories. Heavy industry consists of: mining and extraction and timber felling; production of raw materials such as cement and energy products; and manufacture and processing of raw materials including the production of machines, metals, agricultural inputs, chemicals etc. Light industry includes the production of most consumer goods and some producer goods such as agricultural hand tools, and is subdivided into industries which use farm products as raw materials (e.g. food and textiles and clothing) and industries which use manufactures as raw materials (e.g. crafts, chemical instruments and office machinery). For more details on the two categories, see World Bank, *China: Socialist Economic Development,* Volume 2, Washington DC, 1983, pp. 129-130.

3/ Gross output of industry is computed by valuing the volume of output at ex-factory prices; net output is computed by estimating the value-added according to the income approach; i.e. it is the sum of taxes, profits, wages, interest and management fees. Depreciation is not included. See World Bank, *China: Socialist Economic Development,* Volume 2, Washington DC, 1983, p. 112 and Volume 1, Annex A, p. 246.

4/ World Bank, *China: Socialist Econmic Development,* Volume 1, Washington DC, 1983, p. 130.

5/ Data derived from *China Statistical Yearbook 1995,* p. 377.

6/ The way in which the Chinese compute MVA may, however, be distorting the data; especially in the early part of the 1980s before the widespread introduction of market prices for many commodities, the value of net output would have been influenced by the inclusion of indirect taxes and planned profits which did not reflect market conditions and which influence the profits of many industries. The progressive and partial removal of some but not all of these distortions (see Chapter I) after the early 1980s will itself have produced another distortion by rendering the data less comparable over time. Gross data are also subject to the influence of price distortions.

7/ See World Bank, *China: Socialist Economic Development,* Volume 2, Washington DC, 1983, pp. 134-135; responsibility for collective industries was also shared between central and regional/local organs of government. The distinction between state-owned and collective was not just one of ownership, the more important enterprises were owned by the state ("the whole people") and they tended to be larger, with higher levels of fixed assets and more employees. See *ibid.*, p. 127.

8/ It is generally believed that there are in fact many more private enterprises, sheltering under a collective or jointly-owned categorization for fear of possible discrimination from local officials.

9/ Ho, Samuel P. S., "Rural Non-agricultural Development in Post-Reform China", *Pacific Affairs,* Vol. 68, No. 3, University of British Columbia.

10/ Jefferson, G. H., and Rawski, T. G., "Enterprise Reform in Chinese Industry", in *Journal of Economic Perspectives*, Volume 8, Number 2, .

11/ A figure of "almost half" is also mentioned; see "The Challenge Facing China's State-owned Enterprises", MacMurray, T., and Woetzel, J., in *The McKinsey Quarterly 1994, Number 2.* This article points out that it is an acknowledged fact in China that if SOE accounts were restated to conform to international standards of accounting, the position would be even worse (*ibid.* p. 68 and p. 70).

12/ *China Statistical Yearbook 1995,* p. 395.

13/ Broadman, H. G., Meeting the *Challenge of Chinese Enterprise Reform,* World Bank Discussion Papers, 1995, p. 12.

14/ Reality is somewhat different; thousands of migrant workers find their way to the cities, where their presence is tolerated provided that they are self-sufficient in cash, food supply and accommodation, and find work on construction sites or do domestic work. Thousands more arrive illegally and are known as "floating" workers. They numbered an estimated 60 million to 80 million in 1990. Such workers are highly vulnerable to exploitation as their status affords them no protection.

15/ *China Statistical Yearbook 1995,* p. 377.

16/ World Bank, *China: Internal Market Development and Regulation,*, 1994 and Ho, Samuel P. S., *op. cit.*

17/ EIU Business Report, *China*, 4th quarter 1995, pp. 24-25.

18/ State Science and Technology Commission of the People's Republic of China White Paper on Science and Technology No. 3, *Guide to China's Science and Technology Policy,* Beijing, 1990.

19/ *China Statistical Yearbook 1995,* p. 628.

20/ EIU Business Report, *op. cit.*, p. 31.

21/ World Bank, *World Development Report 1994,* p. 218 and 1995, p. 218.

22/ For more detail about the female rural labour force as revealed by the 1990 census and for a discussion of issue of the status of rural women see Ho, Samuel P. S., *op. cit.*, pp. 378-387.

23/ Jefferson, G. H., and Rawski, T. G., *op. cit.*, for a discussion of the factors influencing TFP performance in China.

24/ This point is discussed above, and see Broadman, H. G., *op. cit.*, pp. 13-14.

25/ *China Statistical Yearbook 1995,* p. 403.

26/ Broadman, H. G., *op. cit.*, p. 6. He also notes that about 74 per cent of SOE employees work in SOEs run by sub-central authorities and that 14,200 of the 104,700 SOEs that existed at the time of writing the study were classified as "large and medium". Together the large and medium enterprises (defined on the basis of asset value and capacity) account for over 80 per cent of total SOE industrial output and more than 35 per cent of the total industrial output.

27/ *China Statistical Yearbook 1995,* p. 560.

28/ *Ibid.*

29/ For discussion of their development see Byrd, W. A., and Qingsong Lin, eds, *China's Rural Industry: Structure, Development and Reform,* New York, Oxford University Press, 1990.

30/ EIU Country Report, *China, Mongolia,* 4th quarter 1995, pp. 25-26.

31/ *Ibid.*, p. 26.

32/ *China Statistical Yearbook 1995,* p. 399.

33/ Broadman, H. G., *op. cit.*, p. 8: "in markets where TVEs are present there is (a) convergence of factor returns between SOEs and TVEs, (b) declining SOE profits rates and (c) a positive relationship between TVE market share and SOE productivity".

34/ Defence and political considerations, as well as the ambitions of the provincial governments, lay behind this policy.

35/ World Bank, *China: Socialist Economic Development,* Volume 2, 1983, p. 145.

36/ *Ibid.*, p. 145.

37/ Ho, Samuel P. S., *op. cit.*

38/ In China, as in other east Asian countries, there are signs of a growing awareness of environmental issues in educated circles. The environmental implications of the Three Gorges dam project were the subject of considerable debate in China and opposition was expressed on these grounds in debates at the National People's Congress.

39/ World Bank, *China Foreign Trade Reform,* Washington DC, 1994, pp. 11-12.

40/ World Bank, *op. cit.*, and Lardy, *op. cit.*

41/ World Bank, *op. cit.*, p. 12.

42/ World Bank, *op. cit.*, p. 13.

43/ This section draws largely on a UNDP document "China Situation Analysis" which spells out the priority areas for external assistance.

III. INDUSTRIAL BRANCH PROFILES

A. FOOD PRODUCTS

STARCHY STAPLE FOODS

The resource base

Because of the size and geographical diversity of China a vast range of agricultural activities are performed although grain production has long been the most important. The chief staple products produced and consumed in China are rice, wheat and maize. Also of importance are soya and coarse grains such as sorghum and millet. In 1993 grain crops accounted for 75 per cent of total sown area.[1/] The central and northern parts of China are the most important for grain production, accounting for 60 per cent of China's grain output between 1978 and 1986[2/].

Regional imbalances are characteristic of grain production. Whilst the north-east has in the past stockpiled surplus maize and some soybeans but had unsatisfied demand for rice and wheat, the central region has had surplus rice but a deficit of maize and soybeans. Since 1984 grain production in the coastal provinces has fallen and as a consequence the north has gradually overtaken the south as the main supplier of grain.

Recent trends

The abolition of mandatory production planning in 1985, along with price incentives to grow cash crops and the rapid surge in rural industry, have encouraged farmers to switch away from grain production, leading to a decline in the grain sown area and an expansion of economic crops. Between 1990 and 1994 the amount of land planted to grain fell by 4.46 million hectares.[3/] At the same time, rapidly rising incomes per head in the reform era have increased demand for fine grains such as rice and wheat, resulting in a decline in the sown area for coarse grains such as potatoes, millet and sorghum.[4/] Despite the fall in the total grain sown area, national grain production and average grain yields per sown hectare have increased (see Table III.1). Following the drop in grain output in 1994, the government raised purchase prices of grain to encourage cultivation.

Most grain is produced and consumed within the country. For reasons of national security the government is keen that China remains self-sufficient in grain production as far as possible and is particularly reluctant to become dependent on US grain imports. This explains China's concern to exempt the farm sector from trade liberalization discussions in the Asia-Pacific Economic Cooperation Forum.

Table III.1. Grain crops sown area and total grain output, 1985-1994

Year	Total grain crops sown area (Million ha)	Total grain output (Million tonnes)
1985	108.84	379.11
1986	110.93	391.51
1987	111.26	402.98
1988	110.12	394.08
1989	112.20	407.55
1990	113.46	446.24
1991	112.31	435.29
1992	110.56	442.65
1993	110.50	456.48
1994	109.00	444.60[a/]

Source: *China Statistical Yearbook 1994*, pp. 342, 345 for 1985-1993.

a/ "A new reform on contract farming proposed" in *China Economic Digest*, Spring 1995, p. 25.

Production of coarse grains had risen from 82.7 million tonnes in 1985 to 117.7 million tonnes by 1994, an increase of 42 per cent (see Table III.2). China is a net exporter of coarse grains.

Table III.2. Output, exports and imports of coarse grains, 1985-1994
(Million tonnes)

Year	Output	Exports	Imports
1985[a/]	82.701	6.968	0.122
1986	87.270	6.492	0.787
1987[b/]	96.527	4.184	1.768
1988	94.899	4.372	0.190
1989[c/]	94.289	4.494	0.314
1990	114.511	3.768	1.021
1991	110.466	8.210	0.752
1992[d/]	110.318	10.939	0.829
1993	119.519	..	..
1994	117.756	..	..

Source: UNCTAD, *Commodity Yearbook 1994,* New York, 1994, pp. 131-132.

a/ Figures for exports and imports 1985/86 from UNCTAD, *Commodity Yearbook 1992,* New York, 1993, p. 131, and for output from *FAO Production Yearbook 1987-1988,* Rome, 1988, p. 120.

b/ Figures for 1987/88 output.

c/ Figures for 1989, 1990/91 output.

d/ Figures for 1992-1994 output from *FAO Production Yearbooks 1989-1990, 1991 and 1995*, pp. 74, 75 and 73 respectively.

RICE

Recent trends

Rice is primarily grown in the centre, south and south-west of China. In the decade between 1985 and 1994 the total area dedicated to rice-growing fell from 32 million hectares to 30.3 million hectares, a drop of 5.3 per cent (see Table III.3). Total output of rice increased slightly in the years between 1989 and 1992 but thereafter began to decline.

Table III.3. Sown area of rice and total output of rice, 1985-1994

Year	Total sown area (Million ha)	Total output of rice (Million tonnes)
1985	32.07	168.57
1986	32.26	172.22
1987	32.19	174.26
1988	31.98	169.11
1989	32.70	180.13
1990	33.06	189.33
1991	32.59	183.81
1992	32.09	186.22
1993	30.35	177.70
1994[a/]	30.37	178.25

Source: *China Statistical Yearbook 1994*, pp. 342, 345.

a/ 1994 figures are estimates by *FAO Production Yearbook 1994*, Vol. 48, Rome, 1995, p. 70.

Table III.4. Exports and imports of rice, 1985-1994
(Thousand tonnes)

Year	Exports	Imports
1985[a/]	1,006.2	210.8
1986	949.5	322.3
1987	1,021.8	550.8
1988	697.9	310.3
1989	315.1	1,203.2
1990	326.0	58.9
1991	688.8	142.8
1992	953.2	103.6
1993	..	..
1994	..	510.0[b/]

Source: UNCTAD, *Commodity Yearbook 1994*, New York, 1994, pp. 128-129.

a/ 1985 and 1986 figures from UNCTAD sources of information.

b/ From *China's Customs Statistics*, 1994, p. 26.

Rice is consumed primarily as a grain and further processing into flour, noodles or confectionery is very limited.

While many farmers are moving away from rice production to more profitable crops, some are already moving into high-quality and speciality rices such as *simiao* rice and Liaoning Japonica rice which command good prices on the free market.[5/]

Exports of rice have consistently exceeded imports since the mid-1980s (see Table III.4). For the remaining decade China will probably export lower-quality rice to Cuba, Europe and Africa, export Japonica rice to other Asian countries, and import high-quality rice from Thailand and Viet Nam.[6/]

WHEAT

Recent trends

Wheat is mainly grown in the north and north-west of China. Both the total area devoted to wheat production and total output expanded steadily between 1985 and 1994 (see Table III.5).

Table III.5. Sown area of wheat and total output of wheat, 1985-1994

Year	Total sown area (Million ha)	Total output (Million tonnes)
1985	29.21	85.81
1986	29.61	90.04
1987	28.79	85.90
1988	28.78	85.43
1989	29.84	90.81
1990	30.75	98.23
1991	30.94	95.95
1992	30.49	101.58
1993	30.23	106.39
1994[a/]	30.50	101.20[b/]

Source: *China Statistical Yearbook 1994*, pp. 342, 345.

a/ 1994 figures from *FAO Production Yearbook 1995.*

b/ Unofficial figure.

China is a net importer of wheat and wheat flour (see Table III.6). In 1992, for example, imports exceeded exports by 10,581 tonnes and were equivalent to 10.5 per cent of output that year.

Wheat is processed into high- and medium-gluten flour for bread, noodles, mantou and dumpling wrappers, and into low-gluten flour for cakes. China has around 2,000 flour mills throughout the country[7/] but equipment is outdated. In 1990 the Shanghai Municipal Flour Company was the largest flour producing enterprise in China, with a daily wheat processing capacity of 2,000 tonnes.

Joint-venture mills such as Lianyungang Municipal Flour Mill in Jiangsu province, which exports 50 per cent of its output, have been set up in the reform period.

Table III.6. Exports and imports of wheat and wheat flour, 1985-1994
(Thousand tonnes)

Year	Exports	Imports
1985[a/]	12.5	5,518.9
1986	18.6	6,110.0
1987	12.6	13,841.9
1988	11.7	14,687.9
1989	5.0	15,080.6
1990	5.8	12,638.9
1991	29.7	12,582.8
1992	146.8	10,728.4
1993	..	6,420.0[b/]
1994	..	7,180.0[c/]

Source: UNCTAD, *Commodity Yearbook 1992*, New York, pp. 124-125.

a/ 1985 figures and 1986 export figures from UNCTAD, *Commodity Yearbook 1992*, New York, pp. 124-125.

b/ *China Statistical Yearbook 1994*, p. 518.

c/ *China's Customs Statistics*, 1994, 12, p. 26.

With rising living standards, baked foods are becoming increasingly popular in China. Currently over 2 million tonnes of baked foods are produced annually, of which 1 million tonnes are pastries, 300,000 tonnes are bread and 700,000 tonnes are biscuits.[8/] In order to meet this growing demand over 1,300 bread production lines and more than a dozen biscuit production lines have been imported since the reforms began. Guangdong is host to ten of the imported biscuit production lines, which account for 20 per cent of the market in large cities.

Since the late 1980s foreign bread-making companies such as Vie de France and OK Jimmy have also started to set up business in China to satisfy expanding demand. By 1994 there were over 22 such joint-venture bakeries, posing a challenge to domestic bread makers, who have already lost one-third of their market to foreign competitors.[9/] However, domestic producers' sales still exceed those of joint ventures as prices are lower. As quality, taste and packaging become increasingly important factors in future sales, domestic industry with its backward technology and equipment is likely to come under increasing pressure.

MAIZE

Recent trends

Maize is largely produced in the north and north-east of China. Heilongjiang's state farms provide most of this crop. The total area of land devoted to maize has increased by 17 per cent from the low of 17.6 million hectares in 1985 to 20.7 million hectares in 1993 (see Table III.7), with a 61 per cent increase in output. In 1978, however, 19.9 million hectares of land were devoted to

maize. The increase in area of land dedicated to maize is related to the rise in living standards and the concomitant increase in demand for meat, which in turn has raised the demand for feedgrain. As a result maize has been used more for livestock feed than for human consumption. While in 1979 70 per cent of corn output was used for human consumption, by 1993 an estimated 69 per cent was used for livestock feed.[10/]

About 10 per cent of maize output is exported, but at times at the expense of domestic needs. Shortages of maize in the south in 1994 were related in part to the reluctance of some grain bureaux to transfer grain southward when exports could earn much needed foreign exchange.[11/] In December 1994 corn exports were even suspended to guarantee domestic supplies. Despite this China is expected to need 1.5 million tonnes net imports of corn in 1995.[12/] The main export markets are Japan, the Republic of Korea, the Russian Federation and other Asian countries. However transportation problems, slow procurement and slow drying are continuing obstacles to the efficient transfer of maize to the livestock-producing south.

Table III.7. Sown area, total output, and total exports and imports of maize, 1985-1994

Year	Total sown area (Million ha)	Total output (Million tonnes)	Total Imports (Million tonnes)
1985	17.69	63.83	5.38[a/]
1986	19.12	70.86	6.11
1987	20.21	79.24	13.20
1988	19.69	77.35	0.10
1989	20.35	78.93	0.07
1990	21.40	96.82	..
1991	21.57	98.77	..
1992	21.04	95.38	..
1993	20.69	102.70	..
1994[b/]	20.57	103.55	..

Source: *China Statistical Yearbook 1994*, pp. 342, 345.

a/ Import figures for 1985-1989 from *International Trade Statistics Yearbooks 1988, 1989*, Vol. 1, New York, 1990.

b/ Unofficial estimates compiled by *FAO Production Yearbook 1994*, Vol. 48, Rome, 1995, p. 78.

Constraints and prospects

A population forecast to reach 1.3 billion in 2000 as well as rising standards of living will combine to raise demand for grain in the future. In 1995 the Worldwatch environmental research group warned that China could face a shortfall of 216 million tonnes of grain by the year 2030. Other estimates have been more modest, such as the 136 million tonnes suggested by Japan's OECF aid organization. A goal of 500 million tonnes of annual grain production has thus been set for the year 2,000.

The gradual shrinkage of total arable land and a rising population are significant constraints on China's ability to increase grain production. Given the trend towards a decline in the area of land

devoted to grains and the concomitant move towards the cultivation of more profitable crops such as fruit and vegetables, the prospects for self-sufficiency in grain crops will depend very much on agricultural investment, scientific and technological research and appropriate government policy. Loans from international agencies such as the World Bank for the introduction of new seeds, afforestation and land reclamation are already contributing to efforts to develop agricultural production. But the lack of government investment in agriculture in the past has constrained technological advance and hindered the development of this sector. Between 1985 and 1992 central government allocated only 3.5 per cent of the capital construction budget to agriculture.[13/] As a result there has been a general decline in agricultural output between 1988 and 1994.

Since the mid-1990s, however, the government has placed a high priority on the development of agriculture, and in particular on grain production, as reflected in the emphasis given to it in the new Ninth Five-Year Plan. Moreover, in the new guidelines on foreign investment issued in mid-1995 foreign companies are encouraged to invest in this sector, particularly in the reclamation of land and the development of high-quality and high-yield crops.[14/]

As well as investing more in agriculture, the government is seeking both to increase per-unit yields and to expand the area farmed. It is also developing more commodity grain centres, increasing the number from 508 in 1995 to 886 by the end of the century.[15/] A further measure to offset the grain shortage and encourage self-sufficiency is to promote greater meat consumption, particularly of sheep, poultry and cattle but not of pigs. Floods and droughts are, however, a continuing threat to the achievement of these goals and it is likely, nevertheless, that imports of grain will continue.

TUBERS

Recent trends

While tubers are grown in most parts of China, Sichuan province devotes the largest area of land to these crops (see Table III.8). Since 1985 output of tubers has increased 25 per cent, finally recovering the 1978 level of 31 million tonnes.

Table III.8. Sown area of tubers and total output of tubers, 1985-1994

Year	Total sown area (Million ha)	Total output (Million tonnes)
1985	8.57	26.04
1986	8.68	25.34
1987	8.86	28.20
1988	9.05	26.97
1989	9.09	27.30
1990	9.12	27.43
1991	9.07	27.16
1992	9.05	28.44
1993	9.22	31.81

Source: *China Statistical Yearbook 1994*, pp. 342, 345.

SOYBEANS

The resource base

China is one of the world's twenty top producers of soybeans, accounting in 1992 for 8.5 per cent of world output. The north-east provinces of China are the main producers, with state farms in Heilongjiang accounting for the bulk of soybean production.

Recent trends

Total output of soybeans has increased in the decade since 1985, with 1994 output being 30 per cent higher than in 1985 (see Table III.9). A small quantity of soybeans is exported and an even smaller amount imported. In 1993, for example, exports accounted for 7 per cent of total output. The following year, however, this dropped to only 2.8 per cent.

Table III.9. Output, exports and imports and area cultivated of soybeans, 1985-1994

Crop year	Area (Million ha)	Output (Thousand tonnes)	Exports (Thousand tonnes)	Imports (Thousand tonnes)
1985[a/]	7.71	10,500	1,135[b/]	0.60
1986	8.29	11,614	1,368	290.90
1987	8.44	12,480	1,710	273.10
1988	8.12	11,640	1,477	151.80
1989	8.03	10,220	1,247	0.80
1990	7.56	11,000	940	0.90
1991[c/]	7.04	9,710	1,090	0.13
1992	7.22	10,300	300	0.15
1993	9.45	15,310	1.100	0.12
1994	10.00	16,000	450	0.15

Sources: a/ 1985-1990 area and output figures from USDA, "China Soybean Trip Report", *World Agricultural Production*, October 1995, p. 60.

b/ 1985-1990 export and import figures from UNCTAD, *Commodity Yearbook 1992*, New York, 1993, pp. 196-197.

c/ 1991-1994 figures from USDA report cited in a/ p. 56.

Soybeans are processed into soybean oil, soybean meal and soybean protein. Rapid income growth has increased demand for these products and, in the case of soybean oil, has led to increased imports (see Table III.10). Imports in 1994 were 45 times the level in 1985 and were higher than domestic output.

Production and exports of soybean meal have increased substantially in the 1990s (see Table III.11). For example, between 1991 and 1994 output more than doubled and exports more than trebled.

Fig. III. A. Production and imports of soybean oil, 1985 and 1994
(Million tonnes)

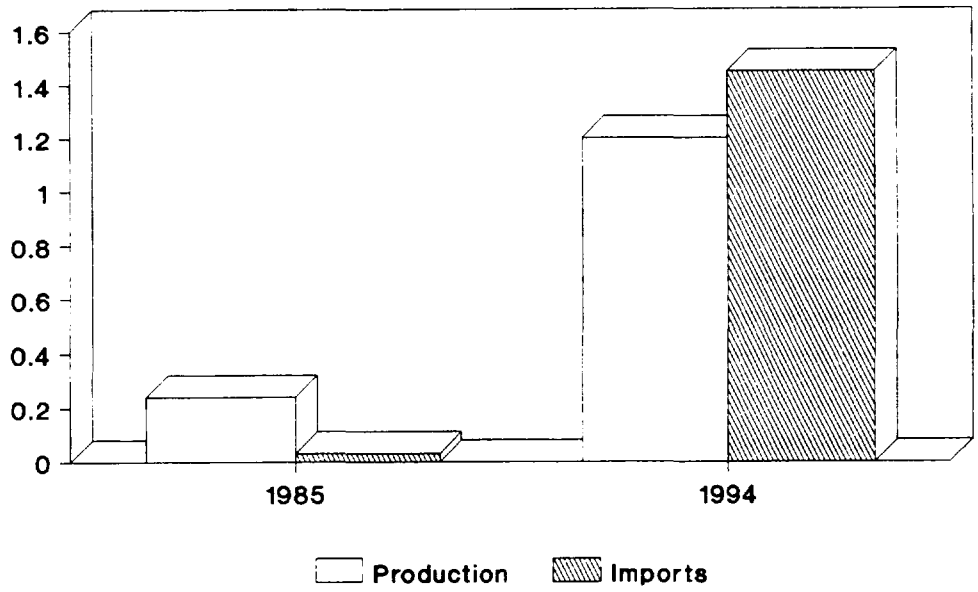


Table III.10. Output, exports and imports of soybean oil, 1985-1994
(Thousand tonnes)

Crop year	Output	Exports	Imports
1985	240.0[a/]	1.3[b/]	32.1
1986	380.0	1.1	171.2
1987	550.0	0.4	406.0
1988	633.0	0.3	138.0
1989	696.0	0.1	421.4
1990	665.0	7.3	524.9
1991	520.0	1.4	322.9
1992	640.0	3.6	223.1
1993[c/]	1,080.0	3.8	640.0
1994	1,200.0	60.0	1,450.0

Source: UNCTAD, *Commodity Yearbook 1994*, New York, 1994, pp. 197-201.

a/ Output figures for 1985-90 from UN, *Industrial Statistics Yearbook 1990, Vol. 2, Commodity Production Statistics 1981-1990*, New York, 1992, p. 159.

b/ Export and import figures for 1985-86 from UNCTAD, *Commodity Yearbook 1992*, New York, p. 198.

c/ 1993 and 1994 figures from USDA, "China Soybean Trip Report", *World Agricultural Production*, October 1995, p. 59.

Table III.11. Total output, imports and exports of soybean meal, 1991-1994
(Million tonnes)

Crop year	Output	Imports	Exports
1991	2.74	0.14	1.48
1992	3.48	0.04	3.12
1993	5.83	-	4.78
1994	6.48	-	5.28

Source: USDA, "China Soybean Trip Report", *World Agricultural Production*, October 1995, p. 57.

Soybean protein manufacture is an area that foreign investors are beginning to enter. For example, the Japanese Fuji Oil Corporation is planning to set up a soybean joint venture to process soybeans into soybean protein.[16/]

Constraints and prospects

Government policy and market prices currently favour grains and cotton over soybeans so output is expected to remain stable over the longer term. Increased yields as well as new growth from soybeans planted on newly drained land in Heilongjiang could lead to expanded output. Projected output for 2000 is 20 million tonnes from 10 million hectares.[17/] This is to be achieved through planting improved varieties, using better technologies, increasing inputs, reclaiming land and double and triple cropping.

OIL-BEARING CROPS AND EDIBLE OIL

Recent trends

The agricultural reforms have given an important boost to oil-bearing crops. In the period between 1985 and 1994 output has increased by 14 per cent (see Table III.12). While output of peanuts and rapeseed has increased during that period, sesame output has fallen from 0.69 million tonnes in 1985 to 0.54 tonnes in 1994. The 41 per cent increase in peanut output in 1993 over the preceding year was the result of increased planting in response to a poor harvest and subsequent higher prices. Rapeseed production fell in 1993 because of bollworm outbreaks and falling prices. 1994 proved to be a record year for the output of oil-bearing crops.

Oil seeds and edible and shelled peanuts are also exported. Between 1992 and 1993 the amount exported rose from 480,000 tonnes to 630,000 tonnes, an increase of 31 per cent. These exports made up 2.2 per cent of total output in 1993. However, growing domestic demand, particularly for soybeans, is likely to restrain exports.

Table III.12. Output of oil-bearing crops, 1985-1994
(Million tonnes)

Year	Total	Peanuts	Rapeseed	Sesame
1985	15.78	6.66	5.60	0.69
1986	14.73	5.88	5.88	0.61
1987	15.27	6.17	6.60	0.52
1988	13.20	5.69	5.04	0.40
1989	12.95	5.36	5.43	0.33
1990	16.13	6.36	6.95	0.46
1991	16.38	6.30	7.43	0.43
1992	16.41	5.95	7.65	0.51
1993	18.03	8.42	6.93	0.56
1994[a/]	19.84	9.64	7.46	0.54[b/]

Source: *China Statistical Yearbook 1994*, p. 345-346.

a/ Statistical Communiqué of the State Statistical Review of the People's Republic of China on 1994 National Economic and Social Development, 28 February 1995, in *Summary of World Broadcasts*, FE/2245 S2/1, 7 March 1995.

b/ FAO estimate from *FAO Production Yearbook 1994*, Vol. 48, Rome, 1995, p. 113.

Although China is one of the 20 leading producers of palm oil in the world, it imports more than it produces domestically (see Table III.13).

Table III.13. Output, exports and imports of palm oil, 1985-1994
(Thousand tonnes)

Year	Output	Exports	Imports
1985[a/]	192	-	56.8
1986	195	-	193.9
1987	200	0.1	254.6
1988	205	-	398.6
1989	210	11.0	734.1
1990	215	74.1	1,133.4
1991[b/]	200	..	..
1992	144[c/]	..	..
1993	150[c/]	..	..
1994	150[c/]	..	..

Sources: a/ Figures for 1985-1990 from UNCTAD, *Commodity Yearbook 1992*, New York, 1992, pp. 210, 212.

b/ Figures for 1991-1994 from *FAO Production Yearbook 1994*, Vol. 48, Rome, 1995, p. 122.

c/ Unofficial FAO figure.

Constraints and prospects

Consumption of edible oils is likely to increase over the next decade and so imports are expected to rise. Currently, per head consumption of edible oils is low, at 5 kg per head compared with 17 kg per head in Japan and 13 kg per head in the Republic of Korea. Moreover, as farmers move away from oil seed production to more profitable cash crops such as fruit and vegetables, the gap between domestic supply and demand is likely to widen.

SUGAR

Recent trends

Beet production is concentrated in Xinjiang in the north-west and in the north-east provinces of Heilongjiang, Inner Mongolia and Jilin. Whilst Guangdong and Fujian provinces were key areas for sugar cane cultivation, in the 1980s and 1990s the western provinces of Guangxi and Yunnan have become increasingly strong in this crop.

China has an annual sugar processing capacity of about 8 million tonnes.[18/] The cultivation of sugar beet and sugar cane and their processing into sugar have increased rapidly in the reform years. Sugar is processed into granulated sugar for domestic consumption and is increasingly used as an input into the expanding beverages and biscuit industries.

Since 1985 there has been a 35 per cent rise in the output of sugar beet (see Table III.14), higher yields per hectare contributing towards this increase. Whereas in 1985 1 hectare yielded 15,915 kg, by 1993 this had risen to 20,124 kg.[19/] However, in 1994 the area devoted to sugar cane declined by 13 per cent to 233,000 hectares as farmers turned to more profitable crops[20/].

Table III.14. Output of sugar cane and sugar beet, 1985-1994
(Million tonnes)

Year	Total	Sugar cane	Sugar beet
1985	60.45	51.54	8.91
1986	58.31	50.21	8.30
1987	55.50	47.36	8.14
1988	61.87	49.06	12.81
1989	58.03	48.79	9.24
1990	72.14	57.62	14.52
1991	84.17	67.89	16.28
1992	88.07	73.01	15.06
1993	76.23	64.19	12.04
1994	73.39[a/]	60.86	12.53

Source: *China Statistical Yearbook 1994*, p. 346.

a/ "Statistical Bureau Communiqué on China's Economic Development in 1994", in *Summary of World Broadcasts*, FE/2245 S2/2, 7 March 1995.

Sugar production has increased by only 29 per cent since 1985, with a 25 per cent drop in output in 1994 over 1993 (see Table III.15). The processing of sugar beet and sugar cane into sugar has not been able to keep pace with the rising demand. In 1986, for example, 1.2 million tonnes of sugar were imported[21/] and by the end of the following year rationing was reintroduced. In 1991 government controls over sugar pricing were lifted to stimulate production but new guidelines for prices were introduced again in 1995 to regulate the market. Further plans were drawn up that year to enhance production. These included providing farmers with low interest loans and raising the purchase price of sugar cane.[22/]

Table III.15. Output of sugar, 1985-1994
(Million tonnes)

1985	4.51
1986	5.25
1987	5.06
1988	4.61
1989	5.01
1990	5.82
1991	6.40
1992	8.29
1993	7.71
1994	5.92

Source: *China Statistical Yearbook 1995*, p. 410.

Small quantities of raw and refined sugar are exported and imported (see Table III.16). Between 1991 and 1992 exports of raw sugar increased more than 12 times whilst exports of refined sugar rose almost five times. In 1993 1.85 million tonnes of sugar were exported, accounting for 2.8 per cent of that year's total output, while 419,635 tonnes of sugar were imported.

Table III.16. Exports and imports of raw and refined sugar, 1985-1994
(Thousand tonnes)

Year	Total exports	Raw sugar	Refined sugar	Total imports	Raw sugar	Refined sugar
1985[a/]	..	-	180.4	1,904.0	1,868.7	40.0
1986	..	3.2	263.3	1,182.5	1,114.2	68.3
1987	452.5	3.7	448.8	1,826.7	1,760.3	66.4
1988	247.8	3.0	244.8	3,708.9	3,351.4	357.5
1989	429.7	3.5	426.2	1,580.6	1,480.2	100.4
1990	570.5	4.6	565.9	1,132.2	958.9	173.3
1991	343.3	6.0	337.3	968.0[c/]	..	..
1992	1,670.0[b/]	79.5	1,590.5	1,079.9	..	..
1993	1,850.0	..	..	419.6	..	..
1994	..	..	..	1,550.0[d/]	..	..

Source: UNCTAD, *Commodity Yearbook 1994,* New York, 1994, p. 146.

a/ 1985-1986 figures and all import figures from UNCTAD, *Commodity Yearbook 1992*, New York, 1993, pp. 145-146.
b/ "Industry and Marketing Opportunities" in *China Economic Digest*, Summer 1995, p. 33.
c/ 1991-1993 import figures from UN, *International Statistics Yearbook 1993*, Vol. 1., New York, 1995, p. 184.
d/ From *China's Customs Statistics*, 1994, 12, p. 26.

Following a 23 per cent drop in sugar output in 1994 over the preceding year, 350,000 tonnes of sugar were imported in the first quarter of 1995, suggesting a further sharp rise in imports.[23/] Given the sharp drop in imports from Cuba, imports from other sources are expected to increase. However, the government has kept tight controls over sugar import quotas as it regards sugar as a non-essential item. Cuts in import duty on this crop are expected in the future which could lead to a further rise in imports.

Constraints and prospects

While there is potential for increasing the yields per hectare of sugar cane and sugar beet, large investments are needed to improve production and processing. Self-sufficiency in sugar is not yet an achievable goal. Rising production costs as well as better returns from crops such as fruits and vegetables imply that sugar output is not likely to increase substantially in the near future. However the growing beverage, alcohol and sweet biscuit industries are pushing up demand for domestic sugar supplies. As rising living standards and higher expectations of a more varied diet increase per head sugar consumption, which is currently estimated at 6 kg a year, well below the Asian average of 11 kg a year and an average 45 kg for developed nations, demand for domestic sugar will come under further pressure. In the next decade a rise in sugar imports is therefore expected.

TOBACCO

The resource base

Tobacco is chiefly grown in Yunnan and Guizhou provinces in the south and Henan in the central part of China. There are 391 large- and medium-scale units engaged in tobacco processing of which the majority (305) are state-run. There are also a further 33 small-scale township-run and 323 small-scale village-run enterprises processing tobacco.

Recent trends

While 1993 tobacco output was 42 per cent higher than that of 1985, it fell by one-third in 1994, putting total output below the 1985 level (see Table III.17). The amount of land devoted to this crop has risen by 60 per cent. However, supply has constantly exceeded demand. In order to address the problem of poor quality, the government proposed in the Seventh Five-Year Plan that production of tobacco be concentrated in those regions where quality was good.[24/]

Tobacco is primarily consumed within the country with small amounts being exported (see Table III.18). For example, in 1993 58,676 tonnes of tobacco were exported, representing barely 2 per cent of total output.

China is the largest producer and consumer of tobacco products in the world. Cigarette manufacturing has increased by 45 per cent since 1985 (see Table III.19). Faced with declining sales in the West, international companies view China with its estimated 300 million smokers as an enormous potential market. Foreign companies such as R.J. Reynolds and Philip Morris of the USA and Rothmans International of the UK have already set up joint ventures in China. Better packaging, quality and strategic advertising have combined to make foreign cigarettes highly popular on the domestic market, although higher prices deter those with lower incomes from purchasing foreign brands.

Table III.17. Sown area of tobacco and total output of tobacco, 1985-1994

Year	Total sown area of tobacco (Million ha)	of which: Flue-cured (Million ha)	Total output of tobacco (Million tonnes)	of which: Flue-cured (Million tonnes)
1985	1.31	1.07	2.42	2.07
1986	1.12	0.89	1.70	1.37
1987	1.12	0.91	1.94	1.63
1988	1.55	1.30	2.73	2.33
1989	1.79	1.50	2.83	2.40
1990	1.59	1.34	2.62	2.25
1991	1.80	1.56	3.03	2.67
1992	2.09	1.84	3.49	3.11
1993	2.08	1.83	3.45	3.00
1994	..	..	..	1.95[a/]

Source: *China Statistical Yearbook 1994*, pp. 344 and 347.

a/ "Statistical Bureau Communiqué on China's Economic Development in 1994" in *Summary of World Broadcasts*, FE/2245 S2/1, 7 March 1995.

Table III.18. Exports and imports of tobacco, 1985-1993
(Thousand tonnes)

Year	Exports	Imports
1985[a/]	17.8	29.0
1986	19.4	16.5
1987	19.0	26.1
1988	21.6	37.4
1989	25.4	20.7
1990	32.4	13.2
1991	74.0	14.7
1992	72.3	20.5
1993	58.67	..

Source: UNCTAD, *Commodity Yearbook 1994,* New York, 1994, pp. 215, 217-218.

a/ UNCTAD, *Commodity Yearbook 1992,* New York, 1992, p. 215.

Constraints and prospects

The government has an ambivalent attitude towards cigarette consumption, particularly as tobacco is the largest source of tax revenue. To the extent that the government ignores anti-smoking advocates, the development of this sector is enhanced. A new law on advertising, which came into effect in February 1995, bans tobacco advertising not only on radio, on television and in print but also in public places. Whether or not this proves a real constraint on cigarette promotion depends on how effectively the law is implemented at local level. Foreign cigarette manufacturers are

doubtful that the law will be effectively enforced.[25/] Moreover the cigarette industry has faced similar restrictions in other countries and has developed other imaginative ways of promoting products.

Fig. III.B. Exports of tobacco, 1987-1993
(Thousand tonnes)

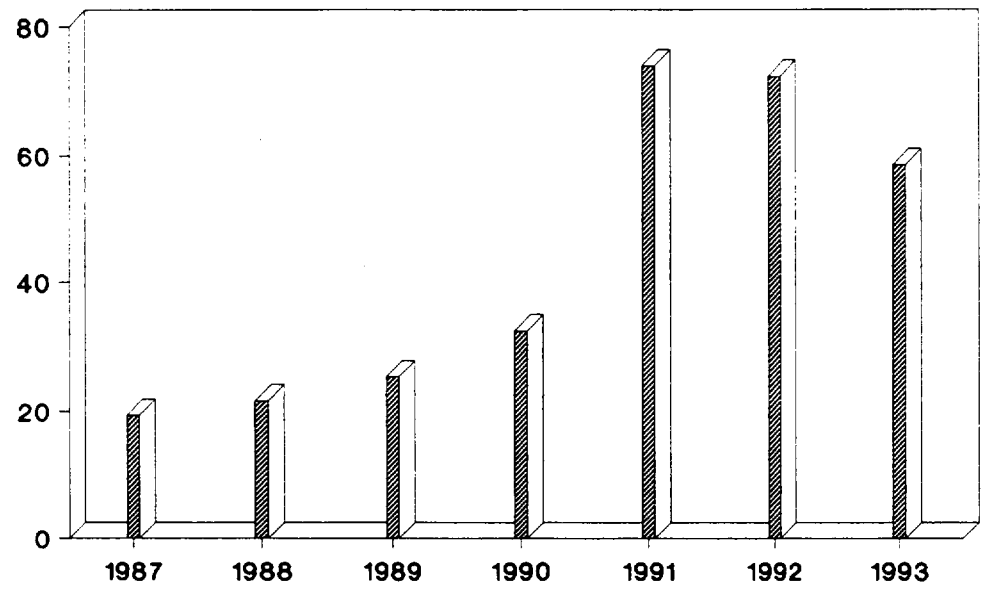


Table III.19. Output of cigarettes, 1985-1994
(Million cases)

Year	Output
1985	23.70
1986	25.96
1987	28.81
1988	30.96
1989	31.95
1990	32.98
1991	32.26
1992	32.85
1993	33.76
1994	34.32

Source: *China Statistical Yearbook 1995*, p. 410.

TEA

Recent trends

China is the world's second largest producer of tea, behind India. Tea production increased steadily in the years between 1985 and 1994, total output rising by 39 per cent in that period (see Table III.20). The leading tea province is Zhejiang, which accounted for 20 per cent of total tea production in 1993. Fujian and Hunan rank second and third respectively, accounting together for about a quarter of all tea output. The primary tea grown in China is green tea for domestic consumption while black tea is produced primarily for export. A substantial amount of domestic output is exported, the total amount in 1993 accounting for one-third of total tea production.

Constraints and prospects

The consumption of alternative hot beverages such as coffee and cocoa is still very low in China; tea can be expected to hold its dominant share of the hot beverages market.

Fig. III.C. Production of tea, 1985-1994
(Thousand tonnes)

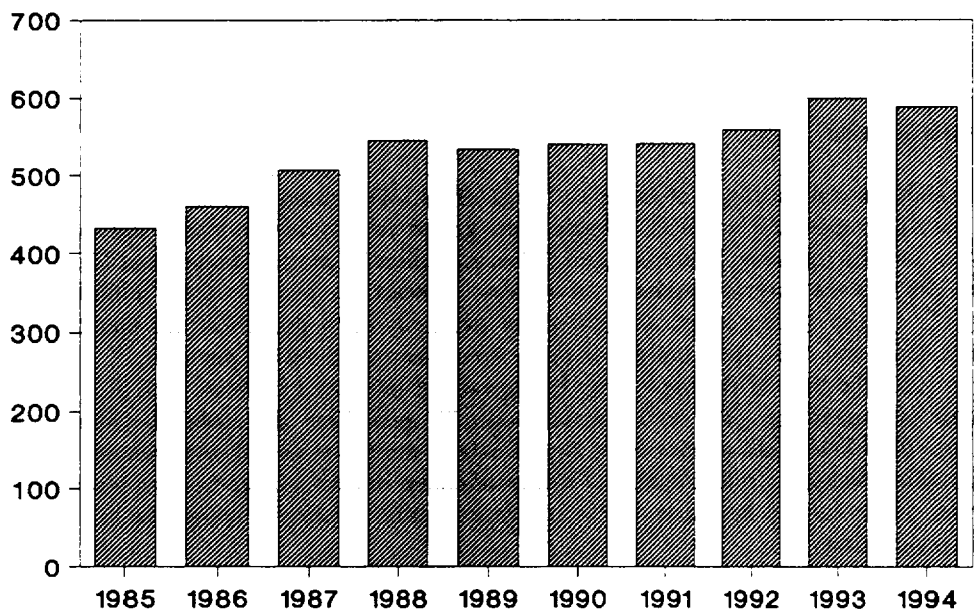


Table III.20. Output, exports and imports of tea, 1985-1994
(Thousand tonnes)

Year	Output	Exports	Imports
1985	432.0	136.7[b/]	- [c/]
1986	460.4	172.0	13.5
1987	507.9	174.3	12.1
1988	545.4	198.4	15.7
1989	534.8	204.6	3.9
1990	540.0	195.5	5.7
1991	541.5	184.9	4.2
1992	559.8	175.5	3.9
1993	599.9	201.4	..
1994	588.0[a/]	..	..

Source: *China Statistical Yearbook 1994*, pp. 347, 515.

a/ USDA, "China Soybean Trip Report", *World Agricultural Production*, October 1995, p. 61.

b/ 1985/86 export figures from *International Trade Statistics Yearbook 1988*, Vol. 1, New York, 1990, p. 175.

c/ 1985/86 import figures from UNCTAD, *Commodity Yearbook 1992*, New York, 1992, p. 172.

FRUITS, VEGETABLES AND BEVERAGES

The resource base

China produces a wide range of fruits and vegetables. The main fruit crops are apples, citrus fruits, pears, grapes and bananas. Apples are grown mainly in the north and north-eastern provinces such as Liaoning, Shandong and Hebei as well as in central Shaanxi and Henan. China is now the world's largest producer of apples, forecast to harvest 12.24 million tonnes in 1995/96.[26/] Crop increases are accounted for primarily by a growth in the number of trees. Between 1991 and 1994 the number of apple trees increased by 53 per cent.[27/] Traditional varieties form the bulk of the apple crop but growth of improved varieties such as Fuji and Red Delicious is expanding. The main citrus-producing provinces are Sichuan, Guangdong and Zhejiang. New kiwi plant species from New Zealand were introduced into Sichuan in the early 1980s, making Sichuan a major centre of kiwi production in China. The western border province of Xinjiang is by far the largest producer of grapes, whilst southern Guangdong is the centre of banana production.

Recent trends

Since 1985 total fruit output has more than doubled (see Table III.21), yet the performance of individual crops has been even more spectacular. Output of bananas, for example, has more than quadrupled whilst grape and citrus fruit production has more than tripled.

This rise in output has been accompanied by an expansion of the total area given over to orchards (see Table III.22) and a concomitant reduction in the area of land devoted to grains. In 1993 orchards covered more than twice as much land as eight years previously.

Table III.21. Fruit output, 1985-1994
(Million tonnes)

Year	Total	Apples	Citrus fruits	Pears	Grapes	Bananas
1985	11.63	3.61	1.80	2.13	0.36	0.63
1986	13.47	3.36	2.54	2.34	0.44	1.25
1987	16.67	4.26	3.22	2.48	0.64	2.02
1988	16.66	4.34	2.56	2.72	0.79	1.82
1989	18.31	4.49	4.56	2.56	0.87	1.40
1990	18.74	4.31	4.85	2.35	0.85	1.45
1991	21.76	4.54	6.33	2.49	0.91	1.98
1992	24.40	6.55	5.16	2.84	1.12	2.45
1993	30.11	9.06	6.56	3.21	1.35	2.70
1994	34.78[a/]	11.12[b/]	..	..	..	..

Source: *China Statistical Yearbook 1994*, p. 347.

a/ "Statistical Bureau Communiqué on China's Economic Development in 1994" in *Summary of World Broadcasts*, FE/2245 S2/1, 7 March 1995.

b/ 1994 apple figure from USDA, *World Agricultural Production*, August 1995, p. 38.

Table III.22. Orchards, area under cultivation, 1985-1994
(Million hectares)

1985	2.73
1986	3.67
1987	4.50
1988	5.06
1989	5.37
1990	5.17
1991	5.31
1992	5.81
1993	6.43
1994	..

Source: *China Statistical Yearbook 1994*, p. 344.

The amount of land devoted to vegetables has also increased, rising by 70 per cent since 1985 (see Table III.23). The main areas for vegetable cultivation are Sichuan, Guangdong and Shandong. According to FAO statistics vegetable output in 1994 was 30 per cent higher than in 1985.

Apples, oranges and mandarins are all exported (see Table III.24). Whilst exports of mandarins and oranges rose by 70 per cent between 1993 and 1994, exports of apples dropped by 10 per cent. Other exports include dried apricots, plums and raisins.

Table III.23. Sown area and output of vegetable crops, 1985-1994

Year	Million ha	Thousand tonnes[a/]
1985	4.75	99,374
1986	5.30	104,898
1987	5.57	109,808
1988	6.03	109,963
1989	6.29	112,655
1990	6.33	117,008
1991	6.54	118,604
1992	7.03	123,094
1993	8.08	125,513
1994	..	128,811

Source: *China Statistical Yearbook 1994*, 1994, p. 344.

a/ Output figures from *FAO Production Yearbooks 1987-1988, 1989-1990, 1991, 1994*, Rome, pp. 174, 173, 125 and 124 respectively.

Table III.24. Exports of fruit, 1992-1994
(Tonnes)

	1992	1993	1994
	145,602	319,723	500,000[a/]
Mandarins and oranges	61,392	81,047	137,600[a/]
Apples	38,317	119,419	107,000[a/]
Pears	..	70,000[a/]	97,000[a/]

Source: *China Statistical Yearbook 1994*, p. 515.

a/ "Fruit exports increased sharply in the first five months" in *China Economic Digest*, Autumn 1995, p.36.

Fresh, prepared and preserved vegetables are also exported (see Table III.25).

Table III.25. Exports of fresh, prepared and preserved vegetables, 1985-1994
(Thousand tonnes)

Year	Fresh vegetables	Preserved vegetables
1985	362.6	234.7
1986	0.4	288.5
1987	415.6	329.8
1988	..	345.8
1989	..	332.1
1990	623.7	503.9
1991	1,279.6	547.9
1992	1,000.0	509.4
1993	747.6	556.4
1994	..	..

Source: UN, *International Trade Statistics Yearbook*, New York, various issues.

Vegetable oil

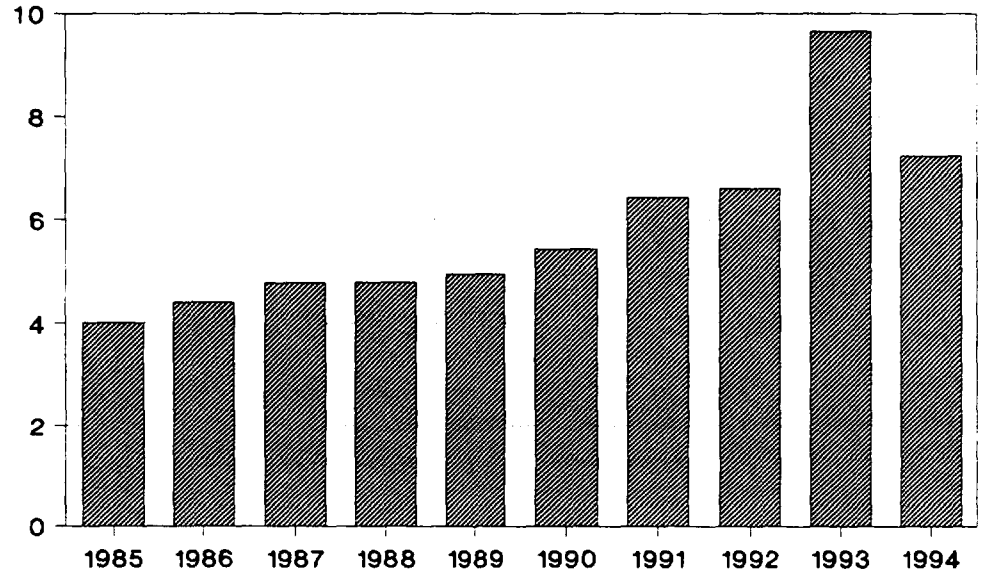
Edible vegetable oil production increased by 80 per cent between 1985 and 1994 (see Table III.26). In 1994 Shandong and Jiangsu were the leading provincial producers of this product, accounting for 21 per cent of total production. Exports of edible vegetable oil doubled between 1992 and 1993, rising from 67,847 tonnes to 136,095 tonnes. At the same time there was a decline in the volume of imports, from 420,000 tonnes in 1992 to 240,000 tonnes in 1993.

Table III.26. Output of vegetable oil, 1985-1994
(Million tonnes)

Year	Output
1985	4.01
1986	4.41
1987	4.78
1988	4.80
1989	4.96
1990	5.44
1991	6.44
1992	6.61
1993	9.65
1994	7.23

Sources: *China Statistical Yearbook 1995*, p. 410.

Fig. III.D. Production of edible vegetable oil, 1985-1994
(Million tonnes)



The rapid expansion in fruit cultivation has been accompanied by a growth in the canning industry. Fruit and vegetable canning account for the bulk of canned foods, generating 67 per cent of total canned food output in 1993, the remainder being canned meat, poultry and aquatic products. Production has increased very steadily in the 1990s (see Table III.27).

Table III.27. Output of canned foods including canned and bottled fruit and vegetables, 1985-1994
(Thousand tonnes)

Year	Canned foods	Fruit	Vegetables
1985	1,425.0	..	..
1986	1,641.0	..	..
1987	1,615.0	721.1	459.9
1988	2,209.0	853.4	653.9
1989	2,325.0	947.8	715.5
1990	1,571.0	581.0	546.0
1991	1,930.0	754.3	648.1
1992	2,243.0	942.1	651.5
1993	2,303.0	880.9	665.7
1994	2,473.0	..	..

Sources: *China Statistical Yearbook 1995*, p. 410; 1987-1990 figures on fruits and vegetables from UN, *Industrial Statistics Yearbook 1990, Vol. 2, Commodity Production Statistics, 1981-1990*, New York, 1992, pp. 142-143, p. 145; 1991-1993 figures on fruits and vegetables from *China Statistical Yearbook 1994*, pp. 412.

In 1993 34 per cent of canned foods was exported (see Table III.28). Over half of all canned vegetables and a quarter of all canned fruits were exported in this year.

Table III.28. Exports of canned fruits and vegetables, 1992 and 1993
(Thousand tonnes)

Year	1992	1993
Canned foods	532.7	779.7
of which:		
Fruits	103.6	236.2
Vegetables	335.1	373.5

Source: *China Statistical Yearbook 1994*, p. 515.

Constraints and prospects

Farmer preference for growing fruit and vegetable crops, which have commanded higher prices than grain crops, provides a sound basis for the further development of the canning industry. However, further investment in canning technology is required before any substantial progress in this sector can be made. Distribution and transport networks pose a constant constraint not only on the canning industry, but more generally on the food industry.

Beverages

The main beverages produced in China include alcoholic drinks such as beer, spirits and wines and non-alcoholic drinks such as juices, carbonated drinks and mineral water. China now has the world's second largest beer market, next to that of the USA, enjoying a 20 per cent growth rate over the past decade. Alcoholic beverage production has increased two and a half times since 1995, with beer accounting for two-thirds of the total (see Table III.29). There are 12,705 enterprises in this sector, of which 3,415 are state-run. In addition there are 6,355 township-run and 17,488 village-run enterprises engaged in manufacturing beverages.

In 1979 China had 200 breweries with a total capacity of 700,000 tonnes.[28/] By 1995 there were around 850 local and regional brewers, with a total output of 14.15 million tonnes. However, the beer market is highly fragmented and regionalized. Moreover, most of the breweries are small-scale, often with a capacity of less than 30,000 tonnes when the minimum capacity needed to be efficient is 50,000 tonnes. Their products are often of a low quality and wasteful of grain. While the average grain consumption per tonne of beer is less than 190 kg, some breweries have an average of 420 kg, compared with under 100 kg in some developed countries.

Chinese brands make up the bulk of the market. The largest market share is taken by the popular Tsingtao which, however, lays claim to only 3 per cent. Whilst Tsingtao is exported all over the world, most beer is consumed domestically. In view of the size of the beer market foreign companies are eager to get a foothold.

Table III.29. Output of alcoholic beverages, 1985-1994
(Million tonnes)

Year	Alcoholic beverages	of which: Beer	Grape wine	Spirits
1985	8.51	3.10	..	..
1986	9.85	4.13	..	..
1987	11.95	5.40	..	..
1988	13.57	6.56	..	..
1989	12.85	6.43	..	..
1990	13.86	6.92	..	..
1991	15.39	8.38	0.24[a/]	5.24
1992	17.53	10.21	0.24	5.47
1993	19.71	11.92	0.24	5.94
1994	22.33	14.15	..	6.51

Source: *China Statistical Yearbook 1995*, pp. 410, 412.

a/ *China Statistical Yearbook 1994*, p. 412.

By 1994 over 40 joint ventures had been set up or were in negotiation, involving contractual investment of $500 million.[29/] Joint ventures are concentrating on upgrading local beers, although international brands are also starting to enter the market. Ginsber, one of the top ten brewers, has set up a joint venture with Bass, a large British brewer, in Jilin province in the north-east. Foster's Brewing Group from Australia has also set up joint ventures in Tianjin, Shanghai and Zhuhai.[30/] Singapore's Asia Pacific Breweries, which produces Tiger Beer, has formed a joint venture in Hainan Island; the Australian brewer Lion Nathan announced plans in October 1994 to open three breweries in China; San Miguel Brewery is expanding production in China; Budweiser has bought into a Sino-German brewer in Wuhan; and ASIMCO of the USA has set up a joint venture with Beijing Shuanghesheng Five Star Brewery Co. Ltd., China's second largest brewery.[31/] The most popular foreign brand is Pabst Blue Ribbon, with annual sales of about 200,000 tonnes or 1.4 per cent of the market.[32/]

As well as beer China has also started wine production on a joint-venture basis. In 1994, for example, the French group Pernod Richard set up a joint venture in Beijing to produce sweet and white wines.[33/] Martell, the high-quality brandy producer, has two joint ventures, in Tianjin and Shanghai.[34/]

Demand for soft drinks has increased rapidly in the reform period, particularly in the 1990s. In 1993 average annual per head consumption of soft drinks came to 3.5 litres, less than 10 per cent of the world's average of 39.3 litres. China is currently the sixth largest international soft drinks market and is likely to become the world's largest soft drinks market by 2000. There are at least 2,700 firms producing soft drinks, most of which use outdated technology and sell at low prices in local markets. Guangdong province is the leading soft drinks producer in China, accounting for almost 34 per cent of national output in 1994.[35/] Local brands account for 70 per cent of sales. Brand preferences differ in rural and urban areas. In the large cities famous brands such as Coca-Cola, Pepsi-Cola, Sprite, Jianlibao, Jinmeile, Xuefeili and Tianfu Cola dominate the market, while in small towns and rural areas soft drinks produced by medium-sized and small factories predominate.

The small scale and local nature of soft drinks manufacturers in China means there is much scope for national, regional and international producers. Carbonated soft drinks account for about 75 per cent of the drinks market in China.[36/] Both Coca-Cola and Pepsi-Cola have already entered the market and are in fierce competition with each other. Pepsi-Cola set up its first joint venture in 1983 and by 1994 had 12 joint-venture bottling plants with a total investment of $175 million and two concentrate plants in Guangzhou. Coca-Cola entered the market in 1979 and by 1994 claimed 19 per cent of the market, outpacing Pepsi-Cola. The rest of the market was accounted for by lemon and lime drinks, which claimed 40 per cent, and orange, which claimed 34 per cent. Coca-Cola has 13 bottling plants. Together Pepsi-Cola and Coca-Cola account for 22 per cent of national production.

Mineral water consumption has increased rapidly in the 1990s. Output rose 50 times from 6,000 tonnes in 1985 to 300,000 tonnes in 1993,[37/] accounting for 5.7 per cent of the soft drinks market. While in 1992 there were 250 mineral water factories, by 1994 this had doubled to 500. Leading the market is Shenzhen I-Li Mineral Water Company, although foreign companies such as Watson's are starting to compete.

China is not a major coffee producer or consumer. Yunnan province is the main coffee-producing area in China. Exports and imports are minimal. In 1992, for example, exports from China came to 100 tonnes, accounting for only 0.01 per cent of total exports in South and South-east Asia (see Table III.30).

In 1992 3,968 tonnes of coffee and coffee extracts were imported. In 1993 this figure was reduced by more than half to 1,453 tonnes. Rising coffee prices in 1995 following a poor harvest the previous year have encouraged farmers to devote more land to coffee.

Table III.30. Exports and imports of coffee, 1985-1992
(Thousand tonnes)

Year	Exports	Imports
1985[a/]	5.0	5.2
1986	2.0	1.3
1987	2.1	0.7
1988	1.4	1.8
1989	5.7	5.3
1990	1.9	0.5
1991	0.5	1.4
1992	0.1	3.3

Sources: UNCTAD, *Commodity Yearbook 1994*, New York, 1994, pp. 157-158.

a/ 1985-1986 figures from UNCTAD, *Commodity Yearbook 1992*, New York, 1992, p. 156-157.

Likewise China is not a major producer or consumer of cocoa beans and their products. Imports of cocoa beans exceed exports (see Table III.31) by a margin which has steadily increased over the decade.

Exports of cocoa products, however, exceed imports (see Table III.32), apart from in 1988 when imports exceeded exports by 5,500 tonnes.

Table III.31. Exports and imports of cocoa beans, 1985-1993
(Thousand tonnes)

Year	Exports	Imports
1985[a/]	-	6.3
1986	3.1	27.2
1987	3.1	14.5
1988	2.6	16.8
1989	1.9	24.0
1990	0.7	10.1
1991	0.1	30.3
1992	0.0	30.9
1993	..	34.0

Source: UNCTAD, *Commodity Yearbook 1994*, New York, 1994, pp. 164-165.

a/ 1985-1986 figures from UNCTAD, *Commodity Yearbook 1992*, New York, 1992, pp. 163-164.

Table III.32. Exports and imports of cocoa products, 1985-1992
(Thousand tonnes)

	Exports	Imports
1985[a/]	5.9	-
1986	9.5	4.3
1987	10.2	2.3
1988	11.1	16.6
1989	10.7	3.0
1990	11.1	0.2
1991	14.2	2.4
1992	15.5	0.7

Sources: UNCTAD, *Commodity Yearbook 1994*, New York, 1994, pp. 167-168.

a/ Export and import figures for 1985-1986 from UNCTAD, *Commodity Yearbook 1992*, New York, 1992, p. 165.

Fruit and vegetable juice production has also taken off in the reform period but compared with carbonated drinks, accounts for only a small share of the total soft drinks market (1.7 per cent). Fruit juice producers in China include Chengbao, a Tianjin-based joint venture producing orange juice, Beijing-based Huabei, and Great Lakes Fresh Food Juice. Orange juice accounts for half

of the Chinese market for fruit juices. Foreign companies have also entered the market. Beijing Oasis, a Hong Kong joint venture, started production of apple, pear and apricot juices in January 1995. A second factory in Wanxian, Sichuan, a major orange growing region, is planned to start production in January 1996. In north-east China the Jiamusi City Concentrated Fruit Juice Factory has started production of gooseberry juice, exporting 70 per cent of its output to Europe and Asia.[38/] In Heilongjiang the development of a melon drink won state and international prizes and it is exported to Japan, the Russian Federation and the Republic of Korea.[39/] Apart from some well-known brands such as Coconut, Qiangli, Weijia, Jianlibao and Shenmei, most juice factories are small-scale and low capacity.

Constraints and prospects

Although beer consumption in China is low by world standards (for example, average annual per head consumption in China comes to 11 litres compared with the US average of 83 litres) it is growing at the rate of 20 per cent per year. There is thus great potential, and by 2000 it is expected that China will have become the world's largest beer market. While the beer industry has enjoyed an annual average growth rate of 25 per cent since the 1980s, over the next five years growth is planned at 5-8 per cent as the focus will be on quality. Still it is expected that total production will reach 20 million tonnes by 2000.[40/]

Reliance on malt imports is one important constraint on the development of the industry. Currently China imports 1 million tonnes of barley a year and still is not able to produce a regular supply of top quality malt. Storage and distribution are also major constraints. If beer is not properly stored it has to be consumed quite soon after brewing, which has implications for the extent of marketing. Inefficient distribution operations also constrain the development of the industry. For example, Harbin brewery distributes its product through 400 wholesalers within Harbin.[41/] Inadequate rail and road capacity is a further constraint.

The next few years are likely to see increasing foreign brand competition in fruit juice production. Well-known companies such as the Canadian Tropicana and Sunripe are expected to enter the market in the near future. Given the lower quality of soft drinks produced by medium-sized and small factories, it is likely that they will be pushed out of the market by the end of the century. The popularity of vegetable juices, cold tea and health drinks is likely to cause production to expand over the next decade. Competition for these niche sectors will be particularly strong among smaller international drinks companies from Asia, which are familiar with the Chinese taste profile.

As ownership of household refrigerators is set to spread rapidly, it is likely that soft drinks will be consumed increasingly in the home. In the 1990s 80 per cent of consumption took place in hotels, bars and restaurants, compared with an average of 40 per cent in developed economies. Supermarkets and other retail outlets account for only 3 per cent of the soft drinks market, again auguring well for growth in this sector. Since 1988 China has accounted for 55-60 per cent of the growth in consumption of carbonated drinks in Asia, suggesting that there is great scope for the expansion of this industry. The production volume of soft drinks is set to expand by 62 per cent between 1994 and 1997.

One potential constraint on the expansion of foreign brand names such as Coca-Cola and Pepsi-Cola is political opposition. At three National People's Congress sessions in the 1990s the dominance of the market by these companies was debated. Again in 1995 a motion was tabled to restrict their influence, but this was rejected by a majority of delegates on the basis of the need to step ahead with the reforms.

Mineral water consumption is expected to double over the coming five years. With improvements in hygiene standards and better packaging, growth could be even higher.

MEAT AND POULTRY PRODUCTS

The resource base

Since 1978 year-end animal inventories and the value of livestock production have increased substantially (see Table III.33). China leads world pork production and is second only to the USA in overall meat production. The main meat produced and consumed in China is pork, but poultry production and consumption have increased rapidly in the 1980s.

Table III.33. Number of livestock, 1985-1994
(Million head)

Year	Cattle and buffalo	of which: Cows	Slaughtered fattened hogs	Hogs year-end	Goats	Sheep
1985	86.82	1.62	238.75	331.39	61.67	94.21
1986	91.66	1.84	257.21	337.19	67.22	99.00
1987	94.65	2.16	261.77	327.73	77.68	102.65
1988	97.94	2.22	275.70	342.21	90.95	110.57
1989	100.75	2.52	290.23	352.81	98.13	113.50
1990	102.88	2.69	309.91	362.40	97.20	112.81
1991	104.59	2.94	328.97	369.64	95.35	110.85
1992	107.84	3.13	351.69	384.21	97.61	109.71
1993	113.15	3.42	378.23	393.00	105.69	111.61
1994	123.30[a/]	..	414.62[b/]	..	..	..

Source: *China Statistical Yearbook 1994*, pp. 350-351.

a/ "Cattle and Buffalo Inventories, Selected Countries", FAS, USDA, October 1995, p. 50.

b/ "Hog Inventories, Selected Countries", FAS, USDA, p. 52.

The contribution of animal husbandry to overall agricultural production has increased over the last decade. While in 1985 animal husbandry accounted for 19.3 per cent of agricultural production, by 1991 this had risen to 22.3 per cent.[42/] The ratio of the value of livestock production to that of crop output is one measure of the relative importance of livestock production. In China this ratio rose from 1:4 in 1979 to almost 1:2 in 1988, implying that the value of livestock production is about half that of crop output.[43/]

Cows are raised in the north and west of China, in Xinjiang, Tibet, Heilongjiang, Inner Mongolia and Hebei provinces. The main hog-producing area is Sichuan, which in 1993 accounted for 18 per cent of total stock. Other key areas for hogs are Jiangsu, Shandong, Hubei, Guangdong and Hunan. Guangdong, for example, has 100 farms raising over 5,000 pigs each. Goats are mainly raised in Shandong, accounting for 20 per cent of total stock in 1993. Henan is the next major

area for goats. Xinjiang accounted for 21 per cent of all sheep in 1993, followed by Inner Mongolia, Tibet and Qinghai.

The key meat-producing areas are Sichuan, Shandong, Guangdong, Hunan and Jiangsu. In 1993 Guangdong produced 2.6 million tonnes of meat, ranking second in the country.[44/] Sichuan leads pork production whilst Shandong and Henan produce the most beef. Mutton is produced mainly in Shandong, Xinjiang and Inner Mongolia. Guangdong, Jiangsu and Sichuan are the main producers of poultry. Shandong leads in rabbit meat, accounting for 38 per cent of total rabbit meat production in 1993.

Pastoral areas in the north and north-west of China tend to have higher average per head meat consumption rates than cropping areas in the south and south-east and eat more beef and mutton. Major grain-producing provinces such as Sichuan, Jiangsu and Hunan tend to produce and consume more pork. Urban residents have higher meat consumption rates than rural inhabitants, although there is considerable regional variation.

Guangdong is the largest fodder producer in China: with over 300 fodder factories it produces an annual volume of 3.6 million tonnes.

Recent trends

Whilst meat output more than doubled between 1985 and 1994, the performance of individual varieties was more impressive (see Table III.34). Beef output rose fivefold, poultry and rabbit meat output quadrupled. High output increases were also seen in pork, which doubled, and mutton, which almost trebled between 1985 and 1994. Egg production also doubled in that period, the first provincial statistics only being published in 1984.

Table III.34. Output of livestock products, 1985-1994

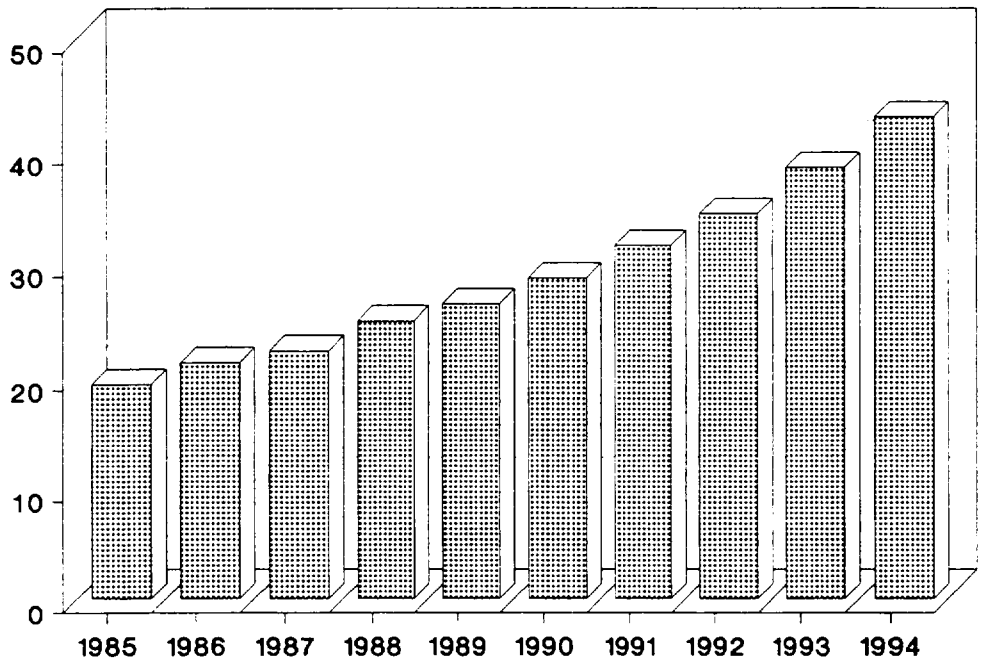
Year	Output of meat (Million tonnes)	of which: Pork	Beef	Mutton	Poultry	Rabbits	Eggs
1985	19.26	16.54	0.46	0.59	1.60	0.05	5.34
1986	21.12	17.96	0.58	0.62	1.87	0.07	5.55
1987	22.15	18.34	0.79	0.71	2.19	0.10	5.90
1988	24.79	20.17	0.95	0.80	2.74	0.11	6.95
1989	26.28	21.22	1.07	0.96	2.82	0.10	7.19
1990	28.57	22.81	1.25	1.06	3.22	0.09	7.94
1991	31.44	24.52	1.53	1.18	3.95	0.10	9.22
1992	34.30	26.35	1.80	1.25	4.54	0.18	10.19
1993	38.41	28.54	2.33	1.37	5.73	0.20	11.79
1994	43.00[a/]	32.04[b/]	2.41[c/]	1.60[d/]	6.47[e/]	..	..

Source: *China Statistical Yearbook 1994*, pp. 352-353.

a/ "Statistical Bureau Communiqué on China's Economic Development in 1994" in *Summary of World Broadcasts*, FE/2245 S2/1, 7 March 1995.
b/ "Pork Production, Selected Countries", FAS, USDA, p. 53.
c/ "Beef and Veal Production, Selected Countries", FAS, USDA, p. 51.
d/ "Lamb, Mutton, Goat Meat Production, Selected Countries", FAS, USDA, p. 55.
e/ From *FAO Production Yearbook 1994*, Vol. 48, Rome, 1995, p. 210.

The government has actively promoted the development of poultry and ruminants on the basis of an assumption of more favourable feed conversion rates. For example, it is argued that whilst 2.5 kg to 3 kg of feedgrain are needed to produce 1 kg of poultry, almost double that amount is needed to yield 1 kg of pork. Demand for poultry meat and eggs has been particularly vigorous around big cities as a result of rising incomes.

Fig. III.E. Meat output, 1985-1994
(Million tonnes)



Live animals such as hogs, cattle and chicken and frozen meat are exported, the key market for the former being Hong Kong and for the latter the Middle East and eastern Europe. The main exported meat is pork, but its contribution to total frozen meat exports has fallen since 1985 (see Table III.35). While in 1985 frozen pork accounted for 61.8 per cent of exports, by 1993 this had dropped to 25.5 per cent.

The rapid expansion of fast-food restaurants, particularly in southern China, is likely to raise demand for meat such as beef and poultry. Joint-venture fast-food restaurants include McDonald's, which had 22 restaurants by 1994, Kentucky Fried Chicken and California Beef Noodle King. McDonald's has a commitment to 100 per cent local sourcing which is already having an impact on the baking and meat processing industry. For example in 1992 a meat plant opened in Shenzhen, producing meat patties, chicken patties, chicken McNuggets and hamburgers for sale in southern China and Hong Kong. The processing of meat into canned meat has also increased (see Table III.36).

Table III.35. Exports of frozen and dried, salted and smoked meat, 1985-1994
(Thousand tonnes)

Year	Frozen meat	Frozen pork	Dried, salted and smoked pork
1985	179.4	111.0	98.5
1986	172.3	104.6	88.6
1987	170.8	99.9	93.7
1988	..	63.4	81.5
1989	..	88.4	86.3
1990	301.6	124.2	..
1991	332.3	116.6	..
1992	202.4	48.3	..
1993	229.7	58.7	..
1994	..	..	..

Sources: UN, *International Trade Statistics Yearbook*, various issues.

Table III.36. Production of canned meat, 1985-1994
(Thousand tonnes)

1985	..
1986	..
1987	235.7
1988	402.9
1989	305.5
1990	234.5
1991	285.5
1992	280.3
1993	264.6
1994	..

Sources: For 1987-1990, UN, *Industrial Statistics Yearbook, 1990, Vol. 2, Commodity Production Statistics, 1981-1990*, New York, 1992, p. 110; for 1991-1993, *China Statistical Yearbook 1994*, p. 412.

Constraints and prospects

The livestock sector will continue to grow over the next decade, but the rate of growth will be more modest because of the slow growth in grain output. The expansion of the livestock sector will depend on the growth of feedgrain supplies and the development of feed manufacturing. In the pre-reform period the livestock industry was not made up of specialized divisions for feed, feeding, slaughtering and distribution and there was virtually no feed industry. Processed feed made up less than 10 per cent of total grain supplies to animals.[45/] Although feed manufacturing has progressed rapidly in the 1980s, domestic supplies in 1988 still only accounted for around 30 per cent of total grain fed to animals. Key constraints on the development of the feedgrain industry include the poor availability of feedgrain in rural areas, a lack of protein meals used in mixing feed, and a shortage of new machinery and blending technology. Thus China will continue to rely on imports of feedgrain, oilseed meal and feed additives over the next decade.

Rising living standards are likely to continue to increase the demand for meat. Annual per head consumption of pork rose from 13.84 kg in 1985 to 18.22 kg in 1992, an increase of 31 per cent, whilst annual per head consumption of beef and mutton rose 56 per cent from 1.31 kg to 2.05 kg. Annual per head consumption of poultry rose from 1.56 kg in 1985 to 2.31 kg in 1992, an increase of 48 per cent. These figures are well below world average consumption rates; for example, annual world average per head consumption of red meat came to 35 kg in 1988, and of poultry to 11.1 kg.[46/] Thus there is considerable potential for growth in this industry.

Pork is likely to continue to be the main meat produced and consumed in China, although its relative importance in total meat output seems likely to decline as the poultry and dairy industries continue to expand. Any significant expansion of ruminant meat production will, however, require considerable investment in the pasturelands.

Livestock pricing policy is an important constraint on the development of the livestock sector. Currently prices are not sufficiently sensitive to regional and seasonal variation and do not adequately reflect the different production costs of various meats, such as poultry and pork. Additionally, maize pricing policy and pig-raising are closely related, for example the rise in the price of maize in 1994 led to a concomitant rise in the price of pigs. As farmers increased pork production, the subsequent oversupply led to a fall in the price of pigs and a shrinking of supply in 1995. Further inhibiting factors on the development of the livestock sector are poor transport and storage facilities, and poor information and lack of research into the economic aspects of the livestock industry.

DAIRY PRODUCTS

Recent trends

In the 1980s the reformers vigorously promoted the dairy industry on the assumption of more favourable feed conversion rates in comparison with pigs. The stock of cows and cow-milk production has thus doubled since 1985, especially in Heilongjiang and around large urban centres like Beijing, Tianjin, Shanghai, Nanjing, Xian and Wuhan (see Table III.37).

Table III.37. Output of milk, 1985-1994
(Million tonnes)

Year	Milk	of which: Cow milk
1985	2.89	2.49
1986	3.32	2.89
1987	3.78	3.30
1988	4.18	3.66
1989	4.35	3.81
1990	4.75	4.15
1991	5.24	4.64
1992	5.63	5.03
1993	5.63	4.98
1994	..	5.30[a/]

Source: *China Statistical Yearbook 1994*, pp. 352-353.

a/ "Statistical Bureau Communiqué on China's Economic Development in 1994" in *Summary of World Broadcasts*, FE/2245 S2/1, 7 March 1995.

Although the output of dairy products increased steadily in the 1990s (see Table III.38) China is not self-sufficient in dairy products, with imported dairy products accounting for 40 per cent of the market.[47/]

Table III.38. Output of dairy products, 1991-1994
(Tonnes)

	1991	1992	1993	1994
Dairy products of which:	376,063	412,865	417,368	424,521
Milk powder	293,856	336,545	294,404	299,431

Sources: *China Statistical Yearbook 1995*, p. 416; 1991 figures from *China Statistical Yearbook 1994*, p. 413.

Milk powder is the main dairy product, accounting for 70 per cent of the total output in 1993. In order to alleviate demand for fluid milk the World Food Programme has donated skimmed milk powder and assisted in the expansion of the industry.[48/]

Other products include ice-cream, yoghurt and condensed milk. Production of condensed cream and milk has increased over the decade but China still remains a very small contributor to the overall market, accounting in 1990 for only 1.4 per cent of the world market. Similarly China is also a very minor producer of dried milk and cream, accounting in 1990 for only 0.27 per cent of world production (see Table III.39).

Table III.39. Output of condensed milk and dried milk and cream, 1985-1990
(Thousand tonnes)

Year	Condensed milk	Dried milk and cream
1985	52.4	19.2
1986	55.9	19.8
1987	59.6	19.6
1988	61.4	20.5
1989	63.4	21.0
1990	66.9	21.5

Source: UN, *Industrial Statistics Yearbook 1990*, Vol. 2, *Commodity Production Statistics, 1981-1990*, pp. 121 and 123. New York, 1992.

With the expanding demand for dairy products, foreign companies have already begun to enter the market. Nestlé has four joint ventures in China. Shuangcheng City Dairy Industry Corporation in Heilongjiang province was the first to become operational in 1990, producing infant formula, infant cereals and full-cream milk powder.[49/] The second joint venture went into operation in November 1991 and produces instant coffee and coffee creamer. Another joint venture in Guangzhou produces ice-cream. Other new joint ventures plan to produce milk powder, sweet condensed milk, ice-cream and yoghurt.

Since 1990 domestic production and sales of ice-cream have increased at an annual rate of 20 per cent. At the end of 1994 China had over 500 large and medium-sized ice-cream enterprises and an even larger number of smaller producers, with an estimated total output that year of 800,000 tonnes of ice-cream.[50/] Half of China's 200 ice-cream production lines are imported. Several foreign companies such as Anglo-Dutch Unilever Ltd (Wall's), Meadow Gold, Nestlé and Kraft have set up joint ventures to produce ice-cream. Foreign brands dominate the higher end of the market because of their superior quality, packaging and promotion. In Beijing Wall's ice-cream and a local brand, New Continent, account for 30 per cent of the market, whilst the remaining 70 per cent is shared by 260 enterprises.

Fermented milk drinks are also produced and marketed mainly for children in China. Market leaders are Wa-Ha-Ha, although Guangdong Hwa-Shien-Mei-Lo Groups is the largest producer, turning out 1 million bottles a day. Other products include yoghurt drinks, which are produced mainly in the north-west of China.

Constraints and prospects

As with meat production, the price of maize is an important determinant of the profitability of raising cows for milk production. With rising incomes, higher ownership rates of refrigerators and demand for a more varied diet, demand for ice-cream and other dairy products is likely to rise over the next decade.

FISH PROCESSING

The resource base

With 147 million hectares of fishing ground in the coastal areas, China has a large area for the development of aquatic products. In addition, an extensive network of rivers provides ideal territory for freshwater fishing. In the reform period the rapid development of artificially raised fish, both freshwater and seawater, has added to the resource base. As well as fish, China is a major producer and consumer of shellfish, shrimps, prawns and crabs as well as algae. Jiangsu, Hubei and Guangdong provinces in the centre and south of China are the main sites for freshwater aquatic products.

Recent trends

Since 1985 the total amount of fresh and seawater aquatic products has more than doubled, and the percentage of agricultural production accounted for by fishery has risen from 2.4 per cent in 1985 to 3.7 per cent in 1991 (see Table III.40).

Table III.40. Output of aquatic products, 1985-1994
(Million tonnes)

Year	Total	Seawater aquatic products	Freshwater aquatic products
1985	7.05	4.19	2.85
1986	8.23	4.75	3.48
1987	9.55	5.48	4.07
1988	10.60	6.05	4.55
1989	11.51	6.61	4.90
1990	12.37	7.13	5.23
1991	13.50	8.00	5.50
1992	15.57	9.33	6.23
1993	18.23	10.76	7.46
1994[a/]	20.98	12.08	8.90

Source: Adapted from *China Statistical Yearbook 1994*, p. 354.

a/ "Statistical Bureau Communiqué on China's Economic Development in 1994" in *Summary of World Broadcasts*, FE/2245 S2/1, 7 March 1995.

Artificial cultivation of both seawater and freshwater aquatic products has contributed significantly to the rapid rise in output. For example, artificially cultured seawater aquatic products have quadrupled since 1985, from 712,300 tonnes to 3 million tonnes in 1993. Fish account for half the total output of seawater aquatic products and 95 per cent of freshwater aquatic products. Also important are shellfish, which make up 27 per cent of seawater aquatic products. Since 1985 the output of fish has doubled (see Table III.41).

Table III.41. Output of fish, 1985-1993
(Million tonnes)

Year	Total	Seawater	Freshwater
1985	5.51	2.74	2.76
1986	6.45	3.09	3.36
1987	7.45	3.51	3.93
1988	8.03	3.62	4.40
1989	8.55	3.83	4.72
1990	9.28	4.23	5.04
1991	9.96	4.66	5.30
1992	11.16	5.17	5.98
1993	12.67	5.57	7.10

Source: Adapted from *China Statistical Yearbook 1994*, p. 355.

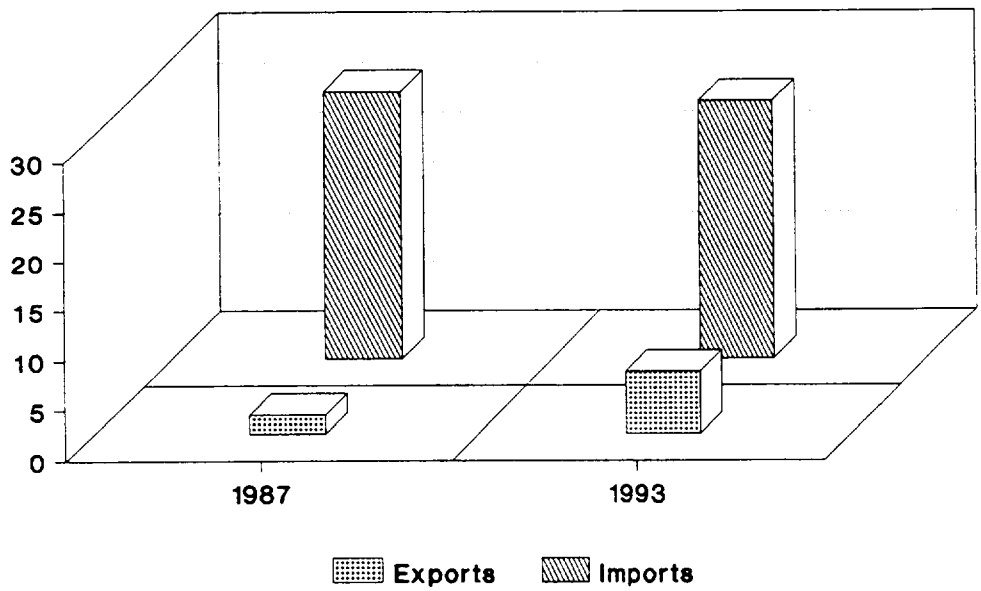
The output of shellfish from seawater has grown six times since 1985, whilst shrimp, prawn and crab output has doubled (see Table III.42).

Table III.42. Output of seawater and freshwater shellfish, shrimp, prawns and crabs, 1985-1993
(Million tonnes)

Year	Seawater shellfish	Shrimps, prawns, crabs	Freshwater shellfish	Shrimps, prawns crabs
1985	0.473	0.706	0.033	0.055
1986	0.658	0.769	0.056	0.062
1987	0.889	0.840	0.053	0.810
1988	1.144	1.033	0.059	0.850
1989	1.375	1.057	0.073	0.950
1990	1.473	1.071	0.076	0.940
1991	1.586	1.194	0.850	0.107
1992	2.044	1.274	0.105	0.124
1993	2.855	1.386	0.162	0.133

Source: *China Statistical Yearbook 1994*, p. 355.

Fig. III.F. Exports and imports of semi-processed fish, 1987 and 1993
(Thousand tonnes)



Fish is processed through salting, drying and smoking (see Table III.43). Imports of salted, dried or smoked fish outweigh exports and in 1993 accounted for 5 per cent of world imports.

Table III.43. Output, exports and imports of fish, salted, dried or smoked, 1985-1993
(Thousand tonnes)

Year	Output	Exports	Imports
1985	125.7	-[a/]	19.0[b/]
1986	151.3	-	23.0[b/]
1987	89.9	1.9	26.9
1988	90.6	1.1	8.9
1989	110.7	1.8	12.7
1990	180.6	2.7	6.9
1991	200.9	3.5	5.3
1992	202.3	6.4	15.8
1993	202.1	6.2	25.9

Source: UN, *Industrial Statistics Yearbook 1990,* Vol. 2, *Commodity Production Statistics, 1981-1990*, New York, 1992, p. 149.

a/ All export and import figures and output figures for 1990-1993 from *FAO Production Yearbook, Fishery Statistics,* 1993, Vol. 77, Rome, pp. 157, 180.

b/ FAO estimates.

While China was a net exporter of fresh, frozen and chilled fish between 1985 and 1987, by 1988 it was already on the way to becoming a net importer (see Table III.44). By 1993 imports exceeded exports by 0.17 million tonnes. China has yet to develop this field of production. Processing technological capacity is an important constraint on this sector.

Table III.44. Output, exports and imports of fresh, chilled and frozen fish, 1985-1993
(Thousand tonnes)

Year	Output	Exports	Imports
1985	668.0	65.0	43.0[a/]
1986	878.3	85.0	47.0[a/]
1987	849.0	93.0	49.0
1988	977.3	91.9	99.6
1989	988.9	104.7	159.0
1990	1,298.1	121.2	121.6
1991	1,326.0	146.8	125.7
1992	1,347.6	188.8	329.4
1993	1,466.1	211.0	390.2

Source: *FAO Production Yearbook, Fishery Statistics,* 1993, Vol. 77, Rome, pp. 110, 145.

a/ FAO estimates.

Unlike fish, exports of fresh, frozen and salted crustaceans outweigh imports (see Table III.45).

Table III.45. Exports and imports of fresh, frozen and salted crustaceans, 1985-1993
(Tonnes)

Year	Exports	Imports
1985	45,000[a/]	5,300[a/]
1986	84,800[a/]	6,000
1987	123,212	7,959
1988	171,129	8,152
1989	187,279	10,202
1990	230,485	11,909
1991	209,703	16,323
1992	239,109	42,285
1993	239,233	79,616

Source: *FAO Production Yearbook, Fishery Statistics,* 1993, Vol. 77, Rome, pp. 196, 212, 213.

a/ FAO estimate.

Both fish products and preparations as well as crustacean and mollusc products and preparations are produced and exported (see Table III.46). The latter products include, for example, canned crabmeat and canned prawns, shrimps and molluscs. Between 1985 and 1993 China's exports of fish products and preparations as a percentage of total output rose from 13 per cent to 25 per cent. China is a net exporter of crustaceans and mollusc products and preparations, with exports accounting for 80 per cent of output in 1993. China accounts for almost 6 per cent of world exports of crustaceans and mollusc products and preparations.

Table III.46. Output, exports and imports of fish products and preparations and crustacean and mollusc products and preparations, 1985-1993
(Thousand tonnes)[a/]

Year	Fish			Crustaceans and molluscs		
	Output	Exports	Imports	Output	Exports	Imports
1985	49.7	6.5	..	8.7[b/]	..	..
1986	65.6	7.5	..	10.8[b/]	..	..
1987	69.2	8.0	-	14.6[b/]	0.8	0.01
1988	70.5	9.5	0.3	14.5	1.9	0.03
1989	72.9	10.2	0.5	16.3	2.0	0.05
1990	72.0	11.2	0.2	16.2	1.9	0.08
1991	79.8	14.8	0.3	21.0	2.8	0.2
1992	82.0	17.7	0.3	21.9	17.0	2.8
1993	93.0	23.4	1.6	24.0	19.3	1.2

Source: *FAO Production Yearbook, Fishery Statistics,* 1993, Vol. 77, Rome, pp. 110, 144-145, 258, 274-5.

a/ Figures include both products contained or not contained in airtight containers.

b/ FAO estimate.

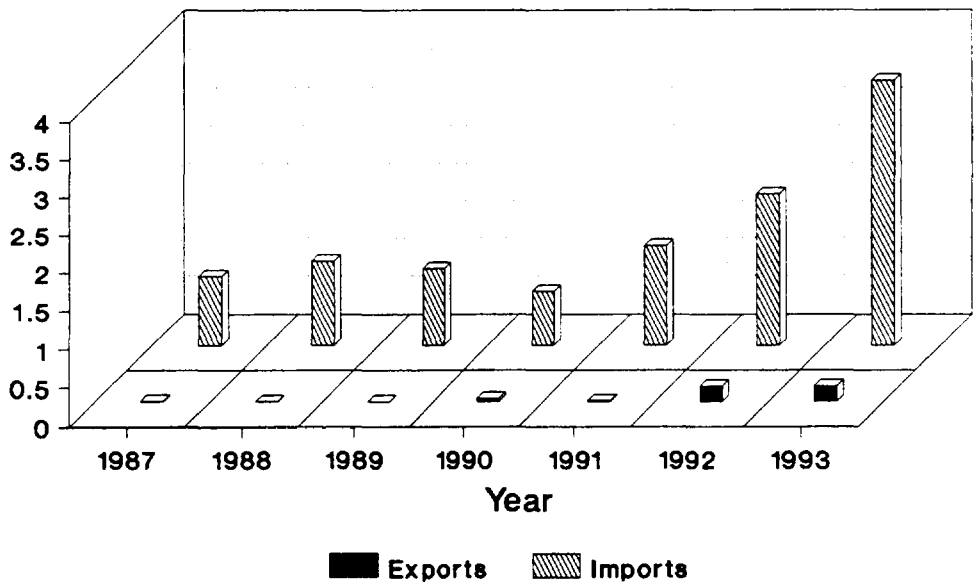
As well as canned fish, crustaceans and molluscs, China produces various kinds of oils and fats from aquatic sources but is not a leading producer in this field, accounting in 1993 for only 0.8 per cent of total world production (see Table III.47). Exports are negligible and imports equalled 35 per cent of output in 1993.

Table III.47. Output, exports and imports of oils and fats of aquatic origin, 1985-1993
(Tonnes)

Year	Output	Exports	Imports
1985	14,429	..	..
1986	6,141	..	..
1987	11,187	5	968
1988	13,798	2	1,114
1989	14,000	0	1,030
1990	10,695	44	752
1991	10,000	13	1,399
1992	10,000	203	2,045
1993	10,000	257	3,501

Source: *FAO Production Yearbook, Fishery Statistics,* 1993, Vol. 77, Rome, pp. 286, 300-301.

Fig. III.G. Exports and imports of oils and fats, 1987-1993
(Thousand tonnes)



China is a major importer of meals, solubles and similar animal feedstuffs of aquatic animal origin, accounting for 11 per cent of world imports in 1993 (see Table III.48). Although output has increased 1.8 times since 1985, China is far from self-sufficient in this product, importing more than four times the volume it produces.

Table III.48. Output, exports and imports of meals, solubles and similar feedstuffs of aquatic animal origin, 1985-1994
(Tonnes)

Year	Output	Exports	Imports
1985	54,500	..	191,262
1986	51,200	..	201,447
1987	56,800	432	220,680
1988	58,700	801	456,835
1989	90,000	1,046	472,310
1990	110,000	2,233	223,904
1991	100,000	2,327	634,291
1992	100,000	1,077	639.546
1993	98,000	491	434,197
1994	..	..	663,396[a/]

Source: *FAO Production Yearbook, Fishery Statistics,* 1993, Vol. 77, Rome, p. 312.

a/ From *China's Customs Statistics*, 1994, 12, p. 26.

Constraints and prospects

The processing of aquatic products is hampered by the lack of advanced technology. Currently China is only able to process 30.7 per cent of its annual aquatic output into value-added finished products.[51/] The Ministry of Agriculture plans to process 50 per cent of annual fish production by 2000.

CONFECTIONERY AND CHOCOLATES

Recent trends

China is not a major producer of chocolate or confectionery. However rising incomes, advertising and changing taste profiles imply a growing demand for such products. Foreign companies are securing a strong position in the growing biscuit market. UB Asia Pacific, a wholly-owned subsidiary of the UK's United Biscuits (Holdings), set up a joint venture in 1988 in Shekou producing 20,000 tonnes of biscuits a year. In 1995 it also set up a wholly-owned factory in Hangzhou, Zhejiang province, in part to get around the problems of transporting and distributing a product with a short shelf-life from south to north. A key rival is the French company, Danone, which has a joint venture in Shanghai. The US biscuit manufacturer Nabisco has a joint venture in Beijing. The Singaporean Khong Guan has two joint ventures in China.[52/]

Constraints and prospects

Given the short shelf-life of these products, the inadequate distribution infrastructure poses a key constraint on the development of this industry. Expansion of domestic production is also constrained by growing pressure on sugar supply as well as the limited output of the emerging dairy industry.

INSTANT CONVENIENCE FOODS

In 1990 it was estimated that less than 30 per cent of food in China had been processed.[53/] However, food processing is gradually emerging as an important export industry. There are over 800 instant noodle manufacturers with about 1,200 production lines.[54/] Foreign companies have also begun to enter this market. For example, in September 1994 Nestlé's third joint venture, Maggi Dongguan Ltd, started production of instant noodles, chicken bouillon and Maggi seasoning. Canned food production has also taken off in the reform period, with output quadrupling between 1980 and 1990. By 1990 China accounted for 5 per cent of total world trade in canned goods.

Constraints and prospects

The lack of efficient distribution networks, refrigerated transport and cold storage facilities are important constraints on the expansion of this sector. Considerable domestic and foreign investment is needed to develop this sector more rapidly.

B. TEXTILES AND GARMENTS

TEXTILES

The resource base

Cotton: China's textiles industry is heavily based on domestic cotton. The most important cotton-growing provinces are Xinjiang in the far interior and Henan, Jiangsu and Hubei. The textiles industry normally absorbs some 95 per cent of domestic cotton production and the remainder, which is exported, is matched by a slightly larger volume of cotton imports. Cotton imports increased sharply in 1994 as a result of shortfalls in domestic cotton production.

For many decades China has been the world's largest producer of cotton, accounting for about a quarter of world output. It is not a major player in international trade in cotton, and normally accounts for only about 5 per cent of world exports and imports.[55/] Chinese cotton purchases in world markets in 1994 and 1995 are, however, thought to have driven up world prices.

Cotton yields increased as a result of the agricultural reforms of the late 1970s and early 1980s, under which the land was effectively decollectivized and allocated to peasant households under the production responsibility system; in addition, government procurement prices were raised. The target for cotton output which was to have been achieved by 1985 under the Sixth Five-Year Plan (1981-1985) was actually achieved by 1981. A peak output of 6.25 million tonnes was reached in

1984, with crop yields almost double those of 1978. This surge in output generated problems for the government, which was unable to buy or fully dispose of the available supplies of cotton. Although cotton exports were increased during the mid-1980s, there were limits on export expansion as a means of disposing of excess supplies since Chinese cotton is perceived on world markets as being of low quality. Measures were taken to reduce supply, including the lowering of procurement prices, and farmers as a result found it difficult to sell their production. These measures were later regarded by the government as excessive, as demand for cotton grew in 1987.[56/] Cotton, as a labour-intensive crop, faced competition for labour with the growth in China of non-farm employment and came to be regarded by peasants as a high-investment, low profit crop. There was a reduction in cultivated area by over a third between 1984 and 1987.

Serious shortfalls in cotton production emerged in the early 1990s as a result of crop pests and continuing inadequate government procurement prices in the face of domestic inflation, with the consequent loss of cotton land to other crops. In 1994 cotton production rose by 16 per cent over 1993's exceptionally low crop of 3.7 million tonnes, and the government brought the cotton market under tighter control in an attempt to curb price rises (see Table III.49).

Table III.49. Cotton: cultivated area, production and yields, 1978, 1985-1994

	1978	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
Cultivated area (Thousand hectares)	4,867	5,141	4,306	4,844	5,535	5,203	5,588	6,538	6,835	4,985	5,528
Output (Thousand tonnes)	2,167	4,147	3,540	4,245	4,149	3,788	4,508	5,675	4,508	3,739	4,341
Yield (kg per hectare)	450	810	825	870	750	735	810	870	660	750	785

Source: *China Statistical Yearbook 1995.*

Silk: China is the largest world producer and exporter of silk. Silk is produced both in coastal regions and in the interior. The main producing provinces are Sichuan, Jiangsu, Zhejiang and Guangdong. The centre of silk production is the city of Suzhou, which accounts for 19 per cent of China's silk exports.[57/] Silk accounts for 30 per cent of China's exports of textile fibres (SITC 26), and 5 per cent of China's exports of textile yarns and fabrics (SITC 65).[58/] Silk output has increased consistently during the reform period, and by the early 1990s had more than tripled compared with 1978 (Table III.50). Ninety per cent of China's silk is exported.[59/] There were problems in production for export markets in 1987-1988, with some shortages and price rises resulting from the dismantling of central control over silk buying within China.[60/] Central control was re-established in the early 1990s, although it was subsequently relaxed. Recent reports suggest that there are continuing problems, since processing capacity for silk has risen faster than raw silk production, and actual purchasing prices paid by factories in 1995 were running some 25 per cent higher than state-fixed prices.[61/]

Synthetic fibres and yarns: Synthetics production started to develop in the late 1950s, and its subsequent growth prior to the 1978 reforms was stimulated by cotton shortages and by the development of China's oil industry. In the 1970s many contracts were made with foreign firms, mainly Japanese, for the supply of equipment for artificial fibre production.[62/] Domestic capacity for synthetic fibres has been increased considerably since 1978, using the country's growing domestic resource base for petrochemicals. However, although there has been a tenfold increase in the production of chemical fibres since 1978, cotton products still provide the bulk of yarn and cloth output (see Table III.50). About 45 per cent of chemical fibre is made into garments and some 18 per cent is used in the manufacture of decorative fabric.[63/]

Wool: China is the world's fourth largest producer of wool (after Australia, the Russian Federation and New Zealand). Only about 3 per cent of the country's wool production is exported directly, and the export of woollen piece goods is also minimal. China has experienced some problems of low quality in its wool production, which has limited its export possibilities. In 1985 the Ministry of Textile Industry set up fine wool production bases in an attempt to improve quality, and from 1987 it established auctions where price was linked to quality grades.[64/] Wool stockpiles developed in the late 1980s due to reduced government procurement resulting from financial shortages. Wool production makes up only 4 per cent of the volume of China's fibre mill output, but nearly 16 per cent of the value of its textile production.[65/]

The production of cashmere is a particular speciality of China, which accounts for 60 per cent of world supply of cashmere products. Cashmere, which is made from special goat hair, was exported as a raw material before the start of the Chinese economic reforms but, partly with the introduction of Japanese investment and technology, exports of cashmere sweaters were developed in the 1980s. Inner Mongolia is the centre of China's cashmere production.

Recent trends

Textiles were the largest industry in pre-Communist China and continue to be one of the country's largest industrial employers, with 10 per cent of China's industrial workforce. Traditionally textiles have been China's largest manufacturing export. Although textiles' share in exports has fallen in recent years, it still accounts for 10.7 per cent of export earnings. The industry grew slowly in the 1970s as a result of the inability of the domestic economy to grow enough cotton, and available imports were insufficient to fill the gap. During the reform period there was a rapid growth in domestic production capacity, particularly in synthetics but also in cotton spinning and weaving.

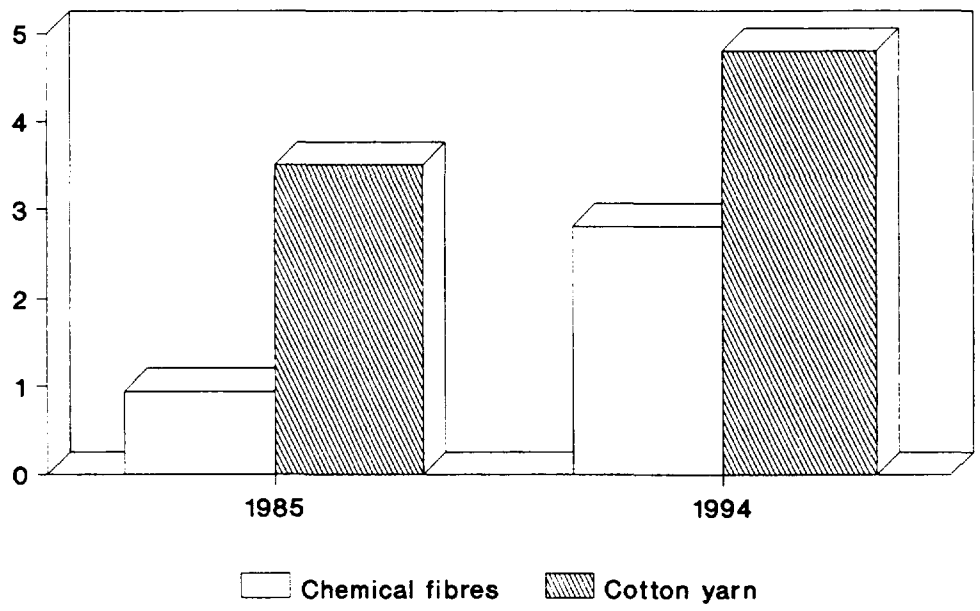
Township and village-level collective enterprises (TVEs) are important in the textile industry. In 1993 there were a total of 32,778 enterprises in the TVE textile sector (including 1,248 in chemical fibre production), employing 3.5 million workers and producing Rmb 203 billion of output. In China's national textile industry statistics there were listed 25,701 enterprises (including 1,088 in chemical fibre production), employing 9.5 million workers and producing Rmb 418 billion of output. The two sets of figures are not strictly comparable since the national figures for China's textile industry include some township enterprises,[66/] but they do indicate a broad order of magnitude. The bulk of the remaining enterprises are state-owned enterprises, but there has also been a growth of foreign investment in the sector (see below).

Table III.50. Production of textiles, 1985-1994

Year	Chemical fibres	Pure cotton yarn	Pure wool and cotton cloth	Knitting	Silk
	Thousand tonnes	Thousand tonnes	Hundred million metres	Thousand tonnes	Thousand tonnes
1985	948	3,535	147	126	42
1986	1,017	3,798	165	149	47
1987	1,175	4,368	173	205	52
1988	1,301	4,657	188	225	51
1989	1,481	4,767	189	250	52
1990	1,654	4,626	189	238	57
1991	1,910	4,608	182	283	60
1992	2,130	5,018	191	351	74
1993	2,374	5,015	203	344	94
1994	2,803	4,895	211	440	106

Source: *China Statistical Yearbook 1995.*

Fig. III.H. Production of selected textiles, 1985 and 1994
(Million tonnes)



Some degree of central control was reasserted over textiles TVEs in 1989 as part of the national measures to curb demand, and TVEs were required to obtain licences for the import of machinery and some raw materials.[67/]

There are problems of out-of-date equipment and excess capacity in cotton textiles in relation to likely domestic and overseas demand. Much of the spinning capacity is more than 20 years old, and 3 million of China's 41 million cotton textile spindles are over 45 years old. In weaving, there are over 25,000 enterprises and China has over a third of the world's cotton weaving capacity, but much of the capacity is obsolete, with most looms being of the shuttle type.

The silk industry also has problems with outmoded operational methods and poor silk reeling technology, and there has been some export of substandard silk.[68/] Silk production has been affected too by high raw material prices: 41 per cent of silk enterprises in 22 main silk producing cities made losses in 1994, and 70 per cent of silk processing enterprises in major silk producing provinces made losses in the first quarter of 1995. There have been changes in the structure of silk exports. In 1987 88 per cent of silk exports were in the form of raw silk and silk products and 12 per cent were in the form of garments, whereas by 1993 the share of garments was 73 per cent.[69/]

The dyeing and finishing sector is comparatively underdeveloped in China. Grey cloth is exported to Hong Kong and reimported by China in finished form. The knitting sector is traditionally based on cotton yarn, but now uses a wider range of materials. This sector has attracted over 20 per cent of total joint-venture foreign investment in the textile and clothing sector combined.[70/]

Besides yarns and fabrics, and consumer textiles such as carpets, China also manufactures a range of industrial textiles.[71/] These include:

- engineering textiles, with an output of 40 million metres, for use in building and engineering construction: the China Textile Industry Council forecasts that demand for these items could rise to as high as 200 million metres by 2000 as a result of major construction projects like the Three Gorges;

- structural textiles, such as cord cloth for tires and conveyor belts; according to a forecast issued in 1994, demand was set to rise to 150,000 tonnes by 1995 and 250,000 tonnes by 2000;

- farming and fishing textiles, with 1994 consumption of 500 million metres;

- medical and health textiles, with 1994 consumption of 40,000 tonnes which, according to the Textile Industry Council, could reach 100,000 by 2000.

Many textile enterprises in the 1990s have been making losses and are heavily in debt. Demand for Chinese textile machinery has been affected by credit restrictions faced by state textile mills. Official policy for the textile industry, announced in 1994, has three main strands:[72/]

- to restructure and technically update the textile industry in order to improve world competitiveness: in 1993 up to $3.6 billion was spent on importing equipment to replace outmoded plant;

- to improve and upgrade chemical fibre production so as to make it a "pillar" of the industry;

to accelerate import substitution in textile machinery with the aim of upgrading traditional fibre-processing equipment.

The chairman of the General Textile Association announced in 1994 that a quarter of backward capacity would be retired.[73/] Restructuring is also taking the form of relocation of capacity to western regions of China where cotton growing is concentrated and where labour costs are lower than in the eastern cities. In 1994 Xinjiang, the most important cotton-growing province, produced 850,000 tonnes of cotton, of which 600,000 tonnes were transported out of the region.[74/] Xinjiang's cotton spinning capacity is planned to double by the end of the century. Shanghai, the long-established centre of China's textile industry, has agreements with Xinjiang to transfer cotton spinning and weaving capacity.

China is the world's third largest exporter of textiles and the fourth largest importer. It is the second largest exporter and third largest importer if Hong Kong's textile re-exports and re-imports are excluded from Hong Kong's export and import totals. The country's total imports of textiles (fibres, yarns and fabrics) are approximately balanced by its textiles imports, with a small surplus for yarns and fabrics and a small deficit for fibres (see Table III.51). In 1994 China imported $880 million of cotton, $794 million of wool, and $1,076 million of synthetic fibres and yarns. Its exports of cotton cloth were larger than those of synthetic cloth and silk combined (see Table III.52).

China's major markets for textiles are Hong Kong, which took 37 per cent of 1993 exports, Japan (12 per cent), the EU (11 per cent), and the USA (8 per cent). Many of China's exports to Hong Kong, however, are re-exported. There are substantial re-exports back to China from Hong Kong of finished cloth which was imported by Hong Kong as grey cloth.

Table III.51. Exports and imports of textiles, 1985-1994
(Million $)

	Textile fibres (SITC 26)		Textile yarns and fabrics (SITC 65)	
Year	Exports	Imports	Exports	Imports
1985	1,077	1,032	3,051	1,508
1986	1,154	1,062	4,241	1,630
1987	1,509	1,131	5,798	1,850
1988	1,672	1,946	6,458	2,388
1989	1,546	2,286	6,994	2,845
1990	1,096	1,840	7,220	5,426
1991	1,126	2,204	8,014	6,976
1992	900	1,953	8,681	7,750
1993	813	1,361	8,807	7,790
1994	1,093	2,983	11,819	9,347

Sources: *China's Customs Statistics Monthly*, December 1994; UN, *International Trade Statistics Yearbooks 1988, 1989, 1993.*

Table III.52. Exports and imports of major textile items, 1985-1994
(Million $)

Exports	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
Cotton yarn	294	424	535	512	424	390	460	391	416	514
Cotton cloth	994	1,270	1,525	1,488	1,600	1,602	1,739	2,057	2,230	2,679
Polyester and synthetic cotton cloth	356	464	632	620	685	676	798	668	537	660
Silks and satins	312	392	459	681	716	770	633	515	412	679
Imports	**1985**	**1986**	**1987**	**1988**	**1989**	**1990**	**1991**	**1992**	**1993**	**1994**
Cotton	-	-	13	59	709	711	631	430	16	880

Sources: UN/ESCAP, *Statistical Yearbook of Asia and the Pacific*, 1994; *China's Customs Statistics Monthly*, December 1994.

Silk export volumes have been affected by the imposition of export quotas for the first time, in 1994, by the EU and the USA. Quotas were introduced in the USA in response to the growing competitive power of silk garments and fabrics in relation to clothing made of other fabrics. In the EU, the opening of the single market in 1993 removed the protection previously enjoyed by the French and Italian silk industries and led to the imposition of quotas as an alternative form of protection. Silk prices, however, stand to rise as a result of the quotas, especially in the USA where China has 90 per cent of the market, although silk quotas are to be abolished under the GATT/World Trade Organization agreement following the Uruguay Round.[75/]

The severe cotton shortages which emerged in 1993 have had an adverse effect on textile output, and many mills in China have cut back on production.[76/] In 1993 the government had to release inventory to prevent cotton shortages, partly caused by farmers withholding cotton in the expectation of higher procurement prices. Procurement prices were raised in September 1994, but farmers were said still to consider them too low. The crop in 1993 suffered from infestation of pests as well as land lost to food crops. The 1994 cotton harvest recovered, but only to 4.25 million tonnes. Estimates suggest that up to October 1995 some 500,000 tonnes of raw cotton had been imported.[77/]

China's textiles exports have suffered not only from the recent domestic shortages of cotton but also from the adverse world market conditions which have prevailed since the early 1990s. China's textiles exports grew by only 1 per cent during 1993.[78/] While many other major exporters also experienced slow export growth, in 1993 the textiles exports of China's major competitors, the Republic of Korea and Taiwan Province of China, which are based more on synthetics, grew by 9 per cent and 8 per cent respectively.[79/]

Since the start of the reform period the textiles industry has used over $3 billion of foreign capital to establish over 3,000 enterprises, which now produce some 30 per cent of the industry's output.[80/]

Constraints and prospects

In the face of rising prices for cotton and intensifying world market competition, the textile industry in China has been sustaining losses for several years. The structural weaknesses in the industry are now being addressed, with technological upgrading and relocation of textile production to cotton-growing areas. The imposition of controls on the cotton market in 1994 have helped to check price rises, and increases in the procurement price for cotton give farmers more incentive to produce, although cotton production remains less profitable and more risky than the growing of some alternative crops.[81/]

Synthetic materials are becoming more important in the production of textiles in China. The chemical fibre capacity will remain concentrated in the central and coastal provinces, near the country's petrochemical plants, and will continue to grow rapidly. With regard to inputs for synthetic materials, polyester chip production was expected to reach 1.4 million tonnes in 1995 and PTA production to reach 700,000 tonnes, which will still be short of demand by 300,000 tonnes and 360,000 tonnes respectively.[82/] The Ministry of Textile Industry has set the strategic goals that by 2000 textile fibre processing capacity should rise to 9.5 million tonnes, compared with a 1994 figure of 7.4 million. Chemical fibre production is to account for 45 per cent of total processed fibre output, compared with its 1994 share of about 30 per cent of output; and meet 85 per cent of domestic demand with a total output of 3.5 million tonnes. Chemical fibres' share of industrial and decorative articles is planned to rise from 40 per cent to 70 per cent by 2000.[83/]

Reorganization of the industry will eventually become even more pressing with the gradual phasing out of the Multi-fibre Arrangement, following the successful completion of the Uruguay Round negotiations. Markets in the USA and EU are likely to become even more competitive in the way that non-quota markets such as those in the Middle East already are, with a consequent reduction in export unit values. However, as the section on garments discusses in more detail, the gradual expansion of quotas under the phase-out will be very slow. China cannot benefit from this quota expansion until it joins the World Trade Organization. Even then, the expansion of its quotas will be based on a "growth-on-growth" formula, under which quotas will expand as a percentage of the existing agreed quota growth rates. Since China's quota growth rates, agreed for the period 1 January 1994 to 31 December 1996, are only 1 per cent for most items, any percentage increase will have minimal effect.

GARMENTS

The resource base

The domestic textile industry is the main supplier of raw materials for China's production of garments. Within the domestic market for textiles, 62 per cent of cloth sold in 1993-1994 was for the manufacture of garments, 20 per cent was for bedding and 18 per cent was decorative cloth (for bedding, tablecloths, furniture covering, etc).[84/]

The development of China's garment exports has been greatly helped by the proximity of Hong Kong, which has provided expertise in marketing, design and quality control. Hong Kong has also provided substantial inflows of direct foreign investment, although the relocation of Hong Kong factories to China has not been as extensive in garments as in some other products because of strict enforcement of rules of origin for export markets. Of the foreign investment of $4.75 billion which China has attracted in textiles and garments, with 4,250 joint ventures, 39 per cent is in

garments, 21 per cent in knitting establishments, and the remainder in other textile production.[85/]

Foreign investment in garment manufacture in China has been made profitable by the country's abundant labour supply and relatively low labour costs. Garment production in the world economy has remained highly labour-intensive, and low wages generate more of a competitive advantage to Chinese garment production than in the case of the textiles industry. Wage statistics for the summer of 1993 show that textiles industry wages in China were on average $0.36 per hour, compared with $11.61 in the USA. Even compared with its Asian rivals Chinese wages were low, hourly rates being $0.43 in Indonesia, $0.56 in India and $1.18 in Malaysia. Of China's main potential competitors, only Bangladesh had lower wages ($0.23 per hour).[86/]

Recent trends

In China before the 1978 economic reforms, consumers would buy cloth to make their own clothes and the market for ready-made garments was small. During the reform period the domestic market for ready-made garments has grown rapidly at the expense of demand for textile fabrics, and the production of clothing has been promoted by the government as a key consumer goods industry. Consumers have become fashion conscious, buying a wider range of colours and styles, particularly Western styles. A survey by a group of Chinese department stores showed that materials for garments made up only 24 per cent, and ready-made garments 76 per cent, of consumer clothing purchases.[87/] Output has risen from 673 million items of clothing in 1978 to 1.27 billion in 1985 and 6.37 billion in 1993 (see Table III.53).

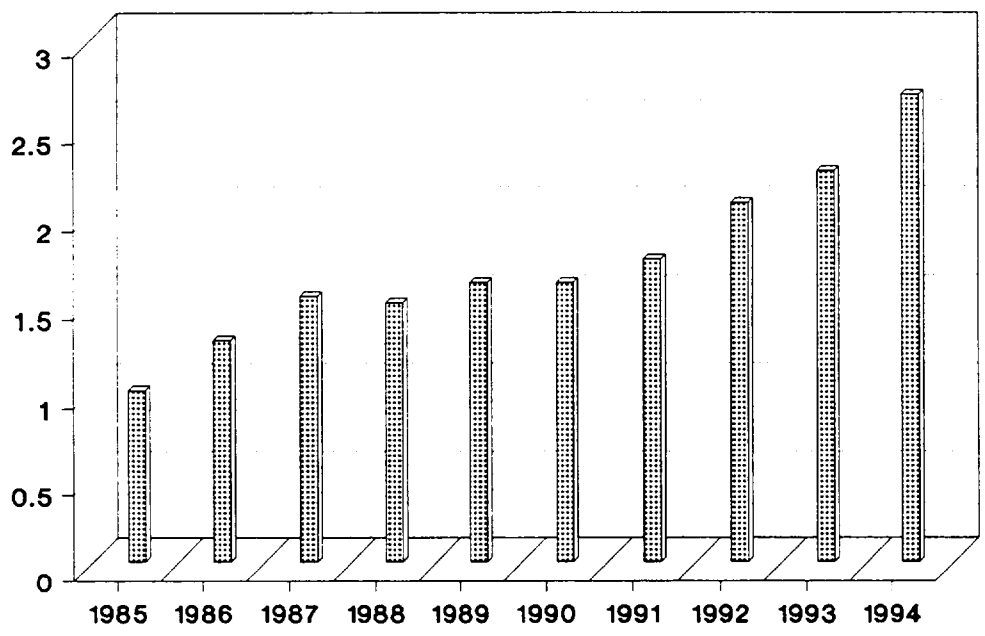
China is the world's largest exporter of garments. The share of garments in China's merchandise exports has grown from under 9 per cent in 1980 to 20 per cent in 1994. Its share of the world garment market in 1994 was 17 per cent. In addition, China's garment exports are understated by its own export figures. According to the World Bank, China's 1991 clothing exports as reported by importing countries were 46 per cent more than those reported in China's own statistics.[88/] China has had problems in making its exporters adhere to quotas, and there is also transhipment of garments through third countries in an attempt to conceal their origin. Under a new textile agreement signed by China and the USA in January 1994, there are severe penalties for transhipment.[89/] China claims to have introduced a stricter system to supervise the issue of textile licences to prevent illegal exports.[90/]

Table III.53. Production of clothing, 1985-1993
(Billion items)

1985	1.27
1986	2.70
1987	2.30
1988	2.91
1989	3.00
1990	3.17
1991	3.63
1992	4.27
1993	6.37

Source: *China Industrial Economic Statistics Yearbook 1994.*

Fig. III.I. Exports of cotton cloth, 1985-1994
($ billion)



China's main markets for clothing in 1993 were Hong Kong (29 per cent), Japan (24 per cent), the USA (15 per cent) and the EU (11 per cent).[91/] Exports to Hong Kong, however, were principally for re-export to third countries.

Township and village enterprises (TVEs) are active in garment production. There were 23,254 TVEs in garment production in 1993 employing 1.6 million workers and producing Rmb 59.4 billion of output. In the national garments industry statistics for China in 1993 there were 17,921 enterprises listed, employing 2.6 million workers and producing Rmb 97.8 billion of output. As in the case of textiles, the latter statistics include some township enterprises so a precise share of TVE production in the total cannot be derived from them, but the importance of TVEs' production is clear.[92/] One source suggests that township enterprises generate 60 per cent of China's garment exports.[93/] The importance of township and village enterprises in production and exports reflects widespread new entry into the industry and an intensification of domestic competition.

Constraints and prospects

Despite increased competition in the world market for garments, China's garment exports have continued to grow rapidly. Even in 1993, when world demand was slack, China's garment exports grew by 10 per cent (compared with 36 per cent in 1992). By 1994 the growth rate of garment exports had risen again to 29 per cent.

In the longer term, rapid economic growth in China, particularly in the booming south of the country, may eventually push up real wages and erode China's competitive advantage, although migration to the south exerts a countervailing pressure on wages.

World competition will further intensify as quotas are progressively phased out in major markets with the ending of the Multi-fibre Arrangement, and this will give China an opportunity to gain market share from less efficient competitors. However this trade liberalization, which will be undertaken over ten years under the new Textiles and Clothing Agreement (TCA) of the GATT Uruguay Round, will be slow. For example, it has been estimated that in the US market some 89 per cent of the apparel subject to US quotas in early 1995 will remain subject to quotas until 2005. China has yet to join the World Trade Organization and cannot therefore participate in the increases to be applied to existing quotas under the TCA. In any case, the existing agreement on textile and clothing quotas between the USA and China (which runs from the beginning of 1994 to the end of 1996) has reduced China's quota growth for most items to only 1 per cent per year. Under the TCA, any additional quota growth is applied as a percentage increase on this base percentage, so the actual increases will be minimal. However, Chinese garment sales should benefit from the removal of quotas on silk in the early stages of the liberalization but recent uncoordinated growth in silk processing (with about three-quarters of silk now exported by China in the form of garments) has led to price-cutting and to losses.[94/]

Recent changes in rules of origin for textile products introduced by the USA may affect China adversely. The place of assembly rather than the country where the material was cut will now determine the country of origin. This means that material cut in Hong Kong or Taiwan Province of China but assembled in China will count as Chinese. Even after Hong Kong's reintegration into China in 1997, Hong Kong and Chinese quotas will be administered separately, so China will not be able to take over part of Hong Kong's quota.[95/]

One constraint on the growth of Chinese garment production and exports is the poor quality of domestic textiles. This constraint has been eased in practice by the import of higher quality fabrics for processing. The contribution of Hong Kong in dyeing and finishing Chinese grey cloth for reimport by China will continue to be important.[96/] Problems in domestic cotton supply are likely to accelerate the increased use of synthetics.

Within the domestic market, rapid growth in consumer incomes is increasing the demand for garments and will make foreign investment in garments for domestic sale attractive. By 2000 it is estimated by the China Textiles Economic Research Centre that the proportion of ready-made garments will have risen from around 50 per cent at present to 80 per cent.[97/]

CARPETS AND TAPESTRY [98/]

The resource base

China, as one of the most important world textile producers, manufactures wool, synthetic fibre and other textile items required for the production of carpet and tapestry products.

Recent trends

The rapid growth of carpet exports is shown in Table III.54, which indicates that they (in terms of current prices) rose by almost 60 per cent between 1990 and 1994.[99/] China in 1993 was the second largest exporter of "carpets, etc, knotted" (SITC 6592) after the Islamic Republic of Iran,

with 18.2 per cent of the world market. China was the third largest exporter of "carpets of wool or fine hair" (SITC 65921), with a 15.7 per cent world market share. It was much less important as an exporter of "man-made textile carpets" (SITC 6595), with a world market share of less than half a percent.

Carpets were approximately 5 per cent of China's 1994 total textile export earnings, and special woven fabrics such as tapestries were 3 per cent of 1994 textiles export earnings. China produced 25 million woollen carpets in 1992.[100/]

Table III.54. Production and exports of carpets, 1985-1994

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
Production (million square metres)	5.8	5.8	13.3	18.1	..	58.7	48.5	56.1	70.8	..
Exports ($ million)	201.7	..	285.1	389.8	431.3	390.2	428.0	517.9	519.5	617.0

Sources: Production statistics are from *China Industrial Economic Statistical Yearbook 1994*. The 1989 production figure is misprinted and it is unclear what should be the correct version. It is also possible that the figures for 1990-1993 are misprinted, since they appear exceptionally large; no other sources have been found which contain carpet production statistics. Export statistics from *China Statistical Yearbooks 1989, 1992, 1994, 1995*. Note that the definition of "carpets" used in this source is slightly wider than that used for the relevant SITC category (SITC 6592) in UN, *International Trade Statistics Yearbook*. For example, the 1993 exports of SITC 6592 were $445.6 million. The UN statistics do not give figures for Chinese carpet exports for the 1980s.

Constraints and prospects

China's exports of carpets have shown rapid growth in the 1990s, and continued growth is likely to depend on the availability and quality of local textile inputs and access to imported inputs where required.

C. LEATHER AND FOOTWEAR

The resource base

In the past decade China has become a major exporter of footwear. Nearly two-thirds of these exports are leather shoes and just under one-third are of plastic or rubber construction, the remainder being traditional Chinese cloth shoes. China still has substantial production of cloth shoes, made from domestic cotton. Leather production has not kept pace with the rapid expansion in shoe output and exports, and increasing quantities of leather have been imported (see Table III.55). Leather imports in 1993 were equivalent to 45 per cent of the value of leather shoe exports (although not all imported leather is used for shoes). Footwear made of synthetic materials can draw on domestic rubber and plastics production.

The footwear industry in China has been transformed by the migration overseas of the bulk of the footwear production of Taiwan Province of China, driven by rising labour costs in Taiwan Province of China and the appreciation of the its currency. China has been the major beneficiary of this relocation,[101/] and has been able to offer low labour costs and a culturally familiar environment to investors from Taiwan Province of China. Relocation of Hong Kong footwear production to China in search of lower labour costs has also helped to develop the Chinese shoe industry.

Recent trends

The growth in Chinese production and exports of footwear is shown in Tables III.55 and III.56 respectively. Table III.57 presents import data for selected leather items. Production of traditional cloth shoes has doubled over the past decade, while that of leather shoes has increased fivefold. Exports have grown from negligible figures in the mid-1980s to over $6 billion in 1994. They doubled (in terms of current prices) between 1989 and 1990, and tripled between 1990 and 1994.

The world shoe market is highly diversified, and an exporter's share of the world market is likely to vary considerably among different product types. For example, in 1989 sales from China accounted for 50 per cent of world imports of rubber/fabric shoes, 30 per cent of juvenile vinyl/plastic footwear and 24 per cent of women's vinyl/plastic footwear. China had 14 per cent of world exports of men's leather shoes and 10 per cent of women's leather shoes.[102/]

One important contributor to the growth in China's footwear exports has been the sourcing of sports shoes by major brand name companies such as Nike and Reebok, who have worked with firms in Hong Kong and Taiwan Province of China to develop production in China. shoe manufacture is a highly labour-intensive operation which takes advantage of China's low wages. Reebok, which started full-scale production in China in 1990, was sourcing 25 per cent of its total supply from China by 1992.[103/] Other well-known brands of footwear which have been produced in China for the export market include Timberland and Hush Puppy.

Table III.55. Production of cloth shoes, leather shoes, and leather, 1985-1993

Year	Cloth shoes (million pairs)	Leather shoes (million pairs)	Leather (million pieces)
1985	499	232	42
1986	534	264	51
1987	..	309	57
1988	708	347	52
1989	750	354	52
1990	765	438	53
1991	793	536	57
1992	842	771	58
1993	1,085	1,151	68

Source: *China Industrial Economic Statistical Yearbook 1994.*

Table III.56. Exports of footwear and leather goods, 1985-1993
($ million)

Year	Exports of rubber and plastic footwear (SITC 85101)	Exports of leather footwear (SITC 85102)	Exports of leather clothes and accessories (SITC 8481)
1985	..	137	..
1986	..	203	..
1987	..	304	..
1988	..	465	..
1989	..	698	325
1990	706	1,203	399
1991	1,080	1,721	455
1992	1,194	2,685	948
1993	1,562	3,268	1,156

Sources: UN, *International Trade Statistics Yearbooks 1988, 1989, 1993*; *China's Customs Statistics Monthly*, December 1994.

Note: Imports of footwear were minimal in comparison to exports: 1994 imports were $325 million. 1994 total footwear exports were $6.0 billion, but *China's Customs Statistics Monthly* does not disaggregate this total.

The bulk of investment from Hong Kong and Taiwan Province of China has gone to the south of China: 80 per cent of Hong Kong shoe factories have located in Guangdong and Fujian provinces. In the southern province of Guangdong alone, which offers good transport connections through Hong Kong, there are at least 3,000 to 5,000 shoe factories of which at least 800 are operated by foreign investors.

Fig. III.J. Exports of footwear and leather goods, 1990-1993
($ billion)

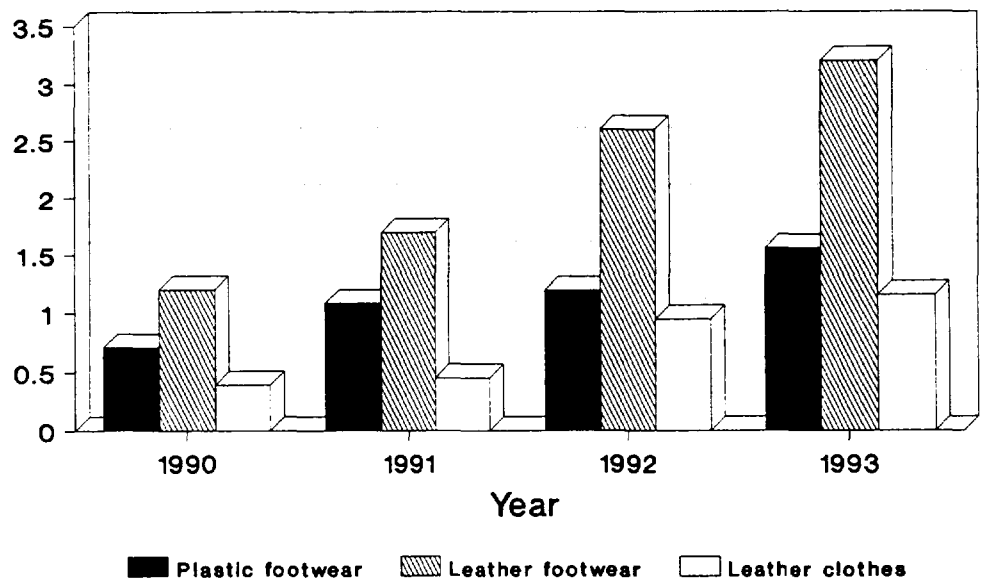


Table III.57. Imports of leather, 1985-1994
($ million)

Year	Imports of leather, leather manufactures not elsewhere specified, dressed fur, etc. (SITC 61)	Imports of leather (SITC 611)
1985	136	..
1986	138	..
1987	184	..
1988	..	..
1989	280	..
1990	374	188
1991	642	360
1992	1,538	1,082
1993	1,932	1,465
1994	1,902	..

Source: UN, *International Trade Statistics Yearbooks 1988, 1989, 1993*; *China's Customs Statistics Monthly*, December 1994.

Investment from Taiwan Province of China has also been important in developing the production of leather fashion shoes. By 1992 China was supplying 49 per cent of the US market purchases of non-rubber footwear, and almost half of China's shoe exports were going to the USA. China has also attracted Italian direct foreign investment, which is an important source of design and marketing expertise, Italy being the world's leader in upmarket fashion footwear. Italian investors in shoes have been supported by Italian investment in at least three tanneries in China, which produce high quality kidskin for women's shoes. Supply of blemish-free calfskin in China is difficult to secure.

One interesting development is the agreement signed in 1993 with foreign investors from Thailand to set up an international leather industrial park at Nanchang in Jiangxi. The park, which should be completed by 1997, will include tanneries, shoe-making, chemicals, research and trade, and joint ventures are expected from a wide variety of well-known international companies in the footwear and leather business. It is expected to employ 150,000 workers.[104/]

State-owned enterprises remain important in the shoe industry, but mainly in the low-end segment of the domestic market.

China has long been self-sufficient in footwear, and the domestic market is protected.[105/] Total footwear imports in 1994 were only equivalent to 5 per cent of the value of exports. The domestic market has been expanding in the 1990s with the rapid rise in consumer incomes, and some production originally designed for export has been shifted towards the domestic market. Chinese department stores provide outlets for upmarket shoe sales. The move towards the domestic market was accentuated by a slackening of international demand in the early 1990s and by the imposition of EU quotas.

Production of leather items such as leather clothing and handbags has increased along with the export of leather footwear, and Italian shoe investors,[106/] for example, have diversified into these items. Exports tripled during the 1990s.

Constraints and prospects

The relocation of footwear factories from Taiwan Province of China and Hong Kong footwear factories to China is now largely complete, and the growth in footwear production and exports is unlikely to continue at the same rate as before. There is some evidence that foreign investors are diversifying from shoes to other leather products, and this provides scope for further export expansion. International buying groups prefer a choice of sourcing locations from which to subcontract production in order to minimize risk, and despite China's low labour costs it is unlikely to attract investment away from other important locations such as Indonesia. China already has large market shares in product segments in the USA and EU, and EU protective measures will limit growth. There is already something of a glut of shoe factories in China, but the domestic market is increasingly providing an outlet for some of the cheaper ranges of footwear which were previously mainly exported.

D. WOOD AND WOOD PRODUCTS

The resource base

Intensive forestation efforts have resulted in sustained growth of forest resources in the 1990s.[107/] However, mature timber resources are almost exhausted, with only 1.96 million cubic metres left. The fourth survey of national forest resources carried out between 1989 and 1993 revealed that forest acreage had risen from 125.7 million hectares with 9.6 billion cubic metres of timber resources in 1988 to 133.7 million hectares with 11.7 billion cubic metres of timber resources. Over 2.78 million hectares of trees were planted during that period, accounting for over 31 per cent of increased forestland.[108/] Artificial forests cover an area of 33.78 million hectares. In the five years since 1988, however, 2.19 million hectares of forest area were destroyed or used for other purposes. As a percentage of total agricultural production forestry fell from 5.0 per cent in 1985 to 4.2 per cent in 1991.[109/]

Recent trends

Timber output has remained steady over the decade 1985-1994 (see Table III.58). The bulk of this is young or immature timber. Heilongjiang is the leading producer of timber, accounting for over 12.2 million cubic metres of timber in 1993, almost 20 per cent of total output. There are 1,100 enterprises engaged in the logging and transport of timber and bamboo and 12,410 involved in timber processing, bamboo, cane, palm fibre and straw products. In addition there are 392 township-run enterprises and 4,751 village-run enterprises transporting and logging timber and 7,479 township-run and 20,792 village-run enterprises processing timber and other wood products.

China is not a leading producer of sawnwood, accounting in 1990 for only 4 per cent of total world production. Moreover its imports of sawnwood exceed output, in 1993 by almost four times (see Table III.59).

Production of railway sleepers has remained static, with output standing at 66,000 cubic metres per year between 1985 and 1990.[110/]

Table. III.58. Output of timber, 1985-1994

Year	Million cubic metres
1985	63.23
1986	65.02
1987	64.08
1988	62.18
1989	58.02
1990	55.71
1991	58.07
1992	61.74
1993	63.90
1994	66.15

Source: *China Statistical Yearbook 1995*, p. 413.

Table III.59. Output, exports and imports of sawnwood,[a/] 1985-1993
(Thousand cubic metres)

Year	Output	Exports	Imports
1985	27,021	94[b/]	692
1986	26,325	110	867
1987	26,278	90	1,257[c/]
1988	26,216	147[c/]	1,482[c/]
1989	24,892	102[c/]	1,199[c/]
1990	22,971	95	1,069
1991	..	131[c/]	1,283[c/]
1992	..	962	2,171
1993	..	653	2,521

Source: UN, *Industrial Statistics Yearbook 1990*, Vol. 2, *Commodity Production Statistics, 1981-1990*, New York, 1992. pp. 329, 332.

a/ Sawnwood includes sleepers, planks, joists, boards and rafters.

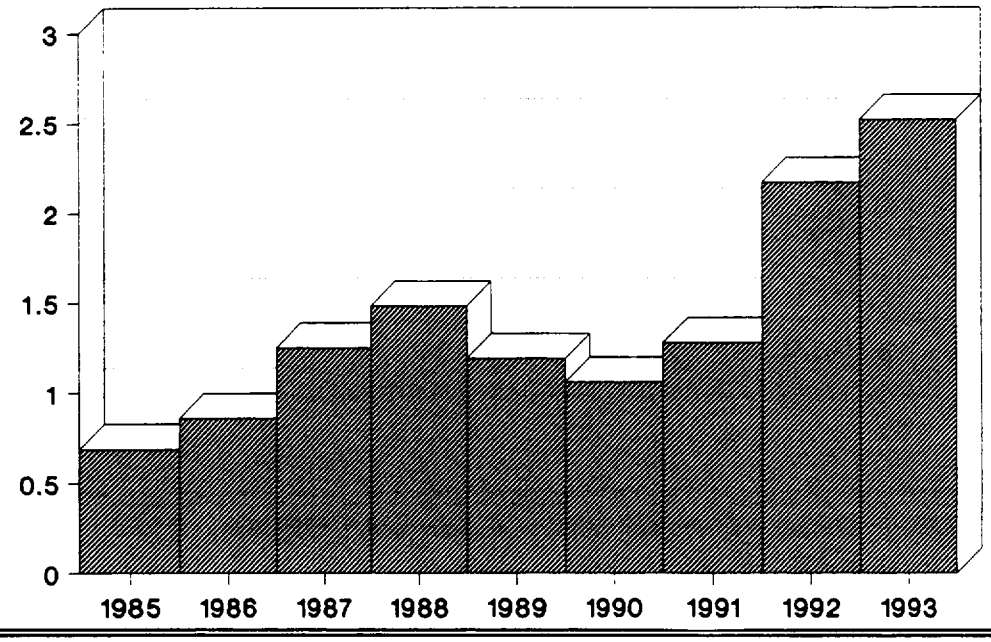
b/ All export and import figures from *FAO Production Yearbook, Forestry Products, 1982-1993*, Rome, 1995, p. 112.

c/ FAO estimate.

FURNITURE

Over 340,000 persons were engaged in furniture-making in 1993, representing a 15 per cent drop compared with the previous year. Altogether there are 8,014 enterprises making furniture, of which 467 are state-run. In addition 3,374 township-run enterprises and 12,086 village-run enterprises produce furniture. The value of furniture exports rose from $487.2 million in 1992 to $603 million in 1993.[111/]

Fig. III.K. Imports of sawnwood, 1985-1993
(Million cubic metres)



OTHER WOOD PRODUCTS

China accounts for 11 per cent of world production of wood-based panels, which include veneer sheets, plywood, particle board and fibreboard, both compressed and non-compressed. However it is a net importer of these products, with exports in 1993 at only 10 per cent of the level of imports (see Table III.60).

Table III.60. Output, exports and imports of wood-based panels, 1985-1993
(Thousand cubic metres)

Year	Output	Exports	Imports
1985	2,553	564	550
1986	2,835	513	589
1987	3,397	560	1,278
1988	3,821	515	1,336
1989	5,576	350	1,788
1990	4,690	261	2,296
1991	7,952	212	2,522
1992	12,786	303	3,834
1993	14,719	344	3,491

Source: *FAO Production Yearbook, Forestry Products 1982-1993*, Rome, 1995, pp. 146, 148.

While market demand for plywood stands at about 4 million cubic metres annually, 1 million of this has to be imported. Demand for plywood has increased in the 1990s following the start of construction of the Three Gorges project, the development of the Pudong area in Shanghai, the vogue for wooden furniture and the completion of various construction and real estate projects.

E. PULP AND PAPER

The resource base

Woodpulp is made up of mechanical, semi-chemical, chemical and dissolving woodpulp. China mainly produces mechanical and chemical woodpulp. Mechanical woodpulp is processed by grinding or milling whilst chemical woodpulp involves treatment with sulphate, soda or sulphite.

Recent trends

Domestic output of woodpulp has increased by 37.5 per cent since 1985. As this has not been able to match demand, there has been a concomitant rise in imports (see Table III.61). In 1993 the volume of imports was 38 per cent higher than in 1985. While in 1985 the volume of imports constituted 48 per cent of domestic output, by 1993 this had risen to 55 per cent.

Table III.61. Output, exports and imports of woodpulp, 1985-1993
(Thousand tonnes)

Year	Output	Exports	Imports
1985	1,773	56	858
1986	1,924	79	949
1987	1,956	65	1,099
1988	2,037	90	1,307
1989	2,077	76	1,049
1990	2,057	76	861
1991	2,102	74	1,340
1992	2,208	134	1,213
1993	2,439	95	1,186

Sources: *FAO Production Yearbook, Forest Products, 1982-1993*, FAO Forestry Series, No. 28, FAO Statistical Series, No. 122, Rome, 1995, pp. 223, 225, 227, 229, 231.

Mechanical woodpulp has fared similarly, with output increasing by 25 per cent between 1985 and 1993 but imports falling (see Table III.62). In 1985 imports of mechanical wood pulp were equivalent to 24 per cent of domestic output, but they were equivalent to only 15 per cent by 1993. Exports of this product are negligible.

Table III.62. Output, exports and imports of mechanical wood pulp, 1985-1994
(Thousand tonnes)

Year	Output	Imports	Exports
1985	401	96	..
1986	402	124	..
1987	384	68	..
1988	402	112	..
1989	406	65	..
1990	417	54	..
1991	410	93	..
1992	435	76	..
1993	500	75	1
1994	..	..	810[a/]

Sources: *FAO Production Yearbook, Forest Products, 1982-1993*, FAO Forestry Series, No. 28, FAO Statistical Series, No. 122, Rome, 1995, pp. 233-234.

a/ From *China's Customs Statistics*, 1994, 12, p. 26.

Chemical woodpulp production rose by 36 per cent between 1985 and 1993 (see Table III.63). Again China is a net importer of chemical woodpulp, with imports exceeding exports in 1993 by seventy times.

Table III.63. Output, exports and imports of chemical woodpulp, 1985-1993
(Thousand tonnes)

Year	Output	Exports	Imports
1985	1,200	56	700
1986	1,334	79	764
1987	1,329	65	973
1988	1,394	90	1,101
1989	1,417	76	829
1990	1,365	76	652
1991	1,389	74	1,064
1992	1,469	52	927
1993	1,635	13	910

Source: *FAO Production Yearbook, Forest Products, 1982-1993*, FAO Forestry Series, No. 28, FAO Statistical Series, No. 122, Rome, 1995, pp. 246-247, 251.

PAPER AND CARDBOARD

Recent trends

There are over 5,000 mills involved in paper and paperboard manufacture. Most are small-scale and geared toward local supply. The production of machine-made paper and paperboards has more than doubled in the decade since 1985 (see Table III.64). This has been matched by a 50 per cent increase in the number of persons engaged in papermaking and paper products. About 90 per cent of paper and paperboard production is of packaging products.

In 1993 1.2 million persons in 11,940 enterprises were employed in this sector. Only 1,662 enterprises are state-run. In the rural areas there are 5,520 township-run enterprises and 14.045 village-run enterprises engaged in this sector. The key provinces producing paper and paperboards are Shandong, Henan and Guangdong. China is not self-sufficient in paper and paperboard, with imports trebling between 1985 and 1993. Imports far outweigh exports. In 1993 there was a net trade deficit of 2 million tonnes for this product.

China produces and trades in a range of different paper types including newsprint, printing and writing paper and other types such as construction paper, household sanitary paper, wrapping and packaging paper (see Table III.65). It is a net importer of newsprint and since 1990 has become increasingly a net importer of printing and writing paper. Output of newsprint increased by 57 per cent between 1985 and 1993 whilst output of printing and writing paper doubled. While exports of printing and writing paper quadrupled between 1985 and 1993, imports rose almost seven times.

Table III.64. Output, exports and imports of machine-made paper and paperboard, 1985-1994
(Thousand tonnes)

Year	Output	Exports[b/]	Imports
1985	9,110	304	941
1986	9,990	386	1,354
1987	11,410	440	1,580
1988	12,700	485	1,169
1989	13,330	475	1,240
1990	13,720	777	1,433
1991	14,790	924	1,861
1992	17,250	949	2,821
1993	19,140	984	3,056
1994	21,380[a/]	..	3,180[c/]

Sources: *China Statistical Yearbook 1994*, p. 405.

a/ *China Statistical Yearbook 1995*, p. 409.

b/ Export and import figures from *FAO Production Yearbook, Forest Products, 1982-1993*, FAO Forestry Series, No. 28, FAO Statistical Series, No. 122, Rome, 1995, pp. 288, 293. FAO figures refer to "paper and paperboard".

c/ From *China's Customs Statistics*, 1994, 12, p. 26.

Fig. III.L. Exports and imports of paper and paperboard, 1985-1993
(Million tonnes)

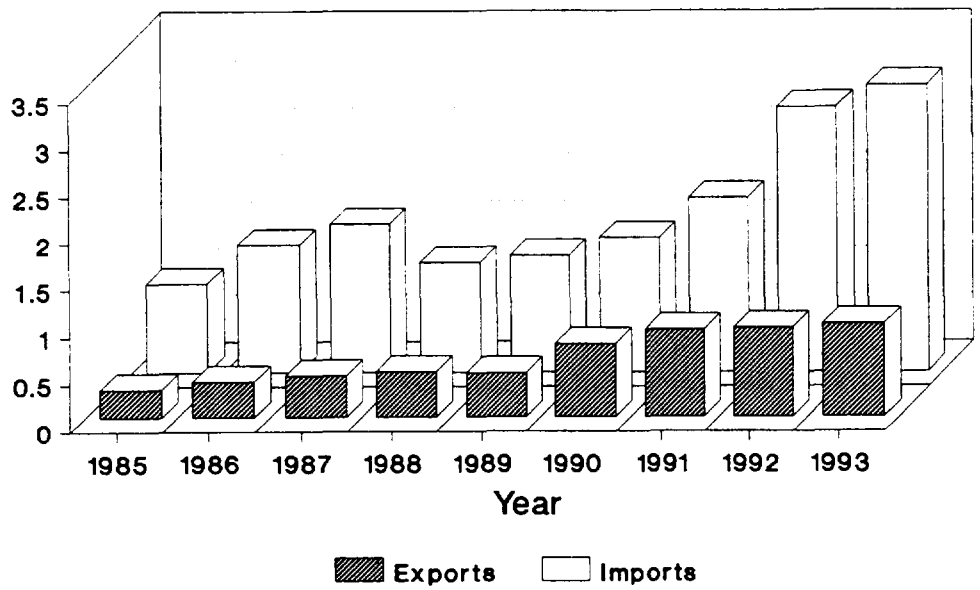


Table III. 65. Output, exports and imports by types of paper, 1989-1993
(Thousand tonnes)

Year	Newsprint			Printing and writing paper		
	Output	Exports	Imports	Output	Exports	Imports
1985	452	..	332	3,076	55	78
1986	456	..	190	3,455	65	73
1987	439	3	219	4,069	128	126
1988	443	4	220	4,462	123	145
1989	454	1	270	4,699	123	110
1990	475	1	243	4,984	93	168
1991	486	3	235	5,199	189	300
1992	590	5	243	5,531	196	525
1993	711	5	372	6,688	217	531

Source: *FAO Production Yearbook, Forest Products, 1982-1993*, FAO Forestry Series, No. 28, FAO Statistical Series, No. 122, Rome, 1995, pp. 308, 311, 316.

Output of other forms of paper, such as packaging and wrapping paper, is more impressive than that of newsprint or printing and writing paper (see Table III.66). Output doubled between 1985 and 1993.

Table III.66. Output of other paper and paperboard, 1985-1993
(Thousand tonnes)

1985	7,669
1986	8,690
1987	9,723
1988	10,795
1989	11,334
1990	11,869
1991	12,840
1992	13,808
1993	16,417[a/]

Source: *FAO Production Yearbook, Forest Products, 1982-1993*, FAO Forestry Series, No. 28, FAO Statistical Series, No. 122, Rome, 1995, p. 321.

a/ FAO estimate.

Constraints and prospects

Of the 210 major capital construction and technical renovation projects planned between 1993 and 2000 are three forestry projects. A project in Inner Mongolia aims to create an annual processing capacity of particle boards of 45,000 cubic metres. The second undertaking, in Sichuan, seeks to develop an annual processing capacity of 30,000 cubic metres of multi-density fibreboard. The third project in Guangdong province has as its goal the production of 50,000 tonnes of pulp per year and high grade art paper.[112/]

Demand for timber is likely to continue to exceed supply over the next decade, requiring imports to meet construction needs. As with agricultural land, timberland is endangered by the rapid pace of industrialization. Since 1995 all enterprises and units have been required to seek permission before using timberland for non-forestry purposes. According to the Ministry of Forestry around 440,000 hectares of timberland have been used for non-forestry purposes each year.[113/]

F. PETROLEUM REFINING[114/]

The resource base

China is estimated to have 80 billion tonnes of oil reserves and 51,000 billion cubic metres of natural gas reserves.[115/] China's oil industry first started to develop in the late 1950s and early 1960s with the discovery in north-eastern China of the Daqing oilfield in Heilongjiang, and subsequently of the oilfields of Shengli in Shandong and Liaohe in Shenyang. Oil output rose from 5.2 million tonnes in 1960 to over 30 million tonnes in 1970, and 105 million tonnes in 1980; more than 90 per cent of this oil came from the north-eastern oilfields. Increases in oil output from these major oilfields began to fall in the 1980s and production costs started to rise. The north-eastern oilfields remain important. Daqing produced 38 per cent of China's oil output in 1994, 21 per cent of oil was from Shengli, and 10 per cent from Liaohe. One region of particular promise is the Tarim basin in Xinjiang, where the China National Petroleum Corporation (CNPC)

has been exploring since 1985. Tarim is hoped to be producing 10 million tonnes of oil a year by 2000. The third round of bidding for oil exploration in this area was being conducted in 1995.[116/]

Table III.67. Production and trade in petroleum products, 1985-1994

Year	Production of crude oil (million tonnes)	Production of natural gas (million cubic metres)	Exports of petroleum and products (SITC 33) ($ million)	Imports of petroleum and products ($ million)
1985	124.9	12,930	6,301	46
1986	130.7	13.760	3,176	373
1987	134.1	13,890	4,008	397
1988	137.0	14,260	3,372	638
1989	137.6	15,049	3,581	1,465
1990	138.3	15,298	4,472	1,054
1991	141.0	16,073	3,908	1,846
1992	142.1	15,788	3,843	3,198
1993	145.2	16,765	3,226	5,413
1994	146.1	17,559	2,789	3,595

Sources: *China Statistical Yearbook 1995* for oil and gas production statistics; UN, *International Trade Statistics Yearbooks 1988, 1989, 1995* for import and export statistics.

The growth in oil production has failed to meet growth in demand. China has been an oil exporter since the 1960s but became a net oil importer for the first time in 1993 (see Table III.67), and had become a net importer of refined products in 1992. China invited foreign participation in offshore oil exploration in the 1980s in an attempt to increase oil supplies. Offshore oil (and gas) deposits have been found in the South China Sea, and oil has also been found in the Bohai Gulf (just east of Tianjin). In 1993 offshore petroleum production was about 4.6 million tonnes, 5 per cent of China's total oil output, and was expected to peak in 1997 at 12 million tonnes (and 4 billion cubic metres of natural gas).

At present, domestic crude oil makes up 90 per cent of refinery feedstocks. Chinese crude is paraffin-based with a low to medium sulphur content.[117/]

CRUDE OIL

Recent trends

The slow growth of oil production during the past decade is clear from Table III.67. 1994 crude oil output was only 17 per cent higher than in 1985. State-determined domestic oil prices have been set below world levels, encouraging excessive consumption and discouraging investment, and there has been some reluctance to allow foreign investment into promising onshore areas.

Import restrictions were imposed on oil in 1994 on a temporary basis. The industry was placed under greater central control and domestic prices were raised.

The China National Petroleum Corporation (CNPC) is the major producer of crude oil, generating 97 per cent of the country's output of crude in 1992. A total of 1.17 million people were employed in petroleum and natural gas extraction in 1994.

Foreign participation in the industry was initially limited to offshore areas. Foreign firms were required to cooperate with the China National Offshore Oil Corporation (CNOOC). During the period 1982-1993 foreign firms spent $3 billion on offshore exploration and $1 billion on offshore development. Offshore oil fields are operated in the South China Sea by Agip, Chevron and Texaco, and CNOOC has wells of its own in the Bohai Gulf.

Onshore oil exploration by foreign companies is now permitted. AMOCO in 1992 became the first foreign company to win the right to produce onshore, with a contract for the Fuyang field in Anhui province. In 1985 11 provinces and regions were opened up to foreign exploration in the south of China, and in 1993 CNPC opened another ten regions, including the Tarim basin in Xinjiang. Foreign companies working with CNPC are expected to bear all exploration costs, while any finds are jointly developed and their proceeds shared. The gains to foreign oil companies from their exploration activities so far, particularly those onshore, have been modest. Natural gas investment appears to have been more profitable for foreign companies, and a joint venture between Arco, the China National Oil Corporation and the Kuwait Foreign Petroleum Exploration Company was in trial production near Hainan island off the coast of Guangdong in 1995.[118/] Liquid natural gas has widely displaced kerosene as a household fuel in cities in the south.

Constraints and prospects

Demand for oil is likely to continue to run ahead of domestic production. Imports of crude oil are likely to rise and exports to fall. Domestic production costs have been rising and there is considerable excess labour in the state-run oil industry. Production is likely to continue to be mainly from onshore deposits. The government has expanded the number of areas in which foreigners can explore, and foreign participation will be important both as a source of investment for exploration and development and as a source of technology to reduce production costs. The climate for foreign investment in oil exploration and development is closely linked with opportunities for investment in downstream activities in refining and distribution within the domestic market. In 1995 China cut the royalty rates on onshore oil in order to encourage foreign involvement in oil exploration in remote regions such as Xinjiang.[119/]

PETROLEUM PRODUCTS

Recent trends

Some $7.5 billion was invested in refining in the five years to 1994, but the increases in refining capacity have not kept up with demand, which in 1993 alone rose by 14 per cent.[120/] China is a substantial net importer of refined petroleum: imports were worth $1,956 million in 1994 compared with exports of $621 million.

The China National Petrochemical Corporation (SINOPEC), set up in 1983, is the dominant organization in refining as well as in petrochemicals. In 1993 SINOPEC accounted for 88 per cent of China's refined oil production. SINOPEC's refineries are located near China's main oilfields

in the north-east, and were set up to process Chinese domestic crude, which is high in paraffin and low in sulphur.[121/]

Since domestic crude oil production has increased little in the past decade, China needs to import increasing quantities of crude. The most likely source of imports is the Middle East, and Chinese refineries will need adaptation to handle the Middle East's higher sulphur crudes. Growth in the consumption of petroleum has been greatest in the south of China, furthest from the country's refining capacity, which has put strains on the transport system and has generated shortages. Until the government imposed controls in May 1994, traders were buying both crude and refined products at low state prices and diverting them to the free market.

About three-quarters of planned increased refinery capacity in the mid-1990s is to be located in the south, near to both main areas of demand growth and to crude supplies from the Middle East.

Foreign investment has been allowed in petroleum refining since 1991. China's first foreign refinery project was at Dalian in Liaoning province, a joint venture involving the Total company of France. SINOPEC was reported to have negotiated 63 joint-venture agreements in refining (and petrochemicals) involving a total of $200 million utilized by the end of 1993.[122/]

While fuel oil and diesel distribution has been tightly controlled, natural gas distribution has been an area where foreign participation has been given easier access. Aviation fuel is also an area where demand growth is outstripping supply, and in 1994 foreign firms were invited to upgrade China's aviation fuel distribution system.

Constraints and prospects

Like crude oil production, China's refining capacity has not been able to match the country's growth in demand. Increased capacity is planned, but rapid economic growth and the expansion of motor vehicle usage in China means that substantial imports of crude and refined products are likely to continue. Foreign investment will be important in providing both capital and technology to increase refining capacity. While much interest has been shown by foreign companies, their experience has been frustrating, particularly with regard to domestic market sales despite buoyant domestic demand. Refinery prices have been tightly controlled since the 1994 clampdown, and access to downstream domestic marketing of petroleum products is strictly limited. Elf Aquitaine in October 1995 pulled out of a $2.5 billion project to build a refinery in Shanghai, apparently because it could not see how or when the refinery could become profitable.[123/] Shell's $6 billion project to build a refinery in Guangdong was, in 1995, still awaiting State Council approval. The agreement for the Total refinery at Dalian involved the foreign partner accepting a largely export-oriented marketing deal.

G. PETROCHEMICALS[124/]

The resource base

The production of petrochemicals depends vitally on the supplies of crude oil for feedstocks and on natural gas. China has been producing its own crude oil since the 1960s, and until 1993 was a net exporter of petroleum products. China was still a net exporter of crude in 1994, but crude production has grown only slowly since the early 1980s.

Recent trends

The petrochemical industry developed during the 1960s and 1970s, following the discovery of oil at Daqing in north-eastern China in 1959. China's first petrochemical plant started operation in Lanzhou in 1962, and other plants were built using domestic technology in the 1960s. The industry initially developed in isolation, using domestic technology and feedstocks. The introduction of overseas technology in the 1970s saw further expansions in capacity, with the importation of plant to produce ethylene, synthetic fibre, synthetic ammonia and urea.

The China National Petrochemical Corporation (SINOPEC), which is responsible for the development of the industry including petroleum refining, was formed in 1983. Over the past decade SINOPEC has installed four 300,000-tonne ethylene plants, three chemical fertilizer and two chemical fibre facilities, and has opened large refineries at Luoyang, Shijiazhuang and Fujian. SINOPEC in 1994 had 865,000 employees, making it one of the world's largest corporations.

One indication of the development of a country's petrochemical industry is its output of ethylene, a major raw material for the production of plastics. Ethylene output rose threefold from 1985 to 1992, reaching 2 million tonnes a year, and 2.19 million tonnes in 1994 (see Table III.68). This made China the tenth largest producer of ethylene in the world economy, although this represented only 3 per cent of world output. The largest producers are the USA and Japan. This relatively small share of world ethylene capacity is mirrored by a low share in the world capacity of plastics (3 per cent), synthetic fibres (8.6 per cent) and synthetic rubber (3.6 per cent).[125/]

SINOPEC accounts for about 90 per cent of the manufacture and sale of petroleum and petrochemicals in China, and in 1993 it had 93 per cent of China's ethylene capacity. In addition to its ethylene facilities, SINOPEC operated:[126/]

- four chemical fibre production plants in Shanghai, Liaoning, Tianjin and Sichuan, which produced 1.1 million tonnes of synthetic fibre monomers, 570,000 tonnes of polymers for synthetic fibre and 450,000 tonnes of synthetic fibre;
- synthetic rubber plants in Shandong, Beijing, and Lanzhou, accounting for most of SINOPEC's output of 300,000 tonnes, which was 77 per cent of the 1993 national total;
- organic chemical production facilities producing 3 million tonnes of chemicals in 1993;
- chemical fertilizer plants producing 3.2 tonnes of synthetic ammonia and 4.79 tonnes of urea.

In the Seventh and Eighth Five-Year Plans (1986-1990 and 1991-1995), rapid growth of petrochemical capacity was planned. In the Seventh Plan, output growth of 7.5 per cent a year was planned in chemicals, with particular stress on petrochemicals. Additional ethylene capacity of 1.28 million tonnes was completed. During the Eighth Plan seven new ethylene plants were authorized; originally the total was to be 15, but a number of smaller projects were frozen as part of austerity measures in the early 1990s. The plan envisaged construction of new petrochemical complexes to provide inputs for industries such as fertilizers, agricultural chemicals and plastics. In 1993 petrochemicals were designated a key industry comparable with machinery, electronics and automobiles. In 1994 most large petrochemical enterprises achieved sales growth of around 40 per cent.

Table III.68. Production and trade in petrochemicals, 1994
(Thousand tonnes)

	Production	Imports	Exports	Apparent demand
Ethylene	2,190	..	..	2,190
Benzene	860	..	..	860
Butonal	70	..	..	70
Octonal	140	..	..	140
Ethylene glycol	450	130	..	580
Acetic acid	390	..	..	390
Polyethylene	1,190	1,340	..	2,530
Polypropylene	860	810	..	1,670
Polyvinyl chloride	1,150	490	110	1,530
Polystyrene	180	1,080	..	1,260
Acrylonitrile butadiene styrene	70	700	..	770
Synthetic rubber	430	250	..	680

Source: Adapted from Takeda, M., "China's Petrochemical Industry", *JETRO China Newsletter*, July-August, 1995, p.18.

China's new industrial policy, announced in outline in March 1994, aimed to improve international industrial competitiveness and included goals for increases in capacity for crude oil refining of 5 million tonnes a year, 70,000-100,000 tonnes a year for polypropylene, and 100,000 tonnes a year for ethylene.

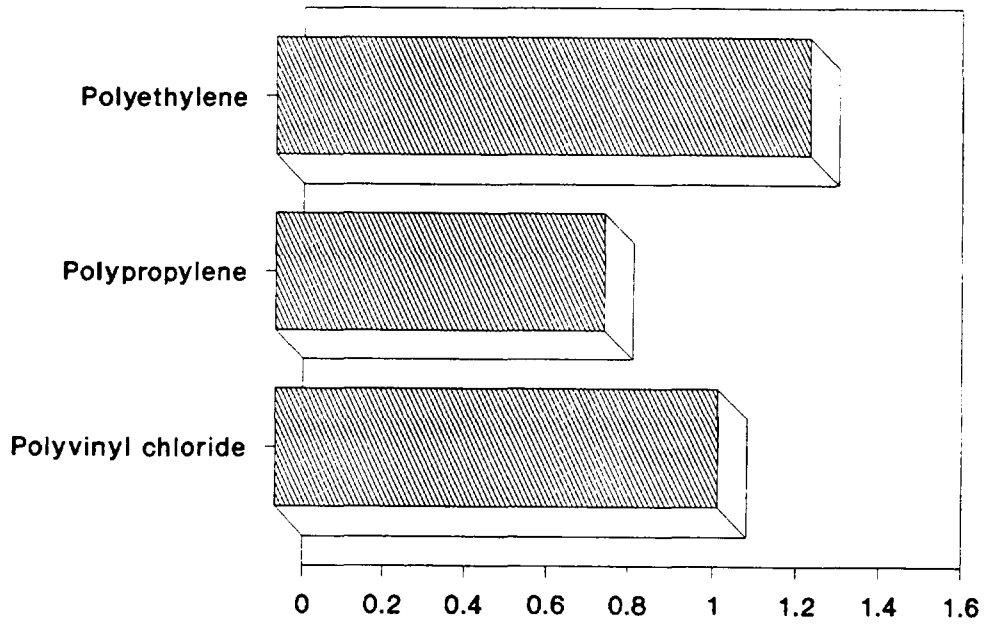
Under the Ninth Five-Year Plan (1996-2000), the minister of the Chemical Industry has announced plans for seven large projects, including petrochemical complexes. Targets for 2000 included the establishment of 100 export-oriented chemical groups, again including petrochemicals. SINOPEC itself announced plans in September 1994 to increase annual processing capacity of crude oil to 200 million tonnes by 2000 and 300 million tonnes by 2010. It also plans to increase ethylene capacity to 5 million tonnes and then to 8 million tonnes over the same period.

Economic reform in the petroleum industry has affected the profitability of petrochemical production and has put pressure on SINOPEC to improve efficiency. Prices of petroleum, which used to be set below world prices, were raised to near the international level in 1994, and tariffs on petrochemical imports are gradually being lowered as part of China's preparation for World Trade Organization membership.

Foreign investment in petrochemicals increased rapidly in the early 1990s. Although many companies have started with relatively small operations, such as investments in petrochemical-using industries such as pharmaceuticals and agrochemicals, larger-scale investments are now taking place. The German companies Hoechst and Bayer, Rhône-Poulenc from France and the US firm Du Pont all signed agreements in 1992 and 1993 to lay the groundwork for investment. For example, Hoechst has a comprehensive cooperation agreement with the Ministry of Chemical Industry relating to the production of acetic acid, engineering plastics, herbicides, polyester fibre and other products. Hoechst also has joint ventures, including polyester non-woven fabric and pharmaceuticals production in Shanghai. ICI from the UK has joint ventures including polyester fibre production in Yizheng and polyurethane blends in Shanghai. Other companies with joint ventures in petrochemicals include Total (in connection with its Dalian oil refinery project), Shell

(in connection with its proposed Huizhou refinery in Guangdong), Elf Aquitaine, Dow Chemicals from the USA and Du Pont.[127/] Du Pont in June 1995 signed a letter of intent to establish a $100 million plant to produce polyformaldehyde, a synthetically engineered plastic resistant to abrasion which is used in industries such as machinery manufacture and motor vehicle production.[128/]

Fig. III.M. Imports of selected petrochemicals, 1994
(Million tonnes)



Constraints and prospects

China is still a small producer of petrochemical products by world standards. The country's industrial growth in the 1990s will require increasing quantities of petrochemicals. These will be required to produce plastics for major export industries such as toys and shoes. Synthetic fibres will be needed by the textile and garment industries, particularly if domestic cotton production stagnates. Expansion of the automotive industry will require many plastics, including synthetic rubber, and there will be a continuing demand from agriculture for chemical fertilizer. China is making vigorous plans to develop petrochemical production and to encourage inward foreign investment. At present China's petrochemical industry, long shielded from foreign competition by import tariffs and artificially low petroleum prices, faces pressure to become more efficient, and there is a substantial influx of foreign capital and technology. However, despite plans for expansion in the petrochemical sector, if the economy continues to grow by nearly 10 per cent a year it is likely that domestic demand growth will outstrip supply, leading to growing imports, including imports of crude oil.

H. FERTILIZERS

Recent trends

The development of the fertilizer industry is closely linked to the government's desire to increase agricultural output. During the readjustment years of 1963-1965 the chemical fertilizer industry experienced rapid growth, with production in 1965 reaching nine times the level of 1957.[129/] In the early 1970s chemical fertilizer plants and equipment were imported to expand output, including 13 large urea plants from European, Japanese and US companies.[130/] By 1979 the application of fertilizers had increased substantially. Between 1979 and 1983 output of chemical fertilizer increased by 13.6 per cent annually in the effort to raise crop yields.

In 1994 there were 1,565 factories producing chemical fertilizers, making China the largest producer in the world.[131/] China accounts for 19 per cent of world production of natural phosphates but still has to import to satisfy most of its needs (see Table III.69).

In the first half of 1995 supply fell short of demand by about 10 million tonnes according to the Ministry of Agriculture. However, without an adequate supply of chemical fertilizers grain output increases are difficult to maintain. According to some estimates chemical fertilizers account for 40 per cent of grain output increases.

Table III.69. Output, exports and imports of natural phosphates, 1985-1993
(Thousand tonnes)

	Output	Exports	Imports
1985	6,970	-	595[a/]
1986	9,790	9	583
1987	15,165	110	554
1988	18,237	158	563
1989	17,000[a/]	194	602
1990	17,300[a/]	345	624
1991	21,000[a/]	534	703
1992	23,196[a/]	319	1,046[a/]
1993	23,500	574	807[a/]

Source: *FAO Production Yearbook, Fertilizers, 1994*, Vol. 44, Rome, 1995, pp. 11, 13.

a/ FAO unofficial figure.[132/]

In order to encourage the production of chemical fertilizers the government has granted preferential policies to this sector. These include:

- provision of $1.1 billion in working capital loans to support small urea and phosphate-ammonium production plants;

- continued exemption from value-added tax;
- low electricity prices;
- guaranteed supplies of coal, phosphate and natural gas;
- a ceiling price for urea;
- and a special allocation of funds to create a reserve of chemical fertilizers.[133/]

NITROGEN AND PHOSPHATES

Recent trends

Production of nitrogenous fertilizers has increased by 33 per cent since 1985 whilst phosphate production has more than doubled over the past decade (see Table III.70). Provinces producing over 1 million tonnes of nitrogenous fertilizers per year include Henan, Sichuan, Shandong, Hebei and Jiangsu. Leading manufacturers of phosphate fertilizers are Sichuan, Hubei, Yunnan and Jiangsu provinces.

Table III.70. Output of chemical fertilizers including nitrogenous and phosphate, 1985-1994
(Million tonnes)

Year	Chemical fertilizers	of which: Nitrogenous	Phosphate
1985	13.22	11.43	1.76
1986	13.59	11.59	2.34
1987	16.72	13.42	3.25
1988	17.40	13.65	3.69
1989	18.02	14.24	3.72
1990	18.79	14.63	4.11
1991	19.79	15.10	4.59
1992	20.47	15.70	4.62
1993	19.56	15.25	4.19
1994	22.72	17.36	5.04

Source: *China Statistical Yearbook 1995*, p. 414.

China is a net importer of nitrogenous fertilizers but a net exporter of phosphate fertilizers (see Table III.71). In 1993 imports of nitrogenous fertilizers were equivalent to 21 per cent of domestic output.

Table III.71. Exports and imports of chemical nitrogenous and phosphate fertilizers, 1985-1993
(Thousand tonnes)

	Nitrogenous fertilizers		Phosphate fertilizers	
Year	Exports	Imports[a/]	Exports	Imports
1985	2.0[b/]	3,870	12.0[b/]	6.3
1986	5.8[b/]	3,010	14.8[b/]	5.0
1987	9.8	5,610	32.0	2.5
1988	14.0[b/]	8,560	43.6[b/]	1.5
1989	5.3[b/]	..	14.0[b/]	6.6
1990	18.0[b/]	8,630	70.1[b/]	7.7
1991	25.4[b/]	7,700	57.7[b/]	7.4
1992	10.0[b/]	8,440	40.0[b/]	9.1
1993	25.0	4,100	97.0[b/]	9.1

Source: *FAO Production Yearbook, Fertilizers, 1994*, Vol. 44, Rome, 1995, pp. 43, 71, 77.

a/ Import figures for chemical nitrogenous fertilizers from UN, *International Trade Statistics Yearbook*, various issues.

b/ FAO unofficial figure.

POTASH

Recent trends

Potash production has more than doubled since 1985 (see Table III.72). Shandong province is the main producer of potash, accounting for 20 per cent of total production in 1993. However supply cannot meet demand, and according to some estimates about 95 per cent of consumption needs are met through imports. Despite increases in the production of potash, China has increasingly had to import potassic fertilizers to meet its needs (see Table III.72). Moreover, between 400,000 and 600,000 tonnes of potassium sulphate are imported every year for potash fertilizer production. Wenzhou Chemical Factory in Zhejiang province has adopted new technology to produce potash fertilizer, becoming one of the few enterprises in the world to use alunite high-efficiency purification technology to produce potassium sulphate.[134/]

Constraints and prospects

Domestic production of chemical fertilizers can only meet 85 per cent of current demand. The gap is being filled by imports, particularly of high-quality chemical fertilizers. In order to boost production the government has included two phosphate-producing fertilizer factories in Hebei and Guizhou provinces in the 210 major capital construction and technical renovation projects for 1993-2000.

Some of the key obstacles facing the development of chemical fertilizer production are shortages of raw materials, inefficient management structures and a poor distribution system.[135/] As nitrogen-based fertilizers in China are mainly dependent on coal and oil feedstocks, the

development of these products will in turn be limited by the performance of the coal and oil sectors. Technological upgrading is needed to take full advantage of China's phosphate reserves.

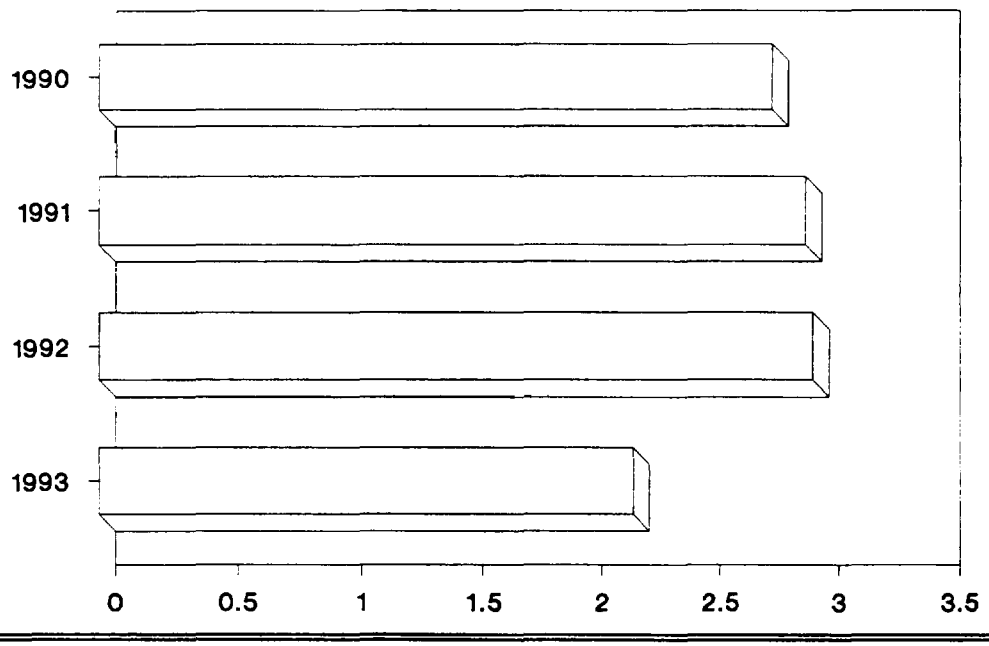
Table III.72. Output of potash and imports of chemical potassic fertilizers, 1985-1994
(Million tonnes)

Year	Potash production	Imports of potassic fertilizers
1985	2.01	..
1986	2.14	..
1987	2.36	..
1988	2.60	..
1989	3.04	..
1990	3.79	2.79a/
1991	3.93	2.93
1992	4.55	2.96
1993	5.34	2.29
1994	5.81	..

Source: *China Statistical Yearbook 1995,* p. 413.

a/ Figures for imports of potassic fertilizers from UN, *International Trade Statistics Yearbook 1993,* Vol. 1, New York, 1995, p. 182.; 1985-1989 figures as well as export figures for this product are not cited in this series.

Fig. III.N. Imports of chemical potassic fertilizers, 1990-1993
(Million tonnes)



I. PHARMACEUTICALS

The resource base

There are 4,198 enterprises engaged in making medical and pharmaceutical products, of which 1,846 are state-run. There are also 938 township-run and 912 village-run enterprises in this sector. Pharmaceuticals account for 50 per cent of all current and planned healthcare expenditure and make up the largest single share of medical spending. Since 1980 more than 1,000 pharmaceutical joint ventures have been set up throughout China, with total foreign investment of $1 billion.[136/]

Recent trends

China is self-sufficient in most pharmaceuticals including antibiotics, analgesics, cardiovascular and other medicines. However the technological production level in this industry is about ten years behind the latest Western developments. China thus has to rely on imports for drugs. Foreign companies have also begun to enter this field but government restrictions on the production and import of drugs, except for new high-tech drugs, has limited development.

Over the last decade the industry has been developing rapidly and pharmaceutical companies have been able to compete in the world market. In order to foster the development of this industry the government introduced a three-step plan at the end of the 1970s. By 1988 China had already achieved the quadrupling of output value which was targeted for 1990. The goals set for the end of the century focus on upgrading product quality, developing new varieties of medicines and equipment and gradually meeting international standards. In the first half of the next decade China plans to develop a modern pharmaceutical industrial base using the latest technology.

BULK DRUGS

Of the 210 major capital construction and technical renovation projects planned between 1993 and 2000, the government has earmarked seven pharmaceutical factories to expand production of penicillin, aspirins and amino-acid infusion.[137/]

Vitamin C production has been dominated by domestic producers because of governmental restrictions on foreign investment in this subsector. In 1993 China produced 12,000 tonnes of vitamin C, of which five-sixths was sold abroad. China took 17 per cent of the world market that year. There are 16 companies producing vitamin C. These will merge over the next five years into five or six groups, each carrying out production, research and distribution.[138/]

Antibiotics account for 15 per cent, the largest share, of total pharmaceutical production in China. While there may be temporary shortages of some antibiotics, China is basically self-sufficient. This has been achieved through the expansion of antibiotics production facilities during the Seventh Five-Year Plan. During that period factories such as the Shanghai No. 3 Factory were expanded and upgraded. With regard to the latest drugs, such as third and fourth-generation cephalosporins and new forms of penicillin, China is reliant on imports.

Imports of all pharmaceutical products are limited by central government control over import licences. The Medical and Health Products Import/Export Corporation has a virtual monopoly over imports and approved imports carry a 30 per cent duty.[139/] Approval depends on whether there are sufficient domestic alternatives and whether the drug is to be used for a priority disease.

Formulations

The potential for over-the-counter drugs in China is enormous. According to a survey carried out in the summer of 1993, 90 per cent of urban consumers interviewed said they had used medication for colds over the previous six months and half said they had taken painkillers.[140/] Although all drugs, apart from herbal preparations, require a doctor's prescription, unofficially there has been an expanding over-the-counter market. Decentralization has weakened the ability of the State Pharmaceutical Adminstration to control and monitor distribution of drugs. As the over-the-counter sector is unofficial, no figures exist pointing to its relative size or importance. While imports are also severely limited, illegal imports from Hong Kong are in evidence in hospitals and drugstores.

Joint-venture activity in pharmaceuticals is restricted by government requirements that any production or importing in this area should only be in the field of new high-tech drugs. China is self-sufficient in low-cost and well-established drugs such as over-the-counter formulations and the government clearly wishes to limit foreign activity in this area. However, some foreign companies have managed to steer their way into the market by promises of future high-tech products and have won government approval for the production and import of over-the-counter products.[141/]

According to a survey of three cities in the summer of 1993 carried out by a Hong Kong-based consultancy company, joint-venture products account for up to 20 per cent of gastrointestinal and cough and cold remedy sales in value terms, and about 5 per cent of painkiller sales. For some formulations one or two joint ventures dominate the foreign drugs market in China. For example, SmithKline Beecham's cold medicine, Contac, which is produced in the Tianjin joint venture, is the only foreign cough and cold remedy. Similarly Bristol-Myers Squibb leads the multivitamin market with its joint-venture product Theragran. The Xian-Janssen Pharmaceuticals joint venture has become well known throughout China with its deworming agent. Other foreign pharmaceutical companies with joint ventures in China include Abbott International Ltd producing diagnostic reagents in Shanghai and Ningbo; Capsugel, producing hard gelatin capsules in Suzhou; ICN Pharmaceuticals Inc, producing ribavirin, an anti-hepatitis drug; Pfizer International Inc, producing antibiotics in Tianjin; and Squibb Pharmaceuticals, producing antibiotics, vitamins and dermatological medicines in Shanghai.

INDIGENOUS MEDICINAL PRODUCTS

Recent trends

Production of Chinese medicines has more than doubled since 1985 (see Table III.73). Sichuan and Guangdong are lead producers in this field, accounting together for 35 per cent of total production in 1994. There are currently over 1,000 traditional Chinese medicine producers.[142/] Medicinal materials as well as medicinal and pharmaceutical products are exported. Between 1992 and 1993 the amount of medicinal materials exported rose from 111,233 tonnes to 121,674 tonnes, an increase of 9 per cent. Whilst figures on the volume of Chinese medicines exported are not available, in 1993 they accounted for 13 per cent of the value of total medicinal and pharmaceutical products exported.[143/]

Table III.73. Output of Chinese medicines, 1985-1994
(Tonnes)

Year	Output
1985	17.5
1986	20.7
1987	24.2
1988	27.5
1989	22.6
1990	22.6
1991	26.9
1992	32.2
1993	36.2
1994	37.9

Source: *China Statistical Yearbook 1995*, p. 411.

In order to expand its exports of traditional medicines the State Administration of Traditional Chinese Medicine is encouraging overseas producers to invest in the sector. Particularly sought after is advanced technology for the production of injections, the decoction of herbs, capsules and pills. However foreign companies are not permitted to produce medicines from rare species of wild materials or to form joint ventures with Chinese partners with confidential prescriptions. Although the adminstration is encouraging joint ventures, wholly-owned foreign enterprises are still not welcome in this sector.

Constraints and prospects

The complicated distribution system as well as unfamiliarity with foreign brand names are important constraints on the entry of foreign producers into this market. Due to differing sales strategies and the distribution system, pharmaceutical products are often used in the locality of production. As a result some products are known in the south but not in the north or in some major cities and not others. In order to cultivate demand for their products foreign drug companies advertise on Chinese television and in newspapers, visit hospitals and sponsor health campaigns. As foreign products are perceived to be of higher quality and efficacy, the potential market for foreign pharmaceutical manufacturers is great, despite the higher price.

The technical level of the domestic pharmaceutical industry lags behind that of developed countries and few domestically researched drugs have been granted patents abroad. Further progress in this sector will require greater government investment and technology transfer from overseas. Similarly, if the traditional Chinese medicines market is to take off, technological upgrading, market research and the expansion of marketing channels are all required.

J. NON-METALLIC MINERAL PRODUCTS[144/]

ASBESTOS

The resource base

Reserves figures are not available for any major producer except Canada, but the US Bureau of Mines estimates that China's reserves of asbestos are "large". China in 1994 accounted for nearly 9 per cent of world mine production of asbestos. Asbestos is found in Liaoning, Qinghai and Sichuan provinces.

Recent trends

China's output of asbestos in 1994 was approximately 240,000 tonnes, a rise from the 160,000 tonnes production recorded in the late 1980s (see Table III.74), although these production figures are approximate and do not necessarily indicate the magnitude of the production increase. Exports in the 1980s were a minimal proportion of output. China's exports in 1993 of crude asbestos (SITC 2784) were a mere 0.02 per cent of the world total.

Constraints and prospects

Prospects for significant sales of asbestos in the world market have been damaged by worries about the health risks of asbestos's use as a building material, although there are some prospects for the material as a constituent of high strength asphalt paving material and in lightweight plastics as a reinforcing agent.[145/]

Table III.74. Production of asbestos, 1985-1994, selected years
(Thousand tonnes)

1985	1986	1987	1988	1989	1990	1993	1994
150	150	150	..	160	160	240	240

Sources: British Geological Survey, *World Mineral Production, 1983-1987*, Nottingham, 1987, for 1985-1987; 1990-1991 from P. Crowson, *Minerals Handbook, 1992-93*, London, 1992; 1993-1994 figures are US Bureau of Mines estimates.

CEMENT

The resource base

China has the non-metallic minerals such as limestone and gypsum required for the production of cement.

Recent trends

In 1994 China produced over 20 per cent of world cement output[146/], and it has been the world's largest producer for a decade. Cement output has risen sixfold since the start of the 1978 economic reforms, and doubled between 1990 and 1994 (see Table III.75). Only about 1 per cent of 1994 output was exported, the low figure presumably resulting from high transport costs. These exports represented a world market share for China of 3.3 per cent in 1993.

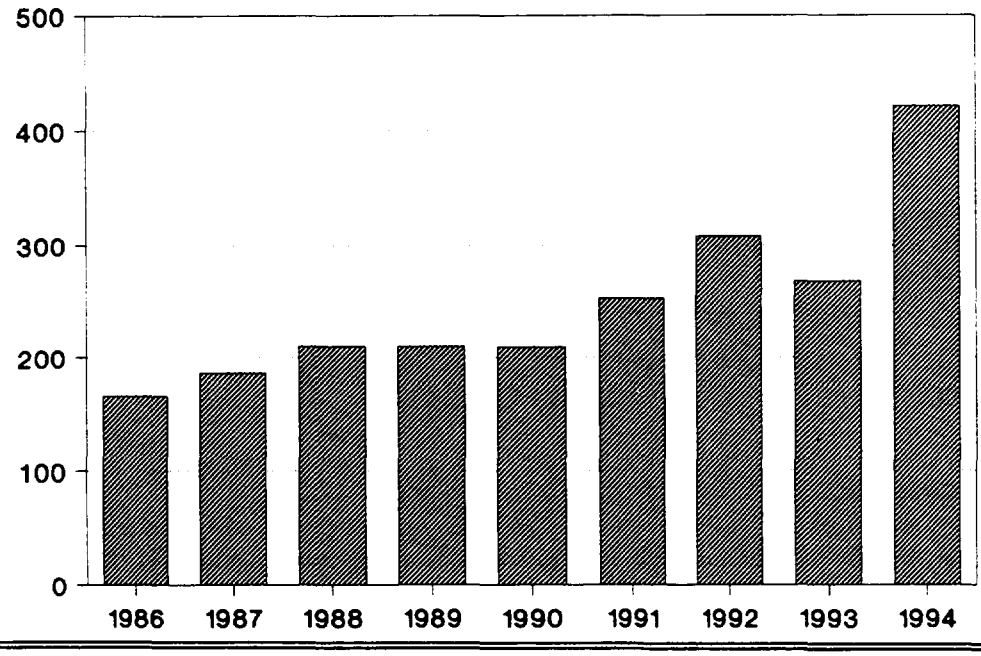
Table III.75. Production of cement, 1985-1994
(Million tonnes)

1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
145.9	166.1	186.2	210.1	210.3	209.7	252.6	308.2	367.9	421.2

Source: *China Statistical Yearbook 1995.*

China has 7,700 cement plants, most of which are of the vertical kiln type. These have low investment costs but are also less efficient and produce poor quality output compared with rotary kilns. There are 195 medium-sized cement plants (with 220,000 tonnes annual production) and 65 large cement plants (with annual production in excess of 5,000 tonnes). Of the medium-sized and large plants, about 100 employ rotary kiln technology. In 1991, state-owned enterprises produced 65 per cent of China's output of cement, and collective enterprises produced 35 per cent.[147/]

Fig. III.O. Production of cement, 1986-1994
(Million tonnes)



Loans from the World Bank, the Asian Development Bank and other overseas sources have been used for investment in 20 cement industry projects, generating 17.7 million tonnes of extra capacity with $1.2 billion of foreign capital. China has been purchasing modern cement-making equipment from Germany, Japan, Denmark, France and the USA, and has welcomed foreign investment into the industry. There were 190 Sino-foreign joint ventures in cement as of 1995, including companies from Japan and the Republic of Korea in Dalian, Nanjing and Shandong.[148/] Foreign investors also include New Zealand's largest cement manufacturer, Milburn, which has taken a share in one of China's largest cement plants, at Suzhou.[149/]

Constraints and prospects

The major constraints are transport problems and the uneven distribution of limestone. Apart from the coastal area of the Liaodong Peninsula, the coastal region from Qingdao in Shandong in the north to Guangxi in the south contains few limestone resources. Transportation of cement and raw materials for cement production is predominantly by rail and puts strains on the nation's transport. There are also some quality problems affecting the three-quarters of China's cement output which is produced by small and medium-sized enterprises. Such cement is generally not suitable for major projects such as expressways, dams and high-rise buildings.[150/] China's use of foreign investment and import of equipment will, however, raise the share of high-grade cement.

Exports currently represent only 1 per cent of output, but attempts are being made to develop bulk export facilities in Dalian, Yingkou, Tangshan, Lianyungang, Nantong, Ningbo, Fangcheng, Xiamen and Guangzhou. Exports are expected to have reached 6.6 million tonnes in 1995.[151/]

Cement production has expanded enormously during the 1990s, and will continue to be in heavy demand because of the boom in residential and industrial construction and China's major construction projects during the Ninth Five-Year Plan to 2000. During 1996-2000 demand for cement is expected to grow at 8-10 per cent annually in line with GDP growth, which is somewhat below the growth rate of the early 1990s. Annual production is expected to reach 650 million tonnes by 2010[152/].

BRICKS[153/]

The resource base

China has adequate clay resources for brick-making. However, the energy requirements for brick production are high. In 1990 and 1991 the production of every 10,000 bricks required 0.7 tonnes of coal and 150-250 kWh of electrical power.

Recent trends

The brick industry has developed quickly in recent years. There are 120,000 enterprises making bricks (and tiles), mostly seasonally operated. The average cost of production per 10,000 bricks was Rmb 400-600, and the selling price was Rmb 600-800.

Total brick production in 1990 was 448.5 billion bricks, of which 31 billion were produced by state enterprises, 402 billion by collective enterprises and 14 billion by other types of enterprise. By 1991 production had risen to 456 billion, of which 91 per cent was produced by collectives. In 1991 China also produced 49.4 billion tiles, of which 94 per cent were produced by collective enterprises.

Constraints and prospects

Brick production is to some extent constrained by its high energy requirements. Also, much farm land has been destroyed because of brick production. The government is trying to accelerate the development of alternative wall materials, but bricks will be a major material for building for a long time to come.

GYPSUM

The resource base

China in 1994 was the world's largest producer of gypsum after the USA. According to the US Bureau of Mines, data on gypsum reserves are not available for any major producers except the USA and Canada, although the bureau estimates that reserves are "large" for the main producing countries. The provinces with the richest gypsum reserves are Hubei, Shandong, Jiangsu, Ningxia, Shanxi, Shaanxi, Hunan, Gansu, and Anhui. Tibet also has large gypsum reserves. The largest producing province is Hubei, with the best known mine at Yingcheng.[154/]

Recent trends

Gypsum output increased two and a half times from the early 1980s to the early 1990s,[155/] due to the growth in demand from the cement industry (see Table III.76). Exports are minimal as a proportion of output.

Table III.76. Production of gypsum, 1985-1994
(Million tonnes)

1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
5.0	6.5	7.2	-	9.0	10.4	10.6	12.0	11.5	11.0

Sources: British Geological Survey, *World Mineral Production, 1983-1987 and 1989-1993*, Nottingham, 1987 and 1995; 1994 figure is US Bureau of Mines estimate.

Constraints and prospects

China is well-endowed with gypsum and demand is likely to continue as the construction industry expands to meet China's rapid economic growth during the Ninth Five-Year Plan (1996-2000). Cement demand is expected to grow in the late 1990s by around 8-10 per cent annually.

MAGNESITE

The resource base

China has reserves of magnesite of approximately 745 million tonnes, equivalent to about 30 per cent of the world total. Magnesium compounds can also be recovered from seawater and from lake brines.[156/] There are magnesite deposits in Liaoning, Gansu and Shandong provinces.

Recent trends

In the late 1980s China's production of magnesite represented some 16 per cent of world magnesite output. About a quarter was exported.[157/] In 1993 and 1994 the US Bureau of Mines estimates that China produced approximately 4 per cent of the world output of magnesium metal. As Table III.77 suggests, however, there are substantial differences in the estimates of China's magnesite output.

A major centre for magnesite production is Haicheng in Liaoning province. Haicheng has 82 magnesite mines and 64 processing enterprises. It started production more than 80 years ago, and is currently seeking foreign investment to update its equipment.[158/]

Table III.77. Production of magnesite, 1985-1993
(Million tonnes)

1985	1986	1987	1988	1989	1990	1991	1992	1993
2.00	2.62	2.63	2.61	2.60 (2.00)	2.60 (2.40)	1.65	1.51	1.5

Sources: UN Economic and Social Commission for Asia and the Pacific, *Statistical Yearbook 1994*, for 1985-1990; and British Geological Survey, *World Mineral Production, 1989-1993*, Nottingham, 1995, for 1991-93 (with 1989 and 1990 shown in brackets, since they differ from the ESCAP figures).

Constraints and prospects

Magnesite is a widely available resource, and China is particularly well-endowed. Its use in the manufacture of aluminium-based alloys and in die-cast magnesium components in the automotive trade suggest it will be in strong and continuing demand as China expands its output of motor vehicles and other industrial products.

BARITE

The resource base

China has 38 million tonnes of barite reserves, the world's largest and approximately 22 per cent of the world total. On a wider definition of reserves, China may have as much as a third of the world total.

Recent trends

In 1994 China was estimated by the US Bureau of Mines to be producing 39 per cent of world barite output, by far the world's largest producer. Its output has risen from around 1 million tonnes in the mid-1980s to 1.9 million tonnes in 1994, although it should be noted that different estimates of production vary considerably. In 1994, 1.17 million tonnes were exported.

Barite is used as a weighing agent in drilling oil and gas wells, and it is also used in producing glass, paint, rubber, and barium chemicals. Exports of barite peaked in 1990 (see Table III.78).

Constraints and prospects

Despite its other industrial uses, demand for barite is heavily dependent on the oil and gas industry, and the growth of barite production for the domestic market will be encouraged if current oil exploration expands.

Table III.78. Production and exports of barite, 1985-1994

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
Production (million tonnes)	1.00	0.82	0.90	..	1.51	1.46	1.50	1.10	1.35	1.90
Exports (million tonnes)	0.97	0.53	0.81	1.1	1.03	1.44	1.12	0.63	0.84	1.17
Exports ($ million)	32.30	..	20.80	28.1	29.30	40.60	33.40	19.70	24.80	32.60

Sources: British Geological Survey, *World Mineral Production, 1983-1987 and 1989-1993*, Nottingham, 1987 and 1995, for production (and 1986 export volume); 1994 production figure is US Bureau of Mines estimate, but note that their estimate for 1993 (shown bracketed) is also 1.9 million tonnes; exports from *China Statistical Yearbooks 1989, 1992, 1994, 1995.*

K. IRON AND STEEL

The resource base

China's steel industry can be traced back to the first decade of this century. Of the 34 largest steel enterprises about 40 per cent were set up before the Second World War. These large plants accounted for 58 per cent of total steel output in 1992. The state considers the steel industry to be of strategic importance.

Key raw materials in the steel industry are coal as a source of power, iron ore and scrap metal. Coal provides 75 per cent of the energy needs of the national economy. In 1992 China's proven coal reserves amounted to 983.3 billion tonnes.[159/] The main coal-producing province in China is Shanxi which, with an output of over 300 million tonnes in 1993, accounted for 27 per cent of total production. In 1994 output of coal registered a 39 per cent increase over 1985 (see Table III.79).

China's coal mines are predominantly state-run. Due to high levels of staffing and poor technology the coal industry has for decades been unprofitable.[160/] In 1992 key state mines accounted for 40 per cent of total coal output while locally-owned mines, of which there are over 21,500, accounted for 60 per cent. Most significant in the latter category are the collectively-run mines which produced 37.5 per cent of total output that year.[161/]

Small amounts of coal are exported, for example in 1993 exports made up 1.72 per cent of total output for that year. Consistent series data on the volume of coal imports are not available, but in 1994 1.21 million tonnes of coal were imported, suggesting that China is largely self-sufficient in coal.[162/]

Table III.79. Output and exports of coal, 1985-1994
(Hundred million tonnes)

	Output	Exports
1985	8.72	..
1986	8.94	0.098
1987	9.28	0.135
1988	9.80	0.156
1989	10.54	0.153
1990	10.80	0.172
1991	10.87	0.020
1992	11.16	0.197
1993	11.50	0.198
1994	12.10[a/]	..

Sources: *China Statistical Yearbook 1994*, p. 408, 516; export and import figures from UN, *International Trade Statistics Yearbook*, various issues.

a/ Statistical Communiqué of the State Statistical Bureau of the People's Republic of China on 1994 National Economic and Social Development, 28 February 1995, p. III.

Also important for the iron and steel industry is iron ore. Proven reserves of this mineral amounted to 48.9 billion tonnes in 1992.[163/] In 1994 China produced 85 per cent more iron ore than in 1985 while imports rose 3.7 times, reflecting both rising demand and a shortfall in domestic supply (see Table III.80).[164/] Of the total production of iron ore in 1994, 70 per cent was steelmaking iron, 25 per cent was foundry iron and 5 per cent was pig iron.[165/]

The production of iron ore has proceeded at a slower rate than iron and steel production. Key constraints on this industry are shortages of iron ore and the fuel needed to increase iron production.

Table III.80. Output and imports of iron ore, 1985-1994
(Million tonnes)

	Output	Imports
1985	137.35	10.04
1986	149.45	13.71
1987	161.43	10.86
1988	167.70	10.54
1989	171.85	12.59
1990	179.34	14.34
1991	190.55	18.54
1992	209.76	25.22
1993	226.35	33.04
1994	253.67	37.34

Sources: Output figures from *1995 China Yearbook of Iron and Steel Industry*, Beijing, pp. 86, 92. Import figures from *China's Customs Statistics*, 1994, 12, p. 26.

Table III.81. Exports and imports of iron and steel scrap, 1990-1994[a/]
(Million tonnes)

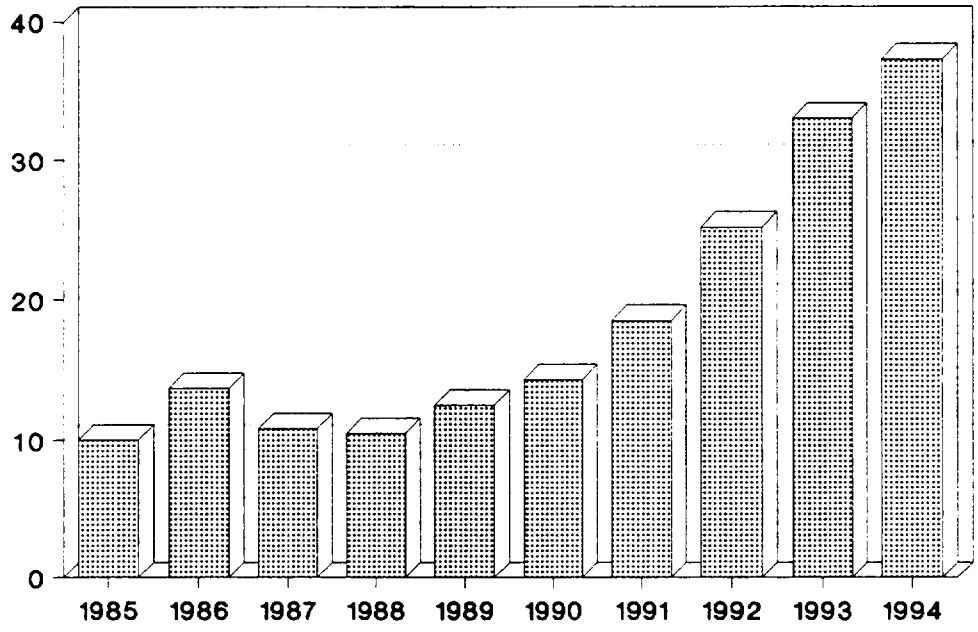
	Exports	Imports
1990	..	0.18
1991	..	0.23
1992	..	0.97
1993	..	2.75
1994	0.02	2.20[b/]

Source: UN, *International Trade Statistics Yearbook 1993*, Vol. 1, New York, 1995, p. 184.

a/ Figures for 1985-1989 are not available.

b/ Export and import figure from *1995 China Yearbook of Iron and Steel Industry*, Beijing, p. 108.

Fig. III.P. Imports of iron ore, 1985-1994
(Million tonnes)



Scrap steel is an indispensable material for smelting raw steel. In 1994 China consumed more than 36 million tonnes of scrap steel, contributing toward the production of 92 million tonnes of crude steel. China recovers 52 per cent of its scrap steel from its metallurgical industries. During the 1980s the annual recovery of scrap steel averaged about 10 million tonnes. By the 1990s annual recovery came to an average of 18 million tonnes as China increased steel production. In 1995 annual recovery was forecast at 19 million tonnes.

However China, like other Asian countries, still needs to import scrap steel. As can be seen from Table III.81 the amount imported has risen steadily in the 1990s, reaching over 2 million tonnes in 1994. Compared with China, the Republic of Korea is a much larger importer of scrap steel, importing 7 million tonnes in 1994. China's exports of scrap steel are minimal, amounting to only 0.02 million tonnes in 1994.

PIG IRON

Recent trends

Pig iron output has more than doubled since 1985 (see Table III.82). Shanxi, Liaoning and Hebei provinces produced over 1 million tonnes of pig iron each in 1994, accounting together for 37.5 per cent of total output. Pig iron is used extensively in the production of tractors, processing machinery and various other kinds of equipment. China is an important producer of pig iron, accounting in 1994 for 19.5 per cent of world production. Since 1992 China has increasingly produced more pig iron than Japan. Its output also exceeds that of the USA and Canada together.

As steel plants have built electric furnaces, which consume scrap steel, the shortage of scrap is already causing an increase in demand for pig iron as a substitute.[166/]

Exports of pig iron are insignificant and domestic supply virtually satisfies demand, with only a small amount of imports required.[167/] Exports of pig iron are predominantly to developing countries.

Table III.82. Output, exports and imports of pig iron, 1985-1994
(Million tonnes)

	Output	Exports	Imports
1985	43.84	..	..
1986	50.64	..	..
1987	55.03	..	1.47
1988	57.04	..	..
1989	58.20	..	0.69
1990	62.38	0.82	1.30
1991	67.65	1.25	0.37
1992	75.89	1.25	0.20
1993	87.39	1.21	..
1994[a/]	97.41	1.55	0.40

Sources: *China Statistical Yearbook 1995*, p. 412; export and import figures 1985-87, 1988-89 and 1990-93 from UN, *International Trade Statistics Yearbooks 1988, 1989, 1993*, New York, 1990, 1991, 1995, pp. 170; 173; 189 and 185 respectively.

a/ Import and export figures from *China's Yearbook of Iron and Steel Industry*, Beijing, p. 108.

ROLLED STEEL

Recent trends

Due in part to its long history, the steel industry has the burden of outdated equipment and technology. Although China is the world's second largest steel producer next to Japan, most of its output is of low quality. Products such as thin steel sheets and seamless steel tubes, which require higher technology for their production, cannot be produced to meet domestic demand.

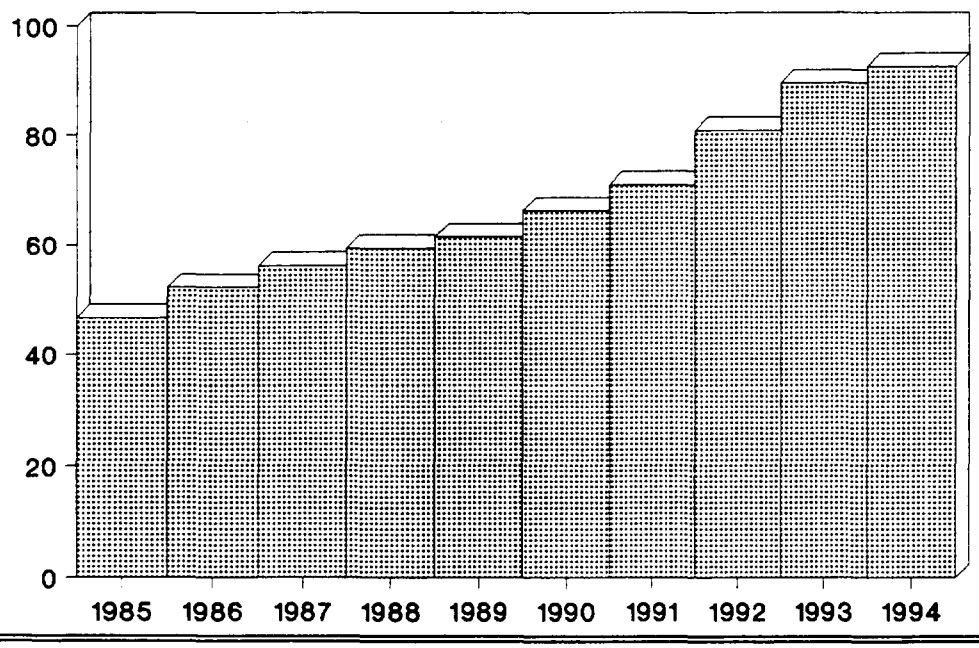
In 1994 there were 1,669 iron and steel production enterprises, 351 more than in 1985. Of these, 22 (1.3 per cent) had an annual steel output over 1 million tonnes, of which four produced more than 5 million tonnes. Most iron and steel enterprises produced less than 0.5 million tonnes of steel per year.[168/] Leading iron and steel producers include, for example, the renowned Baoshan Iron and Steel Complex in Shanghai, which exported 500,000 tonnes of rolled steel worth $120 million in the first quarter of 1995 and the Maanshan Iron and Steel Corporation, which earned $30 million from exports in the first quarter of 1995.[169/] The output and products of the top ten steel producers in 1994 are given in Table III.83.

Table III.83. China's top ten steel producers, products and output, 1994
(Million tonnes)

Company	Products	Crude steel	Steel product
Anshan	Steel plates, section steel, heavy rails, seamless tubes	8.16	5.56
Baoshan	Thin, medium gauge plates and seamless steel tubes	7.27	4.61
Shougang	Medium and small section steel and wire rods	8.23	5.83
Wuhan	Medium and thin gauge plates	5.29	4.59
Baotou	Large section steel, heavy rails and seamless steel tubes	3.04	2.06
Benxi	Thin and medium gauge plates and section steel	2.49	2.05
Panzhihua	Heavy rails and large steel section	2.35	1.38
Maanshan	Medium and small section steel, wire rods	2.42	2.03
Taiyuan	Section steel, medium and thin gauge plates	2.30	1.27
Tanshan	Medium and small section steel and wire rods	1.73	1.49
Total output		**59.20**	**45.49**

Source: *1995 China Yearbook of Iron and Steel Industry*, pp. 123-126.

Fig. III.Q. Production of crude steel, 1985-1994
(Million tonnes)



Crude steel output has virtually doubled between 1985 and 1994 (see Table III.84). However, domestic supply cannot meet rising demand so imports have risen rapidly in the 1990s. Imports of steel doubled between 1993 and 1994 from 10 million tonnes to 20 million tonnes, the bulk of these being of high-quality steel. However this also led to oversupply, causing prices to fall and domestic sales to become sluggish. Taiyuan Steel Works, for example, was forced to lower producers' prices nine times in 1994 alone. Stockpiling of steel in steel enterprises has become a problem and many enterprises are making only minimal profits, which inhibits further growth of the industry.

Table III.84. Crude steel output, 1985-1994
(Million tonnes)

	Crude steel[a/]	of which: Continuous casting steel
1985	46.79	5.06[b/]
1986	52.20	2.59[c/]
1987	56.28	2.65
1988	59.43	2.71
1989	61.59	2.61
1990	66.35	14.80
1991	71.00	18.83
1992	80.94	24.28
1993	89.56	30.30
1994	92.61	36.54

Source: *China Statistical Yearbook 1995*, p. 412.

a/ Crude steel output refers to ingots.

b/ 1985 and 1990-1994 figures from *1995 China Yearbook of Iron and Steel Industry*, p. 85.

c/ Figures from UN, *Industrial Statistics Yearbook 1990*, Vol. 2, *Commodity Production Statistics, 1981-1990*, New York, 1992, p. 567. It should be noted that the latter source underestimates considerably the output of continuous casting steel compared with the China iron and steel yearbook. For example the 1985 figure is 2.64 million tonnes and the 1990 figure 2.50 million. The China sectoral yearbook figures are used here but these do not cover the years 1986-89.

STEEL PRODUCTS

Recent trends

China's iron and steel industry has experienced high growth rates since the 1980s. Output of rolled steel final products has more than doubled since 1985 (see Table III.85). The leading provinces are Liaoning and Shanghai, which in 1995 produced 30 per cent of total output.

The final products can be broken down into a range of items such as heavy rails, ordinary and quality rolled steel, wire rod, steel plate, silicon steel sheet, strip steel and seamless steel pipe. Output of these products is given in Tables III.86 and III.87.

Table III.85. Output of rolled steel final products, 1985-1994
(Million tonnes)

1985	36.93
1986	40.58
1987	43.86
1988	46.89
1989	48.59
1990	51.53
1991	56.38
1992	66.97
1993	77.16
1994	84.29

Source: *China Statistical Yearbook 1995*, p. 412.

Table III.86. Output of various rolled steel products, heavy rails, ordinary and quality rolled steel, 1985-1994
(Million tonnes)

Year	Heavy rails	Ordinary rolled steel of which: Large	Medium	Small	Quality rolled steel	Strip steel	Seamless steel pipe
1985	1.12	0.84[b/]	2.72	9.39	3.50	0.81	1.39
1986	1.10	0.79	3.20	10.21	4.05	0.97	1.46
1987	1.20	0.86	3.23	10.78	4.48.	1.21	1.62
1988	1.38	0.87	2.80	11.19	4.85	1.38	1.78
1989	1.25	0.90	2.63	11.38	4.80	1.50	1.94
1990	1.26	1.05	2.55	12.18	4.56	1.68	2.11
1991[a/]	0.93	0.68	2.96	13.70	4.92	1.82	2.31
1992	0.92	0.87	3.59	17.62	5.29	2.44	2.65
1993	1.25	1.29	4.81	19.25	6.42	2.77	2.83
1994	1.37	1.03	3.79	23.30	..	3.31	3.61

Sources: 1985-1990 from UN, *Industrial Statistics Yearbook 1990*, Vol. 2, *Commodity Production Statistics, 1981-1990*, New York, 1992, p. 572.

a/ 1991-1993, *China Statistical Yearbook 1994*, p. 414; 1994 figures from *1995, China Yearbook of Iron and Steel Industry*, Beijing, pp. 101-2.

b/ 1985-1990 figures for ordinary rolled steel, quality rolled steel, strip steel and seamless steel pipe from *China Industrial Economic Statistical Yearbook 1994*, pp. 43-44.

In 1994 ordinary small rolled steel accounted for 28 per cent of total finished steel products, wire rods for 18.6 per cent, medium steel plate for 12 per cent, and heavy rails for only 1.63 per cent.

Table III.87. Output of various rolled steel products, wire rod, steel plate, silicon steel sheet, 1985-1994
(Million tonnes)

Year	Wire rod	Steel plate			Silicon steel sheet
		High gauge	Medium gauge	Low gauge	
1985	5.98	..	4.36[a/]	3.75	0.48
1986	6.32	..	4.93	3.90	0.55
1987	6.91	..	5.68	3.93	0.67
1988	7.98	..	5.89	5.15	0.60
1989	8.82	..	6.40	5.24	0.64
1990	9.99	..	6.74	5.52	0.67
1991	10.99	0.14	7.04	6.40	0.60
1992	12.57	0.33	8.20	7.50	0.68
1993	13.89	0.37	9.65	8.74	0.76
1994	13.89	0.33	9.91	..	0.81

Sources: *China Statistical Yearbook 1991-1994*, p. 414; 1985-1990 from UN, *Industrial Statistics Yearbook 1990*, Vol. 2, *Commodity Production Statistics, 1981-1990*, New York, 1992, p. 572.

a/ 1985-1990 figures for medium and low gauge steel plate and silicon steel sheet from *1994 China Industrial Economic Statistical Yearbook*, p. 44.

The 1990s have witnessed a surge in imports of steel products. Between 1992 and 1993 the volume of imports rose five times (see Table III.88). However, in 1994 imports dropped to 22.82 million tonnes but were still double the original figure planned and exceeded the amount needed to fill the shortfall in domestic production.

Table III.88. Exports and imports of steel products, 1985-1994
(Million tonnes)

Year	Exports	Imports
1985	..	19.63
1986	..	..
1987	..	..
1988	..	..
1989	..	..
1990	..	3.68
1991	..	3.32
1992	1.9	6.17
1993	0.9	30.26
1994	1.7	22.82

Source: *1995 China Yearbook of Iron and Steel Industry*, Beijing, 1995, p. 84.

The bulk of imports are of high quality steel products such as cold-rolled plates. Due to inadequate domestic production capacity, wide thick steel plates, cold rolled thin steel plates and pipes have to be imported, accounting in 1992 for around 88 per cent of imports.[170/] China can only supply 20 per cent of its annual needs for oil-transport pipe and 25 per cent of demand for steel pipe in power plants. Moreover, China is not able to produce large diameter, extra-long high-pressure boiler pipe with internal threads. There is a particularly severe shortage of 40 millimetres steel plate used for shipbuilding, making high-pressure boilers and oil derricks. Annual domestic demand for cold rolled silicon steel chips is 800,000 tonnes but in 1992 the Wuhan Iron and Steel Company only produced 135,000 tonnes, requiring the deficit to be imported.[171/] Thus China has a very limited capacity to produce high-tech steel products and steel products such as steel sheets, pipes, alloy steel, strips and quality shaped steel. In order to increase the supply of plate steel Shougang steel mill is constructing a strip rolling mill. However, more substantial investment in this subsector will be required to reduce imports. Imports of wire rods, sheet and plate formed the bulk of imported steel products in 1994, accounting for 54 per cent of the total (see Table III.89).

The government is trying to reduce imports and to increase exports, as over-importing in 1992 and 1993 coupled with tight credit arrangements in mid-1993 resulted in stockpiling. However, in 1994 stockpiles of unused steel products were still 50 per cent higher than in 1993.[172/] In order to control imports the State Council issued new regulations in October 1994 stipulating that rolled steel imported by foreign-financed firms for their own construction use could not be sold on the open market in China, and that rolled steel imported for export production or construction work in the special economic zones could not be sold domestically. Furthermore, tariffs would be imposed on steel imported through barter trade, border trade and donations.[173/]

Table III.89. Exports and imports of finished steel products, 1994
(Million tonnes)

	Exports	Imports
TOTAL	1.74	22.80
Steel products for railways	-	0.28
Ordinary rolled steel	0.21	1.57
Quality rolled steel	-	0.01
Steel plate	0.39[a/]	2.02
Sheet		6.01
Silicon sheet	-	0.01
Seamless pipe	0.01	0.99
Welded pipe	0.04	0.36
Wire rods	0.29	4.38
Strip	-	0.62

Source: *1995 China Yearbook of Iron and Steel Industry*, Beijing, p. 108.

a/ Export figure is for both plate and sheet.

Some local governments are also encouraging the formation of joint ventures to deal with local shortages of supply. In Guangdong province, for example, there is a 6 million tonnes shortfall of steel each year, with locally produced steel meeting only 30 per cent of demand.[174/] The Zhanjiang Steel Corporation has set up a joint venture to expand production of sheet steel to 3 million tonnes per year by 2000, using imported technology and ore. Once the second phase of operation begins in 1998 this joint venture will become the first manufacturer of medium plate and thick steel in China.

Constraints and prospects

The long-term strategy of the steel-making industry is to expand exports. The goal for 1995, for example, was to increase exports to 5 million tonnes and restrict imports to 10 million tonnes so as to reduce the stockpiles of steel.

However, imports of certain high-quality categories such as tin plate, special plates, petroleum pipes and silicon steel are likely to continue. Given that wire rod is not produced in large quantities by developed countries, China will have to rely on its own production to meet expanding demand for this product. Domestic producers are being urged to produce more high-quality products to reduce imports. In order to raise the amount of steel products produced in the continuous casting process from the current 40 per cent, the Ministry of Iron and Steel has set a target of 70 per cent to be attained by the end of the century.[175/] Raising the quality of domestically produced rolled steel will prove essential for the development of the automotive, energy and transport sectors. Hence the Ministry of Iron and Steel will prioritise the development of cold-rolled steel plate, zinc-plated steel and other steel for automotive use. Although exact figures are not available, it appears the ministry is planning to invest further in the technical renovation of existing plants in order to achieve these goals.

The further development of China's iron and steel industry hinges largely on securing a steady supply of cheap raw materials such as coal, pig iron and scrap steel. In the first part of the 1990s considerable efforts were made to improve the efficiency of the coal industry. These included not only technical renovation and mechanization but also the transfer of 500,000 workers from mining into profitable businesses. In order to boost coal production the Ninth Five-Year Plan (1996-2000) envisages a greater role for foreign capital in the industry. Four strategic projects planned for the future are the transport of coal through pipelines, exploitation of coalbed methane gas, pit-head power plans, and the development of "clean coal" technology. In an attempt to reduce production costs further, another 500,000 workers are to be transferred according to the Ninth Five-Year Plan.

In order to achieve these goals the government has been looking increasingly towards foreign investment. In the first half of 1995 the government signed $5.2 billion worth of contracts, agreements and letters of cooperation with foreign companies. Inspired by this initial response from foreign investors, the government gave a clear signal to foreign companies in the autumn of 1995 that further assistance in 300 projects was welcomed.[176/] Foreign investment projects so far include an agreement between the Australian firm BHP and the Zhunger Coal Industrial Company to jointly establish an open mine and two pithead power plants; two joint-venture power plants between the CNCIEC Construction and Development Company and the German ERNO Company to produce 200,000 kilowatts a year; and a $10 million joint-venture agreement with the US firm Amoco to tap coalbed methane.[177/] In order to attract foreign investors the Ministry of Coal Industry has permitted them to hold shares in coal enterprises in which they invest and granted lower levels of government greater autonomy in the approval of joint ventures.[178/] Given the rising demand for coal in Asia, China will play an important role in meeting this expansion, which in turn should encourage foreign investors to invest in China's coal mines.[179/]

US restraints on exports of scrap steel in the face of rising domestic demand and higher Japanese purchases in the wake of the Kobe earthquake will affect China's ability to satisfy the increasing demand for this product. Any resulting price rises will increase production costs for China's steel industry. Policy-makers are already preparing countermeasures such as setting up overseas scrap steel processing bases and investing in scrap metal factories in the USA. Indeed one steelworks is already planning to operate a car dismantling and processing plant in the USA with an annual output between 300,000 and 500,000 tonnes of scrap steel.

As well as raw material constraints the iron and steel industry has been plagued by cashflow problems. For example, in December 1994 Anshan Iron and Steel Corporation had to close two blast furnaces because it did not have sufficient cash to pay for coal. In early 1995 lack of funds forced Shougang Iron and Steel Corporation to suspend or cancel ten or so projects involving $1.19 billion.[180/] The cancelled projects included the construction of a steel plant in Qilu in eastern Shandong, a new office building, a cement plant and coal development. These cashflow difficulties are in part related to the problem of debt collection, and in part to excess imports which have led to domestic stockpiling, subsequent price falls and lower profits.

Other constraints on the development of the iron and steel industry are the lack of advanced technology, low technical standards and rising production costs. Most of China's exports are processed steel products made with imported raw materials. In the past production costs were kept low because of low raw material and fuel prices, low rate of depreciation and cheap labour.[181/] As domestic prices of raw materials and fuels increasingly approximate world market levels and wage rises outpace productivity increases, the prospects for domestic steel makers look increasingly bleak.

L. NON-FERROUS METALS[182/]

ALUMINIUM

The resource base

China has relatively small reserves of bauxite, less than 1 per cent of the world's total,[183/] although recent discoveries are claimed to have raised its world reserve share to 5 per cent.[184/] In the early 1990s China was the fifth largest producer of aluminium in the world, but the country's production, which was 5 per cent of the world total, was small in comparison with that of the USA and Canada (with over 30 per cent of world production between them).

Mine output in 1994 came mainly from the provinces of Gansu (271,659 tonnes), Guizhou (147,603 tonnes), Henan (122,842 tonnes), Qinghai (114,376 tonnes) and Liaoning (98,519 tonnes).

Recent trends

As is the case with other non-ferrous metals, China's consumption of aluminum is high by world standards. In relation to gross domestic product, China consumed in 1987 about double the aluminium consumed in OECD countries. Along with copper among the major non-ferrous metals, aluminium is in the shortest supply in China relative to demand. According to rough estimates, China's demand for aluminium would increase by 6.35 per cent over the coming 20 years. Domestic output of bauxite has more than doubled since 1985. CNNC, the China National

Non-Ferrous Metals Corporation, is trying to cut what it regards as excess domestic use of aluminium for consumption goods such as window frames and drinks cans, although already the use of aluminium in such products is lower than in Western countries.[185/] The Ministry of Foreign Economic Relations and Trade in 1989 imposed an export ban on all aluminium metals and alloys.

In the late 1980s smelting capacity for aluminium expanded faster than refinery capacity for alumina. There were bottlenecks at refineries and bauxite was diverted to export, while alumina was imported to feed the smelters. The Eighth Five-Year Plan (1991-1995) gave priority to the development of the aluminium industry, and 20 of the large state projects under the plan were alumina refineries or aluminium smelters.

The Anshan smelter, Guizhou, is China's largest producer of aluminium ingot and has been expanding.

There has been considerable import of foreign technology in aluminium processing according to the entries for large individual enterprises in the *Yearbook of the Non-Ferrous Metals Industry of China*. Foreign investment in aluminium, as in other non-ferrous metals, has been severely restricted. The Minister of Geology and Mining announced in September 1994 that there would be some relaxation. A number of joint-venture projects have been agreed. These include US-based Huang International Holdings taking a stake in the Lanzhou Aluminium Factory in Gansu province to upgrade the plant's facilities. A CNNC delegation in 1994 signed an agreement with the Eisenberg Group in Israel to invest $2 billion in projects including aluminium processing.[186/]

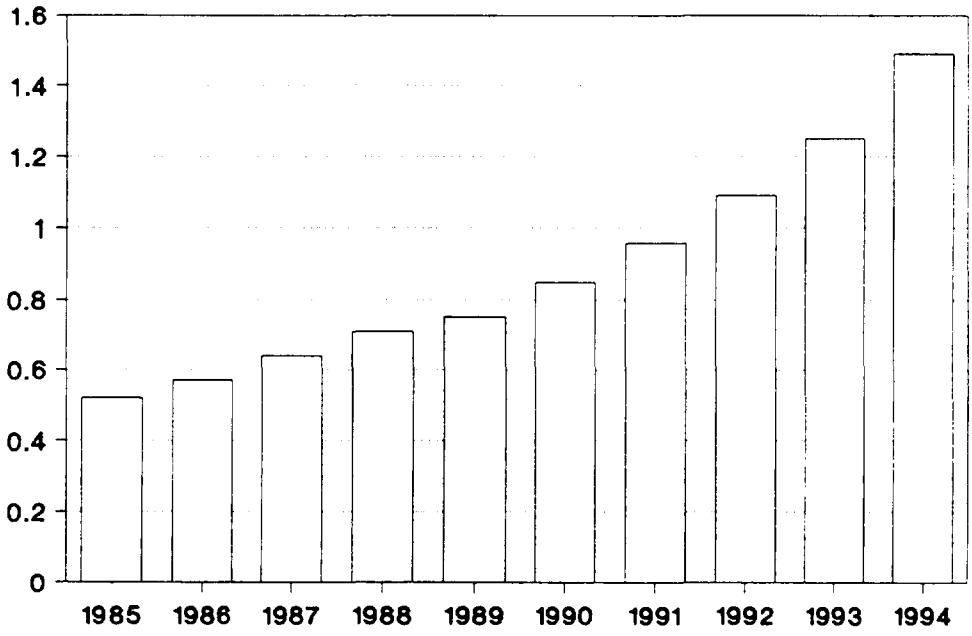
Table III.90. Production and imports of aluminium, 1985-1994

	Production of bauxite (Al content, thousand tonnes)	Production of aluminium (thousand tonnes)	Imports of aluminium (SITC 684) (thousand tonnes)	Imports of aluminium ores and alumina (SITC 2873) ($ million)	Imports of aluminium (SITC 684) ($ million)
1985	526.0	524.7	487.7	..	533.1
1986	530.0	570.0	266.2	..	336.2
1987	550.0	640.0	148.1	..	230.6
1988	595.2	713.0	75.4	..	174.8
1989	629.0	750.0	246.3	..	630.6
1990	621.3	854.3	115.6	200.3	281.7
1991	1,007.0	962.0	108.7	165.3	282.3
1992	1,200.0	1,096.0	344.0	148.9	586.3
1993	..	1,254.5	290.6	184.0	492.5
1994	..	1,498.4	168.8	259.1	189.1

Sources: UNCTAD, *Commodities Yearbook 1994* for bauxite production, and aluminium production for 1986-89. 1990-94 aluminium production statistics are from *Yearbook of Non-Ferrous Metals Industry of China, 1995*; Trade statistics from UN, *International Trade Statistics Yearbooks 1988, 1989, 1993*; *China's Customs Statistics Monthly*, December 1994 for 1994 import figures.

Notes: 1994 import value figures for "aluminium ores and alumina" are only for alumina. In 1993 imports of alumina were 97 per cent of imports under SITC 2873. 1994 import figures for aluminium volume and value are only for unwrought aluminium.

Fig. III.R. Production of aluminium, 1985-1994
(Million tonnes)



Although there are small exports of bauxite, alumina and aluminium, China remains a net importer. In 1994 China imported $189.1 million of unwrought aluminium, while its exports of aluminium products were $80.4 million. However, in 1994 there were pressures to increase exports. These pressures resulted from rises in world prices and also from the reform in exchange rates and taxation which made importing more expensive. The changes had the effect of raising domestic prices for aluminium.[187]

Constraints and prospects

The inadequacy of power supplies for the energy-intensive operation of smelting has held back current production and the growth of new capacity, and the cost of electricity has risen substantially in recent years.[188] Power supply is likely to remain a problem at least until the next century, even though in the long run it may be solved by state investment in the electricity supply industry.

A second constraint is the shortage of alumina. The China National Non-ferrous Metals Corporation has constructed a number of new plants in the 1990s to increase alumina supply.[189]

Transport problems make it costly to ship aluminium ingots produced in the north-west to Guangdong in the south where demand is booming.

China in 1995 is estimated to have produced 1.65 million tonnes of aluminium, which will maintain its position as the fifth largest producer in the world.[190] Aluminium will be in great demand

as Chinese economic growth continues, for example aluminium foil for expansions in air-conditioner output, for the automotive industry, for construction and for aluminium conductors for the power industry.[191/] According to Wang Jianxia of CNNC, annual demand for aluminium is predicted to rise by 60 per cent by the turn of the century, to 2.5 million tonnes, while production is planned to rise to 2.9 million tonnes.[192/] Indeed, reports early in 1996 suggested that domestic supply and demand were beginning to move into balance.

Little new mine development is planned, but this is unlikely to be a constraint on aluminium output. Foreign investment has started in the industry only recently, but will be an influence making for greater efficiency. Efficiency improvements are necessary in aluminium as also in many other branches of non-ferrous metal production; the China National Non-Ferrous Metals Corporation was making losses in the early 1990s.

COPPER

The resource base

China has less than 1 per cent of world reserves of copper, and accounts for about 4 per cent of world mine production. Most of China's ore is relatively low-grade, so production costs are high. The most important copper mining area is Jiangxi province, with nearly a quarter of China's mine production and the country's largest copper mine at Dexing. The largest smelter and refinery in China, at Guixi, is also controlled by the Jiangxi Copper Corporation. The second most important copper mining province is Yunnan, with a refinery at Kunming, and the third is Anhui province with the Wuhu smelter.[193/]

Table III.91. Production and imports of copper, 1985-1994

	Production of copper ore (metal content, thousand tonnes)	Imports of copper ore (metal content, thousand tonnes)	Imports of unrefined copper (metal content, thousand tonnes)	Imports of refined copper (thousand tonnes)	Imports of refined copper ore and refined copper ($ million)
1985	239.8	69.3	43.5	355.7	652.9
1986	253.8	74.8	23.6	171.5	365.3
1987	278.2	59.9	18.2	75.8	232.6
1988	281.9	51.9	5.9	78.5	311.5
1989	299.1	53.5	1.2	68.9	308.9
1990	295.9	72.7	1.9	38.4	235.8
1991	304.0	92.9	6.1	107.8	413.9
1992	334.3	102.0	113.2	265.7	992.7
1993	345.7	..	..	362.4	695.5
1994	395.6	..	..	121.4	224.2

Sources: UNCTAD, *Commodity Yearbooks* 1992 and 1994 for imports, *Yearbook of Non-Ferrous Metal Industry of China*, 1995 for ore productions; *China Statistical Yearbook 1995*, for import figures for 1993 and 1994 (copper and copper alloys).

Domestic demand is substantially in excess of mine production, and the difference is made up by imports of refined copper and also of copper concentrates and blister (unrefined copper) for domestic smelting and refining.

Recent trends

Copper consumption in China is approximately three times more intensive in relation to GDP than in OECD countries, and rapid consumption growth has been forecast. The Economist Intelligence Unit non-ferrous metals study quotes the Hawaii-based East-West Centre's estimate of 3.26 per cent annual consumption growth over the 20 years to 2010, but regards it as possibly being too low. The Chinese government has been trying to encourage substitution of other materials for copper in items such as power transmissions, and in consumer goods such as kitchen utensils. Under the Eighth Five-Year Plan (1991-1995) copper production was targeted to rise by 2.5 per cent per year, with a focus on improving production conditions such as increasing smelter capacity utilization. The major domestic consumers are power generation, vehicle and machinery manufacture and the production of household goods.

The Eighth Five-Year Plan looked to an expansion of smelting and refining capacity more than to an increase in mine production, and Dexing in Jiangxi is likely to continue to be the main source of ore.

Deregulation of foreign trade in China in the 1980s led to many problems. Producers had an incentive to export their copper despite domestic shortages, since plan prices were lower than world prices, and this led to a ban on exports of refined copper and copper alloys in 1989. China is an important player on the world copper market. For example, world copper prices dropped sharply in 1993 when China reduced its purchases, the country's buying of copper previously having supported the market.[194/] In 1995 China was reported to be planning to sell stocks of copper worth about $560 million to pay for food imports. It was also reported to be buying copper scrap in preference to buying refined metal.[195/]

Constraints and prospects

Copper is in relatively short supply in China, and production of refined copper is likely to increase less rapidly than consumption, with the gap being filled by imports. Rises in price in the world market in 1994-1995 caused substantial rises in the domestic price.[196/]

China has been looking for inward direct foreign investment in copper refining, and to outward direct foreign investment of its own to source copper ore overseas. Domestic smelting and refining are likely to continue to be in excess of domestic mine production, with the consequent reliance on imported concentrates and to some extent of imported blister copper (unrefined copper).

TIN[197/]

The resource base

China's tin deposits are part of the Asian tin belt, which runs from Yunnan through Myanmar, Lao People's Democratic Republic, Thailand, Malaysia and Indonesia. China has the world's largest reserves of tin, almost a quarter (1.6 million tonnes) of the estimated world reserves of 7 million tonnes, compared with 1.2 million tonnes each for Brazil[198/] and Malaysia. Tin in China is found in the south, particularly the south-west province of Yunnan, and in Guangxi, which together

have half of China's tin reserves. There are also deposits in Guangdong, Hainan, Hunan, and Jiangxi provinces.

The largest mining and smelting complex is Gejiu in Yunnan, with 10,000 tonnes annual capacity.

Table III.92. Production and exports of tin, 1985-1994

	Production of tin ore (metal content, thousand tonnes)	Exports of tin ore (metal content, thousand tonnes)	Exports of tin metal (thousand tonnes)	Exports of tin metal and tin ore ($ million)
1985	29.8	2.5	13.7	176.8
1986	25.0	4.5	7.7	67.7
1987	28.0	10.4	17.6	132.1
1988	30.0	14.8	10.7	156.4
1989	44.0	21.8	9.9	172.2
1990	42.2	15.8	10.1	116.8
1991	42.1	10.5	15.7	118.1
1992	43.8	5.0	30.3	170.3
1993	49.1	..	40.7	183.1
1994	54.1	..	44.4	200.6

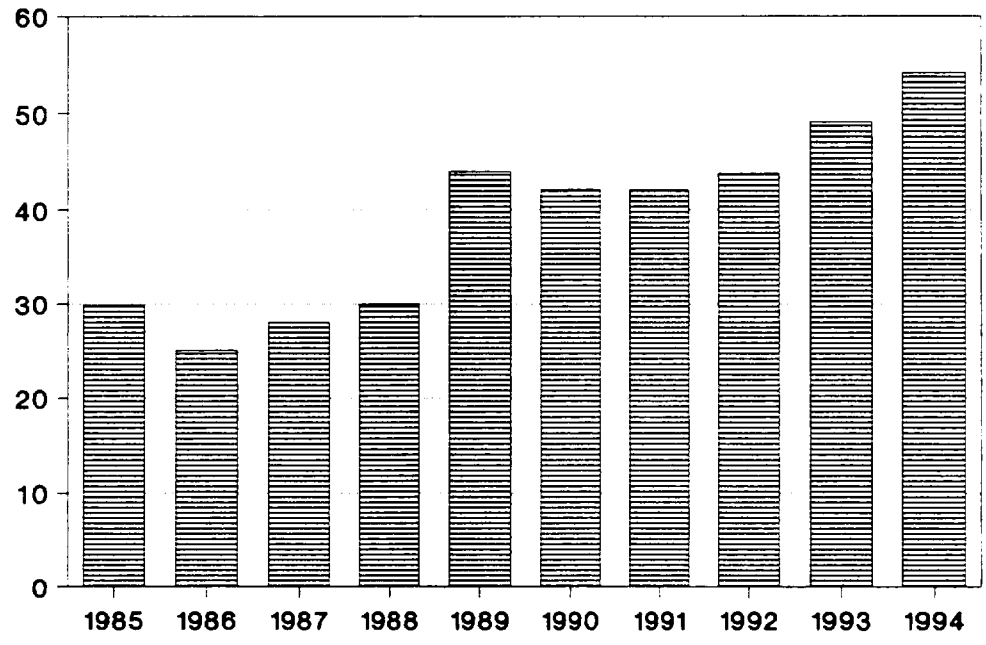
Sources and Notes: Production figures for 1985 and 1990-1994 are from *Yearbook of Non-Ferrous Metals Industry of China*, 1995. 1986-1989 production figures are from UNCTAD *Commodity Yearbook* 1992. Note that UNCTAD gives a 1985 production figure of 20,000 tonnes, so the fall between 1985 and 1986, and indications of changes in later years in the early 1980s may be unreliable. Tin export figures for 1993 and 1994 are from *China Statistical Yearbook 1995*, and refer to "tin and tin alloys". Export figures for 1984-1992 are from UNCTAD *Commodity Yearbooks*.

Recent trends

Figures for China's tin production are rather unreliable, and vary considerably between different sources. Nevertheless, it is clear that China's recorded production of tin ore rose sharply in the 1980s, probably from around 16,000 tonnes of tin-in-concentrates in 1980 to 42,000 tonnes in 1990, a very high figure by historical standards. Production has increased further in the 1990s.

The rise in production was associated with increased exports (see Table III.92). Production since the early 1980s has been substantially in excess of domestic consumption requirements, which averaged 10,000-15,000 tonnes annually in the late 1980s. Consumption rose to 21,100 tonnes in 1993 and 26,100 tonnes in 1994,[199/] but this is still far less than the 54,000 tonnes of tin-in-concentrates estimated to have been produced in 1994.

Fig. III.S. Production of tin ore, 1985-1994
(Thousand tonnes)



The rise in Chinese exports in the 1980s, coupled with export increases from newly discovered tin deposits in Brazil, was a key factor in causing the collapse of the International Tin Agreement (ITA) in 1985 which plunged real tin prices down to levels not seen since the 1930s. While the Association of Tin Producing Countries (ATPC) attempted to support the tin price by means of a supply rationalization scheme after the ITA's collapse, China (like Brazil) remained outside the ATPC and continued to export high volumes. China joined the ATPC in 1994, and accepted a quota of 20,000 tonnes for 1995 to limit exports. An official of the China Non-Ferrous Metals Import and Export Corporation was reported in late 1995 as wanting an increase in China's quota, but strongly supported the continuance of the supply rationalization scheme. There were fears within the ATPC that smuggling would mean additional tin from China entering the world market illegally[200/], but the general manager of China's largest tin producer, Yunnan Tin Import/Export Kunming Co, was on record as saying that he thought high domestic tin prices within China would act as a break on excessive exports in relation to quota. Chinese domestic consumption is currently dominated by solders and alloys, but usage in tinplate and chemicals is expected to expand.[201/]

China in the late 1980s was exporting between a third and a half of its tin output as unsmelted ore. These ore exports were not for reimport; China's imports of tin metal were minimal. Since the early 1990s expansion in refined tin production, reported to have increased from 32,620 tonnes in 1992 to 67,767 tonnes in 1994, has led to China becoming a net importer of tin ore.[202/]

Constraints and prospects

China's expansion of production in the 1980s and its emergence as a significant player in the world market for tin to some extent reflected a lack of control over exporters as the country's system of foreign trade was decentralized. In 1990 the State Council said that the production of tin and some other metals would be limited, and a greater degree of central control over tin production was reasserted in 1991.[203/] This increased control was a necessary condition for China's being able to join the Association of Tin Producing Countries' supply rationalization scheme.

Tin prices have remained low in real terms, but the prospects for higher prices are somewhat better as a result of economic recovery in OECD countries and the decision of the ATPC to continue its supply rationalization scheme until at least 30 June 1996.

Foreign involvement in China's tin mining industry in the future is likely to be minimal, despite the sector now being open to foreign investment. Most major mining transnationals have already left the world tin industry as a result of the 1980s tin price collapse and are unlikely to return.

LEAD AND ZINC

The resource base

China has 7 million tonnes of lead reserves, equivalent to 11 per cent of the world total, and accounted for 14 per cent of world production in 1994. China's zinc reserves are 5 million tonnes, 4 per cent of the world total, with 12 per cent of world production in 1994. The main lead and zinc deposits are found in Gansu, Yunnan, Inner Mongolia, Guangdong and Qinghai. China's largest lead and zinc mine is Changba in Gansu province; the second largest is Lanping in Yunnan; and Xicheng in Gansu is the third.

Recent trends

Lead mine production doubled between 1985 and 1994 and mine production of zinc rose two and a half times (see Table III.93). Controls on lead and zinc exports were imposed in 1989 after domestic shortages were created by exports of concentrates which peaked in the case of lead at nearly 80,000 tonnes in 1987 and at nearly 58,000 tonnes for zinc in 1989. These exports resulted from world prices rising above the internal prices set by the China National Non-Ferrous Metals Corporation. Exports of lead concentrates have since fallen to low levels, although zinc concentrate exports have continued. Imports of lead ore have been negligible (400 tonnes in 1992) and lead metal imports have been small. Similarly, imports of zinc ore and metal have been minor.

In the early 1990s China remained a small net exporter of zinc, and was exporting the equivalent of a quarter of its output of lead metal (see Table III.94). High prices in 1995 fed through onto the domestic market.[204/]

Under the Eighth Five-Year Plan (1991-1995) lead output was planned to grow at 5.4 per cent a year and zinc at 5 per cent a year. Most reported projects have been for mines rather than smelters, including expansion plans for the three largest mines: Changba, Lanping and Xicheng. Since the removal in 1994 of many of the restrictions on foreign investment in non-ferrous metals, projects have been announced including a joint venture the Hong Kong OrientMet Industry

Company and China's largest zinc-smelting plant at Huludao in Liaoning. The Australian mining transnational, BHP, has been involved in prospecting for zinc in Sichuan.[205/]

Table III.93. Production and trade in lead, 1985-1994

	Mine production of lead ore (metal content, thousand tonnes)	Production of lead metal (thousand tonnes)	Exports of lead ore (metal content, thousand tonnes)	Exports of lead metal (thousand tonnes)	Exports of lead ore and metal ($ million)	Imports of lead metal (thousand tonnes)
1985	230.5	222.5	5.0	6.4	(2.7)	3.6
1986	226.8	211.2	5.1	7.4	(3.0)	4.5
1987	267.2	210.3	79.8	23.5	38.5	4.6
1988	311.6	206.0	58.8	11.9	29.4	4.6
1989	341.4	269.0	19.2	1.8	9.0	36.4
1990	363.9	296.5	0.1	38.0	30.5	1.7
1991	352.2	320.0	2.5	15.9	11.8	0.2
1992	330.2	366.0	7.4	89.9	55.8	1.7
1993	338.1	411.9	..	..	..	..
1994	461.9	467.9	..	..	..	..

Sources: UNCTAD *Commodity Yearbook* 1992 for lead production figures 1986-1989 and *Yearbook of Non-Ferrous Metal Industry of China*, 1995 for 1985 and 1990-1994. Other statistics from UNCTAD *Commodity Yearbooks*, 1992 and 1994.

Note: 1985-1986 export value statistics (bracketed) for lead ore and metal are for metal exports only.

Table III.94. Production and trade in zinc, 1985-1994

	Mine production of zinc (metal content, thousand tonnes)	Production of zinc metal (thousand tonnes)	Exports of zinc ore (metal content, thousand tonnes)	Exports of zinc metal (thousand tonnes)	Exports of zinc ore and metal ($ thousand)
1985	395.0	306.2	..	..	..
1986	395.7	336.2	..	..	..
1987	458.2	383.1	18.6	95.3	75.6
1988	527.3	425.4	54.1	13.8	54.5
1989	620.4	450.9	57.5	20.1	63.9
1990	763.1	526.9	38.1	16.7	45.9
1991	749.8	576.1	38.5	6.3	22.8
1992	758.1	648.3	32.7	84.9	105.8
1993	775.4	..	..	..	..
1994	990.3	..	..	..	..

Sources: Ore production statistics for 1985 and 1990-1994 are from *Yearbook of Non-Ferrous Metals Industry of China*, 1995. Other figures are from UNCTAD, *Commodity Yearbook 1994* (UNCTAD's *Commodity Yearbook* did not include zinc statistics prior to the 1994 issue).

Constraints and prospects

The domestic supply of lead at present appears adequate for domestic needs, and lead has been exported, although there have been some reports of shortages. Zinc also has been exported in the 1990s in significant quantities, but in the longer term there is some danger of its moving into deficit despite past output growth.[206/] Like other non-ferrous metals in China, lead and zinc will continue to face increasing domestic demand, and an expansion of output is planned to continue to at least 2000,[207/] aided now by some foreign investment.

M. NON-ELECTRICAL AND ELECTRICAL MACHINERY

The resource base

Chinese development policy has laid great emphasis on the country's capital goods (or "machine-building") industry.[208/] According to the First Five-Year Plan (1953-1957), "the machine-building industry is the key to the technological transformation of our national economy".[209/]

In the early years of the Chinese communist regime, from 1949 until the Soviet withdrawal in 1960, crucial help was provided by the Soviet Union in fostering Chinese production of machinery. The necessary development of the resource base, in the form of transfer of technology and the training of workers and managers, was accomplished by the work of Soviet experts in China and by the training in the Soviet Union of a large cohort of Chinese.

In the 1960s the Chinese made great efforts to develop design technology of their own, including raising educational standards in engineering and requiring research institutes to apply their skills to meet the needs of capital goods production. By the mid-1960s China was capable of manufacturing over a thousand different types of machine tools, including high-precision items such as numerically controlled machine tools.

The technology to produce heavy electrical equipment had been acquired from Soviet and Czechoslovak sources in the 1950s. Work towards self-reliance in this area in the 1960s and early 1970s included further development of thermal generating plant and the manufacture of hydroelectric generating equipment. However, the efficiency of production in these and many other branches of machinery manufacture was by no means generally up to world standards.

The quality of education and training, essential for a highly skill-intensive industry like machinery production, suffered during the disruptions caused by the Cultural Revolution (1966-1976), particulary during its most intense period from 1966 to 1968.

In the late 1970s, after the end of the Cultural Revolution, there began the import of technology through licensing agreements and manufacturing contracts although, unlike in the case of fertilizers, petrochemicals and synthetic fibres, there was little importing of complete plants.[210/]

Besides technology and human resource development, the development of the machinery industry requires inputs of key raw materials. The steel industry is an important element in the resource base for machinery production, as also (and increasingly so) is electronics. By the 1970s the machinery industry was absorbing a quarter of China's steel output.

A problem for Chinese machine building has been the availability of a range of special steels. In the early years of the industry's development, in the 1950s, the special steels for many machines were not available in China and a third of the machinery industry's sheet steel was imported. Since then there has been substantial growth in special steels production,[211/] although there are still serious quality problems.

Ancillary industry development is less important as part of the resource base for machinery production in China than in many countries, because Chinese machinery manufacture has developed in a highly vertically integrated fashion. This structure, however, loses the efficiency gains achieved in Western countries and in Japan through interfirm specialization within a vertically "disintegrated" industrial framework.

Machinery manufacture in China consists of about 100 individual industrial branches such as textile machinery, mining machinery, construction machinery, petrochemical equipment, agricultural machinery, and so on. In 1994 the industries "ordinary machinery manufacturing" and "special purposes equipment manufacturing" employed 7.36 million workers, including some employment in township and village enterprises. This employment was larger even than the textile industry. Also, the official statistics record 3.64 million workers in these two machinery industries in township and village enterprises.[212/]

MACHINE TOOLS

Recent trends

Output has fluctuated considerably over the years, particularly in the 1950s and 1960s. Machine tool production first grew rapidly in the 1950s. In the early 1960s, as the focus of the machine-building industry switched towards the support of agriculture, the growth of machine tool production slowed while that of agricultural machinery increased rapidly. Nevertheless, by the mid-1970s China was meeting 95 per cent of its own requirements of machine tools.[213/] Since then machine tool imports have risen and have been an important way of introducing new technology into the economy. These imports have been encouraged by a reduction in important duties in January 1994. For example, the rate of duty on numerically controlled machine tools was cut from 15 per cent to 9 per cent.[214/]

After rising to 138,900 units a year in 1970, output reached a plateau of around 150,000 a year until the late 1980s and 1990s saw some increase. Between 1993 and 1994 there was a fall, from 262,000 to 206,500,[215/] as a result of efforts to curb growth of output. A detailed breakdown of the different types of machine tool production in China for 1992 and 1993, the latest years for which statistics are available, is given in Table III.95.

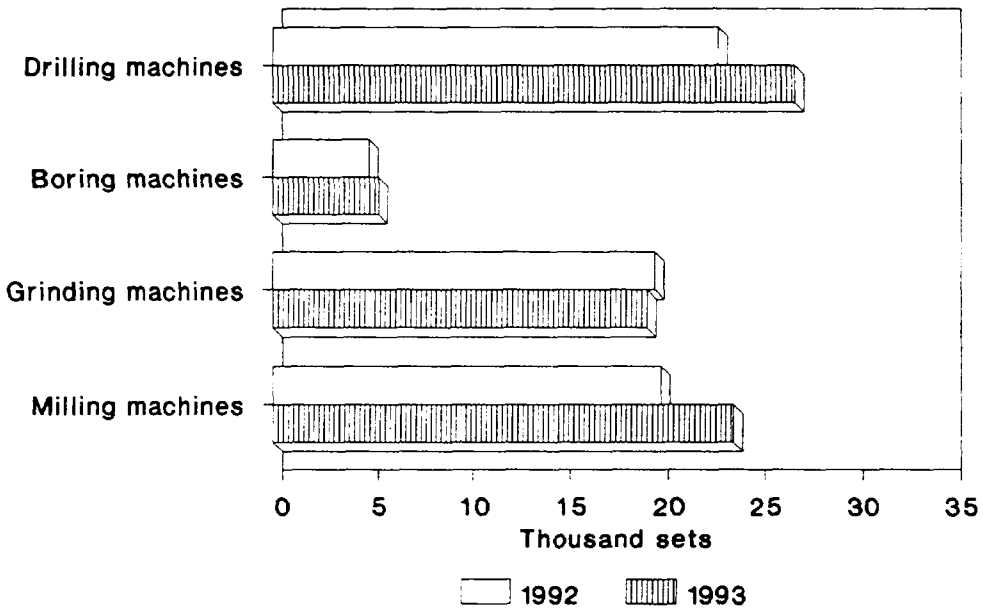
China is the world's biggest importer of machine tools.[216/] As Table III.96 shows, imports have quadrupled in current price terms during the 1990s, and are now eight and a half times the value of exports. Exports have fallen slightly during the 1990s.

Constraints and prospects

The industry at present suffers from fierce import competition, and the current *Yearbook of the Machinery Industry* (1994) mentions that many machinery enterprises are making losses, including

machine tool enterprises. The Ministry of Machine-Building Industry expects that machine tool output will have grown by 8-9 per cent in 1995, after the decline caused by an inrush of imports.[217/]

Fig. III.T. Production of selected machine tools, 1992 and 1993



The machinery industry ministry has announced a 15-year programme to make machinery production into a "pillar of the economy" by 2010. These plans include objectives for machine tools. There will be a heavy stress on improving the quality of production of numerically controlled machine tools, which should take 70 per cent of the domestic market in 2000 and 80 per cent in 2010. The minister of the machinery industry announced in December 1995 that in 1996 serious attempts would be made to increase the machinery industry's international competitiveness, by concentrating resources on the top 100 enterprises and setting up manufacturing research and technology development centres.[218/] It was announced in 1995 that machine-building enterprises would be given greater freedom by the Ministry of Machine-Building Industry to approach prospective foreign investors.[219/]

Table III.95. Production of machine tools, 1992 and 1993
(Thousand sets)

	1992	1993
Metal cutting machine tools	228.7	262.0
of which:		
Numerically controlled machine tools	7.4	13.0
High precision machine tools	1.3	1.5
Large machine tools	4.0	4.8
Other machines and tools:		
Lathes	123.0	142.5
Drilling machines	23.0	27.9
Boring machines	5.0	5.5
Grinding machines	19.8	19.4
Milling machines	20.1	23.8
Planing machines	7.5	7.3
Presses	91.4	105.2

Source: *China Machinery Industry Yearbook*, 1994.

Table III.96. Imports and exports of machine tools, 1985-1994

	Imports of metal working machine tools (SITC 736) ($ million)	Exports of metal working machine tools (SITC 736) ($ million)	Imports of metal cutting machine tools (SITC 7361) (thousand sets)	Imports of metal forming machine tools (SITC 7362) (thousand sets)
1985	134.6	..	..	..
1986	369.4	35.6	..	..
1987	459.1	79.2	..	..
1988	519.0	131.8	..	..
1989	486.2	188.3	..	..
1990	543.9	250.3	21.1	11.9
1991	604.3	230.0	28.4	17.3
1992	1,004.9	226.7	60.1	31.7
1993	2,079.8	242.4	72.8	41.3
	(1,945.2)	(216.3)		
1994	2,060.6	242.0	..	..

Sources: UN, *International Trade Statistics Yearbooks 1988, 1989, 1993*, and (for 1994) *China's Customs Statistics Monthly*, December 1994. The bracketed 1994 figures are for "machine tools" and are shown to indicate the relative sizes of imports and exports. They are not fully comparable with SITC 736 figures for earlier years. For example, 1993 "machine tool" imports were $1,945.2 and exports $216.3 (shown in brackets in the table).

ELECTRICAL MACHINERY

Recent trends

In 1994 there were 2.33 million workers employed in the electric equipment and machinery industry in China, and approximately 1 million workers in township and village enterprises.[220/]

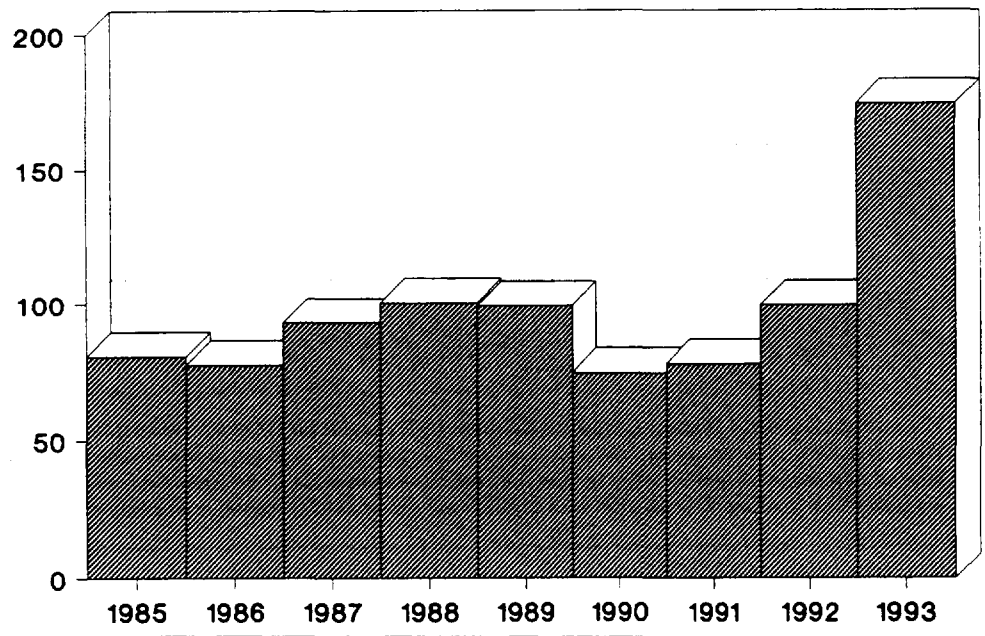
Table III.97 shows trends in the production of major items of electrical equipment. The production of power generating equipment rose threefold between 1985 and 1994.

Table III.97. Production of electrical equipment, 1985-1994

	Power generating equipment (Million kW)	Transformers (Million kVA)	Alternating motors (Million kW)
1985	5.6	80.4	34.5
1986	7.2	77.3	39.7
1987	9.4	93.0	41.7
1988	11.1	100.4	45.1
1989	11.7	99.3	41.0
1990	12.3	74.4	35.3
1991	11.6	77.5	38.2
1992	13.0	99.5	52.4
1993	14.7	174.3	54.5
1994	16.7	..	59.5

Sources: *China Machinery Industry Yearbook*, 1994; 1994 figures from *China Statistical Yearbook 1995.*

Fig. III.U. Production of transformers, 1985-1993
(Million kVA)



An important centre of the electrical machinery industry is Shanghai. Shanghai Electromechanical Holding Group, which is the most important enterprise, has established 129 joint ventures with foreign companies, bringing in $400 million in foreign capital. Foreign partners include General Electric from the USA, Hitachi and Mitsubishi from Japan, and the German company Siemens.[221/]

Constraints and prospects

There is a great shortage of electric power in China and demand for power generating equipment, a major output of the electrical machinery sector, is likely to expand. As mentioned above, the machinery industry ministry has announced a 15-year programme to make machinery production into a "pillar of the economy" by 2010. These plans include objectives for electrical machinery. Power generating equipment is to concentrate on large generating units, and hydroelectric generating equipment will develop units of 700,000 kW capacity for the Three Gorges dam project.[222/]

N. TRANSPORT EQUIPMENT

The resource base[223/]

The motor industry and other branches of transport equipment manufacture are served by China's extensive industrial base of steel production and machine building. China's large pool of cheap labour is also an important resource for the transport equipment industry. In 1994 there was a total of 3.45 million workers employed in the manufacture of motor vehicles, components and other transport equipment, compared with 2.01 million in 1990.

In 1950, when the Chinese government sought help from the former USSR to set up China's first complete automotive factory, there was no proper feeder industry for the supply of components. Before the establishment of the Communist regime in 1949, not only was there no significant production of complete vehicles in China, but the automotive industry was limited to a few truck and bus chassis plants and some shops making bodies. The automotive industry was initially built up using Soviet-made components and Soviet technology. For example, the first truck produced, the "Liberation" model, used over 80 per cent Soviet parts when production started in the mid-1950s, but by the mid-1960s after the political break with the Soviet Union the components were entirely Chinese-made. China now produces a wide range of automotive components, although there are efficiency problems caused by the fragmented, small-scale nature of production.

MOTOR VEHICLES AND AUTOMOTIVE COMPONENTS

Recent trends

The automotive industry, developed (as noted above) in China in the 1950s with Soviet assistance, was originally oriented towards the production of commercial and military vehicles and of tractors to aid agricultural development. Passenger car production did not start until 1958, and by 1960 China was producing less than 100 cars annually. Imports of cars were also minimal, and passenger car use was confined to a handful of high officials. Passenger car production did not increase significantly until the late 1980s, when a substantial demand for cars had appeared, for

example for taxis for the tourist trade in the booming southern provinces. This demand was initially met by imports.

In the early 1980s domestic passenger car production was around 5,000 vehicles per year, while car imports reached over 100,000 units in 1985. Given the high and growing domestic demand for cars in China, decisions were taken in the mid-1980s to develop domestic production. Import substitution in passenger cars was encouraged by import licensing and by import duties of several hundred percent (varying with the type of vehicle), among the highest in the world. Joint-venture foreign investment came to dominate the passenger car industry as foreign vehicle manufacturers, faced with saturated markets in Europe, North America and Japan, were attracted by the prospects of China's vast and growing market.

Tractor production, as Table III.98 shows, rose rapidly in the late 1980s but then stayed stable at around 1.4 million a year except for 1993, when stringent output cooling measures were in force.

Table III.98. Production of motor vehicles, trucks and tractors, 1985-1994
(Thousand units)

Year	Total production of motor vehicles	Production of trucks	Production of tractors
1985	437.2	269.0	867.5
1986	369.8	229.1	803.1
1987	471.8	298.4	1,143.1
1988	644.7	403.3	1,382.9
1989	583.5	363.4	1,157.9
1990	514.0	289.7	1,140.8
1991	714.2	382.5	1,400.5
1992	1,066.7	476.7	1,447.7
1993	1,298.5	597.9	999.1
1994	1,366.9	663.0	1,401.8

Source: *China Statistical Yearbook 1995.*

By 1990 passenger car production was over 42,000;[224/] it doubled in 1991 and 1992, reaching over 250,000 in 1994. The output of trucks has also increased rapidly, more than doubling over the period 1985-1994. Despite these increases, motor vehicle ownership in China remains very low by world standards, at approximately seven vehicles per thousand people.

A legacy of the Chinese communist desire for local self-sufficiency is the large number of geographically dispersed plants in the motor industry. In the Maoist period plants were set up in the interior for greater safety from military attack. In 1964 there were 417 factories producing trucks, cars, motorcycles and automotive components; by 1974 there were nearly 2000. Nearly every province had its own automobile plant, often producing far below minimum efficient size.[225/] In the mid-1990s there are some 200 assemblers of motor vehicles, ranging from plants producing under 1,000 units a year to plants with annual production of over 100,000 units.[226/] Nevertheless, in the passenger car industry a small number of large groups, all joint

ventures, dominate production. Export and import data for vehicles and parts are presented in Table III.99 and Table III.100, respectively. The largest groups at present are presented in Table III.101.

Table III.99. Exports of vehicles and parts, 1985-1994
(Million $)

	Total road vehicles and parts (SITC 78)	Parts (SITC 784)	Cycles (motorized and non-motorized) (SITC 785)	Cycles (non-motorized) (SITC 7852)
1985	54.5	..	..	..
1986	104.8	..	..	..
1987	115.7	..	..	..
1988	..	..	..	..
1989	295.2	..	..	..
1990	3,814.3	3,432	214	145
1991	5,085.7	4,348	440	358
1992	1,160.9	126	559	433
1993	1,240.9	178	596	427
1994	1,791.3	..	..	..

Sources: UN, *International Trade Statistics Yearbooks 1988, 1989, 1993*; *China's Customs Statistics Monthly*, December 1994.

Table III.100. Imports of vehicles and parts, 1985-1994
(Million $)

Year	Total road vehicles and parts (SITC 78)	Parts (SITC 784)	Cycles (motorized and non-motorized) (SITC 785)	Motorcyles (SITC 7851)
1985	3,063.8	328	..	..
1986	2,135.7	321	..	..
1987	1,311.2	349	..	..
1988	1,491.0	391	..	..
1989	1,436.0	..	..	..
1990	4,283.6	3,485	64	9
1991	5,901.9	4,686	164	4
1992	3,518.5	909	169	9
1993	5,285.8	1,000	553	366
1994	4,666.6	..	..	..

Sources: UN, *International Trade Statistics Yearbooks 1988, 1989, 1993*; *China's Customs Statistics Monthly*, December 1994.

Table III.101. Production of automobiles by company, 1993
(Thousand vehicles)

Assembler	Production
Shanghai Volkswagen	100.0
Tianjin Auto (Daihatsu)	47.9
FAW Audi	18.3
Dongfeng (Citroen)	17.1
Guangzhou Peugeot	16.7
Changan (Susuki)	15.0
First Auto Works (VW)	12.0
Hainan (Mazda)	..
Guizhou (Fuji Heavy Industries)	1.2
Others	9.9
Total	240.0

Source: Adapted from EIU, "China's Automotive Business: Prospects to 2000", *International Motor Business,* 1st quarter 1995, p. 157.

The overwhelming importance of joint-venture foreign investment in passenger car production dates from the rapid expansion of car production in the late 1980s. The largest producer, Volkswagen, was set up in 1984, and most others in the late 1980s.

Commercial vehicle production was already well developed before the post-1978 economic reforms. Domestic state-owned enterprises dominate, though there are some important foreign investors. The largest commercial vehicle producers and their estimated production for 1994 are presented in Table III.102.

Table III.102. Estimated production of automobiles by selected companies, 1994
(Thousand vehicles)

Assembler	Production
Dongfeng Motors	150.0
First Auto Works	130.0
Beijing Jeep (Chrysler)	81.0
Nanjing Motor Works	75.0
Tianjin Autos	45.0
Total	850.0

Source: EIU, "China's Automotive Business: Prospects to 2000", *International Motor Business*, 1st quarter 1995.

The automotive industry was designated as a "pillar" industry of the Chinese economy under the Eighth Five-Year Plan (1991-1996), along with petrochemicals, electronics and machine building. In 1994 a new automotive industry policy was announced, which aimed to consolidate the industry and develop mass production by encouraging enterprises to merge and cooperate. By 2000 there

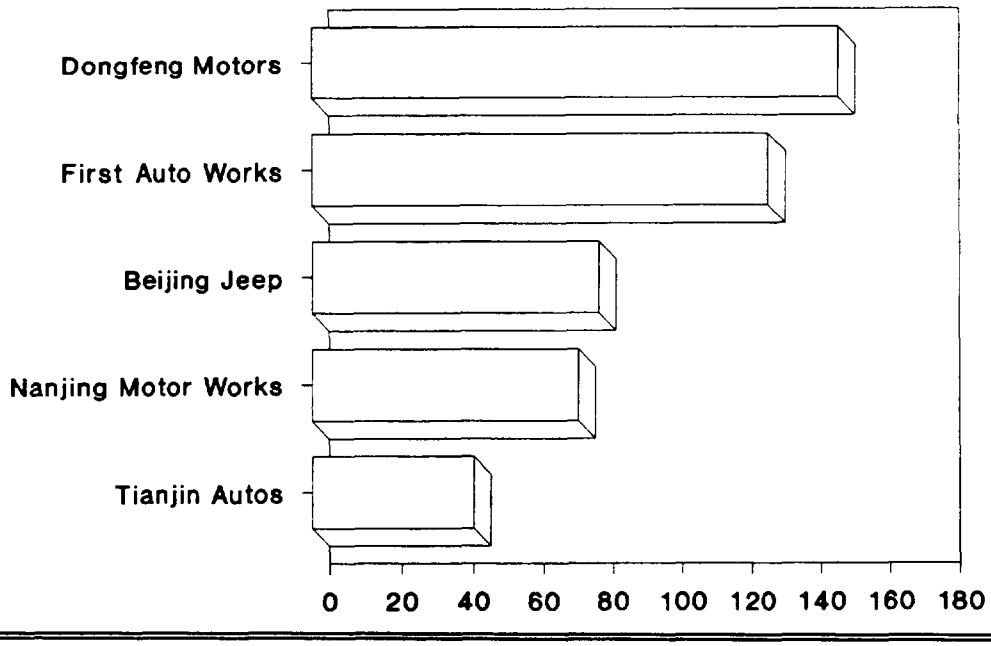
would be six or seven conglomerates formed out of the existing 13 automotive groups, each expected to make 300,000 cars a year; these seven would be reorganized into three or four in the early decades of the next century.[227/] Domestic production of motor vehicles is planned to satisfy 90 per cent of domestic market demand by 2000. In 1993 total domestic vehicle production was already over 80 per cent of domestic vehicle sales (nearly 70 per cent in the case of passenger cars).[228/]

An additional and important objective of current policy is to develop the domestic automotive components industry. While no new vehicle assembly ventures were to be approved under the policy until 1996, joint-venture investment in components was not only to be encouraged but made a condition of the granting of approval for subsequent assembly investment.[229/] The government also hopes that the growth of the motor industry will stimulate expansion in a wider range of related industries such as plastics and glass manufacture.

Local content requirements are imposed on joint-venture vehicle assemblers, which are expected to reach a 40 per cent local content level within three years of starting production, and to reach 80 per cent within eight years. One consequence of these requirements is that Chinese vehicle production suffers from quality problems, which inhibit exports.

At present China has 2,000-3,000 automotive components suppliers making parts for over 1 million vehicles per year. Many lack the skills and technology to meet international standards of quality control. The components industry is highly dispersed and fragmented. The situation in components supply mirrors that in automobile production, where there is an excessive number of manufacturers. Local governments have encouraged the growth of components production in their regions so that local vehicle manufacturers can buy locally.

Fig. III.V. Estimated production of automobiles by selected companies, 1994
(Thousand vehicles)



The standard of components production in China is also rapidly being changed by foreign investors in the automotive industry, driven by the local content requirements as well as by the economic advantages of sourcing from nearby suppliers. Foreign components manufacturers are setting up in China to service their customers, and in some cases foreign assemblers are entering components joint ventures in the expectation of establishing assembly plants in China at a later date. General Motors has a joint venture to produce wiring harnesses for FAW-Volkswagen and is also involved in spark plug, air-conditioning and fuel injection projects. Ford plans to produce interior parts. Daewoo of the Republic of Korea is setting up a plant for engines, transmissions and components, and Hyundai will produce dashboards. Toyota components suppliers are setting up in Tianjin to service the production of Toyota's automotive joint venture. Mercedes-Benz was reported to be going to invest $100 million in components manufacturing ventures in China.[230/]

Foreign investors are also beginning to use China as a regional base for the supply of components; for example, a Honda plant making forgings and coatings is reported to be planning to export to Thailand.[231/]

According to the Automotive Department of the Ministry of Machine-Building Industry, the development and manufacture of autoparts will be a budgetary priority during the 1996-2000 period. 300 firms will receive government support, and this will concentrate on the development of 23 key components which China has hitherto been unable to manufacture. The programme will include an electronic autoparts research and development venture.[232/]

Constraints and prospects

There was a slump in domestic sales following austerity measures which led to a shortage of funds in state-owned enterprise in 1993-1994. Nevertheless, motor vehicle production is likely to expand considerably up to the turn of the century and beyond. Under the Ninth Five-Year Plan (1996-2000) demand for automobiles is expected to grow at over 9 per cent annually, and by 8 per cent annually from 2000 to 2010.[233/] The Chinese government expects vehicle output will double to 3 million vehicles a year by 2000, and that most local vehicle requirements will be met by domestic production. Demand for vehicles will be stimulated by China's high rate of GDP growth and very low vehicle ownership per head of population. Nevertheless private ownership of cars will remain small, given that consumer incomes are low and car prices are very high by world standards despite some recent price reductions.[234/] Low-income consumers are likely to see car ownership as a distant priority compared with other consumer durables. In both passenger cars and commercial vehicles production is likely to concentrate on a small number of efficient producers.

Rapid growth is likely in the automotive components sector as the domestic market for vehicles expands and as more joint ventures are established to serve the needs of foreign investors in vehicles. There will also be a growing demand for auto-electronics components such as fuel injections, computerized ignition systems and air-conditioners; a senior official of the Automotive Department of the Ministry of the Machine-Building Industry estimated recently that the share of electronic equipment as a percentage of the value of a Chinese-made car would rise from the present 2.5 per cent to around 25 per cent by 2000.[235/] The Economist Intelligence Unit estimates that the sales of automotive parts could grow from a 1990 figure of $1.5 billion to $45.5 billion in 2000. Smaller and less efficient component manufacturers are likely to be damaged by the increasing entry of internationally competitive foreign component suppliers, but some degree of inefficiency is likely to remain in the supply of parts for the domestic market as a result of the forces which make for local protectionism in the Chinese economy.

An efficient components industry serving the main assemblers is crucial for the development of internationally competitive vehicle production. At the beginning of 1996, car production was still protected against imports by tariffs of 110 per cent and 150 per cent of the basic price (varying with engine size),[236/] and China faces the threat of import competition when it eventually joins the World Trade Organization and such tariffs have to be reduced.

MOTORCYCLES AND BICYCLES

Recent trends

An increased production of bicycles has been a consequence of the decision of the government to allow mass consumption standards to rise during the course of the post-1978 economic reforms. Annual production of bicycles, which was a little over 1 million a year in the early 1960s, rose to 13 million in 1980 and to 32 million in 1985. Production has since stabilized at around 40 million bicycles a year (see Table III.103).

China normally contributes about half of total world exports of bicycles. Exports rose from 2.45 million bicycles in 1989 to over 10 million in 1993[237/] and 13.4 million in 1994. In 1994 exports were equivalent to 30 per cent of China's bicycle production, generating $503.1 million in export revenue.

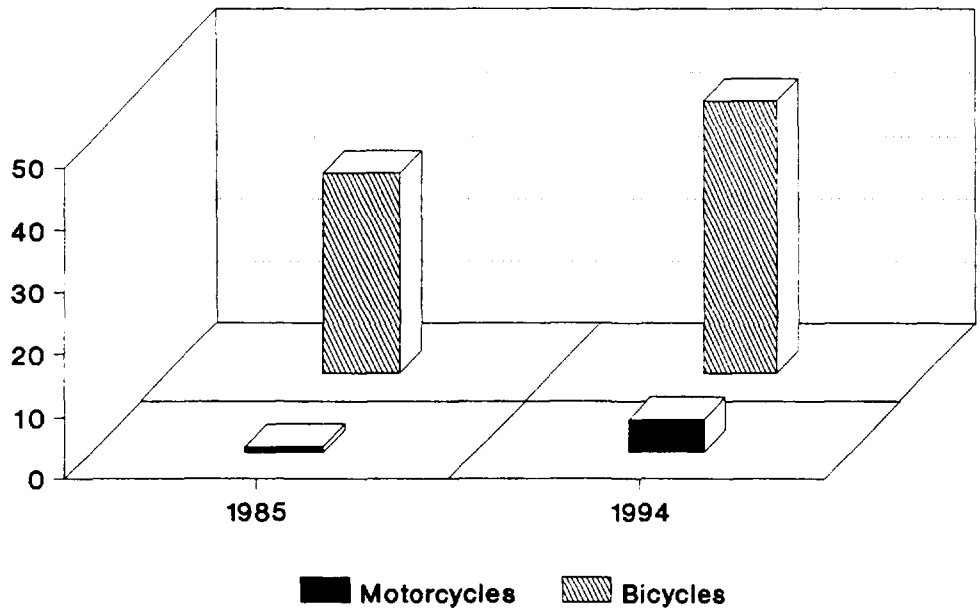
Table III.103. Production of motorcycles and bicycles, 1985-1994
(Thousand units)

Year	Motorcycles	Bicycles
1985	1,045	32,277
1986	635	35,683
1987	734	41,167
1988	1,171	41,401
1989	1,032	36,768
1990	966	31,416
1991	1,317	36,768
1992	1,982	40,836
1993	3,536	41,496
1994	5,291	43,649

Sources: *China Automotive Industry Yearbook*, 1995, for motorcycles; and *China Statistical Yearbook 1995*, for bicycles.

Bicycle manufacture is widely spread throughout China, with Shanghai and Guangdong province being the largest producers. There are approximately 800 enterprises engaged in bicycle manufacture, of which 200 assemble bicycles and the remainder make bicycle parts; about 200 are foreign-funded enterprises, of which 40 assemble bicycles and 160 make parts. Most of the foreign-funded enterprises are in Guangdong and Jiangsu provinces. However, domestic brands such as "Forever", "Phoenix" and "Flying Pigeon" still dominate the market. The makers of "Forever" and "Phoenix" bicycles have over a quarter of the Chinese market.[238/]

Fig. III.W. Production of motorcycles and bicycles, 1985 and 1994
(Million units)



China's largest foreign-invested bicycle venture, China Bicycle, had become by the early 1990s one of the largest international cycle manufacturers in the world, second only to Giant Manufacturing Corporation in Taiwan Province of China[239/]. Based in the Shenzhen special economic zone in Guangdong province, China Bicycle has been making export models for sale under international brand names as well as its own brands, and in 1992 sold 80 per cent of its output overseas. Chinese bicycles have traditionally been low-priced items, selling for a few hundred renminbi, but rising consumer incomes have produced a demand for more expensive models (particularly mountain bikes) which will generate increased sales for joint-venture investors in the Chinese domestic market. The domestic market for standard bicycles is already mature, with demand growing at about 3 per cent annually.[240/]

Rising consumer incomes have also generated a rapidly growing demand for motorcycles. Motorcycles are now within the reach of more affluent consumers, whereas private passenger cars are not. Sales are expected to rise especially rapidly when personal incomes reach $1,000 per year, as they have in Guangdong.[241/] As Table III.103 shows, motorcycle production in 1994 had risen fivefold compared with the late 1980s. Motorcycle production has risen from about 1 million a year in the late 1980s to 5.3 million in 1994. The largest-selling items are motorcycles of 50-100 cubic centimetres.

Foreign technology has been important in developing Chinese motorcycle production. The leading producers are joint ventures with major Japanese motorcycle manufacturers: Jialing, in Chongqing, is linked with Honda, while Jianshe, also in Chongqing, is linked with Yamaha. In

addition, Kawasaki and Suzuuki from Japan and Sanyang from Taiwan Province of China are among the foreign motorcycle companies with joint ventures in China.

There are 94 motorcycle manufacturers in China.[242/] Jianling and Jianshe, together with the third largest manufacturer, Qingqi in Jinan, produce half of China's output. The Ministry of Machine-Building Industry has announced plans to consolidate China's motorcycle producers into ten large enterprises by 2000.

Until recently the Chinese government has limited the foreign partners in joint-venture motorcycle projects to 50 per cent of the total equity, and foreign investors such as Honda have been limited to supplying components and technology for motorcycles which would be sold mainly under the Chinese partners' brand name. A new foreign investor, Piaggio (the manufacturer of the pioneering Vespa model in Europe), has entered into a joint venture at Foshan in Guangdong. In this venture, whose production started in 1995, the foreign partner will have 75 per cent equity and the right to sell under its own name.

Constraints and prospects

China already has mass ownership of bicycles, and output has stabilized. There is scope for expansion of more upmarket items, particularly mountain bikes, as consumer real incomes continue to rise. China's bicycle exports are already substantial, but its export growth prospects suffered a blow in 1993 when the EU agreed to impose provisional anti-dumping duties against China's bicycle exporters.[243/]

Incomes in China are fast rising to levels which will support mass ownership of motorcycles, which are already widely used for working transport, especially in rural areas. China is forecast to have 45 million motorcycles by 2000, with an annual demand of over 11 million, making it the largest market for motorcycles in the world.[244/]

Export prospects are limited by poor quality, although this is changing as foreign investors gain a stronger position. The latest major foreign investor, Piaggio, has declared its intention to use China as a regional production base as well as selling to the domestic market.

SHIPBUILDING[245/]

Recent trends

China is the world's third most important shipbuilding nation, after the Republic of Korea and Japan. The main shipbuilding centres are Dalian, Shanghai and Guangzhou. The country has one dry dock with a manufacturing capacity of 100,000 tonnes, one shipyard with capacity of 200,000 tonnes, and a floating dock which can fabricate 100,000 tonnes ships. China's output includes oil tankers, bulk cargo freighters, drive-on automobile carriers, aluminium alloy hydrofoils, chemical freighters and refrigerated ships, and the country also undertakes major repair and refurbishment operations.

The central organization of the Chinese shipbuilding industry is the China State Shipbuilding Corporation (CSSC), which has 80 enterprises including 26 large shipyards which produce both civilian and naval vessels.[246/] In 1994 the 26 major shipyards run by CSSC outfitted ships totalling 1.64 million tonnes, a rise of 23 per cent on 1993.[247/] Over half that 1.64 million tonnage was for export. Over the period 1979 to 1994 China has exported approximately half the tonnage it has built. China's total shipbuilding production was 3 million deadweight tonnes. The

1.36 million tonnes of non-CSSC output consisted of small and medium-sized vessels. CSSC also has auxiliary factories producing diesel engines and items such as navigation instruments.

China's shipbuilding capacity increased greatly in the 1980s, and much foreign technology and equipment was imported. Technology agreements were signed with overseas companies including Mitsubishi, Mitsui and Sumitomo. These agreements were used to undertake a major programme of shipyard renovation.[248/] In 1995 Kawasaki Heavy Industries was reported to be setting up a ship-engine manufacturing venture in Wuhan, the company's first overseas production centre for marine machinery.[249/]

Constraints and prospects

China still suffers from some lack of technical expertise in shipyard construction. The large dry dock facilities under construction in 1995 in the Dalian shipyard, in Liaoning province in north-east China, were seriously behind schedule. This was the first dry dock of such size to accommodate super-large crude oil tankers to be built by the Chinese without foreign cooperation. Another problem is that there is a shortage of domestic steel plate used for shipbuilding.

China aims to enlarge its share of the world market from its 1994 share of around 5 per cent to 10 per cent by 2000.[250/] CSSC itself has already increased its output by two and a half times over the 600,000 dead weight tonnes it produced in 1989,[251/] and expects to increase output to 2.2 million dead weight tonnes by 1997. As of summer 1995 CSSC had orders for more than 3 million tonnes.

O. ELECTRICAL APPLIANCES AND ELECTRONICS

Recent trends

The development of the household appliance, television, computers, telecommunications and software industries depends crucially on the overall development of China's electronics industry. Since the early 1980s the government has sought to promote the expansion and technological renovation of this industry, pouring money into the modernization of R&D and manufacturing of the key building-blocks of the industry, semi-conductors and integrated circuits. The reformers have pursued a strategy of import-substitution since the early 1980s to foster domestic development. Currently China has around 3,300 electronics enterprises.

Foreign investment and technology imports have been key mechanisms for upgrading manufacturing capabilities and increasing local content. Structural reform has also contributed to higher efficiency. This has involved the creation of large industrial conglomerates such as the Great Wall Computer Group, linking R&D, production, marketing and sales. This process has been assisted by increased government investment in the technical renovation of this sector.[252/]

These efforts to promote the electronics industry had, by the late 1980s and early 1990s, already begun to pay off. Computer production was particularly strong in 1991, with output rising by 57 per cent over the previous year. Whilst in 1985 electronics accounted for only 6 per cent of total exports, by 1990 this had risen to 18 per cent, the bulk being composed of consumer electronics. In 1990 computers accounted for 12 per cent of total electronics output, whilst components made up 29.6 per cent.

However, China still lags behind the rest of the world in electronics production. Inefficiency, duplicate production as a result of decentralization, outdated and old equipment, low labour productivity, and shortages of foreign exchange, parts and components are some of the most relevant factors underpinning this technological gap. Decentralization had encouraged provinces to set up their own electronics factories, but often at the cost of efficiency. For example only one out of 30 factories producing integrated circuits in China can produce more than 10 million units per year, well below the capacity of enterprises in the West and Japan. Although imports have contributed to increased production, there has been little local adaptation of the technologies or technical innovations.

Domestic production of integrated circuits cannot meet demand. In 1989, for example, China consumed around 400 million integrated circuits yet domestic production amounted to only 114 million, requiring the remainder to be imported. There have been some advances in semiconductor production, with output increasing seven times between 1985 and 1993 (see Table III.104). The output of integrated circuits trebled between 1985 and 1993. Although output fell between 1989 and 1990, there were nevertheless improvements in the proportion of units which could actually be used. Out-of-date technology as well as a failure to transfer technological advances made in the laboratory to the factory have meant not only that China's semiconductor industry lags about ten years behind leading world producers but also that China remains dependent on foreign-produced components in most areas.

Table III.104. Production of semiconductors and integrated circuits, 1985-1993
(Million units)

Year	Semiconductors	Integrated circuits
1985	1,479.0[a/]	63.8[a/]
1986	989.9	45.7
1987	1,379.8	76.7
1988	1,875.5	92.2
1989	2,395.2	114.0
1990	3,098.8	108.3
1991	5,469.0	170.4
1992	6,719.0	160.9
1993	9,506.0	201.0

Source: Simon, D., "Sparking the Electronics Industry", *China Business Review*, Vol. 19, No. 1, January-February 1992, pp. 24, 26.

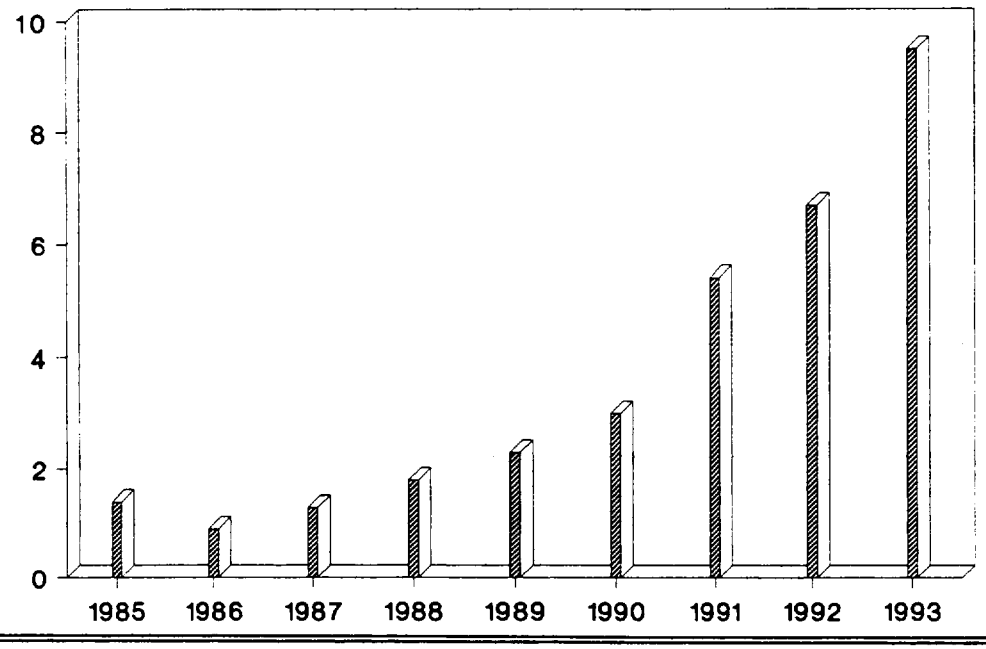
a/ Figures for semiconductors and integrated circuits in 1985 and 1991-1993 from *1994 China Industrial Economic Statistics*, 1995, p. 52.

One of the goals of the Eighth Five-Year Plan was to develop 12 backbone enterprises for semiconductor production in Beijing and Jiangsu provinces with the aid of foreign investment. The plan also aimed at raising annual production of integrated circuits to about 600 million, but this would still not be sufficient to satisfy domestic demand, requiring imports for about two-thirds of local needs.

In the Ninth Five-Year Plan the government gave priority to the development of new components and devices in the electronics industry, such as surface-mounting components and devices, thick-film hybrid integrated circuits, sensors, optical-electronic devices, power-electronic devices and new types of batteries. By the end of the century the output value of these products is planned to increase by between 15 and 20 per cent, matching the planned growth in the electronics industry of 20 per cent. In order to achieve these goals the Ministry of Electronics Industry has proposed manufacturing on a large scale. The ministry will give particular support to two enterprises with a sales value of $600 million each, to ten to 20 enterprises which will rank among the world's largest producers for some items and to ten to 20 enterprises with exports of $10 million each.[253] Integrated circuits are also a key priority in the Ninth Five-Year Plan.

China's attempts to build up its domestic base for integrated circuit production are inhibited by the Coordinating Committee on Multilateral Exports Controls (COCOM) which prevents China from obtaining the technology required to develop more complex integrated circuits. In order to bolster domestic capability China is actively seeking foreign partners. Motorola has set up an integrated circuit production factory in Tianjin, starting initially with assembly but moving eventually to full domestic production capacity. The Japanese NEC also set up a joint venture with Shoudu Iron and Steel Plant to produce an annual output of 50 million circuits which would supply a programme-controlled telephone exchanges joint venture, also belonging to NEC, in Tianjin. Other projects include a joint venture between Philips and Shanghai No. 7 Radio Factory to manufacture five-inch wafers for television and audio use, and a joint venture involving the French company Air Liquid to produce high-purity gases for integrated circuit manufacturing. The Shenzhen Electronics Group plans to set up a sub-micron wafer fabrication plant in Hong Kong through a subsidiary holding intra-COCOM status, thus enabling it possibly to circumvent these international restrictions.[254] Smuggling of integrated circuits, spare parts and components into China continues to damage the growth of the domestic industry.[255]

Fig. III.X. Production of semiconductors, 1985-1993
(Billion units)



For foreign investors and traders the priority given to the electronics sector in government policy, as well as China's inability to innovate and satisfy demand, imply that this will continue to be an important sector for investment and trade over the next decade. However, China's weak intellectual property protection legislation is likely to be an inhibiting factor for some foreign companies, concerned about China as a potential future competitor.

HOUSEHOLD APPLIANCES

Recent trends

Following the rapid development of the household appliances industry over the last decade, China has become one of the world's leading producers of refrigerators, washing machines and electric fans.[256/] The industry has benefited from continuous technological innovation and imports of foreign technology and equipment. The annual production capacity of this sector currently extends to 15 million washing machines, 8 million air-conditioners and 80 million electric fans.[257/] In 1994 20 of the top 500 enterprises in China were in the electrical sector. Of these, 12 have their stocks listed on domestic and foreign stock exchanges.

While the production of refrigerators and washing machines reached a peak in 1988, output has fallen back in subsequent years. Only in 1994 were 1988 levels recovered (see Table III.105).

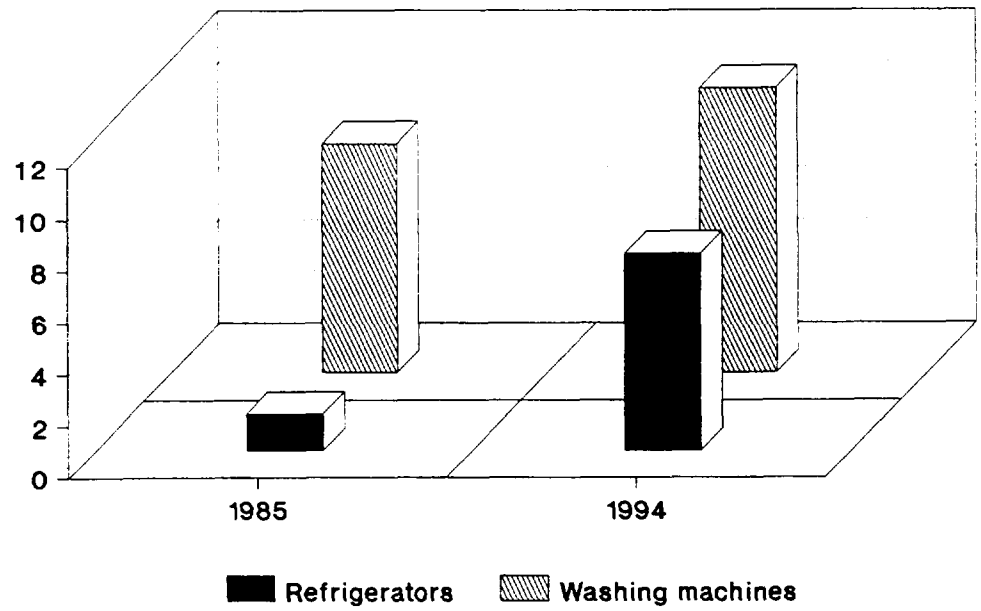
Table III.105. Production of selected household appliances, 1985-1994
(Million units, unless otherwise specified)

Year	Lightbulbs (100 million)	Refrige-rators	Electric fans	Washing machines	Radios
1985	15.33	1.44	31.74	8.87	16.00
1986	16.09	2.25	35.28	8.93	15.89
1987	16.83	4.01	36.60	9.90	17.63
1988	18.27	7.57	44.95	10.46	15.48
1989	20.80	6.70	49.91	8.25	18.34
1990	24.54	4.63	57.99	6.62	21.03
1991	28.00	4.69	62.19	6.87	19.69
1992	32.81	4.85	68.37	7.07	16.48
1993	39.32	5.96	73.87	8.95	17.54
1994	40.65	7.68	86.13	10.94	41.32

Source: *China Statistical Yearbook 1995*, pp. 409, 411.

At the same time, demand for imported refrigerators has been declining as several domestic producers are now able to offer quality products at lower prices and with better after-sales service. Given the excess production capacity for refrigerators and the stagnating demand, less profitable firms are likely to be driven out of the market. Currently only one-third of refrigerator manufacturers are profitable. The Ninth Five-Year Plan envisages a greater role for conglomerates in light industry, which would offer one way of rescuing some of the ailing state-owned enterprises.[258/]

Fig. III.Y. Production of refrigerators and washing machines, 1985 and 1994
(Million units)



Electric fan and audio recorder production has increased steadily during the decade (see Table III.106). Perhaps the most dramatic increase in output has been in cameras, which rose more than six times over the decade.

Table III.106. Production of selected household appliances, 1985-1994
(Million units)

Year	Audio recorders	Cameras	Electric irons	Freezers	Air-conditioners	Vacuum cleaners
1985	13.93	1.78	11.91	..	0.12[a/]	0.08
1986	17.56	2.02	11.43	..	0.09	0.08
1987	19.78	2.56	12.23	..	0.13	0.35
1988	25.40	3.12	21.86	..	0.25	1.82
1989	23.49	2.45	14.20	..	0.37	2.18
1990	30.23	2.13	14.05	..	0.24	0.71
1991	28.73	4.78	14.49	..	0.63	0.69
1992	32.31	5.26	17.22	..	1.58	1.12
1993	36.47	19.30	22.29	..	3.46	1.49
1994	83.95	28.30	7.60[b/]	3.83[c/]	1.71[c/]	16.46[c/]

Source: *China Statistical Yearbook 1995*, p. 410.

a/ 1985-1993 figures for electric irons, air-conditioners and vacuum cleaners from *1994 China Industrial Economic Statistical Yearbook*, 1995, p. 52.
b/ Qiu Qi, "Appliance industry registers gain in international market" in *China Daily*, 1 April 1995.
c/ Wu Naitao, "Development and Exports" in *Beijing Review*, Vol. 38, No. 28, 10-16 July 1995, p. 9.

The leading provinces producing light bulbs were Shanghai, Jiangsu and Guangdong. Jiangsu and Guangdong lead production of electric fans, accounting for 85 per cent of total output in 1993. In fact Guangdong is the main location of household appliance production, taking first place for all products. There are 12 main producers of freezers which hold 85 per cent of the market. Similarly the 12 main producers of washing machines and air-conditioners account for 77 per cent and 62 per cent respectively of the domestic market.[259/] The 12 largest enterprises in the refrigerator sector already accounted for 87 per cent of total production in 1994.

With the rapid development of the industry, exports have also begun to increase. In 1994 China exported 562,000 refrigerators, 25 per cent more than in 1993 (see Table III.107). Exports of air-conditioners rose 11 per cent in 1993 to 227,000. China is the leading world exporter of electrical fans, accounting for 70 per cent of the global market. The bulk of exports of household appliances go to the US market.

Table III.107. Exports of selected household appliances, 1992-1994
(Ten thousand units, except where stated)

	1992	1993	1994
Electric fans	3,252	4,424	..
Cameras (pieces)	2,923	3,882	..
Torches	17,827	21,505	..
Refrigerators	..	449,600	562,000[a/]
Air-conditioners	..	157,600	227,000[a/]

Source: *China Statistical Yearbook 1994*, p. 517.

a/ Wu Naitao, "Development and Exports", *Beijing Review*, Vol. 38, No. 28, 10-16 July 1995, p. 9.

Foreign companies such as General Electrical and Siemens, and Samsung of the Republic of Korea have also begun to enter the China market, where Japanese electrical firms currently enjoy the largest share.[260/] However, due to imports of advanced foreign technology and production lines the quality and prices of domestically produced household electrical appliances match those of foreign imports.

Sound recorders and radio cassette recorders continue to be imported to meet domestic demand and the preference for foreign brand names. In 1994 imports of these products came to 4.6 million units.

Constraints and prospects

Demand for consumer electronics products has remained stable in the 1990s. Sales of traditional home appliances in urban areas have reached saturation point according to some analysts, and rural markets for these products have not yet opened to any significant degree.[261/] However, as per head incomes continue to rise, demand for first-time purchases in rural areas is likely to increase.

By mid-1994 75 per cent and 11 per cent of urban and rural households, respectively, had refrigerators. Future demand is expected to come from newly-formed families, which amounts to about 10 million per year, and the replacement of old refrigerators. Demand for frost-free, multi-door and larger capacity models is likely to increase. With supply falling short of demand, the prospects for manufacturers of these more sophisticated designs are good.

Similarly, as about 90 per cent of urban households have washing machines, demand will be driven by replacement and upgrading, mainly to fully automatic and rotary-type models. Imports are not an immediate threat to domestic producers of washing machines as they are from 50 per cent to 100 per cent more expensive, even without import duty. As only 30 per cent of households in rural areas have washing machines, semi-automatic models will continue to find markets. However, the growth of the rural market is limited by the underdevelopment of basic running water infrastructure.

As only 15 per cent of households in large cities own air-conditioners, there is a large potential market waiting to be tapped. Foreign brands and split-type air-conditioners are becoming increasingly popular, despite their higher prices. The growing demand for air-conditioners is likely to lead to output increases.

Import tariffs have served to protect the domestic industry. However, in preparation for entry into the WTO, rates were cut in mid-1994. For example the tariff for refrigerators was reduced from 100 per cent to 50 per cent, for air-conditioners from 130 per cent to 90 per cent, and for washing machines from 100 per cent to 90 per cent. The development of the household appliances sector may be adversely affected by further possible cuts in import tariffs if China enters the WTO.

TELEVISION SETS

Recent trends

Before the reforms began colour television set production was virtually non-existent. In 1979 China produced less than 10,000 sets. The first imported colour television production line started operation in Tianjin in April 1980. Government investment in this sector has enabled television set production to almost double in the decade since 1985 (see Table III.108). In 1993 13.07 million colour television sets were produced and China became the third largest producer behind the USA and the Republic of Korea. Currently China has an annual production capacity of 20 million colour television sets. In 1993 the total output value of colour television sets and related products accounted for over 21.5 per cent of the total output value of the electronics industry. Since then almost 1,000 production lines for colour television components, including colour picture tubes, integrated circuits, electronic tuners, printed circuit boards, metres and instruments, have been established.[262/]

There are around 50 enterprises manufacturing colour television sets, of which nine produce more than 500,000 sets annually and three over 1 million units. The top ten enterprises account for 61 per cent of the total output for the industry. The top three local brands are Great Wall, Konka and Panda. Decentralization of the electronics sector, including colour television production, in the mid-late 1980s has led to a proliferation of factories and excessive imports of foreign equipment. There are about 30 factories producing integrated circuits, but these operate well below the standard capacity of factories in Japan and the West. China depends on imports of colour television tubes for production. Annual production capacity currently exceeds demand.

Domestic sales of black-and-white television sets have declined in recent years whilst exports account for an increasing share of total output. Poor electricity infrastructure in rural areas constrains the uptake of television sets.

With the rise in living standards, the preference for foreign-made brands and the desire to replace earlier television purchases, imports of colour television sets continue to increase. For example, between 1992 and 1993 the number of television sets imported rose threefold from 230,000 to 770,000. Whilst television sets are in general replaced every five to seven years, in China the replacement period is eight to ten years. China also exports its colour television sets and exports amounted to 4.6 million sets in 1993 (see Table III.108).[263/]

Table III.108. Production of television sets and exports of colour television sets, 1985-1994
(Million sets)

Year	Total production	of which: Colour television sets	Exports of colour television sets
1985	16.67	4.35	..
1986	14.59	4.14	..
1987	19.34	6.72	1.82[a/]
1988	25.05	10.37	..
1989	27.66	9.40	1.73[a/]
1990	26.84	10.33	..
1991	26.91	12.05	2.42[a/]
1992	28.67	13.33	..
1993	30.32	14.35	4.60[a/]
1994	32.83	16.89	..

Sources: *China Statistical Yearbook 1995*, p. 411.

a/ "Development of China's Colour TV Industry", *Beijing Review*, Vol. 38, No. 10, 6-12 March 1995, p. 21.

Constraints and prospects

Currently 80 per cent of the 100 million colour television sets in use across China are located in urban households. While demand for black-and-white television sets and colour television sets in rural areas should remain strong in the near future, the prospects for the colour television market in urban areas are less bright. However, large screen television sets are enjoying a burst of popularity which will benefit manufacturers capable of producing these models. Changing preferences will serve to sift out inefficient manufacturers.

In the Ninth Five-Year Plan (1996-2000) the Ministry of Electronics Industry has set the goal of expanding colour television set production to 20 million sets. This will involve nurturing one or two large enterprises with an annual capacity of 4 million colour television sets. Dependence on imported integrated circuits as well as various components and parts will continue to limit the growth of this sector.

Import tariffs have protected the fledgling colour television industry. However, in preparation for entry into the WTO China has cut tariffs for colour television sets from 100 per cent to between

50 per cent and 65 per cent depending on the size.[264/] Further cuts may have an adverse effect on the development of this industry.

INFORMATION TECHNOLOGY AND COMPUTERS

The resource base

In the pre-reform period modern computer technology was virtually non-existent. Domestically produced data processors used low-tech, outdated vacuum-tube technology. Computer technology was also imported from the Eastern Bloc.

There are 36 major domestic personal computer manufacturers in China, of which only five are capable of large-scale production. The key producers are China Great Wall Computer Group (the largest non-governmental computer conglomerate), Legend Group established in 1984, Changjiang Computer Group, Langchao Information Industry Group and the Yunnan Electronic Equipment Corporation, which together accounted for 82 per cent of domestically manufactured personal computers sold in 1992. However, only five of these manufacturers are capable of large-scale production. The Beijing Legend Group has reached out into the global market by establishing joint ventures with Hong Kong computer companies and setting up overseas branches in the USA, Germany, Canada, Australia and Singapore.[265/] It currently holds a 2 per cent share of the global computer market.

Recent trends

In its efforts to modernize rapidly the government began in the early 1980s to nurture the development of the computer industry. Between 1981 and 1985 the government aimed to build up a domestic capacity through technology transfer and foreign investment so as to avoid dependency on the West. As foreign companies proved reluctant to transfer technology in this sector, the government had to rely more on direct sales. In this five-year period China imported $3.78 million worth of computer equipment, especially high-end systems. Following the surge in computer imports after decentralization in 1984 the government increased import duties and import licensing requirements linking computer purchases to key projects. By the late 1980s imports took only 65 per cent of the market, as compared with 75 per cent previously.

From 1986 the government altered its position on technology transfer and in this changed context the first Sino-foreign computer joint venture was set up. The initial goal in building up domestic capacity was to create facilities to manufacture personal computers and small-scale computer hardware. The "Torch Programme" was launched in 1988 to promote the development of high-tech industry, including computers. One of the success stories of this programme is the "Super" desk-top publishing system developed at Beijing University, the popularity of which has presented an obstacle to the entrance of Apple into the China market.

As a result of the 1988 austerity programme and tightening export policies in 1989, computer imports began to fall. However, domestic industry was unable to take advantage of this downturn. This prompted the government in 1991 to abandon any aspirations for self-reliance in computer production. It focused attention on the development of a domestic capacity in low-end products, while continuing to import high-end equipment such as mainframes and minicomputers. In 1991 China's computer industry accounted for only 9 per cent of the total electronics industry output value. China relies on imports for high-end computer products. In 1992 it imported over $1 billion worth of computer equipment, a 12.9 per cent increase over 1991 (see Table III.109).

Table III.109. Computer imports, 1991 and 1992
($ million)

Product	1991	1992
Total	902	1,019
of which:		
Parts and peripherals	402	428
PCs	199	290
Multi-user systems	211	186
Workstations	90	115

Source: Hui, S. and McKown, H., "China Computes", *The China Business Review*, September-October 1993, p. 15.

Although there is an official policy of source diversification for technology imports, the USA holds about 70 per cent of the China computer market in terms of shipment value. IBM and Digital Equipment Company (DEC) dominate the multi-user system market. IBM is the leading mainframe vendor, supplying most government ministries and large organizations. Digital is the largest small-scale supplier. Hewlett-Packard is the largest server supplier, accounting for 40 per cent of the domestic market. It also accounts for 60 per cent of the inkjet and laser printer markets. Both Hewlett-Packard and Silicon Graphics dominate the workstation market. Compaq leads the personal computer market, overtaking its rival AST in 1994. Vendors from Taiwan Province of China and Japanese and European companies such as NEC, Olivetti and Bull HN have also entered this fiercely competitive arena. In 1995 the US internetworking technology giant Bay Networks, which focuses on internetworking products and services, launched a major initiative to expand its operations in China.

China has a rapidly expanding market for personal computers and printers. Large transnational companies such as Apple, IBM, DEC, Compaq, NEC, AST and Hewlett-Packard are investing or have promised to invest in China's computer industry. Hewlett-Packard, which was the first foreign company to form a joint venture in China in the high-tech field, plans to invest $20 million in China in 1996 to manufacture personal computers.[266/] It has five joint ventures in China and manufacturing facilities in Shenzhen, Qingdao and Shanghai. Compaq's joint venture in Shenzhen was scheduled to start operation in 1995, with an annual output target of 100,000 PCs both for domestic sale and export.[267/] While the Ministry of Electronics Industry welcomes foreign investment, it does not seem to encourage companies to set up several joint ventures producing the same product.

China's computer export market has also been developing rapidly. In 1987 China exported $45 million worth of products, mainly components such as power supplies, floppy diskettes, monitors, printer heads and cables to North America, Europe and the Middle East. By the late 1980s it began to export high-level products such as motherboards. The overall goal is to establish China as a low-end personal computer and component supplier rather than a high-end manufacturer in competition with foreign firms.

With regard to information technology, rising foreign direct investment coupled with the government's determination to encourage rapid economic development imply that demand for

information and data networks will continue to increase. By building up its national grid of optical fibre cables and expanding its satellite programme, China will create an important stimulus to the rapid expansion of its infant information technology industry. In 1994 there were only 800 acknowledged databases in China, mostly not on-line. However, only 300 of these were actually in operation and of these only 60 really served the public, according to a *China Daily* report.[268/] Official estimates put the number of installed PCs at less than 1.5 million. However the State Information Centre under the State Planning Commission as well as many enterprises are exploring this area. Chinapac, a packet-switched data network, extends nationwide.

Both central and local governments are already planning ahead to improve information technology. A feasibility study of a national high-speed broadband network is already under way. Guangzhou, Shanghai and Beijing are planning, or are in the process of installing, synchronous digital hierarchy high-speed data transmission networks. The US company SCM/Brooks is providing financial support for a joint venture in Guangdong with the People's Liberation Army's Galaxy New Technology Company to build an asynchronous transfer mode broadband switching system with AT&T equipment. This network would provide services to hotels and exhibition and trade centres in Guangzhou.[269/]

Constraints and prospects

There is growing demand for computer equipment from public bodies such as ministries, banks and financial institutions, private enterprises and home users. There will therefore be rapid expansion of this market over the coming decade with positive spin-off effects on the development of the software industry. In the coming five years sales are expected to continue to increase at an annual rate of 25 per cent. In order to meet this expanding demand the government will increase investment and continue preferential treatment to this sector through to the end of the century. In the Ninth Five-Year Plan the Ministry of Electronics Industry plans to promote computer utilization in other industries. For example, the target has been set that 70 per cent of large and medium-sized enterprises and major research institutes will adopt CAD systems. Computer-control for power conservation as well as computer assisted management systems will also be introduced.[270/]

Although China has some domestic capacity, reliance on imports, especially for higher-end systems, peripherals, components and software, will continue over the next decade. The government is encouraging the development of the software industry. Government policy aims to make China a major supplier in domestic and global markets of low-end personal computers and peripherals, including printers, monitors, and circuit boards. Foreign exchange earnings from these products would then support imports of higher-end systems. In order to corner a larger share of the global export market, the Ministry of Electronics Industry plans to export 1 million personal computers by the end of the century. To achieve this, high priority is being given to domestic microcomputer manufacturing.

One of the constraints on the development of the domestic computer industry is the outdated and inefficient state-run factories. By separating enterprise management from government administration the government intends to make leading producers, such as China Great Wall Computer Group, Langchao Electronic Information Industry Group and Changjiang Computer Group, more efficient. China's Legend Group, for example, sought listing on the Hong Kong stock exchange as a way to raise more capital. Similarly the Beijing Stone Group, the largest non-governmental computer conglomerate, was listed on the exchange from the summer of 1993.

China's continued dependence on the imported chip is perhaps the major obstacle facing the development of the domestic computer industry. China has a very low integrated circuit (IC) production capability which is currently limited to ICs in consumer products. It is not yet able to mass produce chips at the 1-3 micron level, which is necessary for the production of basic computers. Thus all ICs required in computer production are currently imported. Given COCOM restrictions on technology transfer at least two to three decades of R&D are required before China can attain current Western standards of semi-conductor technology. Thus COCOM and US Department of Commerce regulations on the export of high technology to China are also major obstacles both to foreign exporters and to the future development of the domestic computer industry. In order to develop its IC production capacity China has set up a joint venture with NEC Corporation in Beijing, planning to export 70 per cent of the output. Motorola has also set up an integrated circuit manufacturing facility in Tianjin.[271/]

The lack of intellectual property protection in China is a major inhibitor on increased sales of foreign software and services to China. Rife smuggling of computer products, which sell at a lower price than domestic products, is also a serious constraint on the development of the domestic computer industry. In 1994, for example, only 90,000 computers sold were officially imported, the remaining 530,000 being smuggled or illegally assembled.[272/]

TELECOMMUNICATIONS

The resource base

There are over 40 telecommunications equipment production enterprises in China, funded jointly by enterprises attached to the Ministry of Posts and Telecommunication and overseas companies. Domestic production cannot meet the needs of a modern telecommunications network so foreign companies have been active in entering this field. While initially foreign companies mainly conducted direct sales or set up licensing arrangements, more are now moving towards joint ventures. Particularly lucrative has been the local production of digital switching equipment, which yields high margins and regular post-sale revenues from upgrading software and system expansion. As switching software is vendor-specific, suppliers can be sure of software revenues for up to 15 years after the sale of a digital switch. Alcatel, Siemens, NEC, AT&T and Northern Telecom have all set up joint-venture digital switching equipment production companies in China. Switchboards were the leading item in electronics imports in 1995.[273/] The ministry is now discouraging new joint ventures intending to produce digital switching systems. As companies have still managed to export digital switching systems through foreign government loan arrangements, domestic companies (including joint ventures) are currently operating at under-capacity. In the second half of 1994 imports of switches through foreign government loans was brought to a halt but imports will continue in the near future as contracts already signed are fulfilled.[274/]

China is at an early stage in the production process of telecoms equipment. Its production of telecoms equipment such as fibre-optic transmission systems, multiplexer equipment, microwave radio systems and cellular handsets mainly takes the form of assembly of kits, either Complete Knock-Down or Semi Knock-Down, with key modules and subsystems already assembled. From the point of view of the foreign supplier this type of production has lower margins and less post-sale revenues than digital switching. However China is developing a research capacity in this field so as to encourage technological adaptation and innovation. There are at least 100 plants and research institutes engaged in the development and production of fibre-optic cable and transmission systems and foreign companies have already begun to set up joint ventures. For example, Philips, Olex and Furukawa Electronic have invested in joint ventures in Wuhan, Xian, Shanghai, Guangzhou and Beijing.[275/] Around 30 Chinese companies, however, dominate the

production of other cable used in the telecoms industry, such as coaxial, pair, trunk and loop cable, providing annually about 3.5 million kilometres of cable for the ministry's expansion plans. Chengdu Cable Factory, for example, has an annual production capacity of over 1.2 million kilometres and rates as the largest cable producer in the country. While the opportunities for foreign companies in fibre-optic cable production are likely to lessen as domestic plants move into this area, radio-based technologies, particularly high-capacity digital microwave and TDMA systems, are likely to provide other avenues for investment.

China has 164,000 route-kilometres of analogue open wire and 40,000 route-kilometres of digital microwave and 2,000 backbone telephone telecommunications trunks use satellite facilities. Fibre has taken the place of analogue coaxial cable.[276/]

Recent trends

For historical and political reasons China suffers from a chronic underdevelopment of its telecommunications networks. In 1978 China had only 3 million telephone exchange channels, with one phone for every 300 people and only two main lines per 100 inhabitants. Aware of the importance of telecommunications to economic growth and regional competitive advantage, the reformers have embarked upon significant changes in policy to accelerate the development of this sector.[277/]

The first major initiatives in the telecommunications sector came in 1984 when a leading group for the revitalization of the electronics industry was established to promote not only electronics but also the development of the telecommunications sector. Telecommunications is viewed as an instrument of industrial policy, which can stimulate domestic equipment and components manufacturing.

During the Seventh Five-Year Plan (1986-1990) the key focus of the Ministry of Posts and Telecommunications was on digitizing and expanding trunk backbone facilities and installing more digital switching facilities in major urban networks. The key areas targeted were provincial and coastal cities. The Eighth and Ninth Five-Year Plans envisaged a much faster expansion of this sector, with goals previously set to be attained in 2000 being brought forward to 1995. In 1992 alone 2.8 million lines were installed, a 44 per cent increase over 1990 and a 250 per cent increase over 1988.[278/] This rapid expansion is reflected in China's imports of US telecoms equipment, which amounted to $460 million between 1987 and 1991.[279/]

By 1994 China had a total of 49 million lines and 10.83 million new telephone subscribers.[280/] Moreover, the number of international direct-dial telephone circuits had increased from only 78 in 1978 to 24,000. A similar rapid growth is seen for long-distance circuits, which more than quadrupled between 1985 and 1991, attaining a figure in that latter year of 152,000.[281/] However, it is mainly the urban areas which have benefited from this rapid expansion: 26 per cent of China's townships have no telephone exchange and 57 per cent of villages do not have any telephone service.[282/] In large cities there are between eight and 20 telephones per 100 population compared with an average of only 17 to every 10,000 in the rural areas.

The 1990s have seen a continuation of rapid policy changes. These have included liberalization measures to extend network capacity as well as efforts to develop digital exchanges and to expand fibre-optic cable use. In 1992 China had a total fixed-wire network capacity of 32 million lines, of which 19.26 million were for public use and 12.74 million were for private or specialized use. While the Ministry of Posts and Telecommunications thus operated about 60 per cent of network

capacity, the remaining 40 per cent were run by township and village enterprises, other ministries such as the Ministry of Energy, and state-owned enterprises.[283/]

Organizational reform is an important aspect of changes in the telecommunications sector. In 1994 the Ministry of Posts and Telecommunications became the national regulator funded directly by the state budget while the national network operator, the Directorate-General of Telecommunications, was separated off. Under the initiative of the Ministry of Electronics two corporations, Jitong and Liantong, were set up in 1993 and 1994 to provide alternative or supplementary networks. By constructing satellite, microwave and cable connections Jitong was to contribute towards three of the "golden projects" aimed at providing an information resources network for private end-users. Liantong was given authority to build and operate fixed-line and radio-based local and trunk telecommunications networks. In 1993 the State Council liberalized radio-paging, non-public cellular mobile telephones (450 MHz and 800 MHz), VSATS (subject to obtaining a licence), and telephone and computer messaging services, e-mail, EDI and videotex, subject to a declaration.

As part of a ten-year plan to raise technological levels and attract capital, the State Planning Commission and Ministry of Foreign Trade and Economic Cooperation has announced 210 major projects to be implemented by the end of the century, including the expansion of digital exchanges in nine provinces and cities and the construction of optical fibre cable lines between Beijing and Guangzhou, Beijing and Xian, Beijing and Lanzhou and Fuzhou and Chengdu.[284/] In 1994 the Ministry of Posts and Telecommunications commissioned the first public digital data network, which will link over 300 cities in the first stage of development.[285/] Guangdong province has set up a highly advanced fibre-optic network, a 2.5 Gbps line, linking the Pearl River Delta and Hong Kong. In 1994 seven long-distance optical fibre cables and 14 satellite ground stations were completed, increasing the number of long-distance telephone lines by 63 per cent.[286/]

By 2000 the government hopes to achieve targets double its 1995 goals. Plans are afoot:

- to increase long-distance telephone service circuits to 2.4 million lines, by completing an optical fibre cable trunk network which is complemented by satellite communications and digital microwave communications facilities;[287/]

- to increase the number of office telephone exchanges to 114 million lines and mainline subscribers to 93 million;

- to increase urban ownership of telephones to 30-40 per cent;

- to provide 90 per cent urban coverage for public packet switching and digital data networks; and

- to increase the number of cellular phone users to 10 million and pager users to 25 million.[288/]

It is projected that a digital network will serve 60 per cent of the 9 million mobile phone and telephone lines in urban and rural areas. In order to fulfil these plans the Chinese government is seeking foreign investment.

Concerned about the current domination of digital exchange production by foreign companies, in the autumn of 1995 the government announced a plan to merge eight state-owned enterprises into one large telephone exchange producer, the China Great Dragon Telecommunication (Group). This new company will receive government credit and financial support for R&D with the long-

term goal of taking over the telecoms market. By 1997 the company intends to achieve an annual output reaching 6 million lines. Plans are also afoot to set up manufacturing ventures in the Russian Federation and in India.[289/]

Constraints and prospects

Currently China is adding 11-12 million telephone lines annually to the telecoms infrastructure. Cellular mobile phone use has risen rapidly in the reform period. In 1994 alone there were 5 million new pager users, bringing the total to 10 million, a remarkable increase compared with 1990 when there were less than 500,000 pager users.[290/] Thus the telecommunications sector is enjoying rapid development, and government plans foresee even faster growth.

Financing of this sector does not appear to be a major constraint on its development. As local governments view telecommunications as an import asset in the stiff competition with other regions for foreign investment, provincial authorities often provide cables free for the local loop to their posts and telephones bureaux and the local People's Liberation Army provides free labour for the construction of ducts.[291/] Switches are manufactured in China at less than $80 per circuit. Network installation costs are recouped through high registration and connection charges. Mobile phones have been a particularly profitable area for the posts and telephone administrations, with handset prices and registration fees as high as $3,000 or more. Thus the post and telephone administrations have been able to recover their capital outlay within one or two years and to pay foreign systems suppliers such as Ericsson and Motorola cash for turnkey networks.

Given the weakness of domestic telecommunications equipment production, however, China will continue to rely on imports of advanced technology while endeavouring to bolster its own development and production capacity. The Ministry of Posts and Telecommunications favours investment contracts over technology transfer agreements, and foreign firms are already beginning to convert their licensing arrangements into joint-venture contracts so as to gain a stronger foothold in the China market. New guidelines on foreign investment issued in mid-1995 permit foreign companies to participate and jointly invest in telecommunications construction projects, but they are still not allowed to hold shares or engage directly in telecommunications business operations.[292/] Moreover, the ministry has issued guidelines requiring joint ventures to source at least 60-70 per cent of their inputs locally.[293/] As Chinese plants move into the production of fibre-optic cable, the opportunities for foreign companies in this area are likely to narrow.

Software

The development of the software industry is closely related to the continuing demand for computers. Like the computer industry this is also a fiercely competitive sector, both between domestic producers and foreign companies and among overseas producers. The domestic industry is very much in its early stages. Although sales in 1994 were 20 per cent higher than in 1993, compared with the sales of hardware products the pace of growth is relatively slow.[294/] Software products only account for 12.3 per cent of total computer industry sales while hardware products take up 73.84 per cent. The Beijing Stone Group Corporation is an active player in the software industry, developing in 1989 its own typesetting system for small publishers of books and magazines.[295/] However, it lost the market to a more advanced system developed by the Founders Group. In 1994 a Stone Group joint venture with a Hong Kong company created "RichWIN", a Chinese language platform for Microsoft's Windows operating environment, which was adopted that year as the standard operating system by the State Statistical Bureau throughout China.

The government is keen to promote this sector. One step in this direction has been the planned construction in 1993 of three software parks in Beijing, Shanghai and Guangdong provinces. The Shanghai park, situated in Pudong New Area, will accommodate 40 software companies, including joint ventures. The Guangdong location is export-oriented. The Ministry of Electronics aims to focus on the development of application software products. Cooperation with foreign partners is welcomed but wholly-owned software ventures are still out of the question.

Foreign companies have already begun to set up software joint ventures. In 1990 IBM and Shenzhen University Software Development set up an international software development joint venture. Bull HN Information Systems, a US/French joint venture, announced plans in 1991 to set up a joint venture to produce UNIX application software. The Dutch Word House also revealed that year its plans to set up a joint venture to develop computer software in Guangzhou. Information Global Service, a Japanese company, has joined up with an institute in Shanghai to manufacture computer software for export to Japan and the USA.

Microsoft currently dominates the software market in China. Since its entry into China in 1992 its sales have doubled each year. Anticipating an accelerating pace of office automation, Microsoft focused on Microsoft Office for Windows during 1995. The company has developed Chinese versions for Word, Excel and Mail, thus homing successfully in on the specificities of the domestic market. By expanding its after-sales service Microsoft is also hoping to counter the rampant piracy in software products. Microsoft faces fierce competition, however, from other companies such as Novell, Oracle, Sybase and IBM from the USA and NEC from Japan.

Constraints and prospects

Software piracy has been a thorn in the side of government attempts to obtain the latest technology from overseas producers. While the software industry in China is at an early stage in its development, government prioritization of this sector as well as foreign investors' interest in the potentially huge market will be positive factors in its rapid promotion.

P. OTHER INDUSTRIES

TOYS

China has become the world's largest producer of toys. In 1991 total output value of the toy sector reached Rmb 5 billion. There are over 3,000 toy manufacturers in China with a total of more than 300,000 employees.[296/] Of these, 242 enterprises fall within the light industrial administrative system, employing a total of 60,000 workers. Production is concentrated in big cities such as Beijing, Shanghai and Guangzhou and in the eastern coastal areas. Foreign investors dominate the successful export market. According to the China Association of Toys, 80 per cent of toymakers in Guangdong and 50 per cent in Fujian are overseas-funded.[297/]

Exports of toys have grown at an annual rate of 15-20 per cent. Between 1991 and 1994 the value of exports quadrupled from $820 million to $3,063 million.[298/] The main export markets are North America, western Europe and Japan. In 1992 Hong Kong exported HK$ 53 billion worth of toys, of which half were made in China. China accounts for one-third of imported play items in the USA, 28.5 per cent in Germany, 30 per cent in the UK, 60 per cent in Italy and 20 per cent of the Japanese market. China is a net exporter of toys, with the value of imports in 1994

amounting to $118.6 million. Table III.110 gives some indication of the relative importance of certain toy categories as sources of foreign exchange.

Table III.110. Exports of toys, 1985-1994
($ million)

Year	Toys,[a/] sporting goods	Toys, indoor games equipment	Dolls
1985	82	74	..
1986	163	153	..
1987	292	280	..
1988	..	393	..
1989	..	508	..
1990	1,970	1,830	16
1991	2,454	2,241	23
1992	3,487	3,131	370
1993	4,050	3,590	330
1994	..	..	..

Sources: UN, *International Trade Statistics Yearbooks 1988, 1989, 1993*, New York, 1990, 1991 and 1995, pp. 176, 173, 190 respectively.

a/ This first category includes items such as children's bikes.

The Guangdong Provincial Association of Toys and the Taibao Group have jointly invested in the Shenzhen International Toy World which will hold international toy fairs. It was due to be completed in October 1995.[299/]

Constraints and prospects

The lack of a toy designing body is a key constraint on the development of the exporting capacity of domestic producers. Toys tend to be of low quality and of limited variety. Most of the toys are copied and few are new creations. Hence China is not able to keep pace with the changing requirements of the international market. While Hong Kong manufacturers require only three months to develop a new toy product, Chinese enterprises require on average six months. Hong Kong produces over 100,000 different types of toys, the USA 150,000 types but China only 20,000 types.[300/]

Low-level technology is a further constraint on the development of the industry, which currently relies on technology from the 1960s and 1970s. The need to import some inputs such as stuffing materials because of the poor quality of domestic inputs raises production costs. However, domestic demand can mop up those products which meet obstacles overseas because of a failure to match international standards. According to a national market survey the demand for toys will increase by 20 per cent annually, reaching a value of $24.6 billion by 2000.[301/]

As with other industries the problem of loss-making state enterprises is an added burden. Moreover the number of these which fall under the Light Industrial Bureau has been increasing in the 1990s.[302/]

HANDICRAFTS

In 1993 there were 2,492 handicrafts and arts enterprises in the light industrial system, 125 less than in 1992. They employed 711,000 staff and workers, a drop of 12,200 compared with 1992.[303/] Handicrafts and artworks have been a mainstay export product of rural enterprises but since 1987 their relative importance as an export from rural enterprises has been falling. While in 1987 15.6 per cent of exports of rural enterprises were handicrafts, by 1993 this had fallen to 9.8 per cent, its relative position being taken by exports of footwear, paper and paper products, furniture, toys, and other light industrial manufactures.[304/]

Rural enterprises in Beijing, Shandong and Hebei are the prime source of exports of handicrafts and artworks (see Table III.111).

Table III.111. Ratio of exports of handicrafts and artworks from rural enterprises to total exports of handicrafts and artworks, 1988-1992
(Percentage)

1988	1989	1990	1991	1992
39.0	43.1	45.0	52.0	63.7

Source: Yan Shanping, "Export-Oriented Rural Enterprises", *China Newsletter*, JETRO, No. 118, September-October 1995, p. 9.

Constraints and prospects

Further development of the handicrafts and arts industry will hinge on the sector's capacity to raise the quality of its products. The government has set this as a policy goal and in that spirit has supported exhibitions and national-level meetings. Further links with foreign buyers will push producers to raise standards and to respond more rapidly to changing market needs.

NOTES TO CHAPTER III

1/ Crook, F., "Seeds of Change", *China Business Review,* Vol. 21, No. 6, November-December 1994, p. 22.

2/ Walker, K.R., "Trends in Crop Production", Chapter 5, pp. 161-201 in Kueh, Y.Y. and Ash, R.F., (eds), *Economic Trends in Chinese Agriculture, The Impact of Post-Mao Reforms,* Clarendon Press, Oxford, p. 174.

3/ Liu Chengguo, "Increased Output Hopeful Despite Difficulties", *Beijing Review,* Vol. 38, No. 12, 20-26 March 1995.

4/ For a detailed discussion of trends in crop production see Walker, K., "Trends in Crop Production", Chapter 5, pp. 160-201, in Kueh, Y.Y. and Ash, R.F. (eds), *Economic Trends in Chinese Agriculture, The Impact of Post-Mao Reforms,* Clarendon Press, Oxford, 1993.

5/ Crook, F., *op. cit.,* p. 22.

6/ *Ibid.*

7/ Department of Trade and Industry, *Food Processing Industry,* China, March 1990.

8/ "Baked food is now moving into the mainstream of the diet", *China Economic Digest,* Winter 1994, p. 31.

9/ "Foreign bread makers have emerged on the Chinese market", *China Economic Digest,* Winter 1994, p. 31.

10/ Crook, F., *op. cit.,* p. 23.

11/ Price, S., "New Year Grain Jitters", *China Trade Report,* February 1995, Vol. 33, p. 1.

12/ "Trouble on the Farm", EIU, *Business China,* 20 February 1995, p. 9.

13/ Crook, F., *op. cit.,* pp. 20-23.

14/ "China Publishes Interim Provisions on Guidance for Foreign Investment", *Beijing Review,* 18-24 September 1995, pp. 17-26.

15/ "More grain centres to be built to boost grain output", *China Economic Digest,* Spring 1995, pp. 24-25.

16/ "Japanese Fuji Oil Co is to set up a new venture", *China Economic Digest,* Autumn 1994, p. 60.

17/ USDA, "China Soybean Trip Report", *World Agricultural Production,* October 1995, p. 56.

18/ USDA, FS1-95, *Sugar and World Markets and Trade,* June 1995, p. 9.

19/ *China Statistical Yearbook 1994,* China Statistical Publishing House, Beijing, Table 11-17, p. 348.

20/ "Bittersweet future for sugar sector", *China Economic Digest,* Autumn 1994, p. 31.

21/ Walker, K.R. , *op. cit.*, p. 183.

22/ "State has placed new restrictions on sugar prices", *China Economic Digest,* Spring 1995, pp. 29-30.

23/ "Industry and Marketing Opportunities", *China Economic Digest,* Summer 1995, p. 33.

24/ Walker, K.R., *op. cit.*, p. 183.

25/ Billing, C., "No to Joe Camel", *China Trade Report,* December 1994, p. 9.

26/ USDA, *World Agricultural Production,* August 1995, p. 38.

27/ *Ibid.*

28/ "A Heady Brew", *China-Britain Trade Review,* Issue 371, September 1995, p. 8.

29/ "Beer sales are brisk and the potential is still huge", *China Economic Digest,* Autumn 1995, p. 34.

30/ For an account of Foster's experience in joint-venture beer-brewing in China see Harris, M., "Roll out the barrel", *China Trade Report,* Vol. 32, December 1994, p. 4, and also "Foster's pieces its market together, Complex Brew", *Business China,* EIU, 21 August 1995.

31/ Harris, M., "Roll out the barrel", *China Trade Report,* Vol. 32, December 1994, p. 4, and "China to Build Largest Beer Enterprise", *Beijing Review,* 24-30 April 1995, p. 33.

32/ "Beer sales are brisk and the potential is still huge", *China Economic Digest,* Autumn 1995, p. 34.

33/ "A Sino-French vinery joint venture sets up", *China Economic Digest,* Autumn 1994, p. 60.

34/ "Cognac sales are on the increase", *China Economic Digest,* Autumn 1994, p. 37.

35/ "China's Food Industry Shows Steady Growth", *Beijing Review,* 11-17 December 1995, p. 21.

36/ "China – a great potential drinks market", *China Economic Digest,* Spring 1995, p. 30.

37/ *Ibid.*

38/ "Gooseberry sweetens drinks", *China Economic Digest,* Spring 1995, p. 31.

39/ "Foreign Appeal for Melon Products", *Beijing Review,* 19-25 June 1995, p. 28.

40/ "Beer sales are brisk and the potential is still huge", *China Economic Digest,* Autumn 1995, p. 34.

41/ "A Heady Brew", *China-Britain Trade Review,* September 1995, p. 11.

42/ Bo Qi Lin, *Rural Reforms, Structural Change and Agricultural Growth in the People's Republic of China,* EDRC Report Series, No. 62, Asian Development Bank.

43/ Tuan, F.C., "The Livestock Sector", Chapter 6 in Kueh, Y.Y. and Ash, R.F., (eds), *Economic Trends in Chinese Agriculture, The Impact of Post-Mao Reforms,* Clarendon Press, Oxford, 1993, p. 209.

44/ "Livestock Sector in South China's Guangdong Province", *China Economic Digest,* Autumn 1994, p. 31.

45/ For a detailed study of the livestock sector see Tuan, F.C., "The Livestock Sector", Chapter 6 in Kueh, Y.Y. and Ash, R.F., (eds), *Economic Trends in Chinese Agriculture, The Impact of Post-Mao Reforms,* Clarendon Press, Oxford, pp. 203-228.

46/ 1988 figures taken from Tuan, F.C., *op. cit.*, p. 210.

47/ "China saw a quick growth in food exports", *China Economic Digest,* p. 35.

48/ For a detailed study of the livestock sector see Tuan, F.C., *op. cit.,* p. 208.

49/ For a detailed account of Nestlé in China see "Sweet Success", *China Business Review,* November-December 1994, p. 37.

50/ "Ice-cream market sports hot sales", *China Economic Digest,* Autumn 1995, p. 36.

51/ "Demand on processed fish is on the increase", *China Economic Digest,* Winter 1994, p. 29.

52/ "United Biscuits, the Way the Cookie Crumbles", EIU, *Business China,* 30 October 1995.

53/ Department of Trade and Industry, *Food Processing Industry, China,* March 1990.

54/ "Shanghai is China's No. 1 instant noodle market", *China Economic Digest,* Autumn 1995, p. 36.

55/ UNCTAD, *Commodity Yearbook,* 1994.

56/ See Sicular, T., "Ten years of reform: progress and setbacks in agricultural planning and pricing", Chapter. 2, and Walker, K. R., "Trends in Crop Production", Chapter 5, in Kueh, Y. Y. and Ash, R. F. (eds), *Economic Trends in Chinese Agriculture. The Impact of Post-Mao Reforms,* Oxford, 1993.

57/ *Beijing Review,* 23-29 August 1993.

58/ 1993 figures from UN, *International Trade Statistics, 1993.*

59/ *China Economic Digest,* Winter 1993/94.

60/ Glasse, J., *Textiles and Clothing in China, Competitive Threat or Investment Opportunity,* EIU Special Report No. 2638, London, 1995, pp. 92-98.

61/ *China Economic News,* 28 August 1995.

62/ These details of the history of Chinese textile production are from Howe, C., *China's Economy, A Basic Guide,* 1978, pp. 124-126.

63/ *China Economic Digest,* Summer 1993.

64/ *China Economic Digest,* Winter 1993/94.

65/ Glasse, J., *op. cit.,* EIU Special Report No. 2638, London, 1995, p. 89.

66/ Thus there are 25,701 textile (and chemical fibre) enterprises, including township enterprises, listed for the textile industry as a whole, but 32,778 TVEs in textiles (and chemical fibres) in the (separate) listing of rural and township industries. See *Almanac of China's Textile Industry,* 1994, pp. 116 and 139.

67/ Glasse, J., *op. cit.*

68/ *China Economic Digest,* Winter 1993/4.

69/ Most information in this paragraph comes from *China Economic News,* 28 August 1995.

70/ Glasse, J., *op. cit.* pp. 3-5.

71/ The material in this paragraph on industrial textiles comes from *China Economic News,* 27 June 1994.

72/ *China Economic News,* 27 June 1994 and 7 November 1994.

73/ *Economic Reporter,* 4, 1994.

74/ *China Economic Review,* 10 April 1995.

75/ *China Business Review,* May-June 1994.

76/ *China Trade Report,* October 1995.

77/ *China Trade Report,* January 1994, October 1994 and October 1995.

78/ World Trade Organization, *International Trade Trends and Statistics,* 1995.

79/ GATT, *International Trade Trends and Statistics,* 1994.

80/ *China Economic Digest,* Winter 1993/4.

81/ *China Economic News,* 8 May 1995.

82/ *China Trade Report,* October 1995.

83/ *China Economic News,* 27 June 1994 and 7 November 1994.

84/ *Economic Reporter,* 1, 1994.

85/ Glasse, J., *op. cit.,* pp. 3-5.

86/ *Ibid.,* p. 116. These wage statistics are quoted from Werner International Inc, *Spinning and Weaving Labour Cost Comparisons,* 1993. The statistics relate to spinning and weaving, but garment industry wages are likely to be broadly comparable, leaving aside any differences caused by regional wage variations in China.

87/ *Economic Reporter,* 1, 1994.

88/ World Bank, *China: Foreign Trade Reform,* 1994, pp. 262-3.

89/ *China Business Review,* May-June 1994.

90/ *Beijing Review,* 2-8 January 1995.

91/ Glasse, J., *op. cit.*

92/ *Almanac of China's Textile Industry,* 1994, pp. 116 and 139.

93/ "The developing Chinese garment industry", *JTN Quarterly,* Osaka, 1995.

94/ *China Economic News,* 28 August 1995.

95/ The information here on this phase of the MFA, and on changes in rules of origin, is taken from *China Business Review,* March-April 1995.

96/ Glasse, J., *op. cit.*, pp. 3-5.

97/ *China Economic News,* 21 August 1995.

98/ There is a surprising shortage of both statistical and (particularly) narrative material on Chinese carpet and tapestry production. The comments made here should be seen in this light, and be regarded as tentative.

99/ Although the production statistics appear to show a phenomenal growth in the 1990s, there are some reasons for regarding them as misprinted in the only available source (see notes to Table III.54).

100/ BBC, *Summary of World Broadcasts, China,* 11 May 1994.

101/ In contrast, much of the relocation of the footwear industry of the Republic of Korea has been to Indonesia.

102/ Gereffi, G., "New realities of industrial development in East Asia and Latin America: global, regional and national trends", Chapter 4, in Applebaum, R. P. and Henderson, J. (eds), *States and Development in the Asian Pacific Rim,* London, 1992, p. 103.

103/ This account draws on *China Trade Report,* November 1993 and January 1994, for information on shoe manufacture in China.

104/ *China Economic News,* 18 September 1995.

105/ The 1992 trade-weighted nominal tariff for footwear was 78 per cent. World Bank, *China: Foreign Trade Reform,* 1994, p. 50.

106/ *China Trade Report,* January 1984.

107/ "China's Forest Coverage Rises to 13.9 per cent", *Beijing Review,* Vol. 36, No. 52, 27 December 1993-2 January 1994, p. 5.

108/ *Ibid.*, p. 6.

109/ Bo Qi Lin, "Rural Reforms, Structural Change and Agricultural Growth in the People's Republic of China", EDRC Report Series, No. 62, Asian Development Bank, p. 5.

110/ UN, *Industrial Statistics Yearbook 1990,* Vol. 2, *Commodity Production Statistics, 1981-1990,* New York, 1992, p. 327.

111/ *China Statistical Yearbook 1994,* China Statistical Publishing House, Beijing, p. 517.

112/ "Compilation of Major Technology Projects Scheduled for the People's Republic of China between 1993-2000", *Beijing Review,* Vol. 37, No. 48, 28 November-4 December 1994, p. 21.

113/ "Measures to curb shrinkage of timberland", *China Economic Digest,* Spring 1995, p. 22.

114/ Much of the basic information for this section comes from *China Business Review's Focus on the Oil Industry,* July-August 1994; and Dorian, J. P., *Minerals, Energy and Economic Development in China,* Oxford, 1994.

115/ *China Daily,* 25 April 1995.

116/ *Beijing Review,* 17-23 July 1995.

117/ EIU, *Business China,* 10 July 1995.

118/ EIU, *Business China,* 13 November 1995.

119/ *Beijing Review,* 11-17 September 1995.

120/ *China Business Review,* July-August 1994, p. 17.

121/ *Ibid.*

122/ This is an East-West Centre (Hawaii) figure, quoted in *China Business Report,* July-August 1994, p. 19.

123/ These and other details about recent foreign investment in refining are from EIU, *Business China,* 10 July 1995 and 13 November 1995.

124/ Much of the information used in this section comes from Takeda, M., "China's petrochemical industry", China Newsletter, July-August 1995; *China Business Review's Focus on the Oil Industry,* July-August 1994, which has some material on petrochemicals; and *Beijing Review,* 31 October-6 November 1994, which contains a paper "Vigorously develop the petrochemical industry" by the president of the China Petroleum Corporation.

125/ *Beijing Review,* 31 October - 6 November 1994.

126/ *Ibid.*

127/ This information is taken from the listing of foreign investments in chemicals in China, *China Newsletter,* July-August 1995.

128/ *Beijing Review,* 11-17 September 1995.

129/ For a further discussion of agricultural development in this period, see Riskin, C., *China's Political Economy, The Quest for Development since 1949,* Oxford University Press, 1988, Chapter 7.

130/ *Ibid.,* p. 193.

131/ "Fertilizer plants are pushed to produce more", *China Economic Digest,* Spring 1995, pp. 22-23.

132/ UNCTAD import figures for natural phosphates reported in UN, *UNCTAD Commodity Yearbook,* 1992, p. 370, are about half those cited by the FAO.

133/ "Fertilizer plants are pushed to produce more", *China Economic Digest,* Spring 1995, pp. 22-23.

134/ "New technology developed for potash fertilizer production", *China Chemical Week,* Vol. 02, No. 37, 29 March 1995, p. 1.

135/ Ding Xuemei, "Fertilizer output growth needed", *China Daily,* 6 April 1995.

136/ Zhu Baoxia, "Medicine firms take new pill", *China Daily,* 4 October 1995, p. 2.

137/ "Compilation of Major Technology Projects Scheduled for the People's Republic of China between 1993-2000", *Beijing Review,* Vol. 37, No. 48, 28 November-4 December 1994, pp. 21-22.

138/ "Vitamin may get more funds", *China Economic Digest,* Winter 1994, p. 20.

139/ Swanson, M., "A Prescription for Success", *The China Business Review,* July-August 1992, pp. 26-30.

140/ Swanson, M., "Unofficial and Untapped: China's Over-the Counter Drug Market", *China Business Review,* Vol. 21, No. 2, March-April 1994, pp. 34-39.

141/ *Ibid,* p. 35.

142/ Xiao Sun, "Traditional medicine seeks non-traditional funding", *China Daily, Business Weekly,* 5-11 November 1995, p. 2.

143/ *China Statistical Yearbook 1994,* p. 516, China Statistical Publishing House, Beijing.

144/ Most figures for reserves, and some current production statistics, used in this branch profile are from the US Bureau of Mines, *Mineral Commodity Summaries,* 1995. See also Crowson, P., *Minerals Handbook, 1992-93,* London, 1992.

145/ Crowson, P., *Minerals Handbook, 1992-93,* London, 1992, p. 30.

146/ Details of the cement industry have been taken from "Introduction to investment in the cement industry", *China Monitor,* 1, 1995.

147/ *Almanac of China's Building Materials Industry,* 1991-1992.

148/ *China Economic Digest,* Winter 1995.

149/ *China Economic Report,* February 1995.

150/ *China Daily,* 16 December 1995.

151/ *China Daily,* 3 January 1996.

152/ *China Daily,* 16 December 1995.

153/ There is a shortage of information about brick-making in China. Neither the *China Statistical Yearbook* nor the *China Industrial Economic Statistical Yearbook* gives any production statistics for bricks. Even the *Almanac of China's Building Materials Industry,* for which the latest obtainable version dates from 1991-1992, gives only two years' (1990 and 1991) production statistics and less than a page of text on the industry; everything here is taken from this source.

154/ Dorian, J.P., *Minerals, Energy and Economic Development in China,* Oxford, 1994, p. 95.

155/ *Ibid.,* p. 122.

156/ Crowson, P., *Minerals Handbook, 1992-93,* London, 1992, pp. 145-153.

157/ See British Geological Survey, *World Mineral Statistics,* 1983-7.

158/ *China Economic Digest,* Winter 1995.

159/ A billion equals one thousand million. Figures from *1995 China Yearbook of Iron and Steel Industry,* Beijing 1995, p. 79. According to "Foreign Funds Fire Coal Future", *China*

Daily, 27 September 1995, China has underground deposits of 2,600 billion tonnes but less than half of these have been verified.

160/ Chang Weimin, "Foreign funds fire coal future", *China Daily,* 27 September 1995, p. 1.

161/ *China Coal Industry Yearbook,* 1994, Coal Industry Publishing House, 1995, p. 23 (in Chinese).

162/ 1994 figure taken from *China's Customs Statistics,* 1994, 12, p. 26.

163/ A billion equals one thousand million. Figures from *1995 China Yearbook of Iron and Steel Industry,* Beijing, 1995, p. 79.

164/ As the *UN International Trade Statistics Yearbook* does not provide figures for insignificant exports, we can assume that exports of iron ore are likewise of minimal significance.

165/ Figures from *1995 China Yearbook of Iron and Steel Industry,* Beijing, 1995, p. 101.

166/ Pan Zhongming, "High stockpiles mean record steel exports", *China Daily, Business Weekly,* 25 July 1995, p. 5.

167/ The *UN International Trade Statistics Yearbooks* and the *1995 China Iron and Steel Industry Yearbook* do not give statistics for exports. In the case of the former this is an indication that the export is not significant.

168/ Only 16 enterprises produced between 500,000 tonnes and 990,000 tonnes.

169/ Commercial Department, British Embassy, Beijing, "Steel Plant Plans Ahead", *China-Britain Trade Review,* February 1994, Issue 352, p. 7.

170/ "China to increase steel imports", *China Economic Digest,* Summer 1993, p. 30.

171/ *Ibid.,* pp. 30-31.

172/ Price, S., "Steel Slump", *China Trade Report,* Vol. 32, December 1994, p. 2.

173/ *Ibid.,* p. 3.

174/ "New steel giant seeking partners", *China Economic Digest,* Summer 1993, p. 23.

175/ Song Xin and Zhong Ming, "Forget quantity, steel official urges", *China Daily, Business Weekly,* 20-24 August 1995, p. 1.

176/ Chang Weimin, "Foreign funds fire coal future", *China Daily,* 27 September 1995, p. 1.

177/ Lao Chang, "Overseas funds to fuel coal goals", *China Daily,* 6 January 1996, and Chang Weimin, "Foreign funds fire coal future", *China Daily,* 27 September 1995, p. 1.

178/ "300 coal projects in sight", *China Daily,* 9 September 1995, p. 1.

179/ "Asia's demand for coal to grow", *China Daily,* 2 June 1995, p. 6.

180/ "Chinese steelmaker forced to cut activity", *Financial Times,* 4 May 1995.

181/ "Domestic steel makers still facing harsh times", *China Economic Digest,* Spring 1995, pp. 18-19.

182/ Useful background information on non-ferrous metals has been obtained from Dorian, J. P., *Minerals, Energy and Economic Development in China,* Oxford, 1994; and from US Bureau of Mines, *Mineral Commodity Summaries,* 1995, which provides the figures used here on reserves of major minerals. Useful detailed information on individual non-ferrous metals has been derived from Vivian, R., *China's Metals and World Markets: Emerging Opportunities for Trade,* EIU Special Report No. 2185, by Richard Vivian, October 1992, and the *Yearbook of Non-Ferrous Metals Industry of China,* 1995. Note that production statistics for non-ferrous metals are problematic; there are discrepancies between Chinese sources such as the *Yearbook of Non-Ferrous Metals Industry* and international sources such as UNCTAD's *Commodity Yearbook.* These discrepancies are small in some cases (such as aluminium) and large in others (such as tin). Discussion of such discrepancies is included where appropriate.

183/ Crowson, P., *Minerals Handbook, 1992-93,* London, 1992.

184/ *China Trade Report,* November 1994.

185/ *China Daily,* 14 October 1993.

186/ *China Trade Report,* November 1994.

187/ *China Economic News,* 11 July 1994.

188/ *China Economic Digest,* Winter 1995.

189/ *Ibid.*

190/ *Ibid.*

191/ *China Economic News,* 11 July 1994.

192/ *China-Britain Trade Review,* December 1995, and *Metal Bulletin Monthly,* January 1996.

193/ See *Yearbook of the Non-Ferrous Metals Industry of China,* 1995.

194/ *China Trade Report,* June 1993.

195/ *Financial Times,* 26 May 1995.

196/ *China Economic News,* 22 May 1995.

197/ Information on tin is derived from Thoburn, J. T., *Tin in the World Economy,* Edinburgh, 1994; Thoburn, J. T., "The tin industry since the collapse of the International Tin Agreement", *Resources Policy,* June 1994.

198/ However, if a broader definition of reserves is used, the US Bureau of Mines estimates for Brazil rise to 2.5 million tonnes, compared with a world total of 10 million, while China's estimated reserves on the broader definition stay at 1.6 million, putting China at second place.

199/ See world tin statistics listed in *Malaysian Tin Bulletin,* September 1995.

200/ *Malaysian Tin Bulletin,* September 1995.

201/ *Tin International,* Vol. 68, No. 3, 1995.

202/ *Malaysian Tin Bulletin,* September 1995, p. 3.

203/ Vivian, R., *China's Metals and World Markets: Emerging Opportunities for Trade,* EIU Special Report No. 2185, October 1992, p. 59.

204/ *China Economic News,* 22 May 1995.

205/ *China Trade Report, November 1994.*

206/ *China-Britain Trade Review,* May 1995; and *Metal Bulletin Monthly,* December 1994.

207/ See Dorian, J. P., *Minerals, Energy and Economic Development in China,* Oxford, 1994, p. 162.

208/ This branch profile has derived much useful information on the development of machinery production in China from Chudnovsky, D., Nagao, M. and Jacobsson, S., *Capital Goods Production in the Third World. An Economic Study of Technology Acquisition,* London, 1983, Chapter 4, "Production of complex capital goods: the experience of China", pp. 155-82.

209/ Quoted in Howe, C., *China's Economy, A Basic Guide,* London, 1978, p. 118. Pages 118-121 have some valuable material on the history of machine-building in China, which is used here.

210/ Chudnovsky *et al., op. cit.,* give a very detailed account of these technology transfers, pp. 158-177.

211/ These details about steel come from Howe, C., *op. cit.*, pp. 120-121.

212/ *China Statistical Yearbook 1995.* Since the first figure includes an unspecified proportion of township and village enterprises in its total, the two figures cannot be aggregated.

213/ Howe, C., *op. cit.*, pp. 118-120.

214/ *China Economic News,* 27 June 1994.

215/ *China Statistical Yearbook 1995.*

216/ *China Economic News,* 27 June 1994.

217/ *China-Britain Trade Report,* February 1995.

218/ *China Daily,* 27 December 1995.

219/ *China-Britain Trade Report,* April 1995.

220/ *China Statistical Yearbook 1995.* Since the first figure includes an unspecified proportion of township and village enterprises in its total, the two figures cannot be aggregated.

221/ *China Economic Digest,* Winter 1995.

222/ *China Economic News,* 20 March 1995.

223/ The information in this branch profile mainly comes from Harwitt, E., *China's Automotive Industry, Policies, Problems and Prospects,* New York, 1995; EIU, "China's Automotive Business. Prospects to 2000", *International Motor Business,* 1st quarter, 1995; and "Focus" on the Chinese auto industry in *China Business Review,* March-April 1994. See also Tomoo Marukawa, "China's Automotive Industry: Heading for the 21st Century", in Institute of Developing Economies Spot Survey, *The Automotive Industry in Asia: the Great Leap Forward?,* Tokyo, October 1995.

224/ This figure is from *World Motor Vehicle Data,* 1994. It apparently includes CKDs. The EIU figure for passenger car production in 1990 is 37,600. The *China Automotive Industry Yearbook,* 1995, also gives a 1990 figure of over 42,000 (42,409).

225/ For further details see Harwitt, E., *China's Automotive Industry, Policies, Problems and Prospects,* New York, 1995, pp. 21-23.

226/ More details of the size distribution of firms are given in Tomoo Marukawa, "China's Automotive Industry: Heading for the 21st Century", in Institute of Developing Economies Spot Survey, *The Automotive Industry in Asia: the Great Leap Forward?,* Tokyo, October 1995, p. 1.

227/ *China Daily,* 1-7 May 1994.

228/ These estimates are based on figures in EIU, "China's Automotive Business. Prospects to 2000", *International Motor Business,* 1st quarter 1995. Note that they differ slightly from some other sources.

229/ *China Economic Digest,* Autumn 1995.

230/ *China Daily,* 17 October 1995.

231/ "Sum of the parts", *China Economic Review,* January 1995.

232/ *China Economic Digest,* Summer 1995.

233/ *Beijing Review,* 6-12 November 1995.

234/ For example, the price of a Volkswagen Santana, a Chinese best selling car, was reduced during the course of 1995 from Rmb 170,000 ($20,500) to Rmb 140,000 ($16,900). See *China Daily,* 4 January 1998.

235/ *China Daily,* 17 October 1995.

236/ *China Daily,* 4 January 1996.

237/ *China Monitor,* 1994, No. 3.

238/ *China Economic Review,* May 1995.

239/ *China Business Review,* May-June 1993.

240/ *China Economic Review,* May 1995.

241/ *Business China,* 2 October 1995. This section draws on this source, and on *Business China,* 10 July 1995.

242/ *China Economic Digest,* Summer 1995.

243/ *China Business Review,* May-June 1993.

244/ *China-Britain Trade Report,* December 1995.

245/ See in particular "Shipbuilding: orders rank third in the world", *Beijing Review,* 26 June - 2 July 1995.

246/ *China Economic Digest,* Summer 1993.

247/ *Beijing Review,* 26 June - 2 July 1995.

248/ See "China International Economic Consultants", *China Investment Guide* (4th ed.), p. 85.

249/ *China Economic Review,* June 1995.

250/ *China Economic Digest,* Summer 1995.

251/ *China Trade Report,* January 1995, from which details of the Dalian project are taken.

252/ For an overview of the electronics industry see Simon, D., "Sparking the Electronics Industry", *The China Business Review,* Vol. 19, No. 1, January/February 1992, pp. 22-28.

253/ Xu Binglan, "Components important to electronics development", *China Daily, Business Weekly,* 15-22 October 1995, p. 8.

254/ Hui, S. and McKown, H., "China computes", *The China Business Review,* Vol. 20, No. 5, September-October 1993, p. 20.

255/ Li Shuguo, "Electronics sector flourishing", *Economic Reporter,* No. 5, 1994, p. 23.

256/ Qiu Qi, "Appliance industry registers gain in international market", *China Daily,* 1 April 1995.

257/ Wu Naitao, "Development and Exports", *Beijing Review,* Vol. 38, No. 28, 10-16 July 1995, p. 8.

258/ Li Yan, "Conglomerates key to future light industry edge", *China Daily,* 7 November 1995, p. 5.

259/ Qiu Qi, *op. cit.*

260/ Wu Naitao, *op. cit.,* p. 8.

261/ Li Shuguo, "Electronics sector flourishing", *Economic Reporter,* No. 5, 1994, p. 22.

262/ "Development of China's Colour TV Industry", *Beijing Review,* Vol. 38, No. 10, 6-12 March 1995, p. 21.

263/ "Development of China's Colour TV Industry", *Beijing Review,* Vol. 38, No. 10, 6-12 March 1995, p. 21.

264/ The import tariff for colour televisions sized 42 cm or less has been cut to 50 per cent, for 52 cm or less to 60 per cent, for larger than 52 cm to 65 per cent, and for other televisions to 60 per cent.

265/ For a detailed history of the Legend Group see Feng Jing, "Legend in Chinese Computer Industry", *Beijing Review,* Vol. 36, No. 25, 21-27 June 1993, pp. 25-29.

266/ Xiao Pei, "Computer giant invests in China", *China Daily,* 30 March 1995.

267/ Xiao Pei, "Computer giants show hard drive for market share", *China Daily, Business Weekly,* 16-22 July 1995, p. 2.

268/ *China Daily,* 2 October 1994, p. 1, quoted in Ure, J., (ed.), *Telecommunications in Asia, Policy, Planning and Development,* Hong Kong University Press, 1995, p. 44.

269/ *Ibid.*

270/ Bing Lan, "Ministry to boost computer use in other industries", *China Daily,* 23 November 1995, p. 5.

271/ Simon, D. F., "Sparking the Electronics Industry", *China Business Review,* Vol. 19, No. 1, January-February 1992, p. 24.

272/ Pei Jianfeng, "Computer smuggling damaging", *China Daily,* 28 July 1995.

273/ Li Yan, "Electronics are a sound investment for the future", *China Daily,* 1 August 1995, p. 5.

274/ Guo Linhuan (ed), "China is to install more than 16 million lines of digital switching systems", *China Economic Digest,* Spring 1995, Hanli Consultancy Ltd, London, pp. 16-17.

275/ Gorham, S. and Chadran, A. M., "Telecom Races Ahead", *China Business Review,* Vol. 20, No. 2, March-April 1993, p. 20.

276/ Commercial Section, British Embassy, Beijing, "Telecommunications in China", *China-Britain Trade Review,* May 1994, Issue 355, p. 5.

277/ For an excellent discussion of telecommunications in China and other Asian countries see Ure, J. (ed.), *Telecommunications in Asia, Policy, Planning and Development,* Hong Kong University Press, 1995.

278/ Gorham, S. and Chadran, A.M., *op. cit.,* p. 18.

279/ *Ibid.*

280/ Wu Jichuan, "Telecom Sector Expands International Cooperation", *Beijing Review,* Vol. 39, No. 26, 26 June-2 July 1995, p. 8.

281/ Commercial Section, British Embassy, Beijing, "Telecommunications in China", *China-Britain Trade Review,* May 1994, Issue 355, p. 4.

282/ *Ibid.,* p. 5.

283/ Ure, J., *op. cit.*

284/ "Compilation of Major Technology Projects Scheduled for the People's Republic of China between 1993-2000", *Beijing Review,* Vol. 37, No. 48, 28 November-4 December 1994, p. 18.

285/ "Telecom spurred by fibre-optic lines", *China Daily,* 15 April 1995.

286/ Wu Jichuan, "Telecom Sector Expands International Cooperation", *Beijing Review,* Vol. 38, No. 26, 26 June-2 July 1995, p. 8.

287/ This will involve building eight north-south and eight east-west fibre-optic trunk lines, using 622 Mbps SDH systems for the main links and 2.5 Gbps for the larger trunk lines.

288/ Wu Jichuan, "Telecom Sector Expands International Cooperation", *Beijing Review,* Vol. 38, No. 26, 26 June-2 July 1995, pp. 9-10.

289/ Wu Yunhe, "Eight firms merge to form giant", *China Daily, Business Weekly,* 17-23 September 1995, p. 8.

290/ Wu Jichuan, *op. cit.,* p. 8, and Ure, J., *op. cit.,* p. 19.

291/ Ure, J., *op. cit.,* p. 18.

292/ Wu Jichuan, *op. cit.*, p. 11.

293/ Gorham, S. and Chadran, A.M., "Telecom Races Ahead", *China Business Review,* Vol. 20, No. 2, March-April 1993, p. 20.

294/ Jing Ji, "Computer market to support domestic developers", *China Daily, Business Weekly,* 25 June-1 July 1995, p. 8.

295/ Kennedy, S., "Reaching into All Corners", *China Business Review,* Vol. 22, No. 1, January-February 1995, p. 43.

296/ "Beijing to Host Toys Exposition", *Beijing Review,* Vol. 36, No. 21, 24-30 May 1993, p. 24.

297/ Li Yan, "Toy industry growing up", *China Daily, Business Weekly,* 3-9 September 1995, p. 2.

298/ *China's Customs Statistics,* 12, 1994, pp. 25, 28.

299/ "A huge toy industry complex is being built in Shenzhen", *China Economic Digest,* Winter 1994, p. 35.

300/ *1994 China Light Industry Yearbook,* 1994, pp. 207-209 (in Chinese).

301/ "Toy industry has been growing up in recent years", *China Economic Digest,* Autumn 1995, p. 24.

302/ *1994 China Light Industry Yearbook,* 1994, pp. 207-209 (in Chinese).

303/ *Ibid.,* p. 206.

304/ Yan Shanping, "Export-Oriented Rural Enterprises", *China Newsletter*, No. 118, September-October 1995, p. 9.

ANNEX A

STATISTICAL TABLES

Annex Table A-1. GDP indices by sector of origin, 1980-94, selected years
(1978 = 100)

	1980	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
Gross domestic product	116.0	170.0	192.9	210.0	234.3	260.7	271.3	281.5	307.7	351.5	399.1	446.2
Primary industry	104.6	152.6	155.4	160.5	168.1	172.3	177.6	190.7	195.2	204.4	214.0	222.6
Secondary industry	122.9	166.9	197.9	218.2	248.1	284.1	294.8	304.1	344.7	419.5	506.2	594.2
Industry	122.4	166.0	196.2	215.2	243.6	280.8	295.0	304.9	346.9	422.6	511.3	603.4
Construction	129.2	179.0	218.7	253.4	298.7	322.5	295.3	298.8	327.4	396.2	467.5	523.7
Tertiary industry	114.2	196.1	231.9	260.0	297.4	336.7	354.8	362.0	398.1	444.4	486.9	526.9
Transportation, postal and telecommunications services	113.8	163.8	185.9	209.7	230.7	261.5	273.8	297.2	330.6	365.4	410.6	453.5
Commerce	107.4	214.8	276.8	306.1	347.3	396.9	363.8	342.3	354.2	409.4	436.4	472.5

Source: State Statistical Bureau, *China Statistical Yearbook 1995,* Beijing, 1995.

Annex Table A-2. Indices of gross output value by type of industrial ownership, 1978-94
(Preceding year = 100)

	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994
Total	113.55	108.81	109.27	104.29	107.82	111.19	116.28	121.39	111.67	117.69	120.79	108.54	107.76	114.77	127.52	128.02	126.08
State-owned	114.44	108.88	105.61	102.53	107.05	109.39	108.92	112.94	106.18	111.30	112.61	103.86	102.96	108.62	112.40	105.73	106.50
Collective-owned	110.58	108.57	119.24	109.01	109.54	115.53	134.85	132.69	117.97	123.24	128.16	110.48	109.02	118.40	139.28	135.96	129.84
Individual-owned	..	..	..	234.57	178.95	220.59	197.47	1,189.60	167.57	156.59	147.34	123.77	121.11	125.29	152.88	167.97	158.34
Other ownership	..	..	..	131.60	127.73	133.90	156.81	139.54	134.16	166.39	161.53	142.68	139.33	150.11	164.85	186.54	168.45

Source: State Statistical Bureau, *China Statistical Yearbook 1995*, Beijing, 1995.

Annex Table A-3. Number of industrial sector enterprises by type of ownership, 1990-94
(Ten thousands)

	1990	1991	1992	1993	1994
Number of enterprises	795.78	807.96	861.21	991.16	1,001.71
State-owned enterprises	10.44	10.47	10.33	10.47	10.22
Collective-owned enterprises	166.85	157.72	164.06	180.36	186.30
Township enterprises	22.87	22.96	22.95	20.98	21.77
Village enterprises	68.08	67.52	70.97	77.73	78.87
Joint urban enterprises	3.09	2.95	3.96	6.81	6.73
Joint rural enterprises	56.57	48.35	50.68	57.61	62.19
Individual-owned enterprises in urban and rural areas	617.60	638.67	685.40	797.12	800.74
Urban areas	43.25	45.06	50.70	68.17	88.18
Rural areas	574.35	593.62	634.70	728.95	712.56
Other ownership enterprises	0.88	1.08	1.42	3.21	4.45

Source: State Statistical Bureau, *China Statistical Yearbook 1995,* Beijing, 1995.

Annex Table A-4. Industrial employment by type of ownership and industrial activity, 1990-94
(Ten thousand persons)

	1990	1991	1992	1993	1994
National total	6,378	6,551	6,621	6,626	6,580
Grouped by ownership					
State-owned enterprises	4,364	4,472	4,521	4,498	4,369
Collective-owned enterprises	1,876	1,898	1,862	1,700	1,604
Other enterprises	137	182	238	428	607
Grouped by administrative relationship					
Central enterprises	993	1,021	1,054	1,073	1,066
Local enterprises	5,385	5,530	5,567	5,553	5,514
Grouped by light and heavy industry					
Light industry	2,652	2,727	2,738	2,736	2,633
Heavy industry	3,726	3,824	3,883	3,890	3,947
Grouped by sector					
Excavation	882	905	899	887	904
Coal mining and processing	539	555	555	516	527
Petroleum and natural gas extraction	76	77	83	123	117
Ferrous metals mining and processing	23	27	24	20	22
Non-ferrous metals mining and processing	71	73	68	53	62
Non-metal minerals mining and processing	..	..	..	60	62
Other minerals mining and processing	54	60	56	2	3
Logging and transport of timber and bamboo	119	113	112	112	112
Manufacturing	5,304	5,443	5,510	5,230	5,432

Source: State Statistical Bureau, *China Statistical Yearbook 1995*, Beijing, 1995.

Annex Table A-5. Main indicators of township-run and village-run industrial enterprises with independent accounting systems by selected manufacturing subsectors, 1994
(Rmb hundred million, ten thousand persons)

	Township-run industry			Village-run industry		
	Number of enterprises	Gross output value of industry	Number of employees	Number of enterprises	Gross output value of industry	Number of employees
Food processing	13,545	522.21	44.23	139,289	739.29	117.52
Food manufacturing	5,089	210.75	29.35	22,068	200.15	43.97
Beverage manufacturing	6,594	165.37	26.19	43,035	172.37	59.95
Tobacco processing	26	1.15	0.11	8,786	57.81	17.41
Textile industry	10,556	1,645.03	197.74	18,656	759.30	108.22
Garments and other fibre products	5,648	557.04	83.76	23,583	477.82	115.85
Leather, furs, down and related products	3,470	306.76	47.33	10,764	436.04	246.31
Timber processing, bamboo, cane, palm fibre, straw products	8,516	161.10	32.48	20,870	283.48	107.64
Furniture manufacturing	3,455	86.48	13.78	13,977	189.91	70.42
Papermaking and paper products	5,732	216.76	42.41	18,046	272.18	73.60
Printing and record pressing	2,914	71.06	12.63	8,359	130.20	28.60
Petroleum processing and coking products	1,026	69.94	6.66	4,107	106.73	19.44
Raw chemical materials and chemical products	10,542	628.22	63.48	15,714	498.69	65.90
Medical and pharmaceutical products	994	102.33	8.70	753	44.89	5.03
Chemical fibres	469	109.13	8.34	2,478	78.02	32.88
Rubber products	1,491	110.79	17.07	4,214	112.59	23.89
Plastic products	6,913	344.21	43.48	18,650	363.18	77.04
Non-metal mineral products	35,501	1,243.47	331.55	110,579	1,403.97	453.46
Smelting and pressing of ferrous metals	3,052	456.59	35.16	14,403	617.67	102.05
Smelting and pressing of non-ferrous metals	1,739	259.38	15.68	22,115	326.06	110.15
Metal products	12,824	693.36	87.58	34,592	832.32	146.03
Ordinary machinery manufacturing	10,568	631.38	92.70	25,643	729.88	120.94
Special purpose equipment manufacturing	7,211	442.71	57.42	8,894	250.28	92.64
Transportation equipment manufacturing	4,486	349.72	38.50	12,017	304.49	111.98
Electric equipment and machinery	5,521	586.63	58.35	5,037	235.56	41.14
Electronic and telecommunications equipment and machinery	1,334	139.61	16.93	7,103	233.41	57.98

Source: State Statistical Bureau, *China Statistical Yearbook 1995*, Beijing, 1995.

Annex Table A-6. Financial indicators of state-owned industrial enterprises with independent accounting systems, 1991-94
(Rmb hundred million)

	1991	1992	1993	1994
Original value of fixed assets	13,556.75	15,669.78	19,066.39	23,101.98
Net value of fixed assets	9,507.19	10,982.65	13,304.37	15,677.52
Total loss of loss-making enterprises	367.00	369.27	452.64	482.59
After-tax profits	402.17	535.10	817.26	829.01
Pre-tax profits	1,661.15	1,944.12	2,454.70	2,876.25

Source: State Statistical Bureau, *China Statistical Yearbook 1995*, Beijing, 1995.

Annex Table A-7. Industrial production, March 1996

	Units	Total January to March 1996	March 1996	Change over same period 1995 (per cent)
Total industrial output	Rmb million	1,038,570.0	394,260.0	16.10
of which:				
Light industry	Rmb million	471,120.0	177,840.0	16.10
Heavy industry	Rmb million	567,450.0	216,420.0	16.30
of which:				
State enterprises	Rmb million	456,900.0	167,410.0	7.60
Collective enterprises	Rmb million	364,150.0	143,010.0	24.10
Other types of enterprises	Rmb million	217,520.0	83,840.0	23.80
Bicycles	thousand	7,523.4	3,008.0	-17.47
Sewing machines	thousand	1,529.9	543.6	-22.30
Watches	thousand	63,586.6	19,446.4	1.31
Cameras	thousand	6,642.1	3,252.6	58.84
Television sets	thousand	7,317.6	2,642.6	-5.63
of which:				
Colour television sets	thousand	4,863.8	1,649.6	18.81
Video recorders	thousand	430.9	165.3	36.28
Radios	thousand	5,544.4	2,071.1	-34.91
Cassette recorders	thousand	11,307.5	4,917.0	-31.42
Household washing machines	thousand	2,849.5	1,029.2	7.20
Electric fans	thousand	20,600.8	8,757.8	18.18
Household refrigerators	thousand	2,009.6	861.4	1.43
Chemical fibre	thousand tonnes	744.0	270.6	11.69
of which:				
Synthetic fibre	thousand tonnes	646.7	235.7	16.21
Yarn	thousand tonnes	1,058.9	403.9	-7.15
Cloth	million metres	3,849.0	1,412.0	-9.94
Silk	million tonnes	17.3	6.5	-5.25
Silk fabrics	million metres	660.0	247.0	-6.58
Woollen fabrics	thousand tonnes	73,092.6	23,516.3	9.46
Garments	million	951.0	389.0	3.90
Sugar	thousand tonnes	3,810.0	1,062.6	3.66
Salt	thousand tonnes	2,218.6	1,099.1	-2.32
Cigarette	thousand cases	8,220.1	2,911.8	-3.62
Machine-made paper and paperboard	thousand tonnes	4,799.7	2,057.8	22.48
Detergent	thousand tonnes	535.0	225.2	-22.34
Total energy output	thousand tonnes	279,389.8	104,898.6	7.84
Crude coal	thousand tonnes	299,182.5	115,151.8	8.67
Crude oil	thousand tonnes	38,883.6	13,395.6	5.46

(Continued)

Annex Table A-7. Industrial production, March 1996 (Continued)

	Units	Total January to March 1996	March 1996	Change over same period 1995 (per cent)
Natural gas	million cubic metres	4,893.0	1,669.0	15.65
Power output	million kwh	248,604.0	86,110.0	8.53
of which:				
Hydropower	million kwh	29,511.0	10,488.0	-11.97
Iron ore	thousand tonnes	54,863.3	23,409.5	-1.84
Pig iron	thousand tonnes	25,351.4	9,256.5	8.78
Steel	thousand tonnes	24,122.9	8,559.2	6.79
Rolled steel	thousand tonnes	19,855.1	7,268.6	5.16
Coke	thousand tonnes	18,442.9	6,857.1	9.60
Sulphuric acid	thousand tonnes	4,397.9	1,578.9	11.09
Soda ash	thousand tonnes	1,566.9	571.9	12.80
Caustic soda	thousand tonnes	1,339.2	497.6	15.77
Ethylene	thousand tonnes	734.6	256.1	17.22
Synthetic ammonia	thousand tonnes	7,080.2	2,514.2	8.36
Chemical fertilizers	thousand tonnes	6,852.9	2,542.2	14.26
Chemical pesticides	thousand tonnes	114.7	44.2	41.08
Chemical medicine	thousand tonnes	70.0	24.6	-6.04
Tyres	thousand tonnes	18,436.3	7,329.3	0.45
Cement	thousand tonnes	96,087.9	37,971.6	10.83
Plate glass	thousand cases	37,929.9	13,154.3	37.92
Metal-working machine tools	thousand	35.2	12.1	-12.44
Automobiles	thousand	367.1	141.3	7.59
Tractors (over 20 HP)	thousand	21.9	8.5	31.93
Small tractors	thousand	608.5	242.5	22.90
Locomotives	units	248.0	89.0	11.21
Internal combustion engines	thousand kwh	38,512.2	15,840.9	13.25
Computers	units	49.0	12.0	75.00
Programme-controlled switchboards	thousand	2,585.9	900.7	-8.21
Total freight volume	million tonnes	653.0	225.0	0.60
Total freight turnover volume	million tonnes - kilometre	713,280.0	248,066.0	-1.00
Total passenger volume	million passengers	1,242.0	419.0	-1.80
Cargo handled at major seaports	million tonnes	189.0	65.0	7.90
Civil aviation turnover volume	million tonnes - kilometre	1,767.0	652.0	22.70
Total business value of post and telecommunication service	Rmb million	27,730.0	9,300.0	38.60

Source: State Statistical Bureau, *China Statistical Yearbook 1995*, Beijing, 1995.

Annex Table A-8. Industrial imports each valued at $20 million and above in October 1995

	Units	Volume	Change since October 1994 (per cent)
Edible vegetable oil	10,000 tonnes	16	-27.3
Sugar	10,000 tonnes	21	-38.2
Cigarettes	10,000 cases	1,288	25,660.0
Natural rubber (including emulsion)	10,000 tonnes	3	-25.0
Synthetic rubber (including emulsion)	tonnes	28,226	8.7
Logs	10,000 cubic metres	19	-17.4
Pulp	10,000 tonnes	5	-37.5
Wool (including wool top)	tonnes	28,379	-5.2
Cellulose diacetate tow	tonnes	7,528	-14.0
Synthetic fibre for the textile industry	10,000 tonnes	7	16.7
Iron ore	10,000 tonnes	316	8.2
Scrap copper	tonnes	93,629	35.3
Chromium ore	10,000 tonnes	16	220.0
Oxide of alumina	10,000 tonnes	19	111.1
Crude oil	10,000 tonnes	153	159.3
Oil products	10,000 tonnes	124	26.5
Terphthlac acid	tonnes	81,043	667.5
Pharmaceuticals	tonnes	1,749	16.3
Fertilizers	10,000 tonnes	152	25.6
Primary-types of plastic	10,000 tonnes	59	25.5
Oxhide and horse hide	tonnes	29,165	20.4
Plywood	10,000 cubic metres	7	-50.0
Paper and paperboard	10,000 tonnes	23	-17.9
Synthetic fibre yarn	tonnes	56,636	28.8
Machinery-woven cotton fabrics	10,000 metres	12,658	11.6
Synthetic fibre filament fabrics	10,000 metres	19,254	5.4
Synthetic staple fibre and cotton blended fabrics	10,000 metres	3,160	-0.5
Fabrics coated with, or dipped in, plastics	tonnes	29,345	16.8
Knitted or crocheted fabrics	tonnes	29,847	11.4
Parts for shoes and boots, shinguards, etc.	10,000 tonnes	1	-
Rolled steel	10,000 tonnes	112	-25.3
Copper	tonnes	59,954	148.1
Aluminium	tonnes	46,352	14.8
Iron and steel or aluminium structures and their components	tonnes	12,880	-10.9
Piston combustion engine parts	tonnes	3,621	24.6
Air conditioners	units	15,642	-6.4
Mechanical lifting transporting and loading/unloading equipment and parts	units	14,558	58.5
Construction and mining machinery	units	5,271	16.0
Food processing machinery	units	6,358	15.4
Printing and binding machinery	units	4,112	-1.3
Textile machinery	units	19,425	17.0
Sewing machines for industrial use	units	28,348	-5.8

(Continued)

Annex Table A-8. Industrial imports each valued at $20 million and above in October 1995 (Continued)

	Units	Volume	Change since October 1994 (per cent)
Machine tools for metal processing	units	12,044	-25.2
Metal smelting and casting equipment and parts	units	2,877	-65.2
Machinery for rubber or plastic processing	units	10,877	-2.8
Section mould and moulding box for metal casting	tonnes	4,270	-5.7
Valves	10,000 sets	381	-47.5
Auto-data processing equipment and components	units	465,944	23.5
Parts of auto-data processing equipment	tonnes	4,208	15.4
Motors and generators	10,000 units	4,856	12.6
Power generating sets and rotary current transformers	10,000 units	-	..
Parts of rotary power equipment	tonnes	3,008	-45.0
Exchanges of wire telephone and telegraph	units	1,149	-18.5
Parts and accessories of wire telephones and telegraph	tonnes	3,271	-4.5
Television sets with CKD	10,000 units	15	200.0
Parts and accessories of televisions, radio and wireless communication equipment	tonnes	6,007	-33.0
On-off and protective circuit devices	tonnes	6,872	35.8
Television picture tubes	10,000 pieces	102	6.3
Diode, transistor and semiconduction devices	10,000 pieces	200,277	60.4
Integrated circuits and micro-electronic devices	10,000 pieces	57,314	29.4
Wire and cable	tonnes	16,686	0.4
Automobiles and chassises	units	9,369	-80.8
Auto parts	units	6,360	12.4
Aircraft	units	1	-80.0
Parts of air vehicles	tonnes	71	-5.3
Vessels	units	109	41.6
Medical instruments and machinery	units	2,957	4.6
Measuring, testing and analyzing self-control instruments and devices	units	15,379	15.2
Watch and clock movements and parts	units	9,658	7.9
Plastic products	tonnes	31,481	16.1

Source: *China Economic News,* No. 48, Hong Kong, 11 December 1995.

Annex Table A-9. Industrial exports each valued at $20 million and above in October 1995

	Units	Volume	Change since October 1994 (per cent)
Aquatic products	10,000 tonnes	4	-
Sugar	tonnes	60,213	-15.6
Herbal medicines	tonnes	11,717	0.9
Cigarettes	10,000 cases	4,220	91.0
Clay and other refractory minerals	10,000 tonnes	44	-
Coal	10,000 tonnes	161	-9.0
Coke and semi-coke	10,000 tonnes	89	111.9
Crude oil	10,000 tonnes	191	-8.2
Oil products	10,000 tonnes	19	-17.4
Synthetic organic dyestuffs	tonnes	6,441	21.0
Pharmaceuticals	tonnes	11,815	19.5
Firecrackers	tonnes	16,219	19.6
Tyres	10,000 pieces	364	1.4
Household or decorative wooden products	tonnes	20,546	5.3
Paper and paperboard	10,000 tonnes	2	..
Textile yarn, fabrics and their products	US $10,000	101,089	9.4
Cement	10,000 tonnes	67	39.6
Glass products	US $10,000	2,029	20.6
Household ceramic utensils	tonnes	53,036	9.4
Ornamental pottery and porcelains	tonnes	24,521	-0.9
Pig iron	10,000 tonnes	38	137.5
Steel ingots and coarse forged articles	10,000 tonnes	29	262.5
Rolled steel	10,000 tonnes	43	230.8
Copper	tonnes	9,057	24.2
Aluminium	tonnes	18,107	92.8
Standard steel or copper fixtures	10,000 tonnes	2	100.0
Hand and machine tools	tonnes	27,416	6.1
Locks	tonnes	8,635	12.6
Electric fans	10,000 pieces	553	72.3
Calculators	10,000 pieces	2,607	18.0
Bearings	tonnes	5,028	67.8
Motors and generators	10,000 units	17,390	60.8
Static converters	10,000 pieces	1,048	16.8
Batteries	10,000 pieces	62,063	-5.5
Wire telephones	10,000 pieces	643	12.2
Loudspeakers	10,000 pieces	6,188	-17.1
Recorders, radio-recorders and audio systems with CKD	10,000 pieces	1,647	7.2

(Continued)

Annex Table A-9. Industrial exports each valued at $20 million and above in October 1995 (Continued)

	Units	Volume	Change since October 1994 (per cent)
Radios	10,000 pieces	1,382	31.6
Television sets with CKD	10,000 pieces	105	1.9
Parts and components of televisions, radio and other wireless communication equipment	tonnes	3,755	19.6
Condensers	tonnes	1,457	28.5
On-off and circuit protectors	tonnes	13,648	31.3
Diode, transistor and semiconductor devices	10,000 pieces	158,895	-3.5
Wire and cable	tonnes	18,640	37.3
Containers	unitsnmot	68,039	124.2
Auto parts	US $10,000	3,230	27.2
Bicycles	10,000 pieces	138	-0.7
Motor and bicycle parts	US $10,000	2,387	64.5
Vessels	units	1,345	1,039.8
Cameras	10,000 pieces	612	49.5
Watches	10,000 pieces	6,790	6.6
Clocks for daily use	10,000 pieces	1,956	11.4
Furniture	US $10,000	8,980	39.9
Mattresses, bed clothes, etc.	US $10,000	5,092	19.2
Lamps, illuminators, etc.	tonnes	45,762	1.0
Travelling articles, bags and suitcases	US $10,000	20,287	..
Garments and clothing accessories	US $10,000	211,050	6.3
Shoes	US $10,000	53,496	5.5
Plastic products	tonnes	141,105	29.8
Toys	US $10,000	36,328	15.2
Valuable metals and ornaments inlaid with valuable metals	US $10,000	8,078	58.9
Umbrellas	10,000 pieces	3,199	-14.1
Artificial flowers	tonnes	10,652	-11.6

Source: *China Economic News,* No. 48, Hong Kong, 11 December 1995.

Annex Table A-10. China's top 100 foreign-funded enterprises, 1994
(Rmb ten thousand)

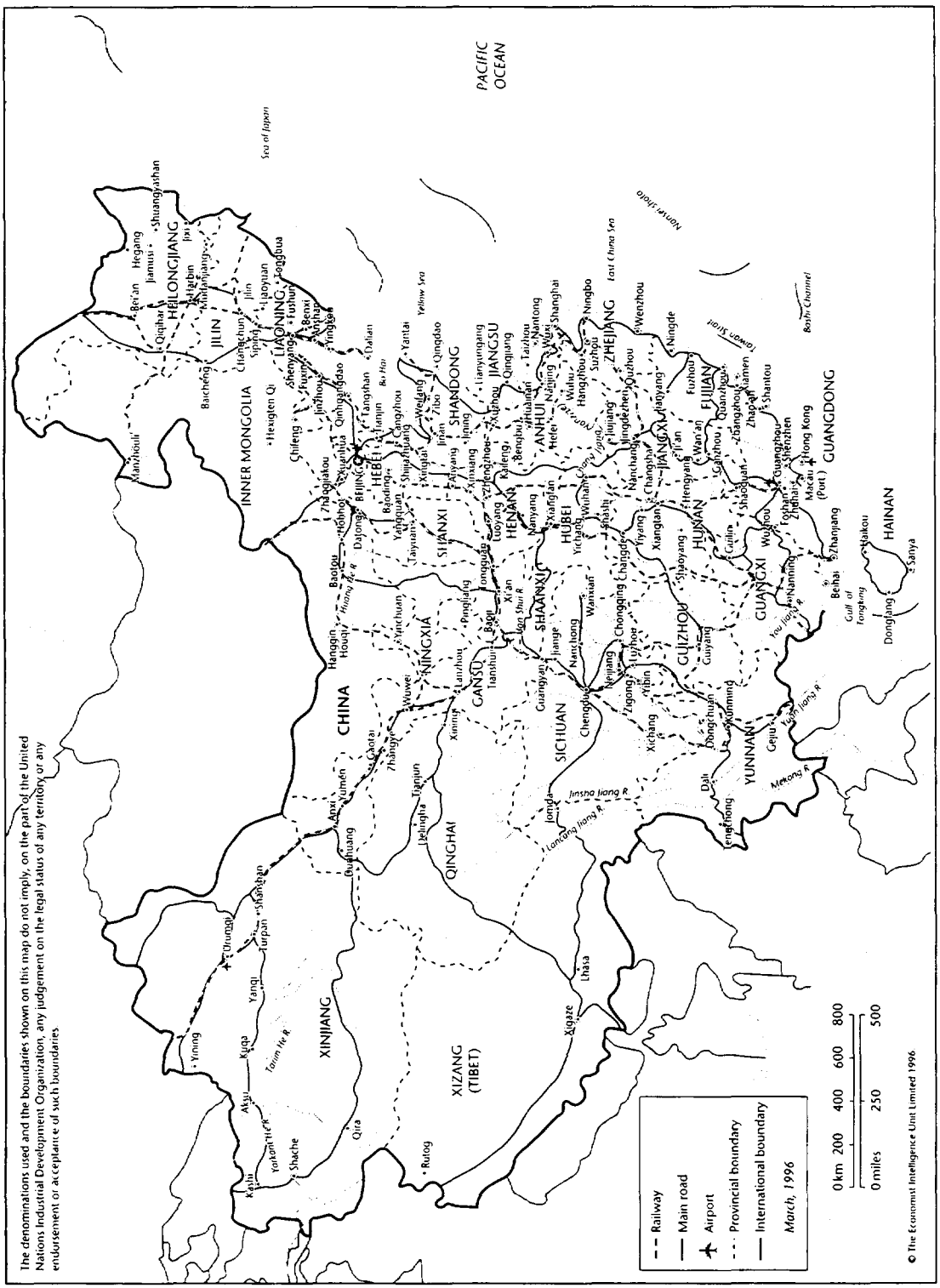
	Sales	Pre-tax profit	Assets
1. Shanghai Volkswagen AG Corp., Ltd.	1,271,037	100,665	614,733
2. Shanghai Bell Telephone Equipment Co., Ltd.	515,494	116,071	555,184
3. Nanhai Fat Industry (Chiwan) Co., Ltd.	432,000	23,803	105,000
4. Beijing Jeep Corp., Ltd.	412,735	25,582	243,920
5. Chongqing Qingling Automobile Joint-Stock Co., Ltd.	270,445	50,178	584,591
6. Motorola (China) Electronics Co., Ltd.	257,055	..	..
7. Shenzhen Konka Electronics (Group) Joint-Stock Co., Ltd.	238,677	36,874	202,592
8. Shenzhen Lianxiang Computer Co., Ltd.	236,167	1,300	30,788
9. Beijing Matsushita TV Picture Tubes Co.	232,895	41,307	184,558
10. Shanghai Fenghuang Bicycles Joint-Stock Co., Ltd.	231,000	13,168	193,626
11. Shanghai Vacuum Electronic Device Joint-Stock Co., Ltd.	226,122	9,112	374,644
12. Shanghai Mitsubishi Lift Co., Ltd.	220,299	26,137	170,877
13. Shanghai Dajiang (Group) Joint-Stock Co., Ltd.	203,519	18,094	193,388
14. Guangzhou P&G Co., Ltd.	194,193	84,535	126,025
15. Huaqiang Sanyo Electronics Co., Ltd.	191,692	3,504	64,342
16. Fujian Yong-en Group Co., Ltd.	191,002	7,452	18,860
17. Guangzhou Steel Joint-Stock Co., Ltd.	189,264	9,891	256,278
18. Guangdong Rongsheng Refrigerator Co., Ltd.	183,874	23,000	105,000
19. Shanghai EK Chor Motorcycle Co., Ltd.	182,881	19,896	109,703
20. Guangxi Yuchai Machinery Joint-Stock Co., Ltd.	180,216	51,097	272,397
21. Shanghai Chlorine and Alkali Chemical Industry Joint-Stock Co., Ltd.	177,853	20,068	466,992
22. Sanyo Electric Machines (Shekou) Co., Ltd.	165,789	3,246	85,507
23. Guangdong Jianlibao Group Joint-Stock Co., Ltd.	163,201	8,112	86,306
24. Guanjie Electronics (Fujian) Co., Ltd.	161,697	541	76,051
25. Jiangxi Isuzu Automobile Co., Ltd.	161,284	7,277	81,589
26. Shenzhen Zhonghua Bicycles (Group) Joint-Stock Co., Ltd.	161,047	14,835	293,994
27. Tianjin Tingyi International Co., Ltd.	159,898	..	172,358
28. Dongguan Fuan Textile, Printing and Dyeing Co., Ltd.	158,004	4,953	142,315
29. Beijing International Exchange System Co., Ltd.	157,240	15,030	168,126
30. Jiangsu Chunlian Refrigerating Equipment Co., Ltd.	155,497	22,241	86,537
31. Fujian Hitachi TV Sets Co., Ltd.	155,217	7,004	72,596
32. Beijing Light-Duty Automobile Co., Ltd.	152,973	3,026	155,935
33. China Tianjin Otis Lift Co., Ltd.	152,878	17,624	107,089
34. Nanjing Jincheng Machinery Co., Ltd.	150,846	11,841	114,931
35. Canon Dalian Office Equipment Co., Ltd.	148,638	5,921	224,735
36. Shanghai Yongxin Color TV Picture Tube Co., Ltd.	147,017	16,014	173,753
37. Shenzhen Saige Hitachi Color Display Appliance Co., Ltd.	142,797	14,192	116,145
38. Wuyang-Honda Motorcycle (Guangzhou) Co., Ltd.	138,233	9,698	65,964
39. Beihai Grain & Oil Industry (Tianjin) Co., Ltd.	137,213	6,781	73,298
40. Fujian Dafeng Investment Group Co., Ltd.	136,747	9,811	132,407
41. China International Shipping & Container Joint-Stock Co., Ltd.	134,196	11,383	124,152
42. Shenyang Jinbei Bus Joint-Stock Co., Ltd.	127,615	9,601	171,338
43. China Schindler Lift Co., Ltd.	124,304	14,624	126,060
44. Luoyang North EK Chor Motorcycle Co., Ltd.	121,196	21,921	61,954
45. Pingshuo No.1 Coal Co., Ltd.	119,619	25,096	280,971
46. Hangzhou Xihu Electronics Co., Ltd.	116,960	6,239	108,540
47. Huafei Color Display System Co., Ltd.	116,574	10,974	150,737
48. Shenzhen Chuanghua Co-operation Co., Ltd.	115,834	3,986	36,033
49. Henan Anyang Color TV Picture Tube Shell Co., Ltd.	110,760	19,983	150,030
50. Shenzhen Datong Industry Joint-Stock Co., Ltd.	110,431	2,220	25,362
51. Xinhua (China) Machinery Co., Ltd.	108,182	1,453	43,071

Annex Table A-10. China's top 100 foreign-funded enterprises, 1994 (Continued)
(Rmb ten thousand)

	Sales	Pre-tax profit	Assets
52. Weiwang (Zhuhai) Magnet Dispatch Co., Ltd.	106,753	1,548	58,448
53. Wanbao-Mada Dalian Co., Ltd.	102,528	8,573	115,708
54. Guangdong Color TV Picture Tube Co., Ltd.	102,460	8,029	253,458
55. Shanghai JVC Electric Appliance Co., Ltd.	101,426	319	96,867
56. Xiamen Zhonglu Vegetable Oil Co., Ltd.	101,182	7,777	34,914
57. Huamao Shunhui Industry (Group) Co., Ltd.	99,149	6,188	63,352
58. Shanghai Shenmei Beverage & Foodstuff Co., Ltd.	98,368	39,976	5,180
59. Shanghai Taiping International Container Co., Ltd.	98,320	10,217	54,429
60. Harbin Shantai Electronics Industry Co., Ltd.	96,300	4,102	68,735
61. First Auto-Volkswagen Co., Ltd.	91,326	-15,892	539,196
62. Tianjin Honda Motorcycle Co., Ltd.	90,595	12,280	45,429
63. Jilin Deda Co., Ltd.	90,433	10,145	92,750
64. Guangdong Baiyangshen (Group) Co., Ltd.	90,078	19,938	98,036
65. Qinghuangdao Shougang Steel Plate Co., Ltd.	89,771	10,867	93,654
66. Shenyang Feilong Health-Care Products Co., Ltd.	89,210	17,890	23,000
67. Shanghai Beimao Co., Ltd.	88,606	1,388	30,607
68. Huafeng Foodstuff Industry (Group) Joint-Stock Co., Ltd.	87,593	9,594	69,621
69. Hangzhou Zhongce Rubber Joint-Stock Co., Ltd.	85,700	2,727	87,232
70. Guangzhou Peugeot Automobile Co., Ltd.	85,351	504	322,652
71. Qingdao Sanmei Electric Motor Co., Ltd.	85,278	2,641	63,706
72. Rongcheng Guotai Tyre Co., Ltd.	84,042	4,908	25,330
73. Shanghai Yongjiu Bicycle Joint-Stock Co., Ltd.	83,500	3,087	121,264
74. Zhongshan Weili Washing Machine Co., Ltd.	77,908	6,221	36,240
75. Nantong Acetate Fibre Co., Ltd.	76,182	8,190	104,097
76. Dongfeng Jinshi Tyre Co., Ltd.	75,181	-85	119,278
77. Jiahua Electronics Industry Co., Ltd.	74,418	542	37,318
78. Shanghai Shenjia Ferroalloy Co., Ltd.	73,312	134	70,155
79. Xian Jansen Pharmaceutical Co., Ltd.	71,862	19,216	71,753
80. Shenzhen Development of Science & Tech Joint-Stock Co., Ltd.	70,134	5,527	86,356
81. China-US SK&F (Tianjin) Pharmaceutical Co., Ltd.	69,672	..	62,724
82. Shenzhen Guangda Timber Industry Co., Ltd.	68,950	4,470	63,167
83. Jiangzhou Xincheng Iron & Steel Co., Ltd.	68,935	8,001	64,439
84. Mozhihua Industry (Group) Co., Ltd.	68,900	8,109	13,666
85. Xiamen Xiaxin Electronics Co., Ltd.	67,862	1,673	45,693
86. Yinchuan Zhongce (Great Wall) Rubber Co., Ltd.	67,576	5,532	83,932
87. China Nanbo Group Joint-Stock Co., Ltd.	67,186	21,017	93,145
88. Xiamen Taihe Electronics Co., Ltd.	66,561	4,121	37,671
89. Shanghai Alti-Enti Communications Equipment Co., Ltd.	66,004	12,289	49,109
90. Tianjin Ridian Electronic Communication Industry Co., Ltd.	65,803	10,331	115,915
91. Beijing Shougang Baosheng Belt Steel Co., Ltd.	64,488	18,393	83,852
92. Zhuhai SEZ Dongda (Group) Joint-Stock Co., Ltd.	64,076	4,379	162,622
93. Yangzhou Tongyun Container Co., Ltd.	63,860	7,559	38,949
94. Shanghai Industrial Sewing Machine Joint-Stock Co., Ltd.	63,330	6,022	123,140
95. Shanghai Sharp Airconditioner Co., Ltd.	62,840	5,200	65,823
96. Shanghai Yaohua Pilkington Glass Joint-Stock Co., Ltd.	62,823	25,320	161,638
97. Guangzhou Paper-Making Co., Ltd.	61,025	3,628	125,045
98. Huizhou TCL Communication Equipment Joint-Stock Co., Ltd.	60,950	10,200	47,000
99. Fosidi Motorcycle Co., Ltd.	60,828	840	90,702
100. Wuxi Union Iron & Steel Co., Ltd.	60,643	5,026	31,370

Source: *China Economic News,* Supplement No. 8, Hong Kong, 16 October 1995.

MAP



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