

Emergence of China and the Economy of South Korea

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1 Introduction

Rapid economic development in China and its emergence as a major trading nation of the world since the late 1970s have brought the two Northeast Asian economies—China and the South Korea—closer together. Their bilateral trade has increased steadily in both volume and variety of goods traded since 1987, when China and South Korea (henceforth Korea) established a formal diplomatic relationship. In 1989, for instance, Korea's merchandise exports to China amounted to US\$1.3 billion, while its merchandise imports from China were US\$472 million. By 2006, Korea's merchandise exports to and imports from China grew to US\$69.5 and US\$48.6 billion respectively. China has also become one of the major host countries for Korea's overseas investment: in 2006 alone, Korea invested US\$3.3 billion in China, and by the end of that year its total cumulative stock of investment in China stood at US\$13.7 billion.

For Korea, China has now become its major competitor for market share in world markets as well as its major trade partner, as it has been gaining a comparative advantage in many of the manufacturing industries, especially labour-intensive ones, in

which Korea used to take the lead (Kim and Lee 2003; Kim, Kim and Lee 2006; Nam 2004; Song 2000).¹ In fact, China's gain in comparative advantage in those industries is seen by some observers in Korea to have put the country in a 'nutcracker' situation (Booz-Allen and Hamilton 1997; *International Herald Tribune*, 28 March 2007) or between two 'neighboring whales' (*Digital Chosun Ilbo*, 29 January 2007), as it is being squeezed between price-competitive China and technologically advanced Japan. Obviously, even if this is true, it will be temporary and of short duration provided Korea succeeds in gaining a comparative advantage in technologically advanced sectors and thus sustain economic growth. If not, the situation will persist with long-term adverse consequences for the Korean economy.

Further complicating the economic relationship between the two economies is the fact that Korea is now a major supplier of parts and components in the manufacture of Chinese exports and thus benefits from the rapid expansion of those exports in third markets. As pointed out by Ravenhill (2006) in the case of ASEAN's relationship with China, Korea has also begun to partake in a new trade 'triangle' that has emerged with China's rapid industrialization.

¹ The situation in which Korea now finds itself with respect to China parallels that in which Japan was before the 1940s. According to Howe (1996), the Japanese economist and theoretician Akamatsu Kaname (1896-1974) characterized the Japanese economy as being challenged by the 'newly industrializing economy' of China but lagging behind the West. Akamatsu saw Japan's situation as a transitional phase that required both the domestic and international processes of adjustment but was made difficult by the West with its entrenched trading position in East Asia.

The paper is hereafter organized as follows: Section 2 examines the trends and characteristics of the overall export structure of the two economies for 1992 and 2004 and shows that China's export structure has 'caught up' with that of Korea, its exports displacing Korean exports to Japan and the United States, Korea's two major trading partners. Section 3 reports on the trends and characteristics of China-Korea bilateral trade, showing that the bilateral trade of these two countries has increased more rapidly than their respective trade with the rest of the world. Section 4 examines trade in parts and components and cross-border production networks connecting the two economies, and section 5 looks into Korean investment in China and its effect on bilateral parts trade. Section 6 examines changes in the profitability of Korean manufacturing industries, which we take to be a harbinger of Korea's comparative advantage. Section 7 concludes the paper.

2 Convergence in export structure

How has the emergence of China affected Korea's exports to the rest of the world? Is China catching up with Korea in export structure? To answer questions such as these, we classify exports from the two countries into four technological groups—low-technology, medium-low technology, medium-high technology, and high-technology

products.² As can be seen in Table 1, the two countries, especially China, went through major changes in export structure between 1992 and 2004.

Over the span of twelve years China's export structure shifted from low technology toward technologically more sophisticated products. In 1992, more than a half of its manufacturing exports were in low-tech products such as textiles, apparel and footwear, while the exports of medium-high and high-tech products accounted for only 12.4 and 10.9 percent respectively. By 2004, the share of low-technology exports declined to 31 percent, while the share of medium-high tech and high-tech exports rose to 19.6 and 34.2 percent respectively. In the high-tech product group, computers and office products, and radio, TV and communication equipment increased the most in terms of export share between 1992 and 2004. The combined share of these exports increased from less than 6 to 26 percent between those two points.³

During the same period Korea also experienced a steady increase in the export shares of both high- and medium-high technology products—from 25.8 to 39.2 percent and from 20.4 to 35.2 percent respectively. Among the high-tech products the largest

² For this purpose we regroup trade data using the International Standard Industrial Classification (ISIC). The four technology groups are thus comprised of the following ISIC sectors; 15-22, 36 and 37 for the low technology group; 23, 25-28 and 351 for the medium-low technology group; 24 (excluding 2423), 29, 31, 34 and 35 (excluding 351 and 353) for the medium-high technology group; and 353, 2423, 30, 32 and 33 for the high technology group. The non-manufacturing group consists of 01-14.

³ Although computers and office products, and radio, TV and communication equipment are classified as high- tech products, the technology involved in their production in China may be of a simple assembly type used at plants of foreign multinational enterprises. Thus 'Made in China' is not necessarily the same as 'Made by Chinese'.

increase took place in radio, TV and communication equipment—from 8.5 to 15.3 percent—while the share of automobile exports, one of the medium-high tech products, more than doubled. In contrast, the shares of both low- and medium-low technology products decreased, with the steepest decline taking place in low-tech products. Indeed, the export share of textiles, apparel and footwear alone, which had been Korea’s major exports up through the early 1990s, decreased from 25.4 percent in 1992 to 6.1 percent in 2004, indicating a rapid loss of Korea’s comparative advantage in this group of products.

Table 1 Export distribution and revealed comparative advantage (RCA) by technology group

	China				Korea			
	Share (%)		RCA		Share (%)		RCA	
	1992	2004	1992	2004	1992	2004	1992	2004
Manufacturing								
High technology and ICT products	10.9%	34.2%	0.56	1.46	25.8%	39.2%	1.33	1.63
-Aircraft and spacecraft	0.5%	0.1%	0.14	0.07	0.9%	0.2%	0.28	0.11
-Pharmaceuticals	1.3%	0.8%	0.74	0.25	0.4%	0.3%	0.26	0.11
-Computers and office products	1.3%	14.9%	0.30	2.85	4.0%	9.0%	0.91	1.73
-Semiconductor, electronic valves	0.8%	3.7%	0.26	0.78	10.6%	11.0%	3.62	2.30
-Radio, TV, communication equip.	4.5%	11.7%	1.24	2.44	8.5%	15.3%	2.31	3.19
-Precision, medical, optical instru.	2.6%	2.9%	0.75	0.81	1.3%	2.4%	0.39	0.65
Med-high technology	12.4%	19.6%	0.36	0.62	20.4%	35.2%	0.60	1.10
-Electrical machinery	3.3%	5.6%	0.87	1.35	2.2%	3.2%	0.59	0.77
-Chemical products	4.1%	3.9%	0.56	0.49	7.2%	10.2%	0.99	1.26
-Motor vehicle and trailer	0.8%	2.0%	0.07	0.20	5.8%	13.6%	0.50	1.33
-Other transport equipment	0.7%	1.0%	1.26	1.87	0.2%	0.2%	0.35	0.29
-Home appliance and machinery	3.5%	7.1%	0.32	0.80	5.0%	8.0%	0.46	0.91

Med-low technology	10.7%	12.4%	0.83	1.03	18.7%	17.3%	1.45	1.43
-Shipbuilding and repairing	0.6%	0.5%	0.61	0.71	5.4%	6.4%	5.77	8.45
-Coke, petroleum products	0.9%	0.8%	1.30	1.24	0.2%	0.1%	0.30	0.20
-Rubber and plastic products	2.0%	2.6%	0.83	1.04	2.8%	2.4%	1.15	0.96
-Non-metallic mineral products	1.9%	1.7%	1.31	1.36	0.8%	0.6%	0.52	0.44
-Basic and fabricated metal products	5.3%	6.7%	0.71	0.98	9.7%	7.7%	1.30	1.12
Low technology	53.4%	31.0%	2.43	1.74	31.6%	8.8%	1.44	0.49
-Textiles, apparel, footwear	37.5%	20.6%	4.42	3.13	25.4%	6.1%	2.99	0.92
-Food, beverages, tobacco	6.4%	2.6%	1.08	0.49	2.1%	1.1%	0.35	0.20
-Wood and paper products	2.0%	1.6%	0.45	0.51	1.0%	0.6%	0.22	0.19
-Other misc. manufacturing prod.	7.5%	6.3%	2.43	2.11	3.2%	1.0%	1.03	0.35
Non-manufacturing products	11.2%	2.6%	1.34	0.22	1.5%	0.4%	0.18	0.03

The changes in China's export structure described above suggest that it has been following other East Asian countries in the 'catching-up product cycle' development that began with Japan in the early 20th century. With China catching up with Korea in industrial development, we would expect a convergence in their export structure and increased competition for exports in world markets. To see how the two countries have fared in this competition, we compare the shares of imports from China and Korea for 1992 and 2004 in four markets—the rest of the world, Japan, the United States, and the European Union (EU) (Figure 1). It is clear that China made significant gains in the market share for all products in Japan and the United States, while Korea made no gain at all. In low-tech industries, China increased its market share in Japan, the United States, and the EU, while Korea's market share in all those markets declined absolutely. Even in medium-low tech industries China made significant gains

in market share in Japan and the United States at the expense of Korea, whereas in the EU both China and Korea increased their market share, albeit the former more than the latter (Figure 2).

Figure 1 Import share of China and Korea in major markets

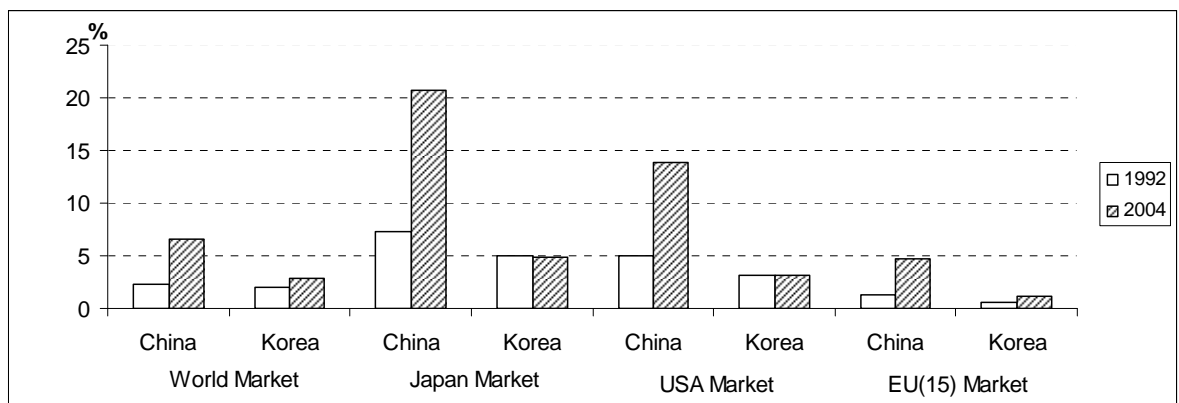
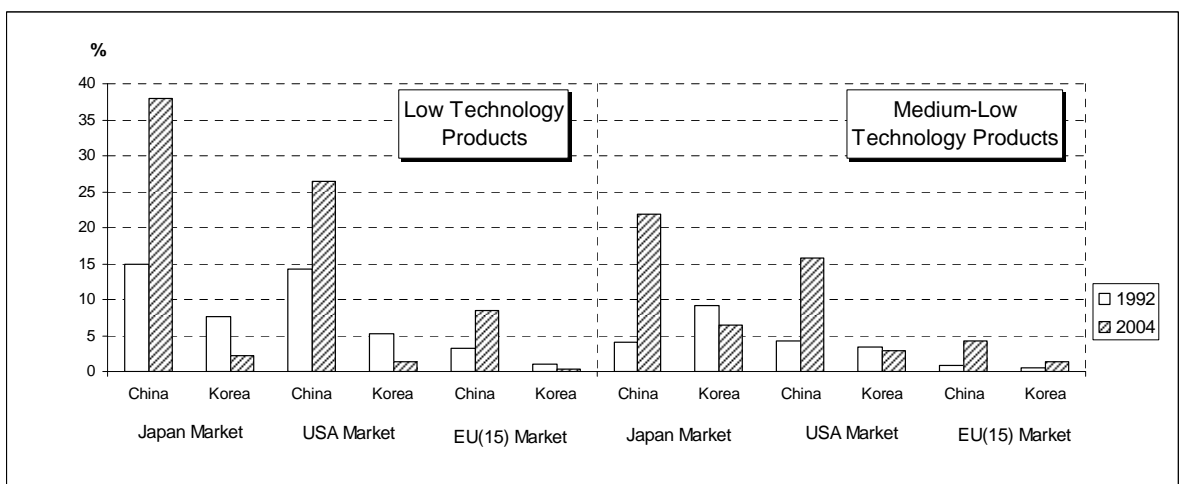


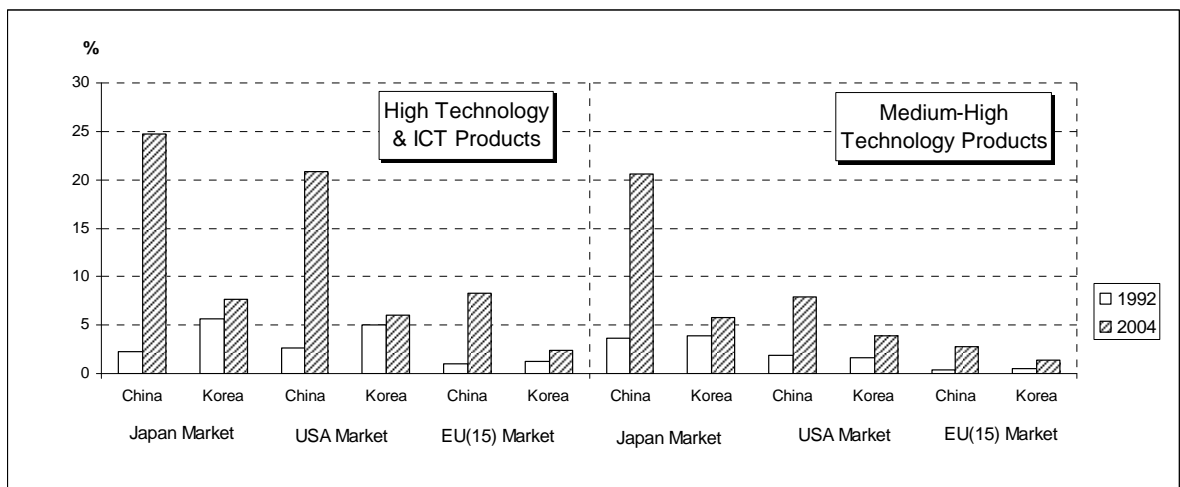
Figure 2 Import share of China and Korea in major markets:

low and medium-low technology industries



In contrast, in high- and medium-high technology products Korea increased its market share in all the major world markets although, during the same period, China's share also increased (Figure 3). It is difficult to tell whether Korea would have increased its market share more in the absence of competition from China, but the data presented so far suggest that, while suffering a loss in market share in low- and medium-low technology products to China, Korea has managed to increase its market share in high- and medium-high tech products sufficiently enough to expand its share of total world exports—from 2.0 in 1992 to 2.8 percent in 2004. Some of this increase was, as we point out in the following section, due to an expansion of bilateral trade between the two countries.

Figure 3 Import share of China and Korea in major markets:
high and medium-high technology industries



3 Expanding bilateral trade

While Korea has been losing its market share for some of its exports in third markets to China, its bilateral trade with China has been expanding. In fact, the increase in Korean exports for the last decade was mainly due to an increase in its exports to China, as the latter's share of Korean exports increased from 3.5 percent in 1992 to 19.6 percent in 2004 (Table 2). This is as to be expected, since rapid economic growth in China has been accompanied by a rapid increase in its trade with the rest of the world, including that with Korea. What is thus of greater interest is whether trade between the two has increased more rapidly than their respective trade with the rest of the world. To answer this question we calculate the export- and import-intensity indices for China and Korea respectively, for the period 1992-2004 (reported in parenthesis in Table 2).⁴

Between 1992 and 2004, Korea's export-intensity with respect to China rose from 1.6 to 3.2, while its import-intensity remained the same. This increase in the export-intensity with the import-intensity remaining stable indicates the growing importance of China as Korea's export destination, albeit not as a source of its imports.

During the same period China's import-intensity with respect to Korea increased from 1.6 to 3.7, indicating both a growth rate of Chinese imports from Korea much

⁴ The export intensity of country A with respect to country B is the ratio of B's share of A's total exports to B's share of world total imports. If it is greater than 1 it suggests that A is more closely tied with B in trade than the latter is with the rest of the world. The import intensity index is similarly calculated and has the same implication.

higher than that from the rest of the world and the growing importance of Korea as a source of China's imports. China's export-intensity with respect to Korea also increased rapidly from 1.3 to 1.9, pointing to a bilateral trade that is expanding faster than their respective trade with the rest of the world.

Table 2 Growing trade interdependency between China and Korea

Share (percent) and trade intensity (in parenthesis)

	1992	1994	1996	1998	2000	2002	2004
China's share in Korea's exports	3.5%	6.5%	8.8%	8.3%	10.7%	14.6%	19.6%
	(1.6)	(2.4)	(3.3)	(3.2)	(3.1)	(3.2)	(3.2)
China's share in Korea's imports	4.6%	5.3%	5.7%	6.7%	8.0%	11.4%	13.2%
	(2.0)	(1.8)	(1.9)	(1.9)	(2.0)	(2.2)	(2.0)
Korea's share in China's exports	2.8%	3.6%	5.0%	3.4%	4.5%	4.8%	4.7%
	(1.3)	(1.5)	(1.7)	(2.0)	(1.8)	(2.0)	(1.9)
Korea's share in China's imports	3.3%	6.3%	9.0%	10.7%	10.3%	9.7%	11.1%
	(1.6)	(2.7)	(3.6)	(4.2)	(3.7)	(3.6)	(3.7)

The growth of bilateral trade between Korea and China is in itself a sign of increasing interdependence between the two economies, which is greater than suggested by the trade data presented in Table 2. The fact is that much of the bilateral trade is in parts and components and the growth in that trade suggests growing cross-border production networks spanning the two economies. In the following section we investigate in greater detail trade in parts and cross-border production networks.

4 Trade in parts and cross-border production networks

The increase in the export- and import-intensities discussed above, itself a measure of expanding bilateral trade between the two economies, may be due to their geographical proximity, but obviously that alone cannot account for such a rapid increase. We examine here whether expanding cross-border production networks have contributed to the increase in the bilateral trade between the two countries. Expanding production networks, which may be a consequence of international fragmentation of production processes, imply increasing parts trade between the two countries (Gaulier, Lemoine and Ünal-Kensenci 2005; Ando and Kimura 2003).

Tables 3 and 4 report the destinations and sources of parts trade for Korea and China in 1992 and 2004 for the industries in which much parts trade takes place. In 1992, China accounted for a meagre 0.9 percent of Korea's total parts exports, but in 2004 it accounted for 26.9 percent (Table 3). Increases in computers and office products; radio, TV and communication equipment; precision, medical and optical instruments; and electrical machinery were all from less than 2 percent to more than 30 percent. Even in motor vehicles and trailers the increase was from 0.9 percent in 1992 to 29.7 percent in 2004. This increase in parts trade, which is much greater than the increase in Korea's total exports from 3.5 to 19.6 percent during the same period, is a sign of the growing importance of parts exports from Korea to China. It also indicates

that China has become a major assembler of parts and components manufactured in Korea for many of its high- and medium-high tech products and that Korea has become an indirect beneficiary from China's growing exports to the world markets. In contrast, China has yet to become a major supplier of parts for Korea, which increased its parts exports to Korea from 1.3 to 5.2 percent (Table 4).

In 1992, Korea imported parts and components mostly from Japan, the United States, and Europe—a total of 82.1 percent—while importing only a miniscule amount—0.4 percent—from China. By 2004, however, imports from the former three sources decreased to 59.6 percent, while those from China increased to 12.2 percent (Table 3). The most dramatic change took place in computers and office products; radio, TV and communication equipment; and electrical machinery, their respective shares of imports from China increasing from 2.7 to 42.6 percent, 1.1 to 24.4 percent, and 0.5 to 30.5 percent. The fact that these increases took place while the share of parts imports in those groups from Japan, the United States and EU decreased is a sign of growing cross-border production networks between China and Korea and growing relative importance of China for Korea's manufacturing sector.

Table 3 Korea's parts trade and trade partners

	China		Japan		USA		EU 15	
	1992	2004	1992	2004	1992	2004	1992	2004

<i>Total Trade</i>	<i>Export</i>	3.5	19.6	15.1	8.5	23.7	16.9	12.8	13.3
	<i>Import</i>	4.6	13.2	23.8	20.6	22.4	12.9	12.8	10.5
Total parts trade	Export	0.9	26.9	10.5	9.2	31.4	13.4	12.7	9.8
	Import	0.4	12.2	40.3	27.3	29.8	20.1	12.0	12.2
Parts for computers and office products	Export	1.5	31.1	11.2	5.4	41.8	18.1	26.6	16.3
	Import	2.7	42.6	46.5	13.8	34.0	11.4	3.7	4.2
Parts for radio, TV, communication equip.	Export	1.0	39.0	17.4	5.8	22.1	6.3	16.9	10.2
	Import	1.1	24.4	65.4	40.6	12.2	9.1	9.6	7.6
Parts for precision, medical, optical instru.	Export	0.9	82.5	18.4	5.7	58.8	3.2	9.0	1.6
	Import	0.2	3.0	39.8	45.0	38.2	20.8	17.9	20.6
Parts for electrical machinery	Export	1.8	38.1	16.8	9.6	19.6	14.4	13.8	5.0
	Import	0.5	30.5	53.2	38.2	22.5	9.0	15.4	12.3
Parts for motor vehicles and trailers	Export	0.9	29.7	20.2	6.3	27.9	16.8	18.2	8.3
	Import	0.3	2.2	62.9	33.9	14.9	12.8	15.9	38.3
Parts for home appliance and machinery equip.	Export	1.9	23.9	15.7	13.9	26.5	13.7	16.0	10.6
	Import	0.4	7.5	39.4	33.7	30.7	21.8	22.9	28.1

China's total parts imports from Korea also increased from 1.7 to 12.3 percent between 1992 and 2004, the most dramatic increase taking place in radio, TV and communication equipment (from 2.3 to 18.8 percent) and in motor vehicles and trailers (from 0.2 to 13.8 percent). These increases are not as large as the increases in Korea's parts imports from China, suggesting that by 2004 Korea had become much more dependent on China for parts and components in the manufacture of high- and medium-high technology products than China had on Korea. This development is probably due to the fact that Korea has transferred some of its parts production to China through direct investment and that many of its parts imported from China are thus those manufactured by Korean affiliates in China. We investigate this possibility in the following section by looking into various possible linkages between foreign direct investment (FDI) and bilateral trade between Korea and China.

Table 4 China's major parts trade and trade partners

		Korea		Japan		HK		USA		EU 15	
		1992	2004	1992	2004	1992	2004	1992	2004	1992	2004
<i>Total Trade</i>	<i>Export</i>	2.8	4.7	13.7	12.4	44.2	17.0	10.1	21.1	9.4	16.8
	<i>Import</i>	3.3	11.1	17.0	16.8	25.5	2.1	11.0	8.0	13.5	12.2
Total parts trade	Export	1.3	5.2	7.2	11.3	54.7	25.9	8.8	16.3	5.5	13.4
	Import	1.7	12.3	22.3	21.2	33.8	2.5	10.2	6.1	19.1	11.6
Parts for computers and office products	Export	1.6	1.7	2.6	7.9	73.4	32.1	10.5	19.8	10.7	18.1
	Import	1.5	9.1	32.9	18.4	49.8	2.3	7.2	4.4	3.1	3.0
Parts for radio, TV, communication equip.	Export	2.1	9.5	13.2	14.1	73.7	27.7	2.3	11.1	1.8	12.3
	Import	2.3	18.8	15.2	20.9	53.9	3.8	4.2	3.2	14.9	11.0
Parts for precision, medical, optical instru.	Export	2.3	2.8	11.9	25.0	53.8	25.3	13.0	16.3	8.5	13.1
	Import	0.1	9.8	26.2	30.4	28.0	1.6	19.1	12.5	12.1	11.2
Parts for electrical machinery	Export	0.6	5.8	11.1	14.1	53.7	24.9	3.8	15.7	2.0	12.0
	Import	0.7	8.3	18.0	30.6	42.4	2.8	5.6	5.8	18.1	19.7
Parts for motor vehicles and trailers	Export	1.5	1.9	6.6	14.5	11.0	1.7	27.9	36.4	11.9	11.4
	Import	0.2	13.8	46.6	34.8	1.0	0.0	6.2	4.4	38.7	33.2
Parts for home appliance and machinery equip.	Export	1.7	4.2	6.2	15.4	30.7	5.4	17.0	21.2	7.9	18.4
	Import	1.1	5.9	23.4	24.8	14.8	0.9	13.8	12.3	34.3	39.4

Note: HK=Hong Kong

5 Korea's investment in China and Korea-China bilateral trade

In this section we examine how Korea's direct investment in China has led to an expansion in parts trade between the two countries and in bilateral trade as FDI generally precedes international fragmentation of production processes or production sharing (Arndt 2004; Jones 2001). As discussed above, one notable development in economic relations between the two countries has been the growth of parts trade between Korea and China and especially the rapid growth of parts exports from Korea

to China, which has replaced the advanced industrialized countries such as the United States as the largest destination for Korea's parts exports.

Here we examine the procurement and sales patterns of affiliates, as reported in the surveys carried out in 1996 and 2003 by the Korea Institute for Industrial Economics and Trade (KIET). The 1996 KIET survey (discussed in Ha and Hong 1998) was carried out on a sample of 615 Korean companies (216 large firms and 399 small and medium-sized firms and their 952 offshore affiliates). The 2003 survey was carried out on 748 companies all in manufacturing (89 large firms and 659 small and medium-sized firms and their 1050 offshore affiliates) (KIET and MOCIE 2004). In Table 5 we report the sources of procurement by Korean affiliates by region. We find that between 1996 and 2003 the share of parts and components imported by Korean manufacturing affiliates in China from Korea decreased from 64.7 to 36.9 percent, while the share of local procurement increased from 26.5 to 45.6 percent, suggesting an increasing localization of parts supplies.

The results of these two surveys indicate that Korean investment in China has had a positive effect on the two countries' bilateral trade, although the share of parts imported from Korea in total procurement by the affiliates in China has declined. They also point to the fact that FDI has created extensive backward local linkages in China.

Table 5 also reports the procurement patterns of Korean affiliates in China by manufacturing industries. Between 1996 and 2003 the share of imports from Korea in total procurement decreased for most industries except for food and beverage, paper and printing, basic metals, and motors and freight. Electronics and telecommunication equipment, in particular, decreased from 86.0 percent in 1996 to 36.3 percent in 2003. Except for machinery & equipment industry, the industries that experienced a decrease in the share of imports from Korea experienced at the same time an increase in the share of local procurement between 1996 and 2003. This indicates strong local backward linkages created by Korean affiliates.

Table 5 Sources of procurement by Korean affiliates in China by industry

(Unit: percent of total procurement)

	Local procurement		Imports from			
			Korea		Third countries	
	1996	2003	1996	2003	1996	2003
Manufacturing	26.5	45.6	64.7	36.9	8.8	17.5
Food and beverage	78.3	59.6	19.2	21.9	2.6	18.4
Textiles and apparel	46.0	63.3	53.8	25.7	0.2	11.0
Footwear and leather	2.6	18.2	94.9	65.6	2.5	16.1
Paper and printing	91.8	51.5	8.2	31.7	0.0	16.8
Petroleum and chemical prod.	1.0	37.1	62.9	47.3	36.1	15.6
Non-metallic minerals	49.0	93.0	51.0	3.2	0.0	3.8
Basic metals	88.6	9.0	11.4	90.8	0.0	0.2

Fabricated metals	0.5	41.7	99.5	56.9	0.0	1.4
Machinery and equipment	40.9	28.9	49.4	8.9	9.8	62.2
Electronics and telecommunications equip.	13.9	56.5	86.0	36.3	0.1	7.2
Motors and freight	78.8	40.8	21.2	59.2	0.0	0.0

Source: Ha and Hong (1998), KIET and MOCIE (2004)

Sales destinations for the output of Korean affiliates in China vary widely from industry to industry (Table 6). According to the 2003 KIET survey, in paper and printing, the petroleum and chemical sector, basic metals, and motors and freight, more than one-half of the affiliate output was destined for local markets. In contrast, in textiles and apparel, footwear and leather, fabricated metals, machinery and equipment, and electronics and telecommunication equipment, more than 60 percent of output was exported. Reverse imports—exports back to Korea—accounted for 17.8 percent of the entire manufacturing output and formed an especially big element in footwear and leather and in both non-metallic minerals and basic metals. Exports to third markets were especially large—at least as much as one-half of total output—in textiles and apparel, footwear and leather, machinery and equipment, and electronics and telecommunication equipment. These are industries that are either labour-intensive or assemblers of parts imported from Korea.

Table 6 Sales destination of Korean affiliates in China by industry

(Unit: percent of total sales)

	Local Sales		Exports to			
			Korea		Third countries	
	1996	2003	1996	2003	1996	2003
Manufacturing	22.6	34.2	25.8	17.8	51.6	48.1
Food and beverage	51.2	43.4	27.4	35.3	21.5	21.2
Textiles and apparel	47.5	22.4	8.2	28.4	44.4	49.2
Footwear and leather	1.2	8.7	29.5	31.5	69.3	59.8
Paper and printing	13.1	97.3	51.2	0.0	35.7	2.7
Petroleum, chemical prod.	0.6	78.4	46.6	10.4	52.8	11.3
Non-metallic minerals	40.0	49.6	57.8	46.4	2.2	4.0
Basic metals	51.3	62.8	23.1	35.3	25.6	1.9
Fabricated metals	3.5	36.6	25.7	17.4	70.7	46.0
Machinery and equipment	51.6	16.1	47.0	6.4	1.4	77.5
Electronics and telecommunications equip.	30.5	32.1	60.7	12.8	8.9	55.1
Motors and freight	0.5	93.4	3.7	6.4	95.8	0.3

Source: Ha and Hong (1998), KIET and MOCIE (2004)

6 Effects on Korea's manufacturing industries

How has China's convergence to Korea affected Korea's manufacturing industries?

We noted at the beginning of the paper that the convergence had raised worrisome concerns about the future of the Korean economy, expressed in such phrases as 'a nutcracker situation' and 'between two neighbouring whales', as it has put Korea

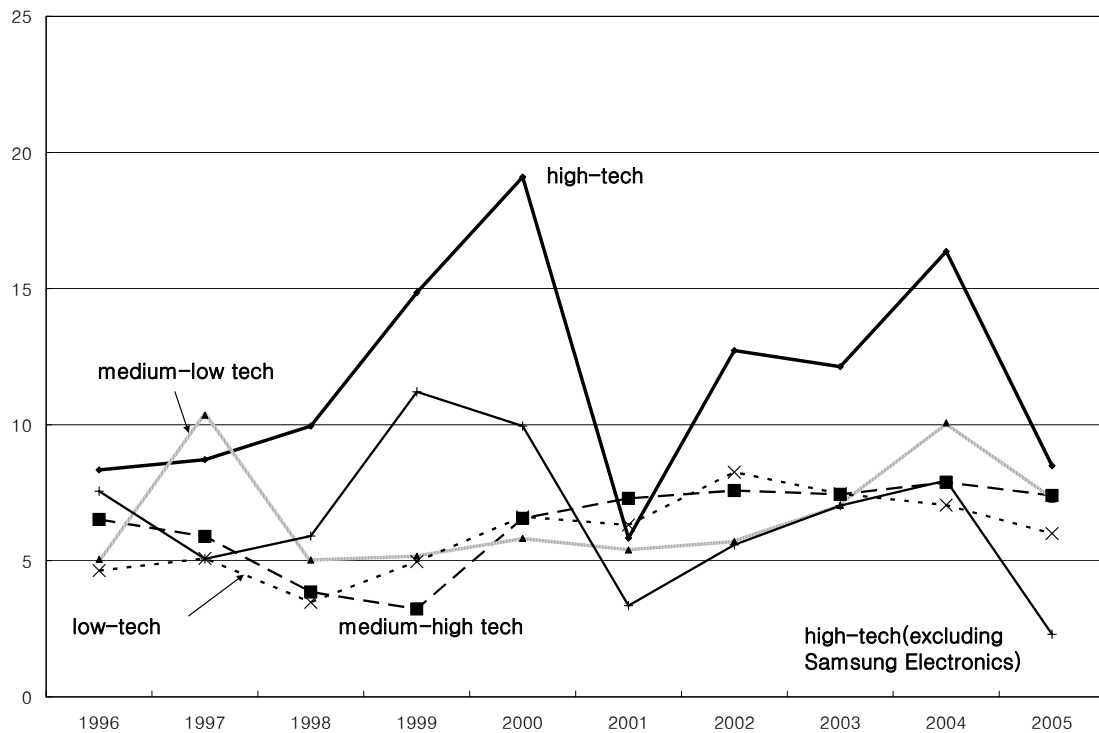
between price-competitive China and technologically advanced countries such as Japan. To see whether this in fact is the case we examine the profitability of firms in various industries: a generally declining or negative profitability of firms in labour-intensive, low-skill industries can be taken as a sign that those industries have received a negative impact from China's emergence, while a high profitability of firms in high-tech industries can be taken as a sign that Korea is making progress in acquiring a comparative advantage in new industries, thus avoiding a nutcracker situation.

Here we examine the profitability of 3,470 externally-audited firms, whose financial data are available for the past several years, by first classifying them into the four industry groups introduced earlier—low-technology, medium-low-technology, medium-high-technology, and high-technology industries. We further group them into large firms and small and medium-sized firms (SMEs) to see whether the two groups of firms have responded differently to the emergence of China.

In Figures 4 and 5 we report the operating profitability (the ratio of operating profits to total assets) of large firms and SMEs respectively, in the four industrial groups for four years between 1996 and 2005. We find that large firms exhibit volatility in profitability in the high-tech industries, which we may attribute to a rapidly changing external demand in the information and communication technology (ICT) sector. If we exclude Samsung Electronics from the sample of firms in the high-

tech industries, the large firms did not do so well as a group: in fact their profitability in 2005 was less than that for all other industries. This is a clear indication of the singularity of Samsung Electronics as a high performer in that industry group.

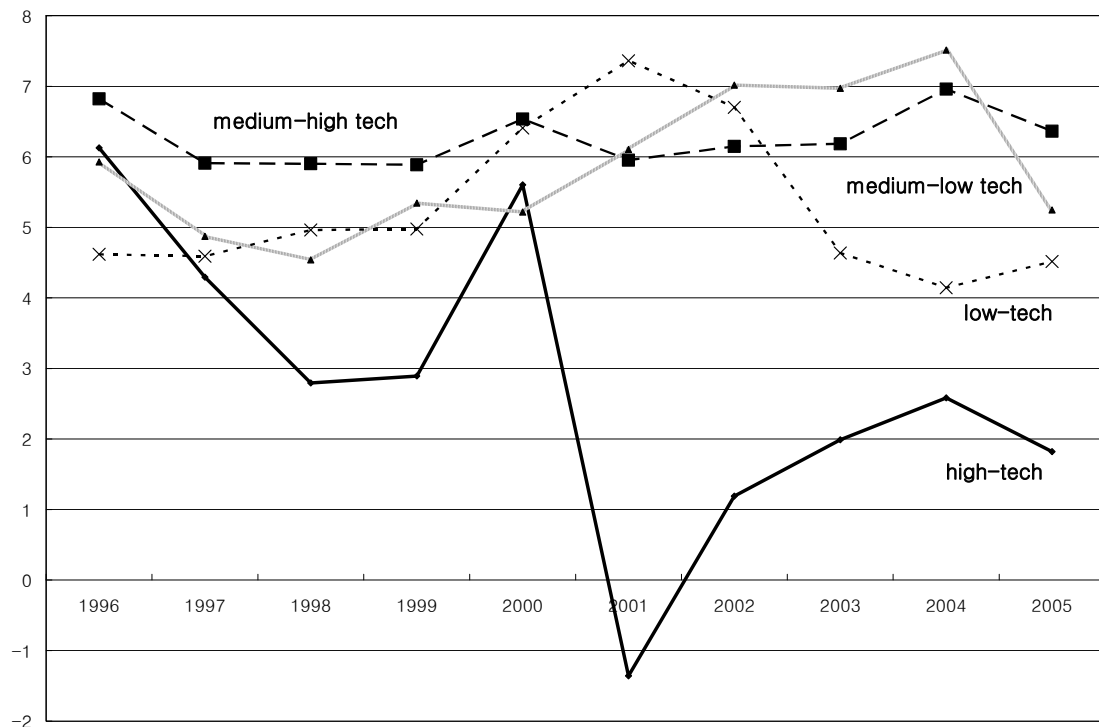
Figure 4 Operating profits/total assets by industry group: large firms (percent)



SMEs performed worse particularly in the high-technology industries, their profitability being much less than that of large firms. It fell sharply into a negative zone in 2001 largely as the consequence of a boom-bust cycle in the information technology (IT) industry. It then improved slightly but has remained low. The picture

for SMEs in the low-technology group is slightly better: their operating profitability increased, decreased but remained at 4.5 percent in 2005, a level slightly lower than in 1996.

Figure 5 Operating profits/total assets by industry group: SMEs (percent)



As a group, Korea's high-tech industry has done quite well in maintaining its profitability, although not so well, as noted above, if Samsung Electronics is excluded from the group. In comparison, the profitability of SMEs in general and especially of those in the high-tech group was less than that of the large firms in the same industry

group. To illustrate this point further we examine changes in the distribution of profitability over time.

Figures 6 through 10 show the distributions of operating profitability for total manufacturing and the four industry groups (and also by firm size) for four separate years in the period 1996-2005. We see that the mean for operating profitability for all manufacturing firms shifted to the left during that period, a sign of a decreasing average profitability for the entire group, while both tails of the distribution were extended, a sign of greater dispersion in profitability and an increasing differential in the competitiveness of firms. The left-side tail, in particular, extended more than the right-side tail—an indication that an increasing proportion of firms are earning negative operating profits and thus becoming vulnerable to bankruptcy. This pattern of change is more pronounced among SMEs than among large firms and, especially, among SMEs in the high- and medium-high- technology industries. (In fact, there seems to be no change among large firms in the medium-high-technology industries.) This seems to reflect a ‘polarization’ trend among Korean manufacturing firms in the high-tech industries, resulting partly from government policies promoting venture businesses in the IT industry, which encouraged the entry of a number of small venture businesses into the industry, and partly from the greater ability of large firms to become competitive in the high-tech industries. Clearly, some small firms in the high-

tech and medium-high-tech industries have done well in terms of profitability while many others seem to be failing. This is as to be expected in any new emerging industry and should be taken as a sign that Korea is successfully meeting the challenge of China and is not likely to be pushed into a nutcracker situation.

In the low-tech industries we find a clear downward shift in profitability for SMEs as well as for large firms. These are the industries in which Korea has been losing a comparative advantage, and the size of firm does not seem to make any difference in profitability when the firms are in declining industries.

Figure 6 Distribution of operating profitability for all manufacturing firms

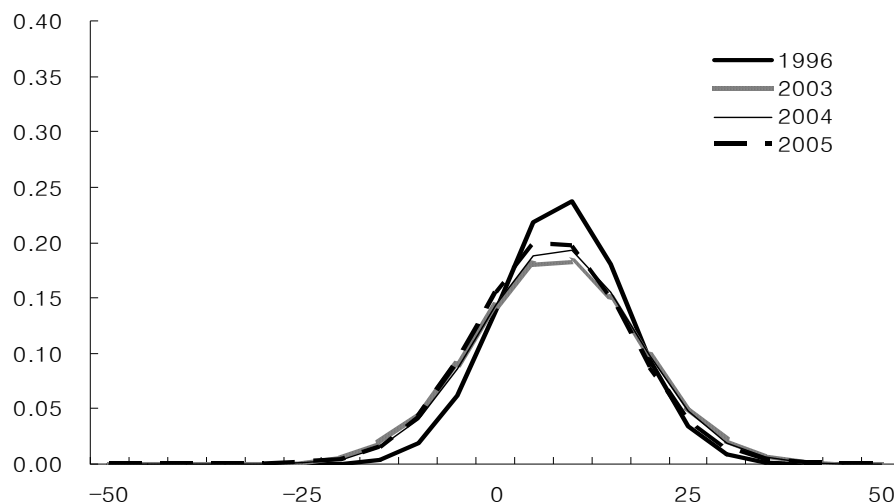


Figure 7 Distribution of operating profitability for high-tech industries

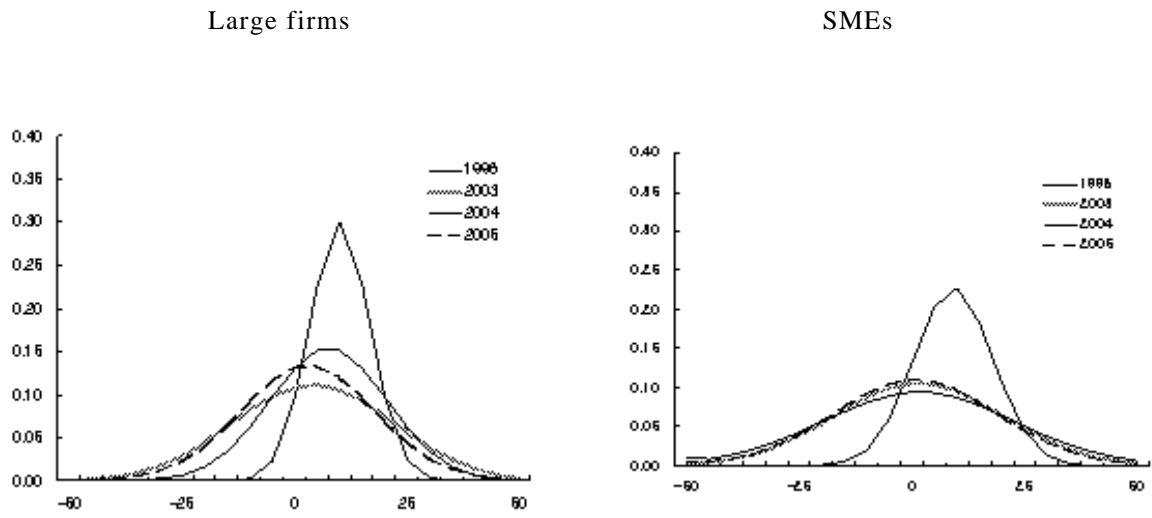


Figure 8 Distribution of operating profitability for medium-high tech industries

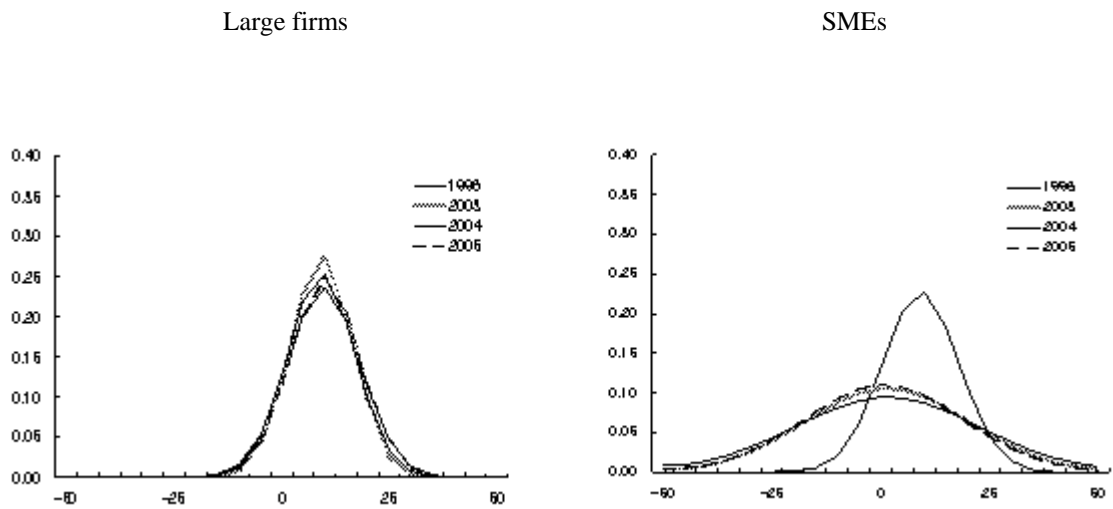


Figure 9 Distribution of operating profitability for medium-low tech industries

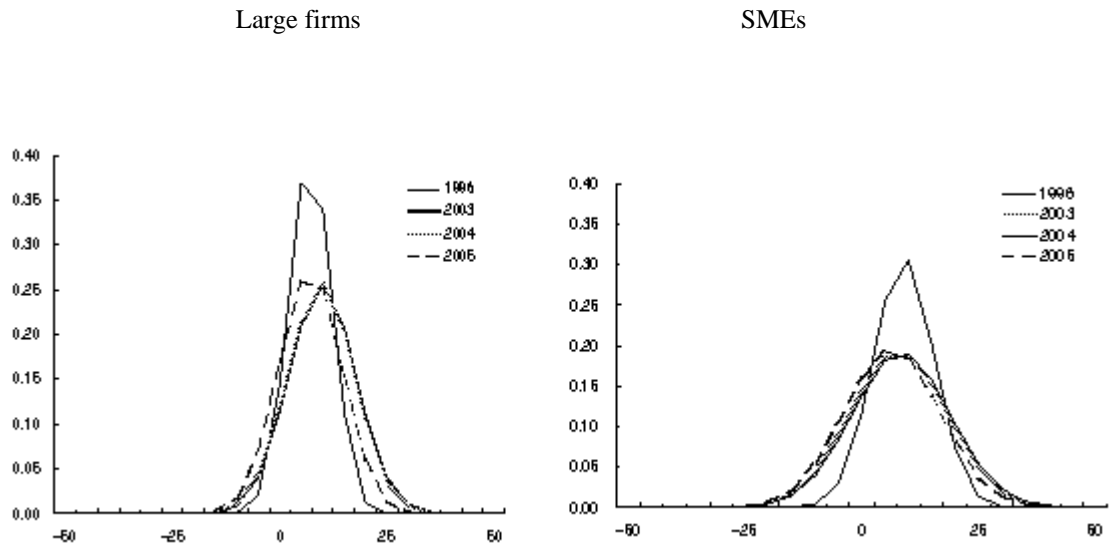
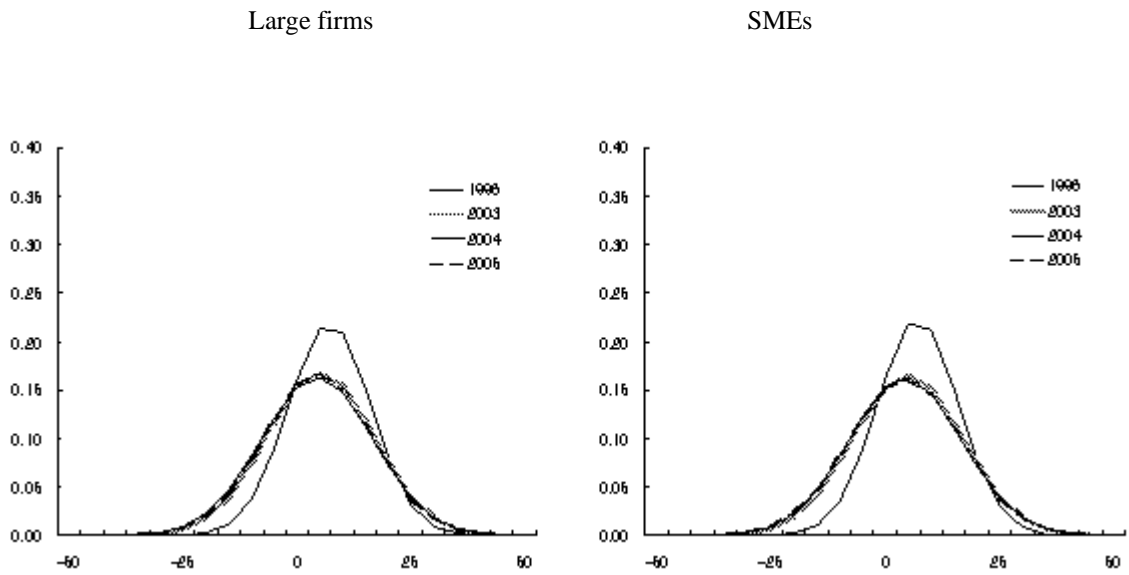


Figure 10 Distribution of operating profitability for low-tech industries



7 Concluding remarks

China's emergence clearly has had a significant impact on the Korean economy. It has become Korea's major competitor in world markets for manufacturing exports. At the same time, however, China has become Korea's major trade partner, importing many intermediate products from Korea for its own exports to the rest of the world and supplying Korea with inexpensive consumer goods. Furthermore, numerous production networks now span the two countries, bringing their economies closer together.

There is little doubt that China will continue to catch up with Korea, and how this catching-up will affect the Korean economy in the long run will depend on how Korea responds to this challenge. Korea will have to keep developing new areas of comparative advantage that will help it sustain economic growth and benefit from China's economic development.

In Korea, the government has selected a number of industries such as digital TV and next-generation mobile phones as the new industries that will lead the country's economic growth (Chun 2003). It is not clear, however, what specific measures the government can provide to promote those industries. Industrial policies such as those used to promote the heavy and chemical industries during the 1970s will be, we suspect, no longer appropriate for the Korean economy, which has become too big and too complex for such policies to be effective. Barring such policies, the government's role will be limited to improving the provision of public goods and

social infrastructure, especially to keeping the capital and labour markets flexible and efficient and to improving its human capital.

The history of world economic primacy shows that economies that once held the position of economic primacy subsequently declined for reasons that were generally unique to each case. In the instance of Venice, for example, which held a world commercial leadership in 1550 but declined to insignificance some years before 1700, the factors that led to its decline included competition from Portugal in spices, from Britain in woollens, and from the Netherlands and Britain in shipping; the rigid attitude of guilds and workers; and a levelling-off of productivity (Kindleberger 1996: 65). Spain and the Low Countries, whose economic growth followed that of Venice, also had a similar fate, but for reasons of their own. Although what brought about the fall from the position of world economic primacy differed from case to case, there appears to have been one factor common to all: in each of those cases rigidity eventually overtook the vitality and flexibility that it had once had (Kindleberger 1996: 36). What actually triggered the downfall of each may have been some uncontrollable external events, but it was the inability to adapt to and successfully deal with those external events that ultimately brought about the downfall. That is a lesson that China's neighbours must learn from the history of world economic primacy: if their economic growth ever falters it will be not because of rapid economic development in China,

which is beyond their control anyway, but because of the loss of vitality and flexibility in their economies. This does not mean, however, that China does not have the responsibility to help them facilitate structural changes by keeping its doors open for their exports.

In sum, China is a new major player in world markets, especially in East Asia, and is likely to continue to present a formidable challenge to Korea. It will at the same time offer Korea a myriad of economic opportunities both as a rapidly growing market and as a potential economic partner. Hence, the challenge for Korea is to respond to the 'Chinese threat' with flexibility and resilience by making the necessary domestic structural adjustments and enhancing competitiveness at home as it integrates into an increasingly borderless international economy.

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