

1 CHINESE FIRMS AS EMERGING COMPETITORS OF JAPANESE FIRMS

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INTRODUCTION

'Aiwa's low-price strategy undercut by Chinese rivals' (*The Nikkei Weekly* 6 March 2000, pp. 1 & 19). 'The principle of competition is awakening the sleeping lion' (*Nikkei Business* 29 November 1999, pp. 6-7). Headlines like these in leading Japanese newspapers and magazines are an expression of rising concerns about the emerging competitiveness of China. While the discussion on the admission of China to the World Trade Organization (WTO) was dominated by growing hopes and expectations among the industrialized countries for easier access to the huge Chinese market, a growing number of observers have pointed to the potential of China's becoming an economic superpower and formidable global competitor. It is the objective of this chapter to provide a comprehensive overview of China's growing international competitiveness in manufacturing and to speculate on possible implications for Japan's industry. The key issues addressed are:

- What are potential competitive advantages of Chinese firms vis-à-vis Japanese firms?
- In which industries can a growing competitive pressure by Chinese firms be expected?
- What are possible counter-strategies of the respective Japanese industries?

The analysis proceeds in four steps. In the following section, empirical evidence for China's growing competitiveness is given by referring to empirical data on trade and factor endowments. It is shown that China's advance to the world's tenth largest trading nation and its recent strong export performance in manufactured goods can be explained by growing competitive advantages not only in respect to labour-intensive industries but increasingly also in (human) capital- and scale-intensive industries.

The next section attempts to provide a theoretical explanation of China's growing competitiveness in industrial goods. Using Michael Porter's concept of 'National Competitive Advantage' it is argued that China has moved to the threshold of the investment-driven development stage

backed by two mutually enforcing mechanisms of advancing national competitive advantage: First, processing trade that serves as an important mechanism for factor advancement in labour cost-intensive industries, and second, domestic reforms that have led to factor advancement in (human) capital-intensive industries by releasing domestic competitive forces. In the fourth section four various examples are given for Chinese industries and firms that are emerging or have already emerged as formidable competitors on global markets. While Chinese competitiveness is mostly recognized for labour cost-intensive industries like textiles, consumer electronics or home appliances, particular attention is given to growing Chinese competitiveness in (human) capital-intensive industries like steel or shipbuilding. The fifth section analyses these developments from the perspective of Japan's industry. Following the analysis of patterns and trends in Chinese-Japanese trade, possible future scenarios and counterstrategies for Japan's industries are reflected upon. While being still quite speculative in nature, it is argued that especially in labour- and capital-intensive assembly industries, Japanese companies are confronted with an increasing Chinese competitiveness derived from low labour costs, good product quality, and state-of-the-art manufacturing and product technology. This growing competitive threat is likely to force Japanese manufacturers to continue to move to overseas production and internationalization of procurement, thereby accelerating the 'industrial hollowing-out' of Japan's supplier and manufacturing base. In respect to (human) capital- and scale-intensive industries like steel, petrochemicals or automobiles, a different scenario is drawn, and we argue that in these industries the formation of strategic alliances between Japanese and Chinese firms are a sensible strategic response. In the last section, the main findings and conclusions are summarized.

EMPIRICAL EVIDENCE FOR THE GROWING COMPETITIVENESS OF CHINA'S INDUSTRY

Since the economic reform process started in 1979, the People's Republic of China has not only emerged as the world's tenth largest trading nation, but exports have developed into a major engine for economic growth and – even more impressively – manufactured goods nowadays account for the dominant share of China's exports. The membership of China in the World Trade Organization will only accelerate these trends and further enhance China's position on global export markets.

Beginning in 1979, the economic reform process with its strong focus on foreign trade and investment resulted in a transformation of China

from an isolated, self-sufficient economy to one of the world's largest trading nations (Chan, Tracy and Wenhui 1999, pp. 35–50). Between 1978 and 1997, China's foreign trade grew twice as fast as world trade at a nominal average rate of 15.5 per cent, and trade volume jumped from USD 78 billion to USD 324 billion. Accounting for a mere 0.75 per cent of world trade in 1978, this share rose to 4 per cent in 1998. As a result, China's development has become more and more dependent on foreign trade, with the share of foreign trade rising from 9.8 per cent of GDP in 1978 to 35.7 per cent in 1996 (Zhang, X. 2000, p. 2).

Exports developed at an even faster pace during this period and became the most important engine for growth. The share of exports rose from 4.6 per cent of GDP in 1978 to 19 per cent in 1998, an increase by a factor of 18.9 times in terms of nominal value (Chan, Tracy and Wenhui 1999, p. 2). The export drive was accompanied by a remarkable shift in its composition by commodities. Prior to the reforms, primary products like petroleum or foodstuffs accounted for two thirds of China's exports. However, since 1985 manufactured goods developed into the dominant export category accounting for 85 per cent of exports in 1995. Until 1992, textiles, clothes and footwear dominated Chinese export structure, but since the mid-1990s electrical machinery (for example, household appliances), telecommunication equipment (for example, switching equipment) and electronic products have emerged as the most important export items (*ibid.*, pp. 13–18). In 1999, electric appliances and electronics surpassed clothing as the single most important export category, accounting for 16.9 per cent of total export value (*The Nikkei Weekly* 28 February 2000, p. 21).

China's WTO-membership is expected to accelerate these developments. The World Bank, for instance, projects an increase of China's share in world trade from 3 per cent in 1992 to 10 per cent by 2020, making it the world's second largest trading nation after the United States. Following the World Bank's assumptions, Chinese exports are expected to grow at an average annual rate of 10 per cent, almost twice as fast as world trade as a whole. In this scenario, China advances to become the world's largest exporting nation by 2020, with a 9.8 per cent share in world exports (The World Bank 1997, pp. 29–31).

The emergence of China as a leading export nation and the significant structural changes in the composition of its exports towards manufactured goods have recently stimulated broader academic research on the sources of China's growing international competitiveness. In his study, Zhang demonstrates by means of econometric modelling and testing that the patterns of China's trade and production and their development since 1978 reflect the underlying comparative advantages of China. In the

study, tradable commodities are classified into five groups based on the Chinese Industrial Classification of the National Economy to reflect differences in relative factor intensity: agricultural goods, natural resource goods (primary commodities), physical capital-intensive goods, unskilled labour-intensive goods, human-capital intensive goods (see Figure 1.1) (Zhang, X. 2000, pp. 36–46).

Figure 1.1: Classification of industries

Agricultural goods (13)	Natural resource-intensive products (6)	Unskilled labour-intensive products (14)	Physical capital-intensive products (15)	Human capital-intensive products (14)
Paddy rice	Coal	Sugar, tobacco, alcohol	Petroleum refining	Household chemicals
Wheat	Crude petroleum	Other processed foods	Coal products	Medicines
Other grains	Ferrous minerals	Cotton textiles	Inorganic chemicals	Agricultural machinery
Oil-bearing crops	Non-ferrous minerals	Wool textiles	Chemical fertilizers	Industrial equipment
Cotton	Non-metallic minerals	Hemp textiles	Organic chemicals	Power station equipment
Other industrial crops	Timber	Silk textiles	Other chemicals	Household mechanical/electrical goods
Vegetables		Knitted goods	Chemical fibres	Railway equipment
Fruits		Other textiles	Plastic articles	Motor vehicles
Forest products		Clothing/leather goods	Cement	Ships
Wool and hides		Furniture	Glass	Other transport equipment
Meat, eggs, milk		Paper	Ceramic products	Other engineering products
Fish		Cultural/sporting goods	Iron	Electronic products
Others		Rubber manufacturers	Steel	Household electronics
		Other building materials	Non-ferrous metals	
			Metal products	

Source: Zhang, X. (2000, p. 67–9).

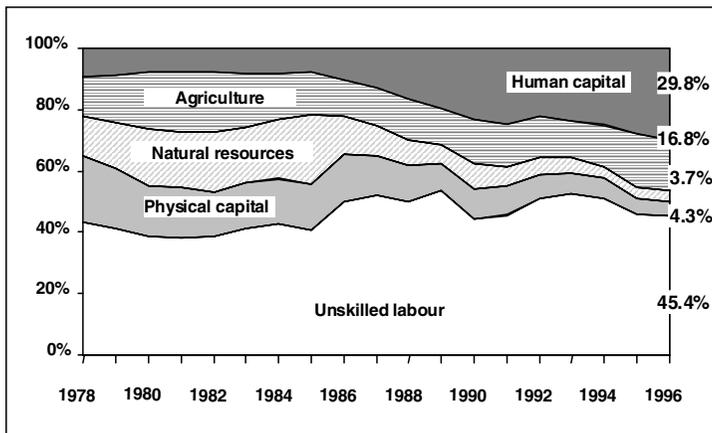
Each of the classified industrial sectors are then analysed in regard to their sector-specific international competitive strength by applying the so-called net export performance ratio (NEPR) as a criterion for measurement. The NEPR indicates the sector-specific trading position of a country relative to the rest of the world and is defined as net exports of a

commodity as a percentage of a commodity's world exports divided by a country's export share in world exports. In other words, the NEPR puts a country's export share of a specific commodity into relation with that commodity's overall share in world exports. A positive NEPR implies that a country is a net supplier in a specific sector with exports being larger than imports in this category; a NEPR larger than 1 implies that the share of a country's net exports in world exports of a specific sector is larger than a country's overall share in world exports. Such a result can be interpreted in a way that a country has a sector-specific competitive advantage against the rest of the world (*ibid.*, pp. 54–64).

The analysis of China's export structure based on the classification of tradable commodities reveals that sectors predominantly applying unskilled labour dominate China's exports with a 45.4 per cent share (see Figure 1.2).

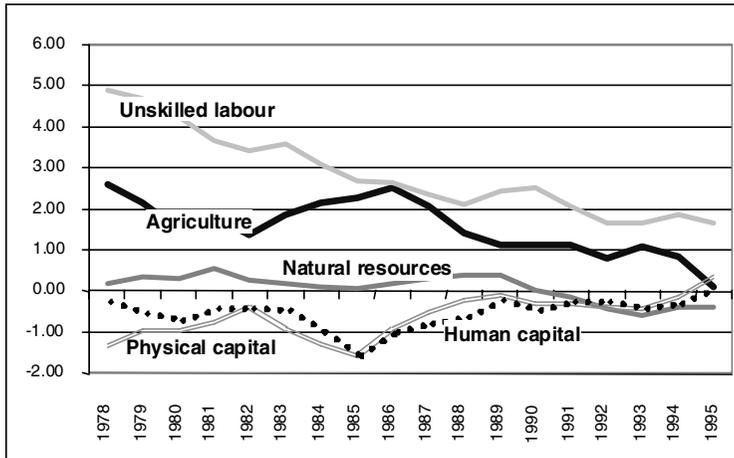
However, since the mid-1980s the category of human capital-intensive sectors has significantly increased its share to 29.8 per cent, thereby advancing to the second most important export category. On the other hand, natural resources and physical capital-intensive sectors have diminished in their importance for Chinese exports. Further analysis of sector-specific NEPRs provides evidence for a remarkable shift in Chinese competitive advantages in the 1980s and 1990s (see Figure 1.3) (*ibid.*, pp. 70–3).

Figure 1.2: Composition of China's exports by commodity type (1978–1996)



Source: Zhang, X. (2000, p. 55)

Figure 1.3: Net export performance ratio by commodity type (1978–1995)



Source: Zhang, X. (2000, p. 70–3)

- China’s competitive advantage is highest, though declining remarkably in unskilled labour-intensive industries like textiles, garments, toys or rubber products.
- China’s competitive advantage has diminished in agriculture and natural resource-based industries such as oil or minerals.
- China is improving its international competitive position in selected physical capital-intensive industries like pig iron, coal products, plastic articles, cement or inorganic chemicals, and – even more remarkable – in selected human capital-intensive sectors such as household appliances, electronics, ships, energy and power generating equipment, railway equipment or agricultural machinery.

Zhang further demonstrates that China’s actual competitiveness in exports as reflected in the sector-specific NEPRs is firmly rooted in distinct underlying cost- and productivity-based comparative advantages of China. He does so by applying the so-called domestic resource productivity (DRP) concept that allows the assessment of a country’s comparative advantage based on the neo-classical notion of factor endowments and comparative cost or productivity advantages (*ibid.*, pp. 82–9). A negative DRP implies a sector-specific resource- and cost-based comparative disadvantage and a positive DRP indicates a sector-specific resource- and cost-based comparative advantage against the rest of the world. The higher the deviation of DRP from zero, the bigger the comparative advantage or disadvantage. The results for China’s sector-specific DRPs and

their development over time provide strong evidence that China's actual, sector-specific competitive position in exports are in line with specific cost- and productivity-based advantages, while distortions caused by China's economic system are on the decline (*ibid.*, pp. 172–200). The results reveal a declining resource-based comparative advantage in agriculture and natural resource-based industries, a strong increase in unskilled labour-intensive sectors, and a significant improvement in physical capital-intensive and human capital-intensive industries.

From the results of Zhang's study, which are supported by other studies as well (for example Yoshitomi 1996, pp. 53–69), it can be concluded that China's emergence as a leading export nation with a growing competitive advantage also in capital-intensive industries and manufactured goods can be explained by improvements in a sector's specific-cost and productivity position. The key question is what factors initiated and facilitated these improvements. To do so, Porter's concept of national competitive advantage provides a suitable theoretical framework (Porter 1990).

THEORETICAL EXPLANATIONS FOR CHINA'S GROWING COMPETITIVENESS IN INDUSTRIAL GOODS

THE PORTER CONCEPT OF 'NATIONAL COMPETITIVE ADVANTAGE'

A country's competitive strength in a specific industry is closely related to the characteristics of the national environment. It results to a large extent from a continued process of upgrading national competitive advantages and requires that the national environment foster competitive improvements and innovation. According to Michael Porter, a country's national competitive advantages is determined by a set of national attributes that shape the competitive environment for national industries and firms (Porter 1990, pp. 71–128). Porter isolates four determinants of national competitive advantage.

- Factor conditions: This attribute refers to the country's endowment with factors of production such as human resources, land, natural resources, capital, knowledge, and infrastructure. Porter discriminates among different types of factors, distinguishing basic and advanced factors (that is unskilled labour versus highly educated human capital) as well as generalized and specialized factors (that is wide skills versus narrowly specialised skills). Most important for national competitive advantage and long-term economic development are the endowment with advanced and specialized factors, and the rate at which these factors are created, upgraded and further specialized.

- Demand conditions: The characteristics of home demand, its size and rate of growth, as well as the structure of demand, the degree of demand segmentation, and the degree of sophistication, independence and uniqueness of buyer needs have an important impact on the nature of competition, the rate and speed of investment and innovation efforts of an industry. National competitive advantages emerge as domestic demand conditions compel firms to innovate rapidly, to invest into new technologies and to enhance productivity and economies of scale and scope.
- Related and supporting industries: Strong supplier industries support the formation of sector-specific national competitive advantages as they produce inputs that are widely used and important to innovation. Close working relationships between world-class suppliers and industry often create a self-enforcing process of innovation and upgrading. Similarly, the presence of strong related industries that produce complementary products and services or share activities in an industry's value chain fosters co-operation and the spread of competitive advantages. Linkages among strong industries through vertical buyer-supplier relationships or horizontal, complementary relations based on shared customers, technologies or activities lead to a clustering of specific highly competitive industries in a nation (*ibid.*, pp. 148–54). Mutually supportive industry clusters are crucial to national economic development as they maintain competitive dynamics in a nation.
- Firm strategy, structure, and rivalry: The context in which firms are created, organized and managed as well as the nature of domestic rivalry shapes the goals and strategic behaviour of firms, their attitude towards investment and innovation, and their entrepreneurial motivations. National competitive advantages arouse from the competitive context within which firms act by creating a more or less fertile environment for innovation and upgrading of skills.

Within the Porter concept the role of the government in shaping national competitive advantage is confined to influencing the four determinants by either fostering or impeding through its policies the competitive dynamics and innovative pressures in a nation's industries.

The individual determinants combine into a dynamic, mutually reinforcing system (the 'diamond') forming distinct patterns in a country's national competitive advantages. Their interactions also determine the rate and direction of upgrading advantages and the innovation process that lay the foundations for economic development and sustainable competitiveness (*ibid.*, pp. 144–8). Upgrading is essential for the competitive

development of national economies as a nation moves towards more sophisticated sources of competitive advantage and towards positions in high-productivity, higher value-added industries. It requires mechanisms for continued factor creation and advancement, motivated people, intense domestic rivalry, demanding buyers that insist on upgrading, as well as a capacity for new business formation (*ibid.*, pp. 560–2). By taking such a dynamic perspective on competitive advantage, Porter’s concept allows to view nations as differing in the respective stage of competitive development due to different positions in regard to the four determinants of national competitive advantage, Porter distinguishes four stages of economic development (*ibid.*, pp. 543–60):

- Factor-driven stage: At this stage of economic development rich endowments with basic factors (such as low-cost, unskilled labour, natural resources) are the main source of national competitive advantage based on factor costs.
- Investment-driven stage: While endowments with basic factors are still important, domestic market conditions characterized by high growth and intensive price competition are the key source for competitive advantage. They trigger aggressive investment by firms to built-up economies-of-scale and motivate them to upgrade basic factors, to absorb and improve new (often foreign) technologies, and to seek productivity gains that enhance their cost advantages.
- Innovation-driven stage: National competitive advantage in this stage is derived from a strong capacity to rapidly advance process and product technologies, to differentiate by supplying specialized and sophisticated products and services that meet the needs of demanding and anticipative buyers, and to generate innovations by utilizing deep industrial clusters.
- Wealth-driven stage: This stage is characterized by a decline in a nation’s capacity to strive for innovation causing under-investment and a deterioration of national competitive advantage.

Porter’s theoretical framework seems suitable to explain (at least partially) the emergence of China as a leading trading nation with a growing competitive edge also in the field of manufactured goods and in (human) capital-intensive industries.

CHINA AT THE THRESHOLD TO INVESTMENT-DRIVEN STAGE
OF ECONOMIC DEVELOPMENT

China’s emergence as an important trading partner is attributable to a significant transition of China’s economy that, at its core, derived from

the advancement and qualification of factors and from the release of domestic competitive forces in the course of economic reforms. As a result, it can be argued that China is moving from a factor-driven stage of development towards the next stage of investment-driven economic development where national competitive advantage is shaped by domestic demand conditions and intensifying domestic rivalry. Two mechanisms are at work that serve as catalysts for factor advancement and the adoption of investment-driven strategies, and have led to the emergence of large, competitive domestic industries: First, processing trade led by the influx of foreign direct investment, and, second, growing domestic competition and entrepreneurship from China's enterprise reform and new business creation.

The abolishment of the state monopoly on foreign trade, the decentralization of responsibilities and increased competition among the Foreign Trade Corporations, the relaxation of controls over tradable commodities, the price reform of tradable commodities, the building of a foreign exchange market with (partial) convertibility, or the promotion of foreign direct investments by means of establishing Special Economic Zones (SEZ) are important milestones that encouraged foreign trade and investment and pushed forward China's integration into the world economy (Zhang, X. 2000, pp. 6–30). In particular, foreign direct investment (FDI) has become a major driving force in the development and transformation of the Chinese economy (Li and Li 1999, pp. 9–11, 204–18). The surge in FDI not only helped to overcome bottlenecks in capital supply but also contributed significantly, though in a regionally unbalanced fashion, to China's technological progress, improvements in enterprise management and work organization, to the creation of employment opportunities and income, and to the rapid growth of exports.

According to China's Statistical Yearbook, foreign-controlled firms accounted for 14 per cent of China's domestic production in 1998, which is equal to half of the production by state-owned enterprises (SOE). The role of foreign invested enterprises in external trade is even bigger. Since 1985 the share of foreign invested enterprises in Chinese exports rose from a mere 1 per cent to 40 per cent in 1998 (*ibid.*, p. 214). The main driving factor for this development is the rapid surge in processing trade, whereby foreign companies either establish own manufacturing plants in mainland China or form subcontracting alliances with local partners, supply equipment and materials for processing in China, and re-export the finished goods to world markets. Led by foreign investment from Hong Kong, Taiwan, and increasingly from the United States and Japan, processing trade has rapidly developed in labour-intensive, light manufacturing industries like garments or electronic components, which de-

mand capabilities for small-lot, large-variety production, and for highly flexible, timely design and delivery on demand (Naughton 1997, pp. 3–37). Initiated with the shift of manufacturing and procurement from Hong Kong to the southern provinces of mainland China, small and highly flexible small companies have mushroomed and developed into open and highly flexible, transnational subcontracting networks. Sometimes labelled the 'China Circle' these networks are now an integral part of the electronics and other global industries. Although independent development efforts are limited, processing trade has initiated a powerful process of technology transfer, of accumulation and upgrading of domestic manufacturing capabilities and quality in China. As a result of increasing global cost-driven competition, foreign manufacturers continue to shift production and procurement of products with more and higher value-added to China (*Nikkei Business* 17 July 2000, pp. 26–40). Therefore more and more assembly plants and subcontractors with world-class manufacturing practices, top-notch quality, yield levels and productivity have been established on Mainland China (*Nikkei Business* 27 March 2000, pp. 8–9). Examples being found in plastic moulds (*Nikkei Business* 20 September 2000, pp. 49–50), audio-visual and office equipment like video tape recorders or copiers, and electronic components like condensers or electric motors (*Nikkei Business* 27 September 1999, pp. 36–49). Besides lower labour costs, foreign manufacturers cite higher flexibility to adjust production, the possibility to run manufacturing over the whole year, 24-hours-a-day, and high flexibility and fast responsiveness as important reasons for shifting production to China.¹ In addition, facility investment cost can be reduced sharply, because many high-cost, capital-intensive and heavily automated processes can be replaced by low-cost, labour-intensive processes due to China's ample supply of low cost labour.

The growth of FDI-initiated processing trade has been accompanied by a surge in new business creation of smaller enterprises or collective or communal township and village enterprises that participated actively in export growth (Zhang, X. 2000, pp. 54–6). While the record regarding the absorption of foreign technology in the case of SOEs has received only mixed appraisal (for empirical studies, see Shen 1999; Shi 1998), the managerial spill-over and demonstration effects for rural Chinese firms as a result of processing trade are considered to be substantial (Chan,

¹ The author is well aware of the fact that despite all progress in liberalisation and economic reform, formidable obstacles like uncertainties in the legal system, limitations to the enforcement of law, bureaucratic arbitrariness, and labour problems still hamper foreign trade and direct investment. Nevertheless, the achievements and progress should not be underestimated.

Tracy and Wenhui 1999, pp. 25–32). As will be shown below, some of the firms have grown rapidly, have strengthened their own, independent R&D functions, and are in the process of internationalisation of their operations.

A second, though less visible and clear mechanism of factor advancement that is bringing China to the edge of an investment-driven stage of economic development relates to China's enterprise reforms. Despite the slow and time-consuming process and the load of remaining problems, particularly in regard to the reform of the large SOEs, significant progress in market and enterprise reform has led to increasing domestic competition.² Initial reform initiatives succeeded in shifting from a centrally planned material allocation system to a increasingly market-based system of decentralized contracting, while the price liberalisation measures and the permission of market entry by non-state firms have resulted in increased competition on product markets. This process can be divided into two phases (Zhang, J. 2000, pp. 15–24). First, the pre-1989 period characterized by growing market size and rapid entry, and, second, the post-1989 period featuring a rising level of industry concentration and scale economics. During the 1980s China saw a rapid entry of the non-state sector into most manufacturing industries, stimulated by a fast-growing market demand and the existence of geographically fragmented, underdeveloped rural markets. Many small firms, township and village enterprises emerged, heavily concentrating on manufacturing of building materials, machinery (for example home appliances), textiles, and foodstuffs. However, due to the fast growing, though highly fragmented market demand, plant scales of production remained below minimum efficient capacity causing diseconomies of scale. Since the recession of the late 1980s, these diseconomies are in the process of correction, by creation of economies-of-scale and by an increase in the industry concentration ratio. This process increases the competitive pressures on firms, enforces structural change and leads to a selection of strong, financially sound 'winners' and weak, loss-making 'losers', which can often be found among the large SOEs. It is supported by government policies to promote mergers, industrial groups and amalgamation of plants, while at the same time encouraging SOEs to spin-off non-core business units and plants, thereby fostering the emergence of private firms.

Progress in regard to enterprise and ownership reform was slower and achieved through a series of small, modest steps, as the Chinese govern-

² The author is, again, aware of the many remaining obstacles and problems that are slowing down reform, particularly in regard to privatisation, management accountability, corporate governance, and the restructuring of large SOEs.

ment resisted the temptation of full-fledged privatisation of its SOEs (for details, see Liu 2000; Nolan and Wang 2000; Child 2000; Kueh 1999; Nyaw 1999). Enterprise reform was approached from two sides: Firstly, as part of the policy of 'grasping the large and let go of the small' mainly the large and very large SOEs in selected industries received continued protection and support, while the survival of smaller SOEs was left to increased competition with communal and collective township and village enterprises, and private firms. At the same time, the government engaged, secondly, in various measures of enterprise reform in order to improve SOE management, to enhance productivity, and to accelerate structural change in industries. Most notable are attempts of management reform focusing on increased managerial accountability and autonomy in decision-making regarding production, investment, marketing, personnel and the like (for example contract responsibility systems, director responsibility systems), and on improvements of incentive schemes for managers and employees (for example internal contract systems). In addition, recent measures to diversify ownership forms (for example stock ownership by managers, joint stock companies) and forms of corporate finance (for example SOE listing on foreign stock exchanges) (*Nihon Keizai Shinbun* 28 September 2000, p. 7) need to be mentioned. In combination, these modest steps in enterprise reform have led to a spread in modern management practices based on stricter financial control, more transparent responsibilities, as well as cost and quality consciousness. While private firms are taking the lead in management reform, state-of-the-art management practices are being increasingly implemented also among state-owned firms and have resulted in the emergence of excellently managed, highly entrepreneurial large SOEs (Child 2000, pp. 45–6; *Nihon Keizai Shinbun* 4 July 2000, p. 10).

The two mentioned mechanisms of factor advancement, processing trade and enterprise reform, are mutually reinforcing each other and have created a powerful process of new business formation, rapid market expansion and increased domestic rivalry among different firms and business formats. Through internationalisation foreign management know-how is absorbed also by domestically oriented firms, while large and rapidly growing domestic markets, particularly in consumer goods, are developing, thereby encouraging strategies of aggressive investment and market entry by newly created firms. Backed by China's considerable pool of technical engineers and its growing number of qualified employees, the conditions for an investment-led process of economic development are emerging under which national competitive advantage is more and more shaped by domestic demand and market conditions as well as improvements in factor skills.

In the following it will be shown in which industries these developments are most visible.

EMERGENCE OF COMPETITIVE CHINESE INDUSTRIES AND FIRMS

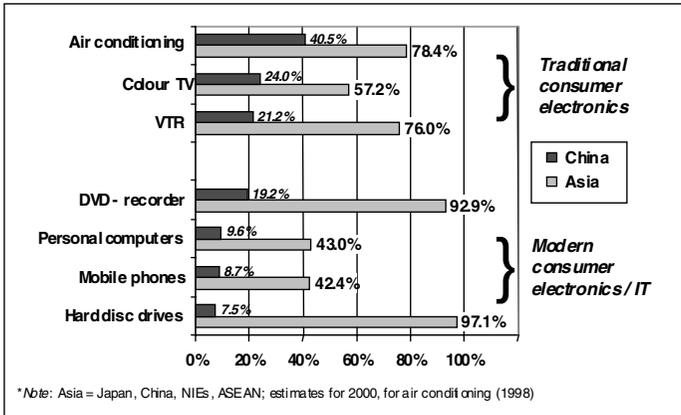
A key ingredient for gaining national competitive advantage during the investment-driven stage of economic development is the emergence of large, rapidly growing domestic markets characterized by a high potential for economies-of-scale and by intense domestic competition. An increasing number of industries in China, both in light, labour-intensive as well as in heavy, (human) capital-intensive industries, are showing these patterns of demand-driven industrial expansion and are producing a growing number of highly competitive and entrepreneurial firms.

EMERGING CHINESE FIRMS IN LIGHT, LABOUR-INTENSIVE MANUFACTURING INDUSTRIES

China's large-scale, fast growing consumer goods industry is probably the best example for the increasing international competitiveness of Chinese firms in manufacturing. Within a decade, China has emerged as a leading producer and market for durable consumer goods and commands a leading share in products like transportation equipment (for example motorcycles), home appliances (such as refrigerators, washing machines, air conditioners), audio-visual equipment (such as television, video tape recorders), information processing and communication equipment (such as personal computers), and the supporting supplier industries (such as electronic components). China is already the largest producer of air conditioners and colour televisions (TV), but is also rapidly expanding its share in modern consumer electronics and information technology (IT) goods such as mobile phones, hard-disc drives and digital video disk (DVD) recorders (*The Nikkei Weekly* 31 July 2000, p. 21) (see Figure 9.4).

China is also likely to quickly emerge as the world's largest market for mobile communication and internet services, thereby further pushing ahead IT-related manufacturing industries. China already boasts more than 60 million subscribers of mobile telephones, making it the second largest market after the United States (*Nihon Keizai Shinbun* 22 June 2000, p. 8), and the number of internet users is expected to increase from 600 000 in 1997 to 20 million by the end of 2000, and to 300 million by 2005 (Jian 2000b). As an anticipation of these developments, the Zhongguancun district in Beijing is already drawing the attention of the global IT indus-

Figure 1.4: Chinese world production share in selected consumer goods*



Source: Nikkei Weekly (31.7.2000)

try as a world-class manufacturing and R&D base for IT products and software, and has attracted the investment by leading multinationals like Microsoft Corporation or Intel Corporation to seek access to the vast pool of highly qualified, but low cost engineers (*The Nikkei Weekly* 26 June 2000, p. 24).

While foreign companies may have initiated these market dynamics by means of processing trade, a number of highly competitive Chinese firms, many of them still state-owned, has emerged, the most known companies being the Haier Group Company (Haier), the TCL Holdings Co., Ltd (TCL), the Konka Group Co., Ltd (Konka), the Chunlan Corporation (Chunlan) or the Midea Holding Co., Ltd (Midea) Corporation in the field of home appliances and consumer electronics, Legend Holdings Ltd (Legend), Founder Holdings Ltd (Founder) and the Stone Group Co., Ltd (Stone) in the field of computers and software, and the China Qingqi Group Co., Ltd (Qingqi), Sundiro Co., Ltd (Sundiro), and again Chunlan in the field of motorcycles and light trucks. The common features of these firms are modern, state-of-the-art management practices in finance, marketing, human resource management, a world-class manufacturing base with strong quality orientation, and an aggressive investment and brand-oriented marketing strategy targeting global markets.

CONSUMER ELECTRONICS

The Chinese TV industry produced almost 35 million colour TV sets in 1998, equal to about 24 per cent of world production, and has recorded an average annual growth rate of 13 per cent since 1992. In 1999, production grew by 21.9 per cent to 42.6 million units (*Nihon Keizai Shinbun* 13 June 2000, p. 7). The lion's share of production is for the domestic market with only 9 per cent going into exports. With only a 3 per cent share of imports and a market share of 15 per cent by foreign-invested firms, the industry is dominated by Chinese firms commanding an 82 per cent market share (Ōhara 2000, p. 30). The Chinese TV industry developed rapidly during the 1980s, and in 1989 over 90 manufacturers crowded the market. The recession of 1989 as well as countermeasures by the government to curb the overheated demand resulted in substantial overcapacity and increased price competition (Marukawa 1999, pp. 128–31). Nowadays, the industry is consolidating and building up scale economics with the top three firms, Haier, TCL, and Konka holding a more than 40 per cent market share (MRI 2000, p. 50).

A similar situation prevails in the air conditioning industry. With a production of 8.5 million sets in 1997, China has a dominating 41 per cent share of world production (Marukawa 1999, p. 122). The industry grew at an average annual rate of 40 per cent since 1992 driven by domestic demand that consumes 81 per cent of production. Chinese firms dominate the market with a 70 per cent market share. Although Japanese-Chinese joint ventures like Shanghai Hitachi Electrical Appliances Co., Ltd, Shanghai Sharp Electronics Co., Ltd or Shanghai Mitsubishi Elevator Engineering & Technology Co., Ltd rank among the top five manufacturers, Chinese firms hold a 70 per cent share of the market and the two Chinese firms, Haier (27 per cent) and Midea (9 per cent), are the dominating market leaders (Ōhara 2000, p. 30). The same is true for other industries in the field of home appliances like refrigerators, washing machines, or electric fans, as well as in the field of audio-visual equipment (Marukawa 1999, pp. 121–7). These industries are suffering from extensive overcapacity causing aggressive price competition, but with maturing demand, product quality and brand image are increasingly becoming important parameters for competition.

Haier is one of China's most outstanding companies and a top brand in durable consumer goods, manufacturing over 9000 products in 42 product categories such as home appliances and electronic consumer products. Haier is a large, state-owned enterprise with a sales turnover of about USD 3.2 billion and more than 20 000 employees. Founded in 1984 as the Qingdao Refrigerator Factory, the company started with 800 em-

ployees, importing refrigerator production technology from Germany. Haier has achieved its dominant market position due to strenuous efforts in manufacturing and quality improvements and from aggressive investment into a direct sales and service network of about 20 000 outlets (*Nihon Keizai Shinbun* 31 July 2000, p. 7). Haier's development can be divided into three stages. After building a brand image throughout the 1980s in refrigerators by implementing total quality control management, it rapidly diversified into new product areas in the field of consumer durables, electronic consumer goods and information processing and communication technologies throughout the 1990s. Since 1996 Haier has been striving to become a global player by aggressively expanding into overseas markets, and aiming to enter the top 500 list of Fortune magazine at the beginning of the next century. Exports account for 10 per cent of sales turnover, but Haier already enjoys double-digit market shares and a well-established brand recognition in the United States, Southern Europe and the Middle East, particularly in the field of small- and medium-sized refrigerators and air conditioners. Since 1996, Haier has established manufacturing plants in Indonesia (1996 for washing machines), in the Philippines (1997 for refrigerators), in Malaysia (1997 for washing machines), in Iran (1998 for washing machines) (Ohara 2000, p. 32–3). In March 2000, Haier opened its first production facility for compact refrigerators in the United States, where it commands a 20 per cent market share in small- and medium-sized refrigerators. The plant has an annual manufacturing capacity of 300 000 units. Further manufacturing sites are planned for Italy, Ukraine and Angola. The development of the Haier group has received increasing worldwide attention supported by articles in well-known publications like the Financial Times and Fortune magazine. Haier's efforts to become a truly multinational electronics company are supported by increased, independent efforts in R&D.

TCL and Konka are similar cases in the field of consumer electronic products like TV and video tape recorders, and Chunlan or Midea in the field of air conditioners and household appliances.

PERSONAL COMPUTERS

China's semiconductor industry is still two or three generations behind foreign technology, highly fragmented and too small in scale, and therefore depends heavily on imports and local manufacturing by foreign-invested companies like Motorola Inc. or NEC Corporation to meet rapidly growing demand (Marukawa 1999, pp. 95–6). However, it has succeeded in overcoming foreign dominance in the personal computer (PC) market with the emergence of fast growing, highly competitive Chinese

manufacturers like Legend, Founder or Stone (Huchet 1997, pp. 256–7; *The Nikkei Weekly* 26 June 2000, p. 24). In China's rapidly growing PC market, estimated at about 6.8 million units in 1999, Legend (21.5 per cent) and Founder (8.4 per cent) have managed to grab the top market shares away from long-time leading vendors from the United States, Taiwan and Japan.

Founded by eleven engineers in 1984 as a spin-out of the Chinese Academy of Science, Legend is a child of the entrepreneurial climate in the Beijing high-tech district Zhongguancun and its abundant human resource base of well-educated technicians. It is still a state-owned enterprise with a 60 per cent share by the Chinese Academy of Science, but 40 per cent is held by management and employees. Legend began as a monopolist distributor of foreign-branded computers and computer peripherals, but with the establishment of a number of joint ventures in Hong Kong and the Shenzhen special economic zone, it quickly integrated into the world's electronics industry (Naughton 1997, pp. 27–8). Hong Kong Legend, its listed Hong Kong joint venture, more than quadrupled its annual sales turnover since 1996 reaching HK\$ 17.5 billion in 1999, while reporting even higher growth in profits. While its monopolistic position for the distribution of foreign branded computers in China has been a major source of revenue, the integration of Legend as a design and manufacturing company within the global electronics industry ('China Circle') has been the key contributor to growth and profitability. In 1989, Legend began with the design, manufacture and distribution of motherboards in Hong Kong as well as started to provide systems integration products and services for large corporate and government clients in China. In 1990, Legend began the design, manufacture and distribution of its own line of PCs under the Legend brand, and in 1994 started the manufacturing of printed circuit boards. Since 1997, Legend computers are the number one selling brand in China, and in 1998 the one millionth Legend computer left the production line, symbolising the fast development of China's information technology industry. In fact, Legend is now one of the leading computer brands in the Asia-Pacific region and the largest PC maker in Asia outside Japan with a 9.1 per cent production share (*The Nikkei Weekly* 26 June 2000, p. 24). While PCs account for over half of the turnover, Legend offers a full range of hardware, software, components (motherboards), accessories as well as system integration, application and internet-related services. Much of Legend's success is due to open access to, and integration with, international markets, since the company still relies heavily on the import and assembly of key components and access to foreign technology. Nevertheless, its efforts to upgrade its manufacturing capabilities, product quality, as well as own

research and development efforts have strongly contributed to Legend's growing international reputation as a leading, multinational manufacturer of information technology. Above all, Legend is recognized as a company that has adopted best management practices and operates almost completely like a private enterprise independent from state interference. The management organization at Legend is, like that of Founder or Stone, an example for a modern form of governance in China that balances state ownership with managerial autonomy and non-bureaucratic practices (Child 2000, pp. 43–4). These high tech enterprises have emerged by transfer of scientific staff and advanced technologies from public institutions, but management has secured commercial freedom and the ability to formulate and execute their own strategies almost independently as long as the business and technology targets are achieved. The public owners claim fees rather than ownership rights as payments and surpluses are basically re-invested as retained earnings. Furthermore, access to global capital markets, for instance by means of listing on international stock markets, puts these firms under growing pressure for transparency and performance.

MOTORCYCLES

The Chinese motorcycle industry is another example of a rapidly growing domestic industry that has nurtured highly competitive manufacturers that nowadays seek to expand globally. The advance of China's motorcycle industry follows the typical pattern of national development. By first accommodating to a huge, underdeveloped market that could not yet afford automobiles, it succeeded to establish scale economics and large, efficient producers that now seek expansion on overseas markets. The Chinese motorcycle industry has increased its production by more than ten times since 1985 and produced 10 million units in 1997, thereby accounting for an estimated 50 per cent of global production (Marukawa 1999, pp. 117–9). Driven by domestic demand that consumed 99 per cent of the production, the industry grew rapidly at an average annual rate of 28 per cent. Since the beginning of economic reforms, the number of motorcycle manufacturers increased from 20 to 130 in 1996 backed by buoyant demand. While price competition remains a strong feature of the industry, competition is more and more driven by factors like service capabilities, brand image and product reliability.

The Qingqi Group is China's largest manufacturer of motorcycles, with an annual production capacity of 1.8 million units and a top selling brand 'Mulan'. Like most Chinese motorcycle manufacturers, Qingqi has relied on technical licensing from Japanese suppliers (Suzuki Motors

Corporation) and in the 1990s engaged in Sino-Japanese manufacturing joint ventures. However, the company has developed its own brands in lower class segments by upgrading its manufacturing capabilities and establishing strong service networks. In 1994 it was the first Chinese motorcycle manufacturer that received the ISO 9001 certification for manufacturing quality management. Qingqi started exports in 1988 and now operates sales subsidiaries in six countries (Hong Kong, Pakistan, Sri Lanka, Myanmar, Romania, Uganda) (Ōhara 2000, pp. 33–4). In 1997, Qingqi opened its first overseas manufacturing plant in Pakistan, followed in 1998 by a manufacturing subsidiary in Lithuania. In these plants motorcycles are assembled based on the principle of complete knock-down (CKD) manufacturing. Qingqi exported about 11 000 motorcycles, thereby accounting for 60 per cent of all Chinese motorcycle exports, and its export share of sales turnover reached 30 per cent including exports of components for CKD assembly. While Qingqi has a strong market position on its domestic market due to high brand recognition and a strong sales and service network, its position on international markets is still weak as compared to the Japanese brands from Suzuki Motors Corporation, Honda Motor Co., Ltd, Yamaha Corporation or Kawasaki Motors Co. Nevertheless, large economies of scale and continued efforts to upgrade manufacturing, development and quality management capabilities represent the company's strong potential for advancement on the global market scene. Other Chinese firms like Hainan Sundiro Motorcycle Corporation, one of China's Big Three in the motorcycle industry, may well follow suit.

EMERGING CHINESE FIRMS IN HEAVY, (HUMAN) CAPITAL-INTENSIVE
MANUFACTURING INDUSTRIES

Compared to the rapid growth and growing global competitiveness of China's light, labour-intensive manufacturing industries, scale- and (human) capital-intensive heavy industries are considered to lack international competitiveness due to low quality, low productivity and high cost. After all, these industries are at the heart of China's ailing state-owned sector that suffers from diseconomies of scale, industry-wide overcapacity, low productivity and operational inefficiency, massive debt due to widespread soft-budgeting practices, and above all from excess employment and huge social obligations such as pension liabilities, social security payments, or housing and education costs (for details, see Jian 2000a, pp. 47–65; Liu 2000, pp. 35–63, Nolan and Wang 2000, pp. 9–34; Nyaw 1999, pp. 31–45). Much of the success of China's economic reforms and open-door policy as well as China's social stability depend on the suc-

cessful restructuring and revitalization of China's state-owned sector, but it must progress in a socially acceptable way. On the other hand, China's past investments in human capital and technology and its technical intelligence in heavy manufacturing represent hidden potentials for scale economics and quality improvements to generate future growth by correcting past misallocations of resources (Yoshitomi 1996, p. 66). Despite the many structural deficiencies in China's huge, state-dominated heavy industries, progress has been made and a number of well-managed, competitive firms have been emerging particularly in the steel, shipbuilding, oil-refining and machinery industry.

IRON AND STEEL

In 1996, China became the world's largest producer of crude steel; in 1999 its annual output was 123 million tons and its global production share was 15.7 per cent. As China is also the largest producer of coal, with an output of almost 700 million tons in 1997, China has basically the potential to be a self-sufficient steel producer (Marukawa 1999, pp. 56–9). However, further analysis reveals a fundamental quality problem that results in high dependence of China on imports of high quality steel and iron ore (Gang 2000; Marukawa 1999, pp. 75–7). Although China produces about 250 million tons of iron ore, only about 30 per cent is suitable for melting in modern blast furnaces. To meet production targets, China imports about 45 to 50 million tons of iron ore. Despite strong efforts to modernize its manufacturing technologies, such as investment into continuous casting, China still mainly produces low value-added steel products like bars, but lags behind the world's top steel producers from Japan, Korea, the United States or Germany in higher quality steels like rolled sheets or stainless steel, as well as in regard to semi-finished and finished steel products. It is assumed that still only 20 per cent of China's steel output meets international quality standards. Therefore, China continues to import about 10 million tons of high quality steel annually.

The main reason for this situation is China's highly fragmented industry with hundreds of small, inefficient producers that lack cost-efficient economies-of-scale and modern, integrated steel-making technology. At the same time, a small number of world-class steel manufacturing companies have emerged that are aggressively expanding exports and have developed into formidable competitors on world markets. Presently there are four Chinese steel producers that rank among the top 30 producers in the world, each of them possessing an annual production capacity of over six million tons thought to be the minimum requirement for highly efficient steel manufacturing.

Among them, China's largest and the world's seventh largest steel maker, the Shanghai Baogang Group, is considered to be one of the most competitive steel firms in the world with an annual output of 16.7 million tons (1999). The predecessor of Shanghai Baogang Group, the former Baoshan Iron & Steel Corporation, was established in 1978 and fostered as a model factory under the Chinese government policies to modernize its iron and steel industry. In 1998, it absorbed the Shanghai Metallurgical Holding Corporation and the Meishan Iron & Steel Corporation and was renamed into Shanghai Baogang Group. The group, with 14 500 employees, reported an annual sales turnover of USD 3 billion and a 50 per cent increase in net profits to USD 180 million for 1999. Exports amounted to 1.56 million tons or about 9 per cent of the output and are mainly targeted to other Asian countries. In March 2000, the aggregated exports of rolled steel topped 10 million tons, worth over USD 3 billion, and Baogang has emerged as a strong competitor for large-scale international projects winning, for instance, oil and gas line projects in Russia, Israel, India, Sudan and Venezuela. However, it is not merely the size of the group that is drawing the world's attention but increasingly the technological capabilities, and the growing share of higher value added, high quality products. The Shanghai Baogang group is a comprehensive steel producer offering a full range of steel products with various specifications such as high grade steel sheets for automobiles, oil tubes and pipes, plates for shipbuilding, stainless steel, electrical steel, steel bars for construction, as well as tin plates, silicon steel and other high tech, high value added products. The group has continued to invest heavily in the most modern steel-making technologies, often based on licensing agreements and technical co-operations with leading foreign manufacturers like the Nippon Steel Corporation. Its manufacturing sites are considered to be global and state-of-the-art, and have attained ISO 9001 certification. Equally intensive are its efforts in research and development that have resulted in a range of newly developed products such as O5 surface deep drawing sheet, high strength structure steel, fingerprint-resistant galvanized steel sheet and high strength steel for tubing and casing.

SHIPBUILDING

A similar situation prevails in the shipbuilding industry. In 1999, China became the third largest shipbuilding nation after South Korea and Japan, accounting for 10.4 per cent of the order intake (Lloyd's Register 2000). However, like the iron and steel industry, the industry is widely fragmented and crowded by more than 500, mostly small-scale shipbuilders (BfAI 1999). Similar to other state-dominated industries, the

industry as a whole suffers from overcapacity, high cost manufacturing due to inefficient cost control management, limited technological capabilities, as well as excess employment (Nakatsuka 2000). Due to a lack of large scale, heavy duty shipyards, China's shipbuilders have mainly concentrated on building smaller size, low value-added ships like bulk transporters which meet domestic demand for coastal and river transportation, while having only limited capabilities to built large-size or special purpose, high value-added ships like multi-purpose ocean container carriers, very large and ultra-large crude carriers (VLCCs, ULCCs), Liquefied Petroleum Gas (LPG) tankers or passenger cruising ships (Marukawa 1999, pp. 139–40).

However, next to a growing importance as an international repair site for ships, the Chinese shipbuilding industry drew worldwide attention when in the beginning of 1999 news spread of a large-scale order by the Dalian New Shipyard received from Iran to built five ULCC vessels in the class of 300 000 DWT (deadweight tons) (Nakatsuka 2000, pp. 8–9).

The order symbolises the efforts by the Chinese government to upgrade its international competitiveness by reorganizing the industry and by investing heavily into the modernization and expansion of its capacities. The investment and modernization strategy focuses on the three leading shipbuilding groups, the China State Shipbuilding Corporation (CSSC) under central state control with three large shipyards in Shanghai (100 000 DWT), Jiangnan (100 000 DWT) and Hudong (80 000 DWT), the CISC group with three large shipyards in Dalian (New Dalian with 300,000 DWT and Dalian with 80 000 DWT) and Tianjin (80 000 DWT), and the GSI group in Guangzhou (60 000 DWT). At present, six large-scale shipyards with a capacity between 150 000 to 700 000 DWT are under construction, implying a significant increase in China's capability to built modern, large crude carriers. In particular, the completion of the new shipyard of the CSSC group near Shanghai, expected throughout the year 2002, is receiving worldwide attention, as it will rank among the world largest shipyards with a dock size of 470 meter x 80 meter, as well as one 900 tons and two 600 tons heavy duty cranes (KSK 1999, p. 45). Forecasts for the development of the global shipbuilding industry until 2005 expect that China will maintain its position as the world's third largest shipbuilding nation, also due to the fact that the expansion plans by the state-owned shipping fleet China Ocean Shipping Corporation warrants a stable base load for China's shipbuilders (*ibid.*, pp. 46–8, 59). It is expected that, despite the various structural problems, China's shipbuilding industry will be able to meet the needs of the global shipping industry in terms of facilities, capacities, as well as increasingly also in terms of technical capabilities (Nakatsuka 2000, pp. 9–10).

MACHINERY AND ENGINEERING

The machinery and engineering industry is yet another large, state-dominated pillar industry considered to be of strategic importance for China's industrial and technological development but suffering from similar structural problems. Particularly since the mid 1990s, the slowdown in capital investment has caused a sharp decline in production and triggered drastic, industry-wide restructuring, for instance, by means of mergers (Marukawa 1999, p. 108). Generally, China's machinery industry is lagging decades behind the advanced machine building nations like Germany or Japan, and it is questionable whether the high managerial, economic and technical targets for the machinery industry as set in China's vision for 2010 are realistic (KSKK 1997, pp. 39–45). However, because of the diversity of the industry, it is difficult to draw general conclusions. China has a well-developed position in basic machine technologies such as agricultural equipment, non-NC (numerically controlled) machine tools, compressors, boilers or diesel engines, and has produced companies like China Yuchai International Ltd (Yuchai Machinery) that are praised for their modern state-of-the-art management practices, entrepreneurial spirit, manufacturing and product technologies (Child 2000, pp. 45–6). Yuchai Machinery is China's largest producer of medium and heavy-duty truck engines with an annual output of 50 000 units, sales revenues totalling RMB 500 million and over 7000 people. Founded in 1951, it was turned from a state-owned company into a listed joint venture stock company in 1992 and awarded with the ISO 9001 certificate in 1996.

Also, the advancement of the power generating and civil engineering industry is increasingly being recognized. While China still depends heavily on imports for large-scale power generating plants, it has started to export smaller plants. Companies like Harbin Power Equipment Company or Dongfang Electric Corporation are advancing on international markets, although they are still significantly smaller in scale and technologically inferior compared to the world's top power generating firms (Nolan and Wang 2000, pp. 27–8). However, the recent news of a large-scale Chinese order for a 300 000 kW nuclear plant from Pakistan (*Nihon Keizai Shinbun* 18 August 2000, p. 1) and other Chinese orders for international projects in civil and plant engineering underline China's growing international competitiveness.

Dongfang Electric Corporation, for example, is one of China's three giant enterprises specialised in power plant equipment, and it designs, manufactures, and markets a wide range of power generating equipment such as hydro units for hydro power stations, turbo generators,

alternating and direct current electrical motors and controlling equipment for power plants. With an annual production capacity of more than 3300 megawatt in thermal generating units and 960 megawatt in hydro generating units, the company accounts for one third of China's production. The group comprises five wholly owned manufacturers, Dongfang Electric Machinery Works, Dongfang Steam Turbine Works, Dongfang Boiler Works, Dongfang Electric Machinery Works and Zhongzhou Steam Turbine Works, more than 30 specialised companies, 10 stock companies and more than 100 associated enterprises. The group has established regional companies in over 20 cities in China and branches or liaison offices in Canada, Pakistan, Bangladesh and Iran. Thermal units are exported to Pakistan, Bangladesh, Indonesia and Iran, and hydro units to the United States, Canada, Turkey, Syria, Philippines and former Yugoslavia. It is also engaging in joint ventures and co-operations with leading foreign manufacturers like Westinghouse Electric Corporation, Hitachi Ltd and Siemens AG.

OIL AND PETROCHEMICAL

The situation in China's oil and petrochemical industry is even more severe than in other heavy, capital-intensive industries, and the solution of its many structural problems is not only a crucial element for China's successful industrial development, but has far-reaching implications for the world energy and material markets.

In recent years, China has rapidly emerged as one of the world's largest oil producers, raising its annual output from a mere 0.5 million barrels per day in 1970 to almost 3 million barrels per day in the mid-1990s (Priddle 1996, p. 118). However, output growth has levelled off ever since, while oil consumption continues to surge, causing increasingly serious shortages in supply. Since China turned into a net importer of oil in 1993, the shortage in supply is expected to rise to 80 million tons by 2010 raising fears about sharp increases in the world's oil prices (Marukawa 1999, p. 45). Similar bottlenecks exist in regard to oil refining capacities and conversion facilities due to structural deficiencies (Priddle 1996, p. 120). Until the late 1980s, the Chinese refining industry was largely isolated from international markets, and the nature of its refining facilities that were designed to process China's predominantly heavy, waxy, low-sulphur crudes posed constraints to the domestic use of oil energy. With the rapid growth of demand from southern provinces, China faced increasing bottlenecks in the supply of petroleum products and since 1992 has emerged as a net importer.

One major reason for the structural deficiencies in China's oil refining and petrochemical industries relates to the form of industrial organization that prevailed until the major reforms that began in 1998 (Marukawa 1999, pp. 45, 51–2). Until then, the industry was segregated into an oligopoly of three major upstream companies for oil exploration, and several downstream companies concentrating on refining and conversion into petroleum products. By means of mergers and business swaps, two giant, regional groups of integrated oil exploring, refining and converting companies were created in 1998, the northern group under the leadership of the China National Petroleum Corporation (CNPC), and the southern group under the leadership of the China Petrochemical (Group) Corporation (SINOPEC). The objectives were, among others, first to create comprehensive Chinese majors that are able to compete globally with the world's leading oil companies, second to intensify domestic competition among strong, integrated oil companies, and third to introduce drastic management reforms by shutting out state influence. While there are basic doubts remaining about the success of management reform, visible progress has been made in recent years. According to a recent Nikkei Weekly report, both CNPC and SINOPEC enjoy a lifting in the global ranking from rank sixteenth to rank eleventh (CNPC), and from rank twentieth to rank seventeenth (SINOPEC) in the annual evaluation of the world oil companies conducted by Petroleum Intelligence Weekly, a major US trade journal (*The Nikkei Weekly* 29 May 2000, p. 24). Both companies are aggressively investing in exploration of new oil fields, also abroad, and into the modernization of their facilities. In April 2000, CNPC listed one of its subsidiaries, Petro China, on the stock exchanges of Hong Kong and New York. Although the initial public offerings did not meet the expectations due to remaining doubts among investors, the listing itself is a major step towards management reform, enhanced transparency and management accountability. Other well-managed energy companies are expected to follow suit in an attempt to tap into international capital markets for funding of their ambitious modernization and capital investment plans. For example, nine leading Chinese petrochemical firms are in the process of establishing new capacities for ethylene production totalling 1.3 million tons by the year 2005, among them large-scale projects by the Shanghai Petrochemical Company (250 000 tons), the Yangzi Petrochemical Company (250 000 tons), and Yanshan Petrochemical Company (210 000 tons) (KSKK 2000, pp. 90–2, 102–12). Similar ambitious expansion plans exist also for polypropylene, polyethylene and other key basic petroleum materials. However, these plans are dwarfed by the huge investment projects of the world majors in China. The BASF AG and BP Amoco plc. are investing into a new ethylene plant,

each with a capacity of 600 000 tons to be completed in 2004 and 2005, respectively. Royal Dutch Shell is investing in several joint ventures to build a ethylene plant with a capacity of 800 000 tons, a plant for low-density polyethylene with a capacity of 300 000 tons, a plant for high-density polyethylene with a capacity of 150 000 tons, and a plant for polypropylene with a capacity of 240 000 tons, all of them to be completed by the year 2003.

From the above findings, it can be concluded that China's competitiveness in heavy, capital- and knowledge-intensive manufacturing industries is less advanced and obvious when compared to light, labour-intensive industries. Most sectors suffer from serious structural problems due to the dominance of large, state-dominated firms. Nevertheless, visible progress is being made through industry-wide reorganization, managerial and enterprise reform, as well as technical co-operations and joint ventures with leading foreign companies. The build-up of economies-of-scale, the modernization of facilities, and the upgrading of product technologies enjoy top priority within the reform process that – combined with the entrepreneurial spirit of capable managers – has resulted in the emergence of well-managed Chinese firms with a clear international orientation. These firms also capitalize on the high level of past investments into technologies and human capital.

IMPLICATIONS FOR JAPAN'S INDUSTRY AND POSSIBLE STRATEGIC RESPONSES

What are possible implications of these developments in China's manufacturing industries for Japan's industry? And what are possible scenarios and counterstrategies for Japanese firms? In the following, an attempt is made to provide some possible, though speculative clues to these issues.

The Sino-Japanese relationship is characterized by a long history of political rivalry and growing economic interdependence, and exerts a crucial influence for political stability and economic prosperity in Asia (Hilpert and Haak 2002). During the 1990s economic relations between both countries have become even closer and intertwined as a result of the growth in trade, foreign investment, technical cooperation and technology transfer. Trade volume between China and Japan has surged over the past 20 years, but almost tripled between 1990 and 1998 (Hilpert 2002). Foreign direct investment (FDI) from Japan to China increased by eight times between 1990 and 1995, though the prolonged economic stagnation of Japan's economy caused a decline since 1996 (see Chapter 2). Neverthe-

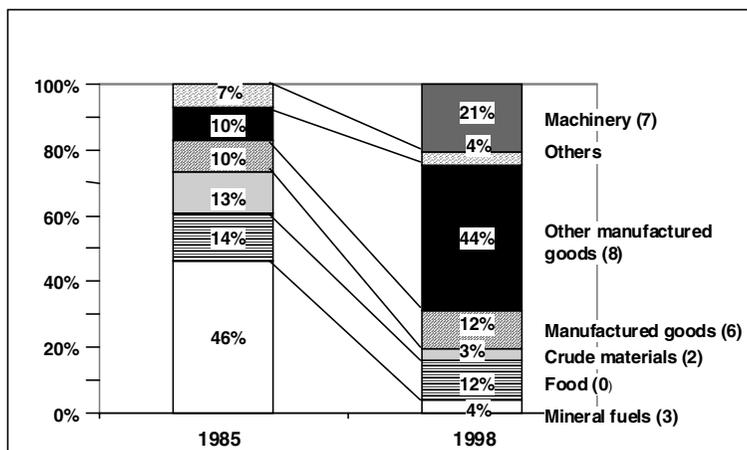
less, the level of Japanese FDI flows into China after 1996 is still four times higher than in 1990. For Japan, China is the second most important export destiny, the second most important source of imports, and the second most important recipient of FDI. China is Japan's most important site for overseas production by Japanese manufacturers, and the most important recipient of official development aid (ODA). For China, Japan is the most important source of imports, and the second largest export market and source of FDI.

Further analysis of Sino-Japanese trade relations reveals a growing intensity, interdependence and degree of integration of both economies since the early 1990s:

From China's point of view, its regional trade structure has gradually shifted towards a growing weight of trade with Japan, reflected in the growing relative importance of the Yangtze delta and the Bohai gulf as a regional export base (Chan, Tracy and Wenhui 1999, pp. 127–47).

Since the 1990s Japan has emerged as the leading importer of Chinese manufactured goods following the growth in overseas production of Japanese firms in China and the sharp increase of processing trade. While in the 1985 raw materials and foodstuff accounted for 60 per cent of Chinese exports to Japan, their share declined to less than 20 per cent in 1998, as manufactured goods increased their share to 80 per cent (see Figure 1.5).

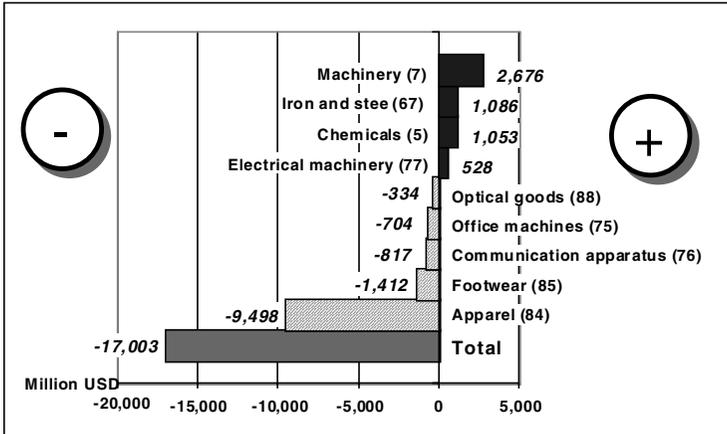
Figure 1.5: Composition of Chinese exports to Japan (1985 vs. 1998)



Source: OECD, Foreign Trade by Commodities (in brackets SITC)

Since 1989, Japan has consistently recorded a trade deficit with China totalling USD 17 billion in 1998. Apparel and footwear are the main sources for the trade deficit, but manufactured industrial goods like communication equipment, office machines, or optical goods contribute a significant and growing portion (see Figure 1.6).

Figure 1.6: Composition of Japan's trade deficit with China (1998)



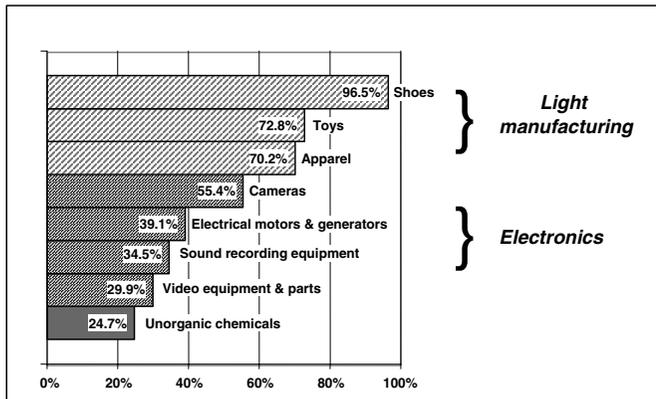
Source: OECD, Foreign Trade by Commodities (in brackets 2-digit SITC classification)

Chinese products have gained a large and growing share in Japan's import market (see Figure 1.7). China not only dominates markets like apparel, footwear or toys, where Japan is heavily dependent on imports, but has succeeded in gaining strong footholds in competitive segments like electronics, where import penetration has been low. China has achieved a far stronger position in Japan's import market than the United States or Europe that have traditionally struggled hard to gain access (Chan, Tracy and Wenhui 1999, pp. 142-4).

From these findings it can be concluded that complementary rather than intra-industrial trade still remains the basic feature of Sino-Japanese trade relations, but that there is a marked shift towards manufactured goods. Chinese products are competitive not only in traditional light manufacturing industries like textiles or toys, but increasingly in labour-intensive, assembly-based industries like electronics, communication equipment or optical goods (Hilpert 2002, pp. 45-8).

For Japan, these industries are still important in terms of scale, employment and global market position, where it maintains a formidable

Figure 1.7: Chinese market shares in Japan's import market (1998)



Source: JETRO, White Paper on International Trade, 2000.

manufacturing and supplier base. Despite Japan's strong position in and focus on technology-intensive, high value-added product segments, the revenue and profits generated from high volume, cost-competitive market segments still exert a significant influence on the overall economic performance of many companies in industries such as home appliances, consumer electronics, communication equipment, office equipment, trucks, agricultural machinery or motorcycles.³ Although Japanese firms in these industries have aggressively shifted production facilities to lower-cost production sites overseas, mainly to Southeast Asia and recently to China, they are increasingly vulnerable to China's growing competitiveness. Not only China's labour cost advantages but also enhancement of product quality, improvements in manufacturing management, and growth in productivity are important factors that have caused a relative decline of Japan's competitiveness vis-à-vis China and that may well lead to a head-on rivalry with Japanese firms, not only on global markets but increasingly also on Japan's home turf.

³ A good example is the home appliance industry. Home appliance products still account for a significant share of business with most of Japan's comprehensive electronic manufacturers – like Hitachi Ltd, Toshiba Corp., Matsushita Electric Industrial Co., Ltd, Sharp Corp. or Sanyo Electric Co., Ltd – and are responsible for their eroding profit position. Instead of retreating from these business segments, as General Electric Corp. has done, Japanese firms are trying to maintain their positions in an effort to secure employment (see *Nikkei Business* 13 November 2000, p. 12).

Japanese firms in these industries do not have many strategic options to respond to this threat (for a comprehensive analysis of Japanese strategies towards China, see Haak 2002, pp. 158–73). Being hesitant to retreat from these business fields, they are accelerating their move to overseas production, adding more and more products and components with higher value-added. Production in Mainland China is assuming a growing importance in the context of this strategy. For example, leading companies – like Sony Corporation, Sharp Corporation, Sanyo Electric Co., Funai Electric Co., Ltd in audio-visual equipment, like NEC Corporation or Fujitsu Corporation in computers and communication equipment, like Canon Inc., Ricoh Co., Ltd or Seiko Epson Corporation in office equipment, like TDK Corporation, Murata Electric Co., Ltd, Taiyo Yuden Inc. in electronic parts, or like Toray Industries, Inc. and Teijin Ltd in textiles – are embarking on large-scale production of key components and products in China (*Nihon Keizai Shinbun* 6 August 2000, p. 11; *Nikkei Business* 27 September 1999, pp. 36–49; *Nikkei Business* 27 March 2000, pp. 8–9; *Nikkei Business* 17 July 2000, pp. 26–40). In these increasingly global industries China is becoming the strategic market and manufacturing site, as other foreign companies are taking similar strategic moves, and as Chinese firms are building up scale. Global competitive success for Japanese firms seems to depend more and more on the successful management and integration of the Chinese operations into their global organization (for a detailed analysis of Japanese management of Chinese operations, see Legewie 2000).

The ongoing overseas shift of production facilities and procurement by Japanese manufacturing firms has had severe consequences for Japan's large supplier industries. While the process of industrial hollowing-out started in the mid-1980s as a result of the rapid appreciation of the Japanese yen, it is likely to further accelerate in the nearer future as many labour-intensive, assembly-based industries are losing their global competitiveness. These trends are increasingly visible in manufacturing industries like casting (for example for machine bodies), dies and mould making (for example for metal and plastic parts) (Kanemura 2000, pp. 32–6) or in processing and subcontracting industries like parts machining or (sub)assembly (for example printed circuit boards). The strategic challenge for Japanese suppliers and subcontractors is to increase competitiveness by moving abroad by themselves or by engaging in international alliances or networks, or to retreat from their traditional business by developing independent, proprietary know-how, technologies and own products.

A different scenario seems likely for the scale- and (human) capital-intensive, heavy manufacturing industries like steel, shipbuilding, paper,

cement, oil refining and petrochemicals, machinery and civil engineering, or automotive, because of the peculiar strategic positioning of these industries in both countries.

From Japan's perspective, these sunset industries were the backbone for its rapid economic and technological development, but domestic demand in these industries is maturing and in some cases declining. Most of these industries suffer from excess capacity and low capacity utilization as well as from overspreading their business portfolio into unprofitable segments. Despite their technological leadership position in many of these industries, cost competitiveness is declining and international competition, particularly from South Korea and from multi-national firms, is on the increase. In addition, industries like oil refining or petrochemicals are suffering from diseconomies of scale due to uncompetitive capacities and low plant utilization. Other industries like automobiles, cement or paper are faced with a global wave of concentration. Most companies that operate in these industries are engaged in massive restructuring efforts such as streamlining their business portfolios as well as reengineering of their processes and cutting capacities (Matsui and Suzuki 1999; Matsui, Suzuki and Ushio 2000). Corporate restructuring efforts in these industries increasingly involve industry-wide, structural change across company boundaries, as business alliances, tie-ups with foreign firms as well as mergers and acquisition become more and more common (Raupach-Sumiya 2000, pp. 23–40).

At the same time, the Chinese market is one of the few remaining markets where future growth can be expected. In order to sustain the global market position, it is essential for Japanese firms in these industries to gain a strong foothold on the Chinese domestic market. Otherwise, their own existence and industrial base seems endangered.

From the Chinese point of view, the heavy manufacturing industries are of an even higher strategic importance. The success of China's enterprise reform, sustained economic development and social stability depend to a large extent on the ability to enhance the competitiveness and efficiency of these mainly state-dominated, large-scale industries. It is, therefore, no surprise that the Chinese government, in its ninth Five Year Plan for the year 1996–2000 and in its 15 Year Perspective Plan, has declared petrochemicals, construction, steel, automotive and machinery as pillar industries that are at the center of Chinese reform efforts and industrial policy. The presence in these industries of substantial economies of scale as well as their scope for significant vertical integration advantages has led the authorities to encourage the building-up of large enterprises within them (Child 2000, pp. 33–5; Marukawa 2000). Without doubt, these industries and enterprises will continue to receive massive

governmental protection and support despite all efforts within the WTO talks to enhance free, market-based competition in China. At the same time, much of the success of the reforms and modernization efforts depends on continued technology transfer, cooperation and investment from foreign partners. Therefore, it seems likely that China will continue to try to link market access and foreign direct investment to the transfer of technology, management and skills.

When taking the strategic situation of both Japan and China into consideration, a growing economic interdependence between both economies seems to be emerging as the interests of both nations and their industries are tied to each other. The ability to sustain Japan's competitiveness and global market position in these industries largely depends on access to the Chinese market. Conversely, the ability of China to upgrade its technological and managerial base and to secure the success of its economic and enterprise reforms depends on the willingness of foreign companies to continue to invest in China and to transfer technologies, capabilities and know-how. Due to its regional vicinity as well as its leading technological position in key, heavy manufacturing industries, Japan appears to be the logical strategic partner. Therefore, the emergence of Sino-Japanese industrial alliances may well be a realistic scenario for important scale- and (human) capital-intensive, heavy manufacturing industries like steel, shipbuilding, petrochemicals, civil engineering or automobiles.

While the benefits for China are more or less obvious, alliances with Chinese firms could also be attractive for Japanese firms. In addition to better access to and insight into the Chinese market, the active pursuance of alliances enables them to better control the flow of know-how and technology, in particular if WTO membership assures the transparency and enforcement of contract law. Alliances with Chinese firms better enable Japanese firms to contain a growing competitive threat by China's firms by means of engagement. Furthermore, such alliances may exploit potentials for intra-industrial specialization with both partners concentrating on specific segments, products or processes. Such alliances can become an integral part of Asian-wide alliances or networks involving Japanese, Korean, Taiwanese and Chinese firms. The alliance between Nippon Steel Corporation and Pohang Iron & Steel Co., Ltd (Posco) of South Korea may well serve as a model. This comprehensive tie-up between the world's largest and second largest steel manufacturer, among others, aims for the establishment of joint ventures in China. Although not explicitly stated, China's largest steel firm, the Shanghai Baogang group, with whom both companies have longstanding cooperative ties, may well play an important role within this strategy. Such an

arrangement serves two strategic purposes: access to the Chinese market and containment of a growing Chinese rival.

This argument is, agreeably, quite speculative as firm empirical evidence is still lacking. For the purpose of its verification – or dismissal – it seems worthwhile to closely watch developments in other heavy manufacturing industries like oil refining, petrochemicals, cement, paper or shipbuilding, and strategic moves of large Japanese manufacturing enterprises.

SUMMARY

This paper attempted to provide a comprehensive analysis of China's growing international competitiveness in manufacturing and speculated on possible implications for and strategic responses by Japan's industry. The main arguments can be summarized as follows:

Despite the progress of economic reforms, China's advancement to the world's tenth largest trading nation and growing competitive success in manufactured goods, China remains a developing country with huge structural problems. Nevertheless, the reform process in China has liberated potentials and competitive forces that have led to the emergence of large, domestic-growth industries and competitive, well-managed firms, both in labour-intensive, assembly-based industries as well as in scale- and (human) capital-intensive, and heavy manufacturing industries. Increasing competition on China's domestic markets and continued foreign technology transfer encourage the advancement of resources and factors, thereby enhancing Chinese competitive advantages in manufacturing.

Japan's assembly industries are likely to face increasing competition by Chinese firms, which will accelerate the internationalisation of procurement and the shift to overseas production in China. This will further accelerate the process of 'industrial hollowing-out' of Japan's supplier and subcontracting industries. Strategic alliances between Japanese and Chinese firms are a likely scenario in scale- and capital-intensive industries in the wake of the growing economic interdependence between China and Japan.

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