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THE IMPACT OF CHINA'S ACCESSION TO WTO ON THE EXPORTS OF DEVELOPING COUNTRIES

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DISCUSSION PAPERS

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CONTENTS

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S.M. Shafaeddin

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Abstract

Using the "revealed competitive advantage indices" for exports and imports, the paper is devoted to the analyses of the vulnerability of selected developing countries if China's competitive position is improved due to its entry to WTO. In contrast to the existing literature which concentrates on labour-intensive products as a group, this paper considers products at a disaggregate level since products in the same group are not often homogeneous.

In labour-intensive manufactured goods, China competes mainly with South Asian countries and a few Latin American and African countries. But it also provides them with little demand complementary effects. Nevertheless, some Latin American and African countries may benefit from the expansion of China's imports of foods and agricultural raw materials. In the final market for capital goods China competes with Asian newly industrializing economies (NIEs) and Association of South-East Asian Nations (ASEAN) countries, and in a limited number of goods with Mexico and Costa Rica. For NIEs, unlike others such competition involves complementary effects, through the import of parts and components, which will over-offset the competition effects in the short- and medium-run. As China develops its capacity to produce components, however, the "competition " effect may dominate.*

China's export structure is similar to that of the Republic of Korea and Malaysia in the final market for a number of "finished" capital goods. By contrast, Thailand is vulnerable in clothing, miscellaneous household equipment and electric machinery. Indonesia has little to worry except for furniture. India concentrates mainly on undergarments, and China in outer garments. Bangladesh, Sri Lanka, Pakistan, Viet Nam and Nepal have similar export structure with China in some clothing items, but overall they, particularly Viet Nam have been aggressive in exportation of these products. Sri Lanka and Pakistan also compete with China in toys and sporting goods, but both have shown some strength in their exports.

Except Mexico, Costa Rica, Haiti and to some extent Uruguay, the export structure of the Latin American countries is mostly different from that of China. Mexico has a strong competitive position vis-à-vis China in a number of clothing items, but weaker in a few assembly operation. Costa Rica's competitive advantage has noticeably improved for a number of clothing items and a few assembly operations. Haiti competes with China in 8 products, mostly clothing. It has a strong competitive position in footwear, one clothing item and some base metal. Uruguay's relative competitive position is weak in a number of labour-intensive products. The export structure of African countries is different from that of China, except for Egypt, Morocco, Tunisia and Malawi. These countries have improved their competitive position in their clothing.

China's entry into the WTO will not change, for some time, its market access for textiles and clothing for it to be a threat to other developing countries. In fact, China's growth in quota for exports to developed countries will increase far less than other developing countries. Nevertheless, if China attempts devaluation the situation could change radically. China's devaluation is however unlikely. Over a longer-term, much depends on what policy China will pursue in its trade and industrialization. China's attempt in increasing domestic value added in exports could lead to improvement in its competitiveness in technology/skill intensive products of interest to NIEs and the ASEAN.

** South Asian countries in this paper include India, Pakistan, Bangladesh, Sri Lanka and Nepal.*

I. INTRODUCTION

The purpose of this paper is to examine the possible impact, on developing countries, of China's accession to WTO by looking into main export items of individual countries at 3-digit level. The aim is not to prove any theory, but to clarify the issue as literature on the subject suffers from some shortcomings by exaggerating the competitive effects of China's accession.

China has joined WTO. It is a large and growing exporter of labour-intensive products. Serious concerns have been raised among developing countries, particularly those heavily dependent on those products in their export structure, about its increased competitive threat in the international market. The literature so far has taken two different approaches in dealing with this issue and has reached similar conclusions. One approach is the application of General Equilibrium Models, mainly through Global Trade Analysis Project (GTAP), to simulate the impact of the Chinese accession on developing countries. In this approach various countries are lumped together in different groups, so are different products such as those that are labour intensive and capital intensive. Although their quantitative results vary, a common conclusion of these studies is that China will obtain considerable market shares at the cost of other developing countries, particularly low-income countries in South Asia (Gilbert and Wahl (2000) for a summary). Similar conclusions have been reached by those who have studied the impact of China's bilateral agreement with the United States (e.g. Noland (1998), Hufbauer and Rosen (2000), USITC (1999) and Naughton (1998)). In some cases the figures obtained from the simulations are colossal. For example, the result of a simulation on the impact of changes in Chinese tariff rates – let alone other liberalization measures – undertaken by the World Bank staff shows that the share of China in the world exports of clothing will reach over 47 per cent in 2005 as a result of the accession as against 18.5 without accession (Ianchovichina and Martin (2001), table 6).

The second approach applied is to compare the industrial and technological capability of China at the general level. For example, it has been concluded that:

> "…China *will* be a major competitive threat to developing countries as liberalization proceeds and it gains access to world markets. The threat will be most immediate and intense in labour-intensive products and processes, but it is broader and is likely to quickly affect the entire technological spectrum" (Lall, 2001, p. 26).

Some of the shortcomings of the first approach has been intensively discussed elsewhere (UNCTAD, *Trade and Development Report, 2002*). We refer here to two main methodological problems and unrealistic assumptions of the models used. One is the lack of consideration of realities of the terms and conditions of the protocol of accession and exaggeration of improvement in Chinese access to market, especially for labour intensive products. The particular case of textiles and clothing which are the main export items of China as well as that of the majority of other developing countries is the outstanding example. There is also an exaggeration on the supply side; that is, the unrealistic

assumption that the removal of tariff barriers will shift the structure of production in favour of exports due to the resulting change in the incentive structure, instantaneously or rapidly. Thus as China has comparative advantage in labour-intensive products, it would flood the international market for these products. This literature overlooks the fact that even if market access were not a problem, shift of resources from one industry/sector to another, and development of capacity in a new one(s), often take a long time after such decision is made by investors. The gestation period of investment is long because the skill requirements of industries vary, and training, product development and improvement of marketing capabilities take time.

Moreover, a common problem of both approaches is that implicitly they regard labour-intensive products, or each category of products, as homogeneous and do not consider individual export items of specific countries. In reality each category of goods involves different, or differentiated, products. For example, all clothing items are regarded as one product in the related literature. Setting aside the question of quality and brand, there exists various types of clothing: outwear, underwear, men's clothing, women's clothing, knitted, woven, cotton, wool, silk or synthetics items. Countries may specialize in different items, and/or in different qualities or brands of the same item.

A. The theme and the analytical framework

The data available does not allow research on different items, or differentiated products of each item in detail. Nevertheless, as a first step we will go beyond product categories at general levels and look into product exports of China and its specific developing country competitors at 3-digit levels. In doing so, we will argue that except for a few products of a few countries, the competitive threat of China in the market for traditional labour-intensive products is exaggerated at least in the short- and medium-term, not only because accession provided little additional market access to China (UNCTAD 2002), but also because the structure of labour-intensive products of China and other developing countries are not always the same and many countries have been able to compete with China successfully. Moreover, at least in the case of more advanced developing countries, notably NIEs and ASEAN, the competitive effect of China's expanding trade is accompanied by important complementary effects in favour of these countries. Competition of China's export with developing countries exports and domestic production could be referred to as "competitive" effect and the prospect for expansion of China's imports from developing countries as "demand complementarity effects" – or to abbreviate, complementarity effect. In the longer-run, China's structure of exports will most probably be changing towards more technology- and skill- intensive products as it continues to deepen its industrialization, thereby reducing its reliance on labour intensive products for exports.

To the extent that the accession has a positive impact on the expansion of China’s exports, it would also involve competition in the world export market as well as in the internal markets of importing countries. The accession also provides trade opportunities for other countries through expansion of China’s imports. These influences will be further strengthened if the Government of China intensifies its export drive policies. The more advanced developing countries, mainly in Asia,

will benefit mostly from complementarity effects of China's accession. In the case of less advance countries, whose pattern of exports is more similar to China, the "competition effects" will prevail.

China's exports compete with those of other developing countries, mainly Asian countries, in the third markets as well as in the own market of developing countries. Such competition possibilities in the international market depend, *inter alia*, on sources of competitiveness of China, its ability to gain market shares, similarities of its export structure with the export structure of its competitors and its trade links, i.e. its already established markets. China's export competition in the domestic market of developing countries would depend, *inter alia*, on similarities between the structure of China's exports and the structure of these countries' imports and their trade links. Whether or not developing countries would benefit from the expansion of China's import is related, among others, to the similarities of China's import structure with their export structure as well as their trade links. The established trade links are important, because they are indications of the existence of trading channels that facilitate further expansion of trade when relative prices are changed. Otherwise, establishing new links takes time. These issues will be taken-up in more detail in the following sections after having considered low wages as the main source of China's competitive advantage.

II. CHINA'S LABOUR COST ADVANTAGES

Low wages are the main source of China's comparative advantages. Unfortunately, comprehensive data at the sectoral level is not available for labour costs. Some data are, however, available for the manufacturing sector (table 1), and textiles and clothing (table 2). In table 1 average wages for China's manufacturing sector as a whole is much lower than those for all other countries. The relative position of China deteriorates considerably when one uses unit labour cost as an indicator. In other words, differences in productivity performance have adverse effects on relative unit labour cost of China for the manufacturing sector as a whole, which includes many inefficient State-owned enterprises. Notwithstanding productivity differences, China still shows lower labour unit costs than the majority of its competitors in developing countries.

Table 2 compares hourly labour costs in textiles and clothing of China with a number of developed and developing countries. Both textiles and clothing in developed countries are more skill intensive than in China and other developing countries. Textile industry is more capital intensive in developed countries, thus requiring more skills. In the case of clothing, quality and design is different in developed countries and require more skill and know-how. Therefore, the figure on wages and labour costs are not comparable as the quality of labour is different in the two groups. China and the developing countries produce and export mostly standard products. Thus, they use more or less similar skills in the production process. The table indicates that China has an advantage over most countries, but it is no longer a low-wage economy as compared with India, Bangladesh and Indonesia – in the latter case mainly due to devaluation after the Asian crisis. Nevertheless, the non-coastal areas of China show lower wages than in the coastal areas where export activities are presently located (Sachs and Woo (2000), p. 41).

Table 1
Ratio of wages and unit labour cost of selected countries to China for the manufacturing, 1998 [a]

Countries	*Wages*	*Unit labour Cost*	*Countries*	*Wages*	*Unit labour cost*
India	1.49	1.39	Mexico	7.78	0.72
Zimbabwe	2.19	1.23	Chile	12.51	0.81
Indonesia (1996)	2.21	0.87	Taiwan Prov.of China (1997)	20.61	2.26
Kenya	2.62	2.01	Republic of Korea	12.85	0.81
Egypt	2.76	1.48	Singapore	23.42	1.30
Bolivia	3.74	0.63	Japan	29.90	1.22
Philippines (1997)	4.14	0.72	Sweden	35.55	1.81
Malaysia	5.17	1.09	United States	47.80	1.34
Turkey	7.54	0.85			

Source: Based on UNIDO's *Industrial Statistic Database*, and *China's Statistical Yearbook.*
a Wages and unit labour costs include social changes and fringes. For calculation of unit labour cost, wages were divided by value added

Table 2
Ratio of hourly labour cost of selected countries to China in textiles and clothing industry, 1998

Textiles		*Clothing*	
Country	*Ratio*	*Country*	*Ratio*
Italy	25.50	United States	23.10
United States	20.92	Hong Kong (China)	12.10
Taiwan Province of China	9.44	Republic of Korea	6.26
Hong Kong (China)	9.11	Costa Rica	12.21
Republic of Korea	5.89	Guatemala	2.98
Turkey	4.00	Mexico	3.51
India	0.97	India	0.91
		Indonesia	0.37
		Bangladesh	0.70
China (US dollars)	0.62		0.43

Source: Based on USITC (1999), tables 8-2 and 8-4 which are in turn based on Werner International Management Consultants, "Hourly Labour Costs in Textiles Industry", 1998, New York and "Hourly Labour Costs in the Apparel Industry", 1998, New York.

Table 3
Indicators of the main export products of China
(Average 1997-98)

Factor intensity [a]	*SITC*	*Items*	*Country share (Per cent)*	*Share in world exports (Per cent)*	*R*	C_R
L	894	Toys, sporting goods	4.49	24.49	7.00	1.10
L	851	Footwear	4.42	22.97	6.56	1.01
L	845	Outer garments knit nonelastic	3.65	16.69	4.77	1.13
L	843	Women's outwear non-knit	3.60	16.12	4.61	0.71
KT	752	Autom. data processing equipment	3.39	3.87	1.11	5.17
L	842	Men's outwear non-knit	3.26	19.02	5.43	0.80
KT	764	Telecom equip, parts, accessories	3.24	4.32	1.23	1.39
L	846	Under garments knitted	2.68	17.25	4.93	1.13
L	893	Articles of plastic nes	2.06	6.97	1.99	1.33
L	831	Travel goods, handbags	1.80	31.03	8.86	1.03
KT	778	Electrical machinery nes	1.79	4.20	1.20	1.44
L	848	Headgear, non-textile clothing	1.70	26.38	7.53	1.12
KT	759	Office, adp machy. parts, accessories	1.64	2.82	0.81	1.75
L	899	Other manufactured goods	1.60	16.37	4.68	0.93
KT	775	Household type equip nes	1.58	8.83	2.52	1.31
L	652	Cotton fabrics, woven	1.58	12.28	4.08	0.73
KT	762	Radio-broadcast receivers	1.49	18.94	5.41	1.17
L	658	Textile articles nes	1.45	18.59	5.31	0.74
L	821	Furniture and parts thereof	1.45	5.03	1.44	1.27
L	653	Woven man-made fib. fabric	1.39	8.46	2.42	1.13
KT	771	Electric power machinery nes	1.24	8.57	2.45	1.46
L	844	Under garments non-knit	1.24	16.97	4.85	0.63
L	651	Textile yarn	1.21	6.50	1.86	0.86
KT	776	Transistors, valves	1.18	1.14	0.33	1.95
RB	333	Crude petroleum	1.16	1.02	0.29	0.48
KT	772	Switch gear, parts nes	1.15	2.91	0.83	1.36
RB	699	Base metal man. nes	1.04	4.40	1.26	1.06
KT	885	Watches and clocks	1.02	12.00	3.43	0.92
Total above			***59.7***			
of which:	L		(37.6)			
	KT		(17.7)			
	RB		(2.2)			
Total value of exports ($ billions)			**183.300**			

Source: Calculations based on United Nations Department of Economic and Social Affairs (UN/DESA), *Commodity Trade Statistics* database.

Notes: Products included are those at 3-digit level with a minimum of 1 per cent share in total exports of China. The classification is based on UNCTAD, *TDR 1996* except for SITC 699 which is included in resource base here.

[a] L stands for labour intensive; KT for capital and technology intensive; RB for natural resource base; R for revealed comparative advantage; and C_R for the ratio of R for 1997-98 to the R for 1992-93.

III. CHINA'S CHANGING COMPETITIVE ADVANTAGE AT PRODUCT LEVEL

A. Market share in export items

It is not easy to measure all the sources of competitive advantage of a country because, in addition to wage cost, a number of price and non-price factors are at work. Nevertheless, one can measure the performance of a country in gaining market share in the international trade of various products. Different measures can be used each with its advantages and shortcomings. The measure used here is the indicator of revealed competitive advantage[1] (R) for a product and its changes over a period (C_R).

$$R = \frac{Kij}{Xj} : \frac{Xwi}{Xw}$$

Where i, j, w, x stand for product, country, world and exports, respectively. R is the ratio of the market share of China in an item, to market share of China in total world exports. R greater than 1 implies that the country has competitive advantage in that product. C_R, i.e. change in R over a period (the ratio of R for a period divided by R for a previous period) indicates whether the country is gaining more competitive advantage (when C_R is greater than unity) or losing competitive advantage (when it is less than unity).

The advantage of these indicators is that they show whether a country has managed to gain and improve its market share in a product in the international market. Its main shortcoming is that it does not reveal whether a country also has advantage in its production, or only in assembly operation as the data on export show output rather than value added. Unfortunately data on value added is not available. Hence, to overcome this problem to some extent, the indicator will also be applied to imports. The application of the revealed competitive advantage (RCA) indicators to imports distinguishes competitive advantages in assembly operation from advantage in production even though it does not measure the extent of value added.[2]

Table 3 provides data on R and C_R for major products of China whose exports exceed 1 percentage point of the country's total exports. These products are grouped into three categories: labour intensive, capital/technology intensive and natural based. The table indicates clearly that the country has competitive advantage mainly in labour-intensive products. The first four products shown in the table account for over 16 per cent of China's exports in 1997/98 and for all those

[1] This indicator is referred to in the literature as "revealed comparative advantage". Nevertheless, as other factors than cost influence the market share, we preferred to use the term "competitive" instead of comparative.

[2] Another indicator used in the literature is the indicator of contribution of a product to balance of payment (Lafay, 1987). This index is, however, deficient for the purpose here. It is an indicator of specialization of a country, but it does not show its relative position *vis-à-vis* other countries. Moreover, it does not allow for specialization and trade in differentiated products.

products R is greater than 4.6. Moreover, for all 16 labour-intensive products whose share exceeds 1 per cent of exports of China, R is greater than one and in some cases R is extremely high. In addition, 10 capital-/technology-intensive products (based mostly on labour-intensive assembly operation) also accounted for nearly 18 per cent of exports of China in 1997/98. For some of these products R is noticeably high. For three products (office machinery, switch gear and transistors) China does not show revealed competitive advantage as yet; in another case (data processing equipment) R is not particularly high. Nevertheless, even for these products it is gaining market share rapidly; C_R, is well above one for all these products. Overall, the gain in market share in capital-technology-intensive goods is impressive. C_R for 10 products concerned is on average 1.89 as against 0.89 for the rest, i.e. 18 labour-intensive and natural-based products included in table 3. Moreover, China has gained market shares in a number of other capital goods, whose export value exceeded $1 billion, and their share in world exports ranges between 4 to 10 per cent although its share in China's export is under 1 per cent. They include for example, ship and boats, rotating electric plants, trailers and non-motor vehicles, sound recorders, office machines, and cements (Annex table 1).

By contrast, a number of labour-intensive light manufactured products have shown a loss in market share. In the case of textiles, except for woven man-made fabrics (C_R=1.13), China has been losing market share in all other textiles products (five items). This is partly because the processing of textiles into clothing has been expanding. Nevertheless, it is also interesting to note that in the case of clothing also China has lost market share in 3 (women's and men's non-knit outwear and non-knit undergarment) out of the 8 items at SITC 3 level (table 3).[3]

B. Assembly operation and potential for production and exports of parts and components

As mentioned above some of the items grouped under capital/technology intensive groups are mainly assembly plants involving final stages of the production process, which are labour intensive. A new pattern of specialization is emerging among the ASEAN, first-tier NIEs, Japan and China. China and other low-wage countries have advantage in the assembly of parts and components. By contrast, more advanced countries of the region – Japan, Taiwan Province of China, Singapore, the Republic of Korea – have more advantage in the production and exports of components. Yet China competes with others in the international market for final products of these items. In their production, however, the country relies mainly on imports of components, notably Japan, the ASEAN and first-tier NIEs, partly through product sharing, thus providing "complementary effects" with those countries. It would therefore be interesting to investigate to what extent China is specializing in the final stage of production, and/or trade in parts and components of these products.

[3] Other clothing items include knitted non-elastic outwear, knitted garments, travel goods, headgear and, miscellaneous textile clothing.

When the RCA indicator is applied to imports of components of a product, it will reveal whether or not a country has a competitive advantage in assembly operation (Ng and Yeats, 1999). The formula used, is:

$$RCA_{ij} = [M_{ij} / Mj] \div [M_{wj} / Mw]$$

where i, j, w and M stand for, product, country, world and imports, respectively. The same formula can also be applied to finished products. RCA greater than unity for a component implies competitive advantage in assembly operation. RCA greater than unity for a finished product implies that the country has disadvantage in production of those products. An increase in RCA between two periods for components implies that China has gained further advantage in assembly operation and vice-versa. By contrast, an increase in RCA for finished products implies intensification of disadvantage in production of that product.

Table 4 provides the share of the most important import items of China in total imports of the country and world and the necessary data on RCA for 1997-98 and C_R, the ratio of RCA for 1997-98 to RCA for 1992-93, for each item. The items included cover all products whose share in total imports of China was around 1 per cent or greater in 1997-98; these items account for nearly 63 per cent of imports of China. Some "finished" items also include imports of parts thus suffering from double counting. Nevertheless, as the total number of finished items is small, the table provides some indication for the purpose of this section. It indicates first of all that except for a few items, intermediate products and components constitute the bulk of the items shown in the table. In fact, the first seven items, with the exclusion of "other machinery" and petroleum, which constitute nearly 27 per cent of China's imports are all intermediate products. Secondly, as expected, most items figure among capital goods (SITC 7). Thirdly, in 1997-98 China had competitive advantage in assembly operation in all items of components and parts shown in the table. Further, for five items (telecommunication equipment and parts, rotating electric parts, non-electric accessories of machinery, heating and cooling equipment and parts), China has reduced its advantage in assembly operation over 1992/93-1997/98. In other words, it has improved on its advantage in production of those components. Although these items still figure among its main imports, China is improving its production capabilities. Fourthly, for other components and intermediate products China's advantage has in fact intensified between 1992-93 and 1997-98. Finally, for some finished products (miscellaneous electric machinery, measuring, checking instruments), their share in imports have declined over 1992/93-1997/98, so did their RCA indicator, indicating that the country's disadvantage in production has declined.

These results are consistent with those of an earlier study for the period 1985-96, which provide evidence on, China's improved capacity in production, and exports of components. In 1985 the country had competitive advantage in 6.7 per cent (out of 60 components); this ratio reached 8.3 per cent in 1996 (Ng and Yeats, tables 1 and A.1). The same study concluded that in 1996 China's capability in production and exports components was greater than a number of ASEAN and NIEs namely Thailand, Indonesia, Hong Kong (China) and Malaysia.

Table 4
Indicators of the main product imports of China at 3-digit level average, 1997-1998

	SITC	Products	Percentage share in: Imports of China	Percentage share in: World import of the product	R	C_R
1	583	Polymerization and copelymerization	5.47	9.84	3.83	1.31
2	776	Thermionic valves, tubes and parts	5.16	3.45	1.34	1.56
3	764	Telecommunication equip. and parts	4.72	4.68	1.82	0.82
4	728	Other mach. and equip.for part. ind.	3.57	7.83	3.05	0.69
5	333	Petroleum	3.09	2.00	0.78	1.77
6	653	Fabrics, woven, of man-made fibers	3.87	11.96	4.66	1.20
7	674	Univ. plates and sheets of iron or steel	2.57	6.76	2.63	2.26
8	759	Parts and accessories for 751 and 752	2.56	3.12	1.22	2.30
9	792	Aircrafts and assoc. equipment and parts	2.27	3.84	1.49	1.07
10	334	Petroleum products	2.20	3.23	1.26	1.17
11	641	Paper and paper board	2.17	4.17	1.63	1.66
12	651	Textiles yarn	2.06	7.92	3.09	1.12
13	772	Fuses and plugs	2.03	3.80	1.48	1.59
14	562	Fertilizers, manufactured	1.92	14.79	5.76	0.90
15	778	Electrical mach. and apparatus, nes	1.85	3.19	1.24	1.33
16	611	Leather	1.43	13.96	5.44	1.09
17	736	Mach.-tools for working metal and parts	1.30	6.03	2.35	0.77
18	724	Textiles and leather mach. and parts	1.30	8.00	3.12	0.48
19	874	Measuring, checking, analyzing inst.	1.29	2.83	1.10	0.98
20	686	Copper	1.26	5.74	2.24	0.90
21	716	Rotating electric parts	1.15	5.59	2.18	0.90
22	652	Cotton fabrics, woven	1.13	7.72	3.01	1.58
23	81	Unmilled cereals	1.13	6.45	2.51	3.20
24	749	Non-electric accessories of machinery	1.09	2.39	0.93	0.97
25	281	Iron ore and concentrates	1.09	11.88	4.63	1.40
26	582	Polyadalition products	1.07	4.92	1.92	1.66
27	752	Automatic data processing machines	1.05	0.83	0.33	1.27
28	744	Mechanical handling equip. and parts	1.04	3.99	1.55	1.23
29	741	Heating and cooling equip. and parts	0.96	3.20	1.25	0.80
30	657	Special text. fabrics and rel. products	0.95	7.42	2.89	0.86
		Total shares for above items	**62.75**			
		of which:				
		SITC(7)	(30.05)			
		SITC(6+8)	16.73			
		SITC(5)	(8.46)			

Source: Calculations based on UN/DESA, *Commodity Trade Statistics* database**.**
Note: For notations see table 3.

In short, while China continues to have strong competitive advantage in the assembly stage of technology/capital-intensive products, and processing trade for a number of products, China improves as well its capacity in production of components.

Further, China has a great potential to deepen its degree of industrialization and to increase the value added in its exports by expanding production of components. In particular, the country's reserve and flow of educated labour force that are essential for growth in the supply of skilled labour is immense as compared with other countries of the region. The latest data available for the mid-1990s indicate that the number of university graduates in China exceeded a million, as compared to about 380,000 for Indonesia and the Republic of Korea. Moreover, engineers and scientists accounted for 35 per cent of the graduates in China, as compared to the average of 24 per cent for Indonesia, Pakistan, the Philippines and Thailand, and 48 per cent for Singapore and the Republic of Korea. Similarly, the number of technicians per million habitants is 200, although less than that of the Republic of Korea (318) and Singapore (301), but far greater than India (108), Malaysia (32) and Thailand (30).[4]

China's potential in production of skilled intensive products is therefore far greater than second-tier Asian NIEs. Nevertheless, in the near term China still has to rely mostly on imported components for expansion of assembly operations.

IV. COMPETITION AND COMPLEMENTARITY EFFECTS OF THE ACCESSION

The preceding analysis on the competitive strength of China indicates that developing countries relying on production and exports of labour-intensive products, and assembly operations will be subjected more to the "competition" effects of China's access than to its "complementarities effects". The situation of more industrialized developing countries, particularly in Asia, will be the opposite. China competes mainly with developing countries in the third market, i.e. in developed countries. More advanced developing countries will benefit from China's import liberalization not only through expansion of its imports of final products, but also from expansion of imports of parts and components as inputs to exports of finished capital- and technology-intensive goods.

A. Competition in the main third markets: developed economies

Table 5 provides information on the main markets for China's exports of manufactured goods and the list of main exporting developing country groups for various export categories. Accordingly, China has similar export structure, in terms of share of light manufactured goods (SITC 6+8-68) in total export, mainly with South Asian countries, Hong Kong (China) and Macao (China) and to some extent with Taiwan Province of China, Indonesia, and Thailand in the ASEAN group. Light manufactured goods account for the bulk of exports of these countries. The share of machinery and equipment (SITC 7) in the export structure of China (30 per cent) is not as high as those of NIEs

[4] Figures are based on UNESCO, *Statistical Yearbook*, 1999.

(60 per cent), Taiwan Province of China (56 per cent) and most ASEAN countries (e.g. 62 per cent for Malaysia, 42 per cent for Thailand, but 11 per cent for Indonesia). China may, however, be a serious competitor in the final product of these items because of its large export volume, high growth rates in exports and China's significant gains in world market share in these products. The Government in fact intends to increase the share of technology/skill-intensive products in its export structure. According to the new Five Year Plan, between 1999 and 2005 the share of electrical and electronic products/machinery and hi-tech products in total exports of China is planned to rise to 50 per cent and 20 per cent, respectively. [5]

Table 5
The main markets in developed countries for China's principal exports of manufactured goods and main developing country group exporters, 1999

	*Main market for China's exports **			
Export items	*United States*	*Japan*	*EU*	*Main competing countries* [a]
All manufactured goods	1	3	2	CG, NIEs, ASEAN, SA, AF, LA
Chemicals (SITC5)	2	3	1	NIEs, CG, ASEAN, LA, SA, AF
Light manufacturers (SITC 6+8)	1	2	3	SA, CD, ASEAN, AF
Machinery and equipment (SITC 7)	1	2	3	NIEs, ASEAN, CG, SA, AF
Main items: [b]				
Clothing	2[c]	1	3	
Textiles and textile fibers	3[c]	1	2	
SITC 75, 76, 77 [d]	1	3	2	
Toys and articles of plastic	1	2	3	
Leather and leather products	1	3	2	
Travel/goods	1	3	2	
Heat/cool and mechanic mach.	1	3	2	
Power generating machines	3	1	2	

Source: UN/DESA, *Commodity Trade Statistics* database.

***** The numbers indicate the order of importance of the destination of China's exports.

a CG = China group including Hong Kong (China), Taiwan Province of China, Macao (China). NIEs = Singapore and the Republic of Korea. SA=South Asia including India, Pakistan, Bangladesh, Sri Lanka, Nepal. LA = Latin America. AF = Africa. Areas are reported in the order of similarities in their export structure with China.

b In order of importance in China's exports.

c Does not include re-exports through Hong Kong (China).

d Office machinery, television and telecom equipment, and electric power machinery, respectively.

In short, while China continues to have strong competitive advantage in the assembly stage of technology/capital-intensive products, and processing trade for a number of products, China improves as well its capacity in production of components.

[5] Mr. Shi Guangsheng, Minister of Foreign Trade and Economic Cooperation of China, quoted in Sit, *China.com*, 21.3.2001.

Further, China has a great potential to deepen its degree of industrialization and to increase the value added in its exports by expanding production of components. In particular, the country's reserve and flow of educated labour force that are essential for growth in the supply of skilled labour is immense as compared with other countries of the region. The latest data available for the mid-1990s indicate that the number of university graduates in China exceeded a million, as compared to about 380,000 for Indonesia and the Republic of Korea. Moreover, engineers and scientists accounted for 35 per cent of the graduates in China, as compared to the average of 24 per cent for Indonesia, Pakistan, the Philippines and Thailand, and 48 per cent for Singapore and the Republic of Korea. Similarly, the number of technicians per million habitants is 200, although less than the Republic of Korea (318) and Singapore (301), but far greater than India (108), Malaysia (32) and Thailand (30).[6]

In comparison to Asian NIEs and ASEAN, African countries concentrate mostly in exports of primary commodities. Except for countries in North Africa, and to some extent Zimbabwe, Kenya and the United Republic of Tanzania, the share of manufactured goods in their total exports is not considerable; it does not exceed 11.4 per cent for sub-Saharan countries as a whole. Nevertheless, labour-intensive products (light-manufactured goods, mainly textiles and clothing) account for the bulk of their manufacturing exports. Hence, China can be their important competitor in these products, particularly in Europe that receive about two-thirds of exports of textiles and clothing from Africa (UNCTAD (2001) table A.11).

The situation for Latin America lies between the Asian countries as previously analyzed, and Africa. Except for Mexico, the share of manufactured goods in the exports of Latin American countries, mainly light products is not as high as those for most Asian countries. Nevertheless, their exports go mainly to the United States that is also a main market for China.

Except for chemicals for which the European Union is the main market for Chinese exports, China has a closer link with the United States, particularly for capital goods, but not for power-generating machines. The European Union takes second place for most products, except for clothing and toys. It is therefore more likely that in the future China will also compete, with Asian NIEs and the ASEAN for the export, particularly to Japan, of final products for power-generating machinery; and to the United States and European Union for other capital goods. Similarly, China is in competition with Mexico and Brazil in the market for final products for SITC 7 group mainly in the United States, which is also the main market for these countries.

For light manufactured goods the US market is again the main destination for Chinese exports, particularly for leather and leather products, toys, articles of plastic. Japan and the European Union take second and third place respectively for most products, except for travel goods, articles of plastics, toys and sporting goods, for which the European Union is the main market.

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[6] Figures are based on UNESCO, *Statistical Yearbook*, 1999.

The position of the United States as a market for exports of textile and clothing is underestimated because of China's exports of these products to the United States through Hong Kong (China) and other third-country territories. According to UN statistics the United States has received about 22 per cent of China's exports in 1999. It is believed, however, that a considerable amount of textiles and clothing are in addition exported through third parties such as Hong Kong (China), Macao (China), Kenya. (USITC, chap. 8). For example, the US Government had estimated that in 1996 US imports from China amounted to $51.5 billion, while Chinese statistics reported $26.7 billion (Naughton (1998), table 5.1). Noland (1998) estimated that $10 billion worth of exports of textiles and clothing from China to the United States was channeled through third countries. For these products therefore the United States is also the main market for China where the country is likely to compete mainly with South Asia and Latin America. Nevertheless, Asian NIEs and ASEAN may also lose to China in these products, as well as in other light manufactured goods.

On balance, South Asia, Africa and Latin America may suffer from the competition effect of China's accession in the third market.

B. Competition in domestic markets of developing countries

China also may eventually intensify competition with developing countries in their domestic markets. Nevertheless, the "safeguard measure" and restrictions that are included in the protocol of accession limit China's ability to penetrate developing countries' market for some time (UNCTAD, *TDR* 2002, chap. IV). China has now a more established trade and links with Asian countries, mostly NIEs and the ASEAN than the Latin American and African countries. Other than Hong Kong (China) and West Asia, less than 10 per cent of exports of light manufactured products of China (mainly textiles and textile fibers, travel goods, clothing and leather products) go to Asian developing countries. Light manufactured goods, mostly textiles and clothing, and capital goods each account for around 35 per cent of export of China to selected Asian countries.[7] To the extent that China's market access to these countries is improved due to the accession, competition in the domestic market of these countries will be facilitated.

Little of China's light manufactured products (2.1 per cent), except for textiles (4.2 per cent) and leather and leather products (2.4 per cent), go to Africa. A somewhat similar pattern is observed in the case of Latin America where clothing and travel goods are also among important items of exports of China to these countries.

Therefore, on balance, one would not notice a significant competitive advantage for China in the domestic markets of developing countries – at least during the early years after accession.

[7] United Nations Department of Economic and Social Affairs (UN/DESA), *Commodity Trade Statistics* database.

Table 6
The main origin of China's imports, 1999
(Percentage)

Categories	SITC	Share in China's total imports							
		United States	*Japan*	*Hong Kong (China)*	*EU*	*Asia* [a]	*LA*	*Africa*	*Africa excl. SA Custom Union*
Food	0+1+22+4	21	4	1	11	19	18	1	1
Agricultural raw material	2-(22+27+28)	12	7	1	9	35	5	5	5
All manufactured goods	5 to 8 -68	12	24	5	17	33	0	0	0
Chemicals	5	15	19	3	10	42	0	1	0
Machinery and equipment	7	14	26	4	24	25	0	0	0
Light manufactures	6+8-68	8	23	8	8	41	1	0	0
All products	1 to 8	12	21	4	15	34	2	1	1

Source: UN/DESA, *Commodity Trade Statistics* database.
a Excluding Japan, Hong Kong (China) and West Asia.

C. China’s imports from developing countries: "complementarity effect"

South Asia, Africa and Latin America, unlike the Republic of Korea, Singapore and Taiwan Province of China, and to some extent the ASEAN countries, will benefit little from the complementarities effect of China’s import liberalization due to the accession. Manufactured goods, particularly capital goods take considerable weight in imports of China. China however imports little from Africa and Latin America because their production and export structure are similar and they do not have much trade links (table 6). The only important manufactured products imported from Latin America are leather and leather products. Nevertheless, as China is undertaking significant trade liberalization in agriculture, Latin America could benefit from China’s expansion of imports of agricultural products, particularly food. The only noticeable benefit possible for Africa is in the field of agricultural raw materials.

In table 6, "Asian" countries account for a significant part of China’s imports of agricultural goods and manufactured products, particularly light ones such as textiles, metals and metal products, leather and leather products; and chemicals, machinery and components, agricultural raw materials and food. However, while both light manufactured goods and food are the main items of South Asia’s exports, China’s imports from these countries were only about 1 per cent of its total imports in 1998. This is mainly because of similarities in their production and export structure. By contrast, newly industrialized countries and territories of the region, Taiwan Province of China, the Republic of Korea, Hong Kong (China) and Singapore are, in the order of importance, the main sources of supply of Chinese imports. Therefore, apart from Taiwan Province of China and Hong Kong (China), the Republic of Korea and Singapore will be the main beneficiaries of expansion of Chinese import liberalization. Imports of foreign-funded enterprises account for over 60 per cent and 50 per cent of

imports of China form NIEs and ASEAN (UNCTAD, 2002, Table 4.3). Trade in differentiated products and product sharing and outsourcing for exports to third markets can partially explain imports of China from Asian NIEs and ASEAN. Nevertheless they are not the only reason.[8] The main reason is differences in the production and export structure of China and those countries as China's capacity in production of capital goods and parts and components of technology-intensive products is still limited.

In the particular case of the Republic of Korea whose exports to China exceeded $10 billion in 1998, expansion of foreign direct investment (FDI) and joint ventures after the accession will further facilitate expansion of export of the Republic of Korea to China, whose main exports to China included such intermediate goods as steel, petrochemicals and textiles. In the late 1990s, petrochemicals alone accounted for 30 per cent of its export to China (Cooper, 2000, p. 2). Liberalization of imports will lead to further expansion of imports of those products from the Republic of Korea with which China has already a strong trade link. Further, the Republic of Korea could benefit from the liberalization of telecommunications and automobile industries both through trade and FDI and joint ventures (*Ibid.*). Trade links between the two countries have been further increasing through FDI. Over 1998-99 China increased by twofold its foreign investment in the Republic of Korea mainly in apparel manufacturing and electronic business. Similarly the investment of the Republic of Korea in China has been fast expanding in 1990s; it stood at $630 million in 1998. The Republic of Korea has been relocating labour-intensive assembly segments of production into China; and is China's sixth largest investor. China is the Republic of Korea's second largest recipient of FDI (Cooper, 2000). According to one estimate the Republic of Korea's exports to China will increase to $1.7 billions a year.[9]

It is worth noting that developed countries will be the main beneficiaries of the complementarities effects of China's accession as they have been the main sources of supply of China's imports (table 6). Judging from their past trade link with China, the United States will benefit mainly from liberalization of agriculture and some capital goods (mainly electric machine and components), and Japan and the European Union mainly from liberalization of manufactured products particularly textiles, electric and non-electric machinery and motor vehicles; more for clothing and textiles in the case of Japan, and travel goods for the European Union.

D. NIEs and ASEAN: the main beneficiaries of processing trade

Generally speaking, it is very likely that the accession will lead to expansion of labour-intensive assembly operation, particularly through expansion of FDI. In this case reliance on imported components will involve complementarity effects for China's main sources of supply. Similarly, the

[8] For example, while China's imports of clothing and clothing accessories from first-tier NIEs constituted 1.2 per cent of total world exports in these products, China's export to those countries was 6.1 per cent of world exports.

[9] Estimate by the Korean Institute for International Economic Policy, *Ibid.*, p. 5.

expansion of production and exports of some labour-intensive products, e.g. clothing, may lead to increases in their imported inputs. NIEs and ASEAN countries have export capacity in parts and components of technology-intensive goods and South Asia in exports of necessary inputs for production of many labour-intensive products. At the same time China may continue to expand its industrialization by increasing production of components and intermediate products as earlier mentioned. It would thus be interesting to measure in more detail China's potential in import or expansion of production and/or exports of these products, i.e. in the increase in the domestic value added in what is referred to in China as processing trade. Would South Asia also benefit from the expansion of China's imports of intermediate products? Unfortunately, disaggregate data on trade in all finished products and components are not readily available. Neither are the data on domestic value added in production of finished products based on imports of components and intermediate products. Hence, as examples, two capital goods items (office machines, and automatic data processing products) and one light manufactured product (clothing) are chosen for a slightly more detailed analysis. These items are important export items of China in production wherein imported components or materials are significant, and for which disaggregate data are available. SITC 759 includes components used in the production of office machines and automatic data processing products, and textiles (SITC 26 and 65) are inputs to production of clothing. Moreover, Asian NIEs and the ASEAN have capabilities in production and exports of SITC 751, and South Asian countries in production of textiles. Thus the examples chosen provide some indication for "complementarity effects" of expansion of exports of finished goods by China in its trade with certain Asian countries – i.e. the NIEs, ASEAN and China group – which are its main trade partners, and South Asia.

1. Office machine and automatic data processing

Office machine and automatic data processing products have been among the dynamic world products, and China has significantly gained a market share in them, partly through product sharing in the region. Bilateral trade in components (SITC 759) in the region increased faster than its world trade (UNCTAD, 2002). Here, it will be shown that although China has the potential to further increase production and exports of components over time, the increase in imports of final products and expansion of assembly operations after the accession will involve complementarity effects mainly with Asian NIEs, and the ASEAN.

Over the 1990s China has become a major exporter of finished products for office machines and automatic data processing products (table 3). The export-import ratio of these products jumped from about 0.57 to 3.2. As China improved its capacity in production of components,[10] the ratio of imports of parts to exports of finished products declined considerably from 1.25 to 0.46, even though the ratio of imports of parts to total imports of components and finished products increased from 0.42 to about 0.60. The value of imports of parts and components also increased by an annual average rate of over 35 per cent between 1990–91 and 1998–99 reaching over 4 billion dollars. Thus despite China's increased capacity in the production of parts and components, its imports of these products

[10] It is also possible that production of some components were in turn based on imported products.

expanded rapidly, and this trend may continue for some time after the accession. During 1998-99, 59 per cent of China's imports of components originated from "Asian countries and Hong Kong (China)",[11] so did 29 per cent of imports of finished products, as against 45 per cent and 26.5 per cent in 1990-91, respectively. In 1998-99, over 27 per cent of China's finished products was exported to "These countries", 9.7 per cent to Japan and 63 per cent to the rest of world[12]. In other words, China competes with "These countries" mainly in the third market for the final products.

Therefore, it appears that such regional links for trade in components will be intensified in the future, particularly as far as China's imports of components from "Asian countries" is concerned.

Which countries in the region will most benefit from this development? As expected, more advanced territories and countries of the region, particularly Taiwan Province of China, Singapore, Malaysia and Thailand will be the main beneficiaries. In 1998-99 the shares of various groups in imports of components to China were as follows: Hong Kong (China) and Taiwan Province of China 18 per cent; Singapore and the Republic of Korea 22 per cent; ASEAN 18.6 per cent; Japan 27 per cent; South Asia 0.04 per cent; rest of the world 14 per cent. South Asia does not gain from complementary effects of China's expansion of exports of these products. Nor is it subject to its competition effect as the South Asian countries are not producer and exporters of these products.

In short, while China competes significantly with the NIEs and ASEAN in the third market for final products, at the same time it provides complementary effect to them through imports of components and to some extent (differentiated) finished products. As China extends its capability in production of components, it could become a more serious competitor not only in assembly operation, but also in terms of the whole production chain. Nevertheless, such a process will take place over a long period of time. In the next 5 to 10 years the complementarity effects of China's expansion of exports of finished products is to dominate.

2. Textiles and clothing

Although textiles are important items of China's exports, China is also an important importer of these products. In other words, textiles are imported intermediate products in production and exports of clothing as China relies on imports of high quality textiles, particularly for the sale of clothing items in foreign markets. Does expansion of clothing exports by China involve complementarity effects for South Asia which is an exporter of textiles?

Table 7 provides the latest available data on trade in textiles and clothing. It shows that the ratio of imports of textiles to exports of clothing declined noticeably during the 1990s, partly because of the rapid expansion of clothing exports. Nevertheless, over the same period imports of textiles also increased from $8.7 to $13.5 billion. In the early 1990s the China group, mainly Hong Kong (China), and Japan were the main source of supply for China. By the end of 1990s, the main beneficiaries of the expansion of China's imports were the more advanced countries of the region namely Taiwan

[11] For the coverage of countries see footnote (a) under table 6.

[12] UN/DESA, *Commodity Trade Statistics* database.

Province of China, Japan and the Republic of Korea rather than South Asia. The main reason for imports from more advanced countries lies in the nature of the textiles industry. Traditionally, this industry had been labour-intensive. During the last two decades, there came a tendency toward robotization. This process involves capital-incentive methods in which more advanced countries of the region have comparative advantage. In addition, the relocation of clothing factories from Japan, Republic of Korea, Hong Kong (China) and Taiwan Province of China, into China, has contributed to China's imports of high quality textiles from these countries as inputs to exports of clothing. By contrast, South Asian countries which mostly use traditional labour-intensive methods in textile manufacturing and produce low quality textiles are in disadvantage position to benefit from "complementarity effects" of expansion of clothing by China.[13]

In short, while South Asia, in contrast to the NIEs and ASEAN, is subject to competition effects of China's accession, it gains little from its complementarity effects.

Table 7

Some indicators of China's trade in textiles and clothing, 1990–1999

	1990-91 (Average)	*1998-99 (Average)*
Export value *($ millions)*:		
Clothing	10,957	30,134
Textiles	8,727	13,848
X/M ratio:		
Clothing	201	27.8
Textiles and textile fibers and yarn	1.06	1.05
Import of textiles, textile fibers and yarn / Export of clothing	0.75	0.44
Share of various groups in import of textiles:		
China group [a]	61.6	34.8
of which:		
Hong Kong (China)	(50.3)	(9.9)
Taiwan Province of China	(10.1)	(24.4)
NIEs	3.3	19.5
of which:		
(Republic of Korea)	(3.2)	(19.3)
ASEAN	0.7	2.96
South Asia	0.9	3.90
Japan	10.5	19.2
Others	23.0	19.7
Total	100	100

Source: UN/DESA, *Commodity Trade Statistics* database.

a China, Hong Kong (China), Taiwan Province of China and Macao (China).

[13] While China's imports of clothing has increased from $55 million in the early 1990s to $1.1 billion by the end of the decade, Hong Kong (China), Taiwan Province of China, the Republic of Korea and Japan account for nearly 90 per cent of imports to China, and South Asia for only 0.7 per cent. The reason seems to be that China's imports of clothing is mostly fashion high quality clothes that are mainly supplied by the more advanced countries of the region.

V. COMPETITION ON MAIN EXPORT PRODUCTS

To analyze the possible competitive position of China vis-à-vis its competitors in the third market in slightly more detail, two analytical methods are applied in the following pages. First, a rank correlation for RCA (for exports) indicators of China and its competitors are calculated for their main export products at 3-digit levels. Subsequently, some qualitative judgments are made also using the data comparing main individual export products of China at 3-digit SITC level with those of its competitors.

A. Similarities in export structure: rank correlation

The export items (at the digit level) of China and it competitors are ranked in order of their RCA indicator for 1997-1998; the indicator for each product shows the ability of each country to gain market share in that product in the international market. Then the 50 fifty items[14] are chosen for each country and the index of rank correlation between the related export items of China and each of the selected countries is calculated. The 50 items that were chosen for China account for nearly three-quarters of the total exports of China. The coefficient correlation equal to unity implies a maximum degree of competition between China and the country concerned. The lower the coefficient, the lower the degree of rivalry between China and the country concerned in international market for the related products. The results are shown in table 8. One problem with this methodology is that there might be certain products for which China has gained market share (RCA greater than unity), but do not figure among the chosen (50) export items of China. If these items happen to be among the first 50 export items of a competing country they are not captured by the calculation of the correlation coefficient. Such an exclusion takes importance only if RCA for the product(s) concerned for China is greater than the relevant RCA for its competitor(s), i.e. China's gain in market share is greater than that of its competitor(s). Nevertheless, as the product(s) is (are) not among the products in which China has gained the highest market shares, i.e. the most dynamic export products of China, the table provides useful information for our purpose.

Table 8 shows that for a number of countries the coefficients which were calculated are not statistically significant. Except for Hong Kong (China) and Macao (China) the Asian group – Sri Lanka Pakistan, Viet Nam, Indonesia, Bangladesh, Thailand and India – if judged by the similarities in their pattern of RCA and export structure, are the main competitors of China. These countries are basically exporters of labour-intensive products and compete with China for a certain number of products, i.e. 19 in the case India and 28 for Viet Nam, from the 50 main export items of China. The high correlation coefficient between China and Hong Kong (China), and China and Macao (China) is partly due to similarities in their export structure, and partly due to the fact that a large number of exports from Hong Kong (China) and Macao (China) are re-exports originating from China.

[14] Similar calculations were also done for all products, first 100 and 75 products, but the resulting correlation coefficients were not statistically significant; hence, they were not reported.

Table 8
Rank correlation coefficients between export items of China (at SITC 3-digit level) and its main competitors in developing countries

Countries	*Correlation coefficient*	*No. of common products*	*Statistical significance*
Asia:			
1) Sri Lanka	0.75	24	1%
2) Hong Kong (China)	0.59	29	1%
3) Macao (China)	0.59	25	1%
4) Pakistan	0.56	21	1%
5) Viet Nam	0.55	28	1%
6) Indonesia	0.53	25	1%
7) Bangladesh	0.46	25	5%
8) Thailand	0.42	31	5%
9) India	0.39	19	10%
10) Myanmar	0.20	18	-
11) Republic of Korea	0.08	20	-
12) Philippines	0.04	29	-
13) Malaysia	0.02	27	-
14) Taiwan Province of China	0.01	26	-
15) Singapore	-0.03	23	-
16) Nepal	-0.06	19	-
Latin America:			
1) Mexico	0.40	28	5%
2) Brazil	0.57	12	10%
3) Chile	0.54	10	-
4) Uruguay	0.38	13	-
5) Jamaica	0.29	17	-
6) Haiti	0.27	24	-
7) Colombia	0.20	20	-
8) Peru	0.14	15	-
9) Bolivia	0.02	12	-
10) Argentina	-0.12	8	-
Africa:			
1) Malawi	0.72	17	1%
2) Tunisia	0.60	28	1%
3) Zambia	0.59	14	5%
4) Egypt	0.39	18	-
5) Sudan	0.36	7	-
6) Ethiopia	0.28	15	-
7) Morocco	0.25	20	-
8) Kenya	0.24	12	-
9) United Rep. of Tanzania	0.12	9	-
10) Zimbabwe	-0.03	13	-
11) Nigeria	-0.32	10	-
12) Sub-Saharan Africa [a]	0.17	16	-

Source: UN/DESA, *Commodity Trade Statistics* database.

a Sub-Saharan Africa excludes South Africa, Botswana, Lesotho, Swaziland, Comoros, Djibouti, Reunion, Equatorial Guinea, Sao Tome and Principe, Rwanda, Dem. Rep. of the Congo and Sudan, for which there is no data.

For other Asian countries, correlation coefficients are small and statistically insignificant (items 10 – 16). Some Asian countries – the Republic of Korea, Malaysia, Taiwan Province of China and Singapore – do have "complementarity" relations with China because, as explained earlier, capital and intermediate goods are important in their export structure. The coefficients for Nepal and Myanmar are either negative, or small principally because their export structure is very concentrated on a few items, mainly on textiles. For example, textiles accounted for 54 per cent of exports of Nepal in 1999.[15]

In the case of Latin America, only two countries show relatively high and statistically significant correlation coefficient: Brazil, and Mexico. Some countries, i.e. Jamaica and Haiti that produce labour-intensive products, compete with China on 17 to 24 items. Nevertheless, the related coefficients are minimal and imply that competition exists for items with small weight either in China's trade, or in the trade of those countries. For other Latin American countries with insignificant correlation, the number of items subject to competition is also small. As a food exporter, Argentina does not compete with China; in fact, it could benefit from exports of food to China as China's trade in agricultural products is being considerably liberalized.

China competes mainly with three countries in Africa – Malawi, Tunisia and Zambia for between 14 to 28 items. Although Morocco also competes with China on 20 items, the related coefficient is minimal.

In short, China competes mainly with Asian countries, notably South Asian countries and Thailand on a relatively large number of products. For East Asia cases, competition in the final market is accompanied with complementarity effects since China's export is also very import intensive, and also because China and the more advanced countries of the region are involved in a two-way trade. Competition with Latin American and African countries is limited mainly to Mexico, Brazil, Malawi, Tunisia and Zambia.

With which main specific items does China compete with other developing countries? What is its relative strength? These questions are tackled below.

B. Product analysis

Table 9 provides the data for the period 1997-98 on which to base some qualitative judgment on the similarities in export structures, and the relative competitive strength of China and its main competitors for each product in Asia and other regions. In this table the main export products of China at the 3-digit level are chosen on the basis of two main criteria: i) the value of exports exceeds 1 per cent of total exports of the country; and ii) the item has shown revealed competitive advantage (R)

[15] The coefficient for the Philippines cannot be economically explained. It is low perhaps because the figures on Philippine exports show high values for exports of capital goods, inflated mostly by assembled products. Further, data for the Philippines do not seem reliable (Ng and Yeats 1999).

indicator (for exports) of greater than unity. The Chinese export items are ranked according to their share in average total exports of China for 1997-98. Moreover, all these items, except those marked by "D", have shown C_R greater than unity. In other words, China has gained further market share in 1990s. "D" indicates that the competitive position of the product had deteriorated in 1997-98 as compared with 1992-93 as C_R was less than unity. Thus even though R was greater than one in 1997-98, it was smaller than that for 1992-93.

For each competing country, if any of the items listed in the table figure among the main product exports of that country (i.e. if the percentage share of the product in total exports of the country was greater than one) the information on the indicators of RCA of the country for that product in 1997-98 i.e. (R) and its changes over 1992/93 – 1997/98 (C_R) are reported. A positive sign (+) means that R was greater than one and the negative sign (-) implies it was less than one – the country's market share of that product in world exports increased. I, D and = imply that R improved, deteriorated or did not change, respectively, for the products concerned. An added dot, and two added dots to "I" imply significant (CR = 2 to 5), or very significant (CR greater than 5) improvement in the R indicator over the period concerned, respectively. This information therefore provides some qualitative judgment on the current competitive position of each country for products concerned. Although the degree of improvement in the competitive positions of China after the accession can not be quantified, the table would indicate in which products various countries are vulnerable and in which products they show some strength.

1. Asia

According to the table, China and ***Republic of Korea*** have four main capital goods items in common (automatic data processing equipment, telecom equipment and parts, electric machinery, household type equipment, SITC 775) and only in one light manufactured goods i.e. textile yarn. Automatic data processing equipment comprises final products, but other products include parts and components as well. As China concentrates mainly on assembly operation, however, and taking into account destination of China's exports, it is plausible to assume that it competes with the Republic of Korea mainly in the final products, mostly in the third market. At the same time as China imports some components from the Republic of Korea, any expansion of China's exports of final products also involves "complementarity effects" although the exact magnitude of effects is not clear in all cases due to lack of data.[16] For textile yarn the Republic of Korea's competitive position is superior to that of China because China's C_R for this product had deteriorated but had improved for the Republic of Korea.

[16] In the case of SITC 751 and 752 about 4 per cent of import of components originated from the Republic of Korea.

Table 9

Revealed competitive advantages and its changes for selected developing countries over 1992-98

1. Asia

Rank [a]	*SITC*	*Items*	*China*	*Republic of Korea*		*Malaysia*		*Thailand*		*Indonesia*		*Viet Nam*		*India*		*Bangladesh*		*Pakistan*		*Sri Lanka*		*Nepal*	
			CR	*R*	*CR*	*R*	*CR*	*R*	*CR*	*R*	*CR*	*R*	*CR*	*R*	*CR*	*R*	*CR*	*R*	*CR*	*C*	*CR*	*C*	*CR*
1	894	Toys, sporting goods																+	I	+	I		
2	851	Footwear						+	D														
3	845	Outer garments knit non-elastic						+	D			+	I•			+	I••	+	I	+	I		
4	843	Women's outwear non-knit	D					+	D			+	I			+	I•	+	D	+	I	+	D
5	752	Automatic data processing equipment		+	D	+	I••																
6	842	Men's outwear non-knit										-	I•			+	D					+	I•
7	764	Telecom equip, parts, accessories		+	D	+	D																
8	846	Undergarments knitted						+	D			+	I•	+	D	+	I••	+	I	+	D	+	I••
9	893	Articles of plastic nes																					
10	831	Travel goods, handbags										+	I•							+	I••		
11	778	Electrical machinery nes		-	D	-	I	-	D														
12	848	Headgear, non-textile clothing				+	I							+	D			+	I	+	I		
14	899	Other manufactured goods nes	D																				
15	775	Household type equip nes		+	=			+	D														
16	652	Cotton fabrics, woven	D															+	I	+	I•		
17	762	Radio-broadcast receivers				+	D																
18	658	Textile articles nes	D											+	I			+	I			+	I•
19	821	Furniture and parts thereof				+	I	+	D	+	D	+	I••										
20	653	Woven man-made fib. fabric																+	I				
21	771	Electric power machinery nes						+	I														
22	844	Undergarments non-knit	D									+	I•	+	I	+	I	+	I	+	D	+	I
23	651	Textile yarn	D	+	I	+	I									+	D	+	D				
24	776	Transistors, valves				+	D	+	D														
27	885	Watches and clocks	D																				

Source: UN/DESA, *Commodity Trade Statistics* database.

Notes: R refers to the indicator of revealed comparative advantage in 1997/98,and CR to its changes over 1992/93-1997/98 (the ratio of CR in 1997/98 to that in 1992/93).
+ sign implies that R is greater than one, and negative sign means R is less than one.
I, D and = refer to improvement, deterioration or no change in R, respectively.
I means CR is greater than one and D implies CR less than one. Moreover: I denotes CR = 1-2 (improved).
I• denotes CR = 2-5 (improved significantly).
I•• denotes CR = greater than 5 (improved very significantly).

a Ranked according to the importance of the items in China's exports. Crude petroleum (SITC 333), switch geared nes. (SITC 772) and base metal manufactured nes. (SITC 699), which figure among important exports of China, but not in main export items of the competing countries, are omitted from the table.

Table 9 (continued)

2. Latin America

Rank [a]	**SITC**	*Items*	*China*	*Brazil*		*Argentina*		*Mexico*		*Chile*		*Columbia*		*Uruguay*		*Peru*		*Bolivia*		*Jamica*		*Haiti*		*Costa Rica*	
			CR	*R*	*CR*	*R*	*CR*	*R*	*CR*	*R*	*CR*	*R*	*CR*	*R*	*CR*	*R*	*CR*	*R*	*CR*	*R*	*CR*	*R*	*CR*	*R*	*CR*
1	894	Toys, sporting goods																				+	D		
2	851	Footwear		+	D																	+	I••		
3	845	Outer garments knit non-elastic						+	I••							+	D	+	D			+	D		
4	843	Women's outwear non-knit	D					+	I•					+	D							+	I•	+	D
5	752	Automatic data processing equip.						+	I•																
6	842	Men's outwear non-knit						+	I•			+	=	+	D							+	D	+	I•
7	764	Telecom equip., parts, accessories						+	=															-	I••
8	846	Undergarments knitted						+	I•			+	D			+	I			+	D	+	n.a.		
9	893	Articles of plastic nes						+	D															+	I••
10	831	Travel goods, handbags																							
11	778	Electrical machinery nes						+	D			+	D	-	I••							+	D	-	I
12	848	Headgear, non-textile clothing												+	D							+	I		
13	759	Office, adp machy. parts						-	I															+	I•
14	899	Other manufactured goods	D																						
15	775	Household type equip. nes						+	I															+	I••
16	652	Cotton fabrics, woven	D																						
17	762	Radio-broadcast receivers						+	D																
18	658	Textile articles nes	D																						
19	821	Furniture and parts thereof						+	I																
20	653	Woven man-made fib. fabric																							
21	771	Electric power machinery nes						+	D																
22	844	Under garments non-knit	D																					+	I•
23	651	Textile yarn	D											+	D	+	D								
24	776	Transistors, valves						-	D															+	I••
26	772	Switch gear, parts nes						+	D															-	D
27	699	Base metal man. nes						+	D													+	I••		
28	885	Watches and clocks	D													+	I••								

Table 9 (concluded)

3. Africa

Rank[a]	SITC	Items	China	Egypt		Morocco		Tunisia		Kenya		Tasmania		Nigeria		Zambia		Zimbabwe		Sudan		Malawi		Ethiopia	
			CR	R	CR	R	CR	R	CR	R	CR	R	CR	R	CR	R	CR	R	CR	R	CR	R	CR	R	CR
1	894	Toys, sporting goods																							
2	851	Footwear				+	I	+	I																
3	845	Outer garments knit non-elastic				+	I	+	I																
4	843	Women's outwear non-knit	D	+	I•	+	I•	+	I																
5	752	Automatic data processing equip.																							
6	842	Men's outwear non-knit		+	D	+	I	+	I													+	I••		
7	764	Telecom equip, parts, accessories						-	I																
8	846	Undergarments knitted		+	I••	+	I	+	I													+	I		
9	893	Articles of plastic nes		-	I•					+	I•														
10	831	Travel goods, handbags																							
11	778	Electrical machinery nes						-	I																
12	848	Headgear, non-textile clothing																							
13	759	Office, adp machy. parts																							
14	899	Other manufactured goods	D																						
15	775	Household type equip. nes																							
16	652	Cotton fabrics, woven	D	+	D																	+	D		
17	762	Radio-broadcast receivers																							
18	658	Textile articles nes	D	+	I																	+	I••		
19	821	Furniture and parts thereof																+	I						
20	653	Woven man-made fib. fabric																							
21	771	Electric power machinery nes						+	D																
22	844	Under garments non-knit	D	+	I•	+	D	+	D													+	I••		
23	651	Textile yarn	D	+	D											+	I•			+	I				
24	776	Transistors, valves				-	D																		
26	772	Switch gear, parts nes						+	I																
27	699	Base metal man. nes																							
28	885	Watches and clocks	D																						

By contrast, for finished capital goods, China has a superior position for all products mentioned, particularly for electric machinery and household equipment. In the case of household equipment Chinese products, vis-à-vis imported products, have also been very competitive not only abroad but also in the domestic market mainly due to encouragement of competition among involved firms in the domestic market, and to investment abroad (Bhalla and Qiu, 2002). For example, "Haier Group", the largest Chinese appliance company has captured 30 per cent of the market niche in compact refrigerators through Wal-mart, Home Depot and other retailers (WSJ, 28 January 2002). For the Republic of Korea, C_R did not change for above-mentioned capital goods; it had a deteriorating tendency for all other products. For electric machinery in addition, R was less than one.

Malaysia is subject to competition from China mainly in three light manufactured goods (headgear, non-textile clothing, furniture and parts and textile yarn) and a number of capital goods (automatic data processing, electrical machinery, telecom equipment and parts, radio receivers and transistors). These items are subject to the same qualification as that for the Republic of Korea. While Malaysia has improved its competitive position, as denoted by changes in R, in its light manufactured items, its C_R has deteriorated for most capital goods (3 out of 5). In other words, China is in a better competitive position than Malaysia in the final market for the capital goods concerned.

China's competition pressure on main ***Thai*** exports is felt severely particularly for light manufactured goods (notably footwear, clothing and furniture and parts), which China exports in large volume. C_R for all Thai products in this category has declined; only for women's outwear does China show a deteriorating C_R, thus suggesting that China's competitive pressure on Thailand is not high for this product. In the case of capital goods (electrical machinery, transistors, household equipment and electric power machinery) Thailand's RCA has also deteriorated except for electric power machinery. Moreover, in the case of electric machinery Thailand's indicator of RCA was already less than 1 in 1992/93, indicating that Thailand was not particularly successful in its export. Only in the final market for two other capital equipments (rotating electric plant – SITC 716 and sound recorders – SITC 763) that were among main exports of Thailand (not shown in table 9), and for which China's share in world export exceeds 5 per cent,[17] has Thailand shown some strength. For these products both R and C_R were greater than 1 for Thailand, i.e. the RCA indicator for Thailand has improved between 1992/93 and 1997/98.

The structure of the main exports of ***Indonesia*** is different from that of China. The only item common with main export of China is furniture, whose C_R has deteriorated for Indonesia.

Viet Nam competes with China mainly on clothing (SITC 845, 843, 842, 844), travel goods and furniture. In all these items, however, Viet Nam has been in a strong position and has shown improvement in its RCA presumably because of lower labour costs.

[17] These items do not figure in table 9 because their share in China's exports was less than 1per cent.

China and ***India*** compete in textiles and clothing, but only in limited items. China's main strength is in outer garments, whereas India's exports are concentrated mainly in underwear and miscellaneous textile items. In textiles and non-knitted undergarments India is in a stronger position, as can be seen from the improved RCA index. Nevertheless, for two other items, i.e. headgear and knitted undergarment China shows more strength. China's imports of textiles from India are only over 1 per cent. Hence, there is little "complementarity effects" related to exports of clothing by China vis-à-vis India.

Bangladesh competes with China mainly in outer garments, undergarments and textile yarns. In all these products, except for textile yarn and non-knit men's outwear, Bangladesh has shown significant, rather very significant, improvement in its RCA indicator. In the case of men's outwear (SITC 842), although initially it had been significant, RCA indicator for Bangladesh had deteriorated. Bangladesh enjoys lower wage cost than China as shown in section II.

China and ***Pakistan*** have a similar export structure in toys and sporting goods, outer garments, cotton fabrics, man-made fabrics, miscellaneous textile articles and textile yarns. In most of these products, particularly cotton fabrics, miscellaneous textile articles and non-knit undergarment, Pakistan shows strength as implied in changes in its RCA indicators when compared with those of China. Nevertheless, its competitive position is not as strong as that of Viet Nam and Bangladesh.

Sri Lanka and China have a similar export structure in toys, sporting goods, articles of plastics, travel goods, women's outwear, knitted and non-knitted undergarments and headgear. Except, for undergarments, Sri Lanka's RCA indicator has improved significantly in all products mentioned, particularly in travel goods and cotton fabrics.

China's export structure is similar to ***Nepal*** in non-knitted outwears, undergarments and miscellaneous textile articles. The only items for which the indicator of RCA for Nepal has worsened is in women's outwear for which China has shown a similar tendency. Otherwise, Nepal's RCA indicator has improved significantly for most other items. It may therefore be said that for Nepal, all things being equal, there seems to be little threat from China.

2. Latin America

The United States is a major market for China and the Latin American countries. Nevertheless, except for Mexico, Costa Rica and Haiti, China competes with the countries shown in the table only on a few products.

As expected, ***Mexico*** competes with China mainly in exports of light manufactured goods, and products that involve assembly operations mostly by TNCs. For clothing (SITC 845, 843, 848), if judged by R and C_R, Mexico has a stronger position than China, presumably due to, *inter alia*, its preferential trade agreement with the United States. In the case of China, exports of textiles and clothing have been strictly restricted by MFA and bilateral agreements. Moreover, China's market

access to the United States for these products will not much improve until at least 2005 (UNCTAD (2002)). For plastic articles and most capital good items, C_R for Mexico had deteriorated, even though R was greater than unity. Thus China is in a stronger position than Mexico. Mexico has improved its competitive position only in exports of components for office machinery and data processing equipment.

Costa Rica competes with China in a few clothing items, and if judged by its indicators of RCA Costa Rica is in a stronger position than China, except for non-knitted women's outwear. So it is with transistors, valves (SITC 776 and household equipment SITC 775). In the case of switchgears, however, R is less than 1 for Costa Rica and has further decreased over time. As Costa Rica's exports transit mainly through an export processing zone, it is highly unlikely that the country could maintain this position.

Haiti has a common export structure with China with regard to outwears, undergarments, headgear, miscellaneous base metals toys and footwear. Except for women's outwear and headgear, the position of Haiti has deteriorated. Nevertheless, it has since been gaining further advantage in footwear and base metal.

Colombia has three main export products in common with China: men's outwear, undergarment, and electric machinery. In all these items it is inferior to China in terms of its export advantage. Although the products are not the same, the situation for ***Uruguay*** is somewhat similar to that of Colombia.

Argentina and ***Chile*** have no common products with China in the list of their main export items, as they are dominant exporters of agricultural products; and copper is the main export of Chile.

Brazil, Bolivia and ***Jamaica*** each have one clothing item common with China in their main export items. Their relative situation for these products has deteriorated during the 1990s.

Peru's comparative advantage in watches and clocks has improved, while that of China deteriorated. By contrast, R has deteriorated for Peru for its two main export items, SITC 845 and 846.

3. Africa

Only North African countries and Malawi have noticeable number of export items in common with China in their export structure. ***Egypt*** is in competition with China exclusively on a number of clothing items, textile yarn and some articles of plastic. The relative position of two of the clothing items has deteriorated for Egypt; the situation for three other items has improved. In textile yarn and cotton fabrics the R for both countries has deteriorated, presumably due to processing into clothing. Overall, for the products concerned, Egypt's performance has improved.

The clearly evident competitive advantage of ***Morocco*** for seven items has further improve for 4 clothing items, in particular for SITC 873 for which China's R has deteriorated. In two others, SITC 844 and 851 the situation is similar for both countries.

Tunisia's situation in light manufactured goods – mainly clothing (4 items) and footwear is almost similar to that of Morocco. By contrast, for SITC 7 products (4 items) R have been less than unity for two items (764 and 778) and in one case, SITC 771, R had deteriorated.

Malawi, like China has three clothing and two textiles articles in its list of main export items. In most cases Malawi's competitive position for these items have strongly improved, while in two cases, SITC 658 and 844, China's position has improved.

Kenya competes relatively strongly with China in plastic articles. With regard to textile yarn, ***Zambia***'s position is superior to that of China; and ***Sudan***'s equal to China. ***Zimbabwe***'s relative strength in furniture is also equal to China. Each of these countries could however find itself in a lower level if China's competitive position improves in these products.

VI. CONCLUSIONS

An attempt was made in this paper to analyze the competitive strength of China in the international market for its main export products in order to gauge which countries will be vulnerable if China's competitive position is improved as a result of its entry into WTO. In contrast to existing literature which consider labour-intensive products in general (or a group of these products), an attempt was made to investigate products at a disaggregated SITC 3-digit level because as often as not, products in the same category, in the same group even, are not homogeneous.

China's large volume, high rate of growth and changing structure of trade involves competitive as well as complementarity effects vis-à-vis some developing countries. China's competitive advantage has evolved around the manufacture of labour-intensive products, i.e. in the assembly of parts and components of some capital goods. Nevertheless, China is also improving its production capacity to manufacture and export components. In labour- intensive, light manufactured products it competes mainly with South Asian countries and a few Latin American and African countries in the third market i.e. in developed countries. But it provides little complementarity effects with these countries.

Some Latin American and African countries may benefit from expansion of China's imports of foods and agricultural raw materials, respectively. In the final market, for a limited number of capital goods China competes with Asian NIEs and the ASEAN countries and a few countries in Latin America, mainly Mexico and Costa Rica. In the case of Asian NIEs and ASEAN, however, China's competition in the final market for capital goods involves some complementarity effects through the

import of parts and components from countries of these groups. By contrast, China does not, generally speaking, have much trade relations with Latin America and Africa, and this provides both regions with little complementarity effects.

The more advanced countries of the region, i.e. Asian NIEs and ASEAN countries, particularly the Republic of Korea and Singapore, will immediately most benefit from liberalization of imports by China. Assuming there is no change in China's exchange rate, it is very likely that the "competition effects" of China's trade liberalization will be over-offset by its "complementarity effects" on Asian NIEs and most ASEAN countries over the short- and medium-term. In this context, as had been earlier mentioned, the intermediate goods used in the manufacture of China's exports of capital goods, are to a large extent, imported from these countries, which have increasingly relocated the last stage (labour intensive) assembly line of production in China. However, as China improves and increases its capacity to produce parts and components the "competition " effect may dominate.

To shed some light on the "competition effects" of China's trade liberalization on specific products of selected developing countries in various regions, similarities of export structure of China with that of those countries are examined at the 3-digit product level of their main export items. Data for the period 1992-98 reveals that in the case of "Asian countries" China, while maintaining superior competitive strength, has an export structure similar to that of the Republic of Korea and Malaysia in the final market for a number of "finished" capital goods, particularly data processing equipment, telecommunications equipment and some electric machinery. It does not, however, compete as much with these countries for light manufactured products. Moreover, some capital goods items, which are exported by China, are manufactured by NIEs companies that have invested in China.

By contrast, Thailand is vulnerable in clothing, miscellaneous household equipment and electric machinery. Indonesia has little to worry except for furniture. India's export structure also does not have many similarities with China. India concentrates mainly in undergarments and China in outer garments. Bangladesh, Sri Lanka, Pakistan, Viet Nam and Nepal have similar export structure with China in some clothing items, but overall these countries, particularly Viet Nam have been aggressive in exporting of these products. Sri Lanka and Pakistan also compete with China in toys and sporting goods, but both former have shown some strength in these products.

Except for Mexico, Costa Rica and Haiti, and to some extent Uruguay, the export structure of selected Latin American countries is mostly different even though the United States is a major market for both China and Latin America. Mexico has more competitive edge over China for a number of clothing items, but less for a few assembly operation, whose products are among its main export items. By contrast, Costa Rica's competitive advantage has noticeably improved for a number of clothing items and a few assembly operation products, presumably due to concentration in export processing zones. Haiti competes with China in 8 products, mostly clothing. It has a strong competitive position in footwear, one clothing item and some base metal. Uruguay's position is weak in a limited number of labour-intensive products in which are subject to competition from China.

Egypt, Morocco, Tunisia and Malawi, which are subject to China's competition mainly in some clothing items, the structure of the main export items of African countries is different from that of China. Overall, the competitive position of these countries for most products considered, mainly clothing items, has improved in the 1990s.

With its entry into WTO the situation in China with respect to market access vis-à-vis main importing countries will not change for some time, particularly in the case of textiles and clothing which are the two main products with which China competes against South Asia, some Latin American and African countries. In fact, China's growth in quota for exports to developed countries will increase far less than other developing countries (UNCTAD, 2002). Therefore, over short- and medium term, its accession to WTO will not improve its competitive position in these products to seriously threaten other developing countries. Over a longer-term, much depends on what policy China will pursue in its trade and industrialization. It is possible that in the future China's attempt to deepen and expand industrialization and to increase value added in exports, through the production of parts and components could lead to improvement in its competitiveness in technology/skill-intensive products which are of interest to NIEs and the ASEAN. One may argue that even in the short or medium run, if China attempts to devaluate the situation could change radically as far as competitiveness of Chinese export is concerned. China's devaluation is however unlikely.

Table A. 1
Indicators of other capital and/or technology intensive export items of China with a value greater than $1 billion [a]
(Average 1997-1998)

SITC	*Items*	*Country share*	*Share in world exports of the product*	*R*	*(C_R)*
793	Ships, boats	0.95	4.48	1.28	2.59
716	Rotating electric plant	0.81	5.78	1.65	1.10
786	Trailers, non-motor vehicles nes	0.78	14.2	4.06	2.04
763	Sound recorders, phonographs	0.74	7.45	2.13	2.46
751	Office machines	0.72	9.47	2.71	2.71
812	Plumb, heating light equipment	0.69	8.18	2.34	1.27
785	Cycles, motorized or not	0.61	8.27	1.79	1.07
661	Lime, cement, building products	0.57	9.44	2.70	1.27
	Total	**5.31**			

Source: See table 3.

Notes: For notations see table 3.

a And R greater than 1 and C_R greater than 1.

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