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Openness of China's Manufacturing Sectors and Its APEC Policy

by Zhao Jianglin

1. Introduction

China's domestic market is finally in the process of being integrated into the international market. Trade liberalization will play an important role in this process. It will expand China's trade opportunities further, lead China's manufacturing sectors to participate extensively in the international division of labor and to shift its trade patterns and industrial structure. On the other hand, it will increase the pressure of competition on domestic enterprises from imports and foreign-funded enterprises. If China's manufacturing sectors can not improve their international competitiveness in time, trade liberalization will not bring benefits, but rather threats, to the development of China's manufacturing sectors.

However, further openness of China's manufacturing sectors will be affected not only by the international environment of trade liberalization in Asia-pacific regions, but also by the processes of adjustment of its industrial structure and the transition from a planned to market-oriented economy. To some extent, the process of industrial structure adjustment and economic transition will perform a more important role in openness of manufacturing sectors than will trade liberalization. It will involve the incentive and capability to compete of China's manufacturing sectors. The incentive to compete held by manufacturing sectors will depend on the successful transition of China's economic system. The increases in the capability to compete will be based on the adjustment of its industrial structure and, especially the improvement in the levels of technological development. Thus trade liberalization will not only offer China's domestic market to other members of APEC by reducing tariffs and abolishing non-tariff barriers, but also, more importantly, will help the development of China's manufacturing sectors.

This paper will focus on comparing openness across manufacturing sectors and offering proposals on industrial adjustment in China's APEC policy. In order to give a complete picture, Section 2 explains the process of openness among manufacturing sectors, followed by their degree of openness and protection. Sections 3 and 4 focus on two different roles of openness in domestic industries. Section 3 mainly discusses changes in trade patterns brought about by opening to outside policy. Section 4 examines changes in competition in the domestic market following the above policy. In Section 5, problems related to openness in manufacturing sectors are given further consideration. These problems include the technological development of manufacturing sectors and the deepening reform of the domestic economic system. Section 6 offers proposals on industrial adjustment for China's APEC policy and presents some major conclusions. A total of 24 manufacturing sectors will be under consideration. The period chosen is 1993-1995.

2. Process of Opening of China's Manufacturing Sectors and Degree of Openness

The pace of China's trade liberalization has sped up since 1992. Trade regime is gradually liberalized. This increased the degree of openness in manufacturing sectors and has made China's economy integrate gradually into the international market. However, China's tariff rates are higher than those of other APEC members. NTBs have performed a more effective role than tariffs in protecting domestic industries. There is space for China to liberalize its trade regime. In this section, two sets of indices related to degree of openness will be used to compare the degree of openness among manufacturing sectors. One set is endogenous indices of openness affected by trade policy, e.g. export dependency, ratio of import penetration and trade dependency. Another is exogenous indices of openness which show the role of trade policy, including the rate of tariffs and NTBs (non tariff barriers).

2.1 Process of Opening of Manufacturing Sectors

There are two remarkable phases in the process of opening of China's manufacturing sectors. In the first phase, between 1979 and 1992, opening to outside policy was mainly focused on reforming the trade administrative system. For example, the central government decentralized decision-making regarding exports and imports to local governments or the regional foreign trade corporations. Administrative restrictions on exports and imports were replaced by tariffs, quotas and licensing. Controls on foreign exchange were loosened.

The second phase, which began in 1992, has involved the reform of international trade policy. This phase has focused on reducing tariffs, abolishing NTBs and improving the transparency of international trade policy. First, China has taken steps to reduce tariffs gradually. On Jan. 1, 1992, import tariffs on 225 products were reduced from an average rate of 45% to 30%. In April 1992, China abolished its import regulatory tax. This surcharge of 20% to 80% applied to 18 categories of goods. In Dec. 1992, it also lowered tariffs by an average of 7.3% on 3,371 items. In Dec. 1993, tariffs on 2,818 items were reduced by an overage of 8.8%, and on Jan. 1, 1994, those on 234 agricultural and industrial items were reduced by an overall average of 50%, with none lower than 35%. The year 1996 saw an important change in trade liberalization, as 4,964 items, which account for two thirds of all items, were reduced, none by less than 30%. The average tariff rate was cut by 23% in 1996. The Chinese government has declared that it will reduce the nominal tariff rate (NTR) to 15% in 2000, 10% in 2010, and 5% in 2020. China is in the process of bringing its tariff system into line with international standards.

Reform of import restrictions and licensing requirements is another part of China's trade liberalization. Licensing requirements once encompassed 53 large product categories of consumer goods, raw materials and some production equipment, covering approximately 50% of total imports by value, and thus acted as an effective import barrier. In 1992, 1,247 products was subject to NTBs. In all, NTBs applied to 17% or so of all China's tradable goods in 1992. After 1992, NTBs were eliminated on hundreds of products. At present, 384 items, which account for less than 6%, are controlled. These items are distributed over 13 manufacturing sectors.

In the past, China's government has always maintained barriers to foreign investment. Some priority sectors, however, such as energy production, communication and transportation encouraged foreign investment. At present, foreign investment is being allowed in more and more sectors, including the financial sector.

2.2 Degree of Openness of Manufacturing Sectors

An economy is tied into the international market mainly through exports and imports. The ratio of exports and imports to domestic production shows the degree of openness. Table 2.1 shows the openness of 24 manufacturing sectors in the period 1993~1995. The data shows that most consumer sectors such as furniture, stationery, leather and garments have the highest export dependency. Some intermediate sectors such as paper and printing, medical, nonmetal and nonferrous metal show the lowest dependency. In all the sectors under study, export dependency is increasing. Stationery, furniture, beverage, tobacco, medical and nonmetal have the lowest import penetration. This means these sectors are only loosely tied into the international market. Sectors such as leather, chemical fibers, plastic, machinery and instruments have the highest import penetration. These sectors are major manufacturing import sectors. Beverages, furniture, stationery, ferrous metal, petroleum and transportation are experiencing a decreasing import penetration. The decreasing import penetration in these sectors except for stationery is generally due to the fact that exports are growing faster than imports. Other sectors show increasing import penetration. The degree of openness ranges from 160.23% in furniture to 3.53% in beverage in 1995 in terms of trade dependency. The degree of total openness has increased rapidly from 24.64% in 1993 to 35.54% in 1995 among manufacturing sectors. This indicates that the domestic market has become more closely tied to the international market (for a comparison of the degree of openness among three groups of industries, see Table 2.3).

Table 2.1 **Degree of Openness of China's Manufacturing Sectors, 1993-1995** **(%)**

sector	export dependency 1993	export dependenc 1994	export dependenc y1995	average 1993-199 5	import penetration 1993	import penetration 1994	import penetration 1995	average 1993-199 5	trade dependenc y1993	trade dependenc y1994	trade dependenc y1995	average 1993-199 5
food	13.96	20.82	19.91	18.78	3.79	9.88	11.00	8.35	16.78	27.15	27.13	23.95
beverages	2.24	3.23	2.82	2.81	0.35	0.32	0.28	0.32	2.58	3.53	3.08	3.04
tobacco	4.74	6.11	8.31	6.53	1.53	0.31	3.15	1.69	6.14	6.38	10.96	7.81
textiles	20.95	28.77	33.08	28.18	9.49	14.66	18.77	14.05	27.00	36.53	42.04	35.09
garments	68.25	91.70	83.55	82.67	6.53	23.20	20.17	13.57	68.94	91.91	84.21	81.61
leather	87.88	110.94	105.44	103.19	64.88	171.07	128.94	107.05	90.10	108.66	104.38	101.29
furniture	100.12	145.14	166.14	141.51	101.20	- 38.27	- 17.42	-41.21	100.11	140.12	160.23	133.50
stationery	104.66	138.50	125.90	125.17	186.64	- 39.03	- 92.59	-94.66	104.24	134.75	123.03	120.72
timber	7.10	9.98	11.93	9.97	25.42	29.23	26.18	26.87	29.44	34.38	32.89	32.17
paper and printing	3.81	5.53	6.49	5.45	11.35	17.29	17.31	15.28	14.36	21.11	21.80	19.09
petroleum	16.34	18.62	21.96	19.27	21.66	18.53	21.31	20.61	32.06	31.33	35.58	33.04
chemical	9.61	14.40	17.05	14.27	12.51	17.68	21.10	17.24	19.95	27.70	32.11	26.91
medical	3.56	4.73	5.39	4.66	2.22	2.15	2.28	2.22	5.63	6.68	7.43	6.56
chemical fibers	21.45	36.22	33.95	31.73	40.47	53.48	50.63	48.34	48.80	63.20	60.62	57.95
rubber	4.79	7.29	10.05	7.66	7.46	11.60	12.83	10.54	11.58	17.35	20.57	16.46
plastics	14.74	24.73	26.18	22.75	31.94	43.25	44.57	40.07	39.10	52.17	53.68	48.69
nonmetals	3.28	5.73	7.37	5.64	1.38	2.19	2.75	2.07	4.57	7.68	9.74	7.23
ferrous metals	1.23	2.88	10.92	4.83	15.14	15.02	13.09	14.59	16.03	17.11	21.46	17.80
nonferrous metals	4.42	9.09	9.82	8.09	11.10	13.00	17.71	13.99	14.61	19.96	24.48	19.73
metal products	18.97	30.92	40.08	30.83	15.68	23.47	26.15	21.20	29.58	43.00	50.57	40.73
machinery	9.49	15.56	21.81	15.96	30.66	39.00	42.67	37.08	35.36	45.17	50.57	43.46
transportation equip.	4.26	7.64	10.36	7.66	16.77	22.27	13.14	17.45	19.75	26.96	21.07	22.47
electric	17.70	28.11	30.95	26.66	22.05	31.45	31.42	28.29	33.24	45.94	47.55	42.56
instruments	17.17	31.46	47.62	32.82	30.57	42.80	55.21	41.83	39.31	54.70	68.17	53.86
consumer goods	28.59	39.80	40.00	37.00	7.90	13.42	15.39	12.63	32.71	44.94	45.92	42.26
intermediate goods	7.45	12.11	16.00	12.23	14.33	17.59	19.26	17.26	19.85	25.99	30.01	25.82
capital goods	11.06	18.52	23.35	18.27	24.43	32.46	32.29	30.17	30.93	41.45	43.87	39.60
total	13.29	20.32	22.61	19.27	14.80	19.60	20.59	18.18	24.64	33.28	35.54	31.07

Source: calculated by author according to China Statistical Yearbook 1994~1996 and China's Customs Statistics 1993, Monthly 1994, 1995. Export dependency is ratio of exports (X) to gross output value of industry (GOVI), Import penetration is ratio of imports (M) to GOVI plus M minus X, trade dependency is ratio of trade to the sum M and GOVI.

2.3 Level of Protection in Manufacturing Sectors

Tariffs and NTBs are adopted mainly to protect domestic industries. They are established in the light of domestic demand, actual level of industrial development, industrial competitiveness and the like. Thus their levels can be employed to some extent to show the level of protection for sectors. Four indices are (1) nominal tariff rate (NTR), defined as simple average tariff rate, (2) actual tariff rate (ATR), defined as the share of tariff revenue in the sum of exports and imports, (3) the percent of NTBs, which is the share of prohibited or restricted items in total number of import items, and (4) effective protection rate (EPR), calculated according to Bela Balassa's formula (1971). China's present protection structure for 24 manufacturing sectors is listed in Table 2.2.

In general, the highest NTR protection is concentrated in consumer goods such as garments, beverages, tobacco and furniture, followed by capital goods such as transportation. Intermediate goods, with the exception of chemical fiber, have the lowest protection. This system of protection aims at encouraging exports of tradable goods and keeping imports as low as possible, on the other hand, at decreasing the cost of imports of intermediate and capital goods employed to domestic production. In practice, China's ATR is much lower than its NTR. China's ATR was 4.28% in 1993, 2.74 % in 1994, and 2.63% in 1995. The major reasons for this are the existence of a large volume of processing trade (meaning importing materials, processing the materials in China and exporting the goods), generally deducted or free taxes policy, and a large amount of smuggling.

In terms of China's EPR, consumer goods such as food, beverages, some textiles, garments and furniture receive the most protection, followed by some intermediate (chemical fibers) and capital goods (vehicles and other transportation). The least protected are the other intermediate and capital goods. Some are given negative protection, e.g. paper and printing, some chemical goods, railway transportation, ships

Table 2.2 **Levels of Protection for China's Manufacturing Sectors** **(%)**

Sector	NTR1995	ATR1995	EPR1995	NTR/EPR 1995	NTBs 1996	structure of NTBs1996
food	42.30	2.76~4.75	3.73~12.02	3.05~9.05	10	2.60
beverages	69.78	6.32	10.79~11.23	6.21~6.46	4	1.04
tobacco	64.09	5.80	6.86	9.34	7	1.82
textiles	54.99	2.49~6.69	1.23~11.73	5.11~22.27	11	2.86
garments	73.33	6.64	11.8	6.21		
leather	53.71	4.86	6.59	8.16		
furniture	56.08	5.08	8.67	6.47		
stationery	55.03	4.98	7.47	7.37		
timber	14.66	1.33	0.70	21.04		
paper and printing	26.57	1.09~2.60	-0.42~2.72	-28.9~10.54		
petroleum	16.23	1.50	1.42~3.12	5.29~11.63	7	1.82
chemical	21.39	0.53~3.59	-0.98~ 4.83	-5.92~24	33	8.59
medical	17.09	1.55	0.62	27.54		
chemical fibers	61.55	5.57	7.18	8.57	30	7.81
rubber	26.24	2.38	1.03~1.36	19.27~ 25.46	11	2.86
plastics	31.34	2.84	3.07~3.33	9.41~10.2	1	0.26
nonmetals	41.30	3.08~4.41	3.64~6.67	7.3~ 9.34		
ferrous metals	13.75	1.25	0.96	14.37		
nonferrous metals	15.19	1.38	1.53	9.95		
metal products	32.76	2.97	3.85~5.08	6.45~8.50		
machinery	26.48	2.40	2.42~2.79	9.5~10.94	90	23.44
transportation equip.	48.10	0.47~5.66	-0.97~9.32	-172~7.63	97	25.26
electric	30.59	2.77	2.7~ 3.63	8.43~11.34	56	14.58
instruments	22.60	2.05	1.57	14.36	20	5.21
total	35.90	2.63			384	100.00

Source: calculated according to China Statistical Yearbook 1996, Input-Output Table of China 1992, Customs General Administration of P. R. China, China's Individual Action Plan 1996.

and aircraft. Since ATR is much lower than NTR, China's EPR is much lower than its NTR. Thus at present China's tariff policy has not performed an effective role in protecting domestic industries.

As for the present structure of NTBs in manufacturing sectors, prohibitions and quotas mainly apply to 384 goods distributed over 13 industrial sectors, accounting for 5.9% of all tradable goods. These sectors are food, beverages, tobacco, textiles, petroleum, chemical, chemical fibers, rubber, plastics, machinery, transportation equipment, electric and instruments. The most prohibited or restricted of all are capital goods of 384 goods for which trading is prohibited or restricted, 263 items, or 68.49%, are capital goods. Intermediate goods account for 21.35%, and consumer goods for 8.33%. The structure of protection is the opposite to that of NTR. It aims at limiting imports of goods which can not be produced by domestic manufacturers or which are overproduced by domestic producers. Since there is rigorous administrative systems in NTBs, NTBs have performed a more effective role in limiting imports than NTR. However, due to the non-transparency of their management, imports have sometimes surpassed the quota amounts.

Table 2.3 Comparison of Openness and Protection among China's Three Groups

	trade dependency	export dependency	import penetration	NTR	ATR	EPR	NTBs
consumer	high	high	low	high	high	high	low
intermediate	low	low	middle	low	middle	middle	middle
capitals	middle	middle	high	middle	low	low	high

source: Made by author according to Table 2.1 and Table 2.2.

A comparison of the level of protection among China's manufacturing sectors divided into three groups is provided in Table 2.3. Within manufacturing sectors, the higher the openness, the higher the protection in terms of tariffs, and the lower the protection by NTBs. Generally

speaking, tariffs have production effects, consumer effects and revenue effects (Williamson J., 1983). The role of the tariffs under study is concentrated on production effects. It seems that the choice of tariff structure is being based on the need for industrial development. Along with the transformation of the production structure, tariffs policy should be changed into protecting leading or key industries and reducing the high level of protection for competitive sectors. Thus industrial development will benefit from tariffs policy. That is the argument presented in this paper.

3. Openness and Changes in China's Trade Patterns among Manufacturing Sectors

Trade liberalization policy results in increases in the trade opportunities for each economy and promotes its economic growth. with the implementation of the strategy of trade liberalization in 1992, China has seen some changes in trade patterns between 1993 and 1995. A slight shift in the leading export sectors from consumer to capital and intermediate goods shows gradual improvement in its trade patterns. This helps China to gain comparative advantage further and participate extensively in the international division of labor.

3.1 Growth of Exports and Imports and Changes in Share of Exports and Imports in Manufacturing Sectors

With the increase in trade opportunities, China's exports and imports have shown great growth recently. Twenty-four manufacturing sectors have experienced positive export growth. The fastest growth is concentrated in intermediate and capital goods such as ferrous metals, instruments, nonferrous metals and transportation equipment. As fo

r the three groups, capital goods have shown the fastest export growth, followed by intermediate goods. The slowest is consumer goods. These changes in the growth of exports among manufacturing sectors likely predict a shift of leading export sectors from the present labor-intensive (mainly consumer goods) goods to some capital- or skilled labor-intensive

goods (due to some problems in the classification of industries, capital goods include some labor-intensive goods such as TVs, refrigerators, and washing machines. In some places this paper provides the commodity composition of exports in a sector).

As for the growth of imports, there are considerable differences between sectors. Intermediate and capital goods have shown slightly lower import growth than have consumer goods. This seems contrary to the previous impression that intermediate and especially, capital goods experienced higher import growth than did consumer goods since the opening to the outside. Consumer goods such as food and garments have shown growth in this area. Some intermediate and capital goods such as ferrous metals and transportation have shown negative import growth. This indicates that import patterns among manufacturing sectors will probably change from importing capital-intensive goods to labor-intensive ones.

Changes in the growth of exports and imports among manufacturing sectors bring about changes in their shares of exports and imports. Consumer goods in general now hold a decreasing share of total exports. A striking decrease is occurring in garments, textiles and leather. The share of total exports of intermediate and capital goods is increasing as a consequence. The share of ferrous metals and electric sectors are increasing especially rapidly. In particular, the share of exports of electric products surpassed that of garments and occupied first place for the first time in 1995. However, changes in import patterns are slightly different from the above changes in export patterns. Intermediate and capital goods hold a decreasing share of total imports. Remarkable changes are taking place in transportation, machinery and ferrous metals. Consumer goods such as textiles hold an increasing share of imports.

Table 3.1 Changes in Exports and Imports among Manufacturing Sectors,1993-1995 (%)

sector	exports 1993	exports 1994	exports 1995	imports 1993	imports 1994	imports 1995	value-added 1993	value-added 1994	value-added 1995	growth of exports 95/93	growth of imports 95/93
food	6.24	6.66	6.48	1.34	2.90	3.63	5.32	5.67	4.58	29.77	85.63
beverages	0.33	0.31	0.26	0.04	0.03	0.03	2.16	2.25	2.29	14.31	-10.24
tobacco	0.70	0.57	0.67	0.19	0.03	0.27	3.29	3.76	3.97	24.90	33.88
textiles	13.98	13.65	12.26	4.88	6.07	6.45	7.40	7.60	5.82	19.24	29.58
garments	12.85	12.67	9.89	0.37	0.36	0.55	2.53	2.42	2.25	11.69	38.19
leather	9.51	8.97	8.27	2.14	2.23	2.14	1.18	1.38	1.30	18.77	12.81
furniture	2.92	3.04	3.02	0.26	0.27	0.20	0.38	0.40	0.37	29.65	-1.73
stationery	4.13	3.98	3.76	0.35	0.33	0.42	0.51	0.53	0.59	21.47	23.29
consumer goods	50.66	49.85	44.61	9.58	12.22	13.70	22.77	24.00	21.16		
timber	0.38	0.35	0.39	1.48	1.37	1.15	0.74	0.68	0.62	29.78	-0.56
paper and printing	0.69	0.62	0.75	1.96	2.30	2.53	2.14	2.15	2.30	32.68	28.17
petroleum	4.48	3.36	3.59	5.60	3.49	3.89	2.69	2.95	3.63	13.95	-6.08
chemical	4.33	4.37	5.24	5.14	5.84	7.68	5.32	5.39	6.10	40.16	37.79
medical	0.47	0.40	0.42	0.25	0.18	0.19	1.78	1.71	1.71	20.46	-1.66
chemical fibers	1.85	2.21	2.21	4.05	4.69	4.97	1.14	1.17	1.31	39.45	24.85
rubber	0.41	0.38	0.50	0.57	0.67	0.74	0.98	0.94	0.90	41.33	28.26
plastics	1.99	2.20	2.38	4.77	5.33	6.07	1.62	1.51	1.46	39.19	27.19
nonmetals	1.45	1.65	1.79	0.53	0.63	0.72	6.99	6.41	5.83	41.61	31.35
ferrous metals	0.92	1.15	3.22	11.59	7.17	4.45	10.01	8.78	6.82	138.56	-30.13
nonferrous metals	0.82	1.05	1.08	1.95	1.64	2.42	2.03	1.79	1.96	46.79	25.61
metal products	4.68	5.06	5.33	3.28	3.63	3.18	3.10	2.99	2.49	35.80	10.87
intermediate goods	22.44	22.79	26.89	41.16	36.94	37.99	38.55	36.48	35.12		
machinery	6.24	6.24	7.24	23.20	22.65	21.75	8.17	7.99	7.25	37.19	9.15
transportation	2.10	2.33	2.76	8.39	8.45	4.06	5.43	5.14	5.21	45.89	-21.58
electric	10.57	11.66	12.77	12.27	14.31	14.70	6.90	7.25	8.02	39.97	23.38
instruments	1.19	1.28	1.63	2.23	2.18	2.49	0.96	0.88	0.79	49.10	19.11
capital goods	20.09	21.51	24.39	46.09	47.60	43.01	21.45	21.26	21.27		

Source: China Customs Statistics Yearbook 1993~1995. China Statistical Yearbook 1994~1996.

However, in 1995, the share of exports of consumer goods in all of China's exports was 44.61%, intermediate goods 26.89% and capitals 24.39%. The share of exports of consumer goods in total exports is much higher than that of intermediate and capital goods. This indicates that consumer goods are the leading exports sector. Within import patterns, capital goods occupied first place (43.01%), followed by intermediate (37.99%) and consumer goods (13.7%) in 1995. The share of imports of intermediate and capital goods is thus a little higher than that of consumer goods. In terms of the composition of imports, China still has great demand for machinery (21.75%) and electric (14.7%). Capital and intermediate goods are major import sectors.

As shown above, the changes in the growth of exports and imports and in shares have been remarkable. To some extent, these are due to changes in China's trade liberalization policy.

3.2 Further Pursuit of Comparative Advantage

"To reap the gains from pursuing comparative advantage, a country must alter its structure of production in response to changes in trade opportunities. Two different types of specialization can be observed. The first type is sectoral specialization with an increasing volume of inter- industry trade, that is, high exports in some sectors and high imports in others. This is the pattern predicted by classical (and neoclassical) trade theory. The second type, which is consistent with the "neotechnological" or "product cycle" views of trade, and especially with the new theory of international trade under imperfect competition, is specialization through diversification within sectors. We would thus expect to see increasing intra-industry trade with both higher imports and higher exports in the manufacturing sectors" (Chenery, 1986).

The conclusion above may be used to evaluate trade patterns within a country and to indicate trade opportunities during the process of industrial development. Therefore, in this and following Section, China's present trade patterns will be examined.

The purpose of participating in inter-industry trade is to obtain gains from comparative advantage. The index of revealed comparative advantage (RCA) is usually used to measure the comparative advantage of different sectors (Bela Balassa,1965, 1977). According to

Balassa, RCA is defined as the ratio of a country's exports in a particular commodity category to its share of total merchandise exports. Generally speaking, the higher the RCA of an export commodity, the higher the extent of sectoral specialization. Sometimes, the net export index (NE) is also employed to show a sector's RCA. It is defined as net exports divided by the sum of exports and imports for a particular industry. The NE indicates the effects of comparative advantage on the relationship between exports and imports rather than on exports alone. The results reported in Table 3.2 show China's RCA for 24 manufacturing sectors in 1994 and the NE for the same sectors between 1993 and 1995.

China's comparative advantage is concentrated in consumer goods, including leather, garments, furniture, and stationery. RCA in these four sectors ranges from 495 to 148, and NE indices between 0.93 (garments) and 0.61 (leather). Imports of tobacco (106) was slightly unusual in 1994, and much less than usual years (its NE index was 0.5 or so in 1993 and 1995). Textiles (469) and food (102) have a comparative advantage in exports, but their net export indices are lower than 0.5 because of China's large population. China has low RCA index (45) and high net export indices (0.82) in the beverage sectors. Since consumer goods are labor-intensive, China has comparative advantage in labor-intensive products.

Among intermediate goods, timber has a comparative disadvantage because of the lack of natural resources, and its net export index is negative. RCA for chemical fibers, plastics and metal products are all higher than 100, but their net export indices are much lower, and even negative for fibers and plastic. Other intermediate goods have comparative disadvantage (their RCA indices range from 22 in paper and printing to 73 in nonmetals) and their net export indices are negative except nonmetals and medical. Capital goods, for this part, have a comparative disadvantage over foreign competitors. The highest RCA value is for electric, and the lowest for transportation. The net export indices of all these sectors are negative, ranging from -0.53 (machinery), to -0.06 (electric), Since intermediate and capital goods are capital or technological-intensive, the comparative disadvantage in these sectors indicates both capital and technology shortages.

However, China's patterns of comparative advantage will probably take the following form. First, the leading role of exports of consumer goods will likely decrease. The NE indices for most consumer goods are decreasing. These sectors will be exposed to increasingly severe competition both from the more advanced technologies used by developed economies and the lower cost of labor forces in other developing economies. Second, tradable goods with comparative disadvantage will have increased NE indices, leading to increasing RCA. For example, the comparative advantage of electric goods is increasing, and it will probably become the leading export sector in the future, although its NE index is negative at present.

3.3 Extensive Participation in the International Division of Labor

With the increasing levels of technological development and changes in consumer patterns, intra-industry trade has become important in patterns of trade. The development of intra-industry trade has brought the following benefits for the developing countries. First it may maintain the balance of payments in a sector. This is helpful in improving the terms of trade of the low-technological goods of developing economies. Second it will expand the extent of the international division of labor for developing countries.

Grubel and Lloyd (1975) invented an index to measure the extent of intra-industry trade and Krugman (1982) proved the validity of this index. It is expressed as: $IITI_i = 1 - |X_i - M_i| / |X_i + M_i|$, where Xi, Mi, respectively denote exports and imports in sector i. Without intra-industry trade, either imports or exports is zero in each sector, the second term is one, and IITIi is 0. If there is perfectly balanced intra-industry trade, exports are equal to imports in every sector and IITIi is 1. China's IITIi are shown in Table 3.2.

Table 3.2 Changes in China's Trade Patterns, 1993-1995

sector	IITI 1993	IITI 1994	IITI 1995	average (1993-1995)	RCA (%)	1994 NE	1993 NE	1994 NE	1995	average (1993-1995)
food	0.39	0.59	0.66	0.58	102.94	0.61	0.41	0.34		0.42
beverages	0.27	0.18	0.17	0.20	45.79	0.73	0.82	0.83		0.80
tobacco	0.48	0.09	0.53	0.41	106.22	0.52	0.91	0.47		0.59
textiles	0.57	0.60	0.64	0.60	468.85	0.43	0.40	0.36		0.40
garments	0.06	0.05	0.09	0.07	346.32	0.94	0.95	0.91		0.93
leather	0.41	0.38	0.37	0.39	494.94	0.59	0.62	0.63		0.61
furniture	0.19	0.16	0.11	0.15	193.53	0.81	0.84	0.89		0.85
stationery	0.18	0.14	0.18	0.17	148.19	0.82	0.86	0.82		0.83
timber	0.37	0.42	0.55	0.45	40.87	-0.63	-0.58	-0.45		-0.55
paper and printing	0.47	0.44	0.50	0.47	22.49	-0.53	-0.56	-0.50		-0.53
petroleum	0.83	1.00	0.98	0.95	56.11	-0.17	0.00	0.02		-0.05
chemical	0.85	0.88	0.87	0.87	57.07	-0.15	-0.12	-0.13		-0.13
medical	0.76	0.61	0.58	0.65	27.11	0.24	0.39	0.42		0.35
chemical fibers	0.57	0.66	0.67	0.64	252.61	-0.43	-0.34	-0.33		-0.36
rubber	0.77	0.75	0.86	0.80	49.94	-0.23	-0.25	-0.14		-0.20
plastics	0.54	0.60	0.61	0.59	220.82	-0.46	-0.40	-0.39		-0.41
nonmetals	0.59	0.54	0.52	0.54	72.58	0.41	0.46	0.48		0.46
ferrous metals	0.13	0.29	0.90	0.42	52.75	-0.87	-0.71	-0.10		-0.58
nonferrous metals	0.54	0.80	0.67	0.68	61.56	-0.46	-0.20	-0.33		-0.32
metal products	0.89	0.81	0.69	0.78	161.40	0.11	0.19	0.31		0.22
machinery	0.38	0.45	0.55	0.47	40.24	-0.62	-0.55	-0.45		-0.53
transportation equip.	0.36	0.45	0.87	0.54	18.98	-0.64	-0.55	-0.13		-0.46
electric	0.86	0.92	0.99	0.94	96.20	-0.14	-0.08	-0.01		-0.06
instruments	0.64	0.76	0.85	0.77	52.46	-0.36	-0.24	-0.15		-0.23
total	0.46	0.52	0.63							

Source: China Customs Statistics Yearbook 1993-1995; International Trade Statistics Yearbook 1994.

Some intermediate and capital goods had the high IITIi values (>0.8) in 1995. These sectors include petroleum, electric, transportation equipment, instruments, rubber, ferrous metals and chemical. The indices are between 0.6 and 0.8 for food, textiles, chemical fibers, nonferrous metals, plastics, and metal products. With the exception of textiles and food, these sectors above are capital- or skilled labor-intensive industries. In terms of changes in IITIi among manufacturing sectors, most sectors have an increasing IITIi, including export goods with the comparative advantage such as textiles. Among sectors with an increasing IITI, the fastest growth can be seen in capital goods such as electric, transportation and instruments. However, machinery has a low IITIi, and exports must be expanded in order to improve the extent of intra-industry trade. The total intra-industry trade index for 24 sectors increased from 0.46 in 1993 to 0.63 in 1995. This shows the increasing ability of China's manufacturing sectors to participate in intra-industry specialization in the world market.

In short, trade liberalization has brought about some changes in inter-industry trade and the development of intra-industry trade. It can be predicted that with the increases in the extent of trade liberalization, intra-industry trade will be further developed and the level of international division of labor among China's manufacturing sectors such as capital sectors will be improved.

4. Openness and Changes in the Level of Competition of China' s Manufacturing Sectors

Trade liberalization leads to the gradual integration of the domestic market into the international market. This subjects the domestic enterprises to the pressure of competition from both domestic and international markets. Uncompetitive domestic enterprises will face a steadily deteriorating economic environment. In China's case, domestic enterprises is facing more serious competition with imports and with foreign-funded enterprises than ever before.

4.1 Competition with Imports

According to Balassa's classification of the level of competition in the domestic and international market (1971), manufacturing sectors are categorized into four groups: (1) the export sectors, meaning sectors where more than 10% of domestic production is exported and less than 10% of domestic consumption is imported; (2) sectors competing with imports and exports, referring to sectors where more than 10% of domestic production is exported and more than 10% of domestic consumption is imported; (3) import-competing sectors, signifying sectors where imports provide more than 10% of domestic supply and less than 10% of domestic production is exported; and (4) non-import-competing sectors, where international trade does not exceed 10% in either direction.

The level of competition of each China's sector is shown in Table 4.1. As shown in this table, the export sectors are concentrated in food, garments, and furniture. These sectors are labor-intensive goods. Therefore, at present labor-intensive sectors are internationally competitive in China's exports.

There are 15 sectors which compete with imports and exports, including textiles, leather, stationery, sawmills, petroleum, chemical, chemical fibers, rubber, plastics, ferrous metals, metal products, machinery, transportation equipment, electric, and instruments. Except for the first three sectors, all sectors are intermediate and capital goods. In the international market, these goods have some competitiveness.

The import-competing sectors are paper and printing and nonferrous metals. These two sectors require a large amount of imports due to China's lack of natural resources. At present, they are the least internationally competitive.

Non-import-competing sectors include tobacco, beverages, nonmetals, and medical. Because these sectors are less linked to the international market, have an absolute advantage or are highly protected, they do not face competition from imports or foreign-funded enterprises.

There have been some changes in competitive level among manufacturing sectors between 1993 and 1995. With the exceptions of furniture and stationery, changes in the competitive level from import-competing to competing with imports and exports, has occurred. These sectors include timber, chemical, rubber, ferrous metals, machinery, and transportation equipment. This shows the increasing ability of these sectors to export. In particular, the increasing ability to export in machinery and transportation equipment manufacturing sectors has been beneficial for the efforts of China's enterprises to take part extensively in the international division of labor.

According to the above, trade liberalization has different effects on different manufacturing sectors. One export sector, the garments sector will probably face an increase in the level of competition from imports. The pressure of competition come from goods of both developed and developing countries. Developed countries adopt advanced technologies to compensate for the rising cost of labor. Other developing countries have lower labor cost than China.

Sectors competing with exports and imports will probably be largely affected by imports. Capital- or technological-intense sectors will be affected more severely than labor-intensity ones. At present, these capital- or technological- intensity sectors do not have increasing returns to scale. Some high-technology goods have not been developed due to lacks in technology. Thus there is a considerable difference in the level of technological development between domestic and imported goods. At present, many of these sectors have high import penetration, e.g. machinery, electric, instruments and chemical fibers. Therefore, these sectors will probably be stressed within China's trade liberalization policy.

Table 4.1 Level of Competition of China's Manufacturing Sectors

sector	export dependency 93	import//(im+sales)93	extent of competition 1993	export dependency94	import//(im+sales)94	extent of competition 1994	export dependency95	import//(im+sales)95	extent of competition 1995	changes in sectors	ric93	ric94	ric95	ric93-95
food	13.96	3.44	e	20.82	9.63	e	19.91	9.34	e	e	0.36	0.49	0.57	0.48
beverages	2.24	0.34	u	3.23	0.38	u	2.82	0.27	u	u	0.05	0.09	0.08	0.08
tobacco	4.74	1.40	u	6.11	0.32	u	8.31	2.70	u	u	0.06	0.10	0.09	0.09
textiles	20.95	74.33	em	28.77	14.21	em	33.08	13.96	em	em	0.47	0.73	0.90	0.70
garments	68.25	2.62	e	91.70	3.18	e	83.55	4.25	e	e	2.02	3.62	3.36	3.03
leather	87.88	19.73	em	110.94	24.61	em	105.44	20.59	em	em	2.46	3.53	3.93	3.38
furniture	100.12	10.29	em	145.14	8.58	e	166.14	9.66	e	em-e	2.86	4.94	6.26	4.78
stationery	104.66	9.83	e	138.50	15.85	em	125.90	11.41	em	e-em	3.02	4.89	4.62	4.27
timber	7.10	25.17	m	9.98	12.46	m	11.93	25.04	em	m-em	-0.72	-1.00	-0.82	-0.85
paper and printing	3.81	11.17	m	5.53	48.37	m	6.49	16.50	m	m	-0.29	-0.52	-0.52	-0.46
petroleum	16.34	18.85	em	18.62	18.32	em	21.96	16.65	em	em	-0.28	0.00	0.03	-0.06
chemical	9.61	11.85	m	14.40	18.21	em	17.05	18.48	em	m-em	-0.12	-0.16	-0.21	-0.17
medical	3.56	2.17	u	4.73	2.41	u	5.39	2.20	u	u	0.04	0.09	0.12	0.08
chemical fibers	21.45	34.53	em	36.22	45.25	em	33.95	40.24	em	em	-0.99	-1.38	-1.35	-1.26
rubber	4.79	7.33	u	7.29	12.91	m	10.05	11.83	em	u-m-em	-0.10	-0.19	-0.14	-0.15
plastics	14.74	31.00	em	24.73	41.79	em	26.18	38.35	em	em	-0.86	-1.36	-1.66	-1.31
nonmetals	3.28	1.45	u	5.73	2.57	u	7.37	2.64	u	u	0.05	0.12	0.16	0.11
ferrous metals	1.23	16.33	m	2.88	17.74	m	10.92	11.01	em	m-em	-0.50	-0.46	-0.09	-0.37
nonferrous metals	4.42	13.31	m	9.09	15.84	m	9.82	16.62	m	m	-0.28	-0.20	-0.44	-0.31
metal products	18.97	14.15	em	30.92	21.45	em	40.08	18.27	em	em	0.13	0.38	0.81	0.43
machinery	9.49	29.23	m	15.56	40.99	em	21.81	37.42	em	m-em	-1.01	-1.37	-1.34	-1.25
transportation equ.	4.26	16.13	m	7.64	23.94	m	10.36	11.91	em	m-em	-0.56	-0.79	-0.13	-0.49
electric	17.70	19.09	em	28.11	28.37	em	30.95	24.29	em	em	-0.20	-0.20	-0.03	-0.13
instruments	17.17	27.12	em	31.46	38.07	em	47.62	38.80	em	em	-0.57	-0.65	-0.59	-0.61

Note: e, u, em, m denote export-competing sectors, non-import-competing sectors, sectors competing with imports and exports, and import-competing sectors, respectively.
Source: China Statistical Yearbook 1994~1996, China Customs Statistics Yearbook, 1993~1995.

Import-competing sectors will be mainly subjected to competition from imports. Although trade liberalization increases the level of competition in these sectors, it also expands the resources for imports of materials. It will be helpful to reduce the pressure of demand for these raw materials in domestic production and for economic development. These sectors can be liberalized further in their trade regimes.

There is different level of competition between domestic enterprises and imports and goods produced by foreign-funded enterprises in non-import-competing sectors. Tobacco is one sector in which China's government does not encourage foreign-funded enterprises to invest and import (as shown in the ratio of value-added of foreign-funded enterprises to domestic ones and in high tariffs). Tobacco faces only a low level of competition with imports at present. The nonmetal and beverage sectors, due to the characteristics of their goods, will probably be somewhat affected by trade liberalization. Among non-import-competing sectors, the most largely affected by trade liberalization will be medical sectors. Medical enterprises have to pay the fees to acquire technologies (patent rights) owned by foreign-funded enterprises. This will increase the cost of production.

With the degree of openness increasing, some manufacturing sectors will face increasing pressure from international competition.

4.2 Competition with Foreign-Funded Enterprises

Tariff reduction is one part of China's trade liberalization, and FDI is another. The share of FDI in the total utilization of foreign capital is increasing rapidly, reaching 77.95% in 1995. Accumulated FDI from 1979 to 1995 (calculated without depreciation) hit $1,331.58 billion. Foreign direct investment takes different operational forms: joint ventures, cooperative operations, wholly foreign-owned enterprises and cooperative developments. Among these,

joint ventures and wholly foreign-owned enterprises are the major forms, their share in all FDI was 80.41% in 1995.

In 1995, imports of FDI in China hit $6,294.271 million and exports $4,687.587 million. The trade value share of FDI in China's total trade is slightly high. Its share of exports increased from 27.51% in 1993 to 31.51%, and its imports from 36.18% in 1993 to 47.65% in 1995. Its imports grew at 22.66% (for total imports, the figure was 12.72%) between 1993 and 1995. Its growth of exports was 36.29% (for total exports, 27.35%). Growth in trade for FDI has surpassed the figure for China as a whole. To some extent, exports and imports of FDI have become an important part of total exports and imports. Value-added amounted to RMB258,641 million in 1995, accounting for 16.74% of total value-added. The growth of value-added was 54.69% between 1993 and 1995.

FDI usually plays two different roles in the economy of the host country. First, increases in supply (exports and goods sold in the domestic market) provided by foreign-funded enterprises raise the total output of the host country. However, domestic enterprises face severe competition from foreign-funded enterprises. Their supply patterns (share of value-added) will be focused on in this section.

We employ three indices to compare domestic with foreign-funded enterprises: the shares of numbers and added-value of foreign-funded enterprises in each sector among those of all foreign-funded enterprises in all sectors, the ratios of numbers and added-value of foreign-funded enterprises to those of all enterprises (sum of foreign and domestic enterprises) in each sector, and the ratios of numbers and added-value of foreign-funded enterprises to those of all domestic enterprises in each sector (see Table 4.2).

Table 4.2 Comparison between Foreign-funded and Domestic Enterprises, 1995 (%)

sector	numbers of total enterprises	added-value of total enterprises	numbers of domestic enterprises	added-value of domestic enterprises	numbers of foreign-funded enterprises	added-value of foreign-funded enterprises	ratio of numbers of foreign-funded to all enterprises	ratio of added value of foreign-funded to all enterprises	ratio of numbers of foreign-funded to domestic enterprises	ratio of added value of foreign-funded to domestic enterprises
food	10.55	4.58	10.91	4.18	7.67	6.60	8.12	24.12	8.83	31.79
beverages	3.31	2.29	3.43	2.17	2.43	2.90	8.17	21.21	8.89	26.92
tobacco	0.10	3.97	0.10	4.74	0.02	0.13	2.36	0.56	2.42	0.57
textiles	5.78	5.82	5.44	5.57	8.51	7.05	16.42	20.28	19.65	25.45
garments	4.51	2.25	3.56	1.35	12.04	6.72	29.81	50.02	42.48	100.10
leather	2.36	1.30	2.02	0.76	5.07	3.99	24.01	51.23	31.59	105.04
furniture	1.97	0.37	2.03	0.32	1.50	0.61	8.46	27.82	9.24	38.55
stationery	1.25	0.59	1.11	0.42	2.40	1.43	21.35	40.56	27.15	68.23
consumer goods	29.83	21.16	28.60	19.50	39.63	29.43	14.83	23.28	17.41	30.35
timber	3.49	0.62	3.60	0.56	2.56	0.90	8.20	24.56	8.94	32.55
paper and printing	6.60	2.30	6.94	2.32	3.91	2.21	6.61	16.09	7.08	19.18
petroleum	0.62	3.63	0.66	4.33	0.27	0.16	4.86	0.74	5.11	0.74
chemical	6.39	6.10	6.53	6.33	5.30	4.97	9.25	13.64	10.20	15.79
medical	1.21	1.71	1.15	1.53	1.75	2.62	16.11	25.59	19.20	34.40
chemical fibers	0.30	1.31	0.25	1.42	0.73	0.79	27.23	10.02	37.42	11.14
rubber	1.05	0.90	1.06	0.83	0.95	1.25	10.08	23.31	11.21	30.40
plastics	4.34	1.46	4.11	1.21	6.13	2.71	15.78	31.11	18.73	45.16
nonmetals	13.80	5.83	14.89	6.18	5.14	4.05	4.16	11.65	4.34	13.18
ferrous metals	1.64	6.82	1.75	7.80	0.77	1.93	5.21	4.74	5.49	4.97
nonferrous metals	1.04	1.96	1.06	2.11	0.93	1.17	9.93	10.05	11.03	11.18
metal products	6.92	2.49	7.19	2.28	4.78	3.50	7.72	23.59	8.36	30.87
intermediate goods	47.40	35.12	49.18	36.90	33.22	26.26	7.82	12.52	8.49	14.31
machinery	10.88	7.25	11.55	7.60	5.55	5.47	5.70	12.64	6.04	14.47
transportation equ.	4.38	5.21	4.57	4.79	2.84	7.32	7.25	23.51	7.81	30.74
electric	6.23	8.02	5.71	5.65	10.35	19.83	18.54	41.40	22.76	70.64
instruments	1.27	0.79	1.18	0.60	2.02	1.75	17.72	36.91	21.54	58.50
capital goods	22.76	21.27	23.02	18.64	20.77	34.37	10.18	27.05	11.33	37.08

Source: China's Statistical Yearbook 1996.

First we present the results of our comparison between domestic and foreign-funded enterprises by these three indices. For the comparison with total enterprises and domestic enterprises (see Table 4.3), the most share of added-value was for intermediate and the least for capital goods. Foreign-funded enterprises hold the smallest share in intermediate and the greatest share in capital goods.

Almost the same pattern applies to composition of numbers in the above enterprises. Specifically speaking, there is a considerable difference in the share of added-value between total enterprises, total domestic and total foreign-funded enterprises. Table 4.4 lists the ranking of share of added-value of the first eight sectors by type. We find that in the share of value-added, domestic enterprises mainly provide the supply of intermediate and capital goods such as ferrous metals, machinery and chemical. Foreign-funded enterprises provide capital and consumer goods in sectors such as electric, transportation and textiles. This shows that FDI is concentrated in China's labor-intensive, especially in skilled labor-intensive sectors. The above indicates that in some leading or key sectors such as electric, transportation and textiles, foreign-funded enterprises have more contribution to growth of total output than domestic enterprises. This leads to the much fast growth of exports in these sectors and a higher share of the market controlled by FDI in these sectors.

Table 4.3 Comparison between Domestic and Foreign-funded Enterprises

	total enterprises		foreign-funded enterprises		domestic enterprises	
	number	added-value	number	added-value	number	added-value
consumer	middle	middle	most	middle	middle	middle
intermediate	most	most	middle	least	most	most
capital	least	middle	least	most	least	least

Source: Made by author according to Table 4.2.

Table 4.4 Rank of Value-added in the First eight sectors

rank	all enterprises	domestic enterprises	foreign-funded enterprises
1	electric	ferrous	electric
2	machinery	machinery	transportation
3	ferrous	chemical	textiles
4	chemical	nonmetals	garments
5	nonmetals	electric	food
6	textiles	textiles	machinery
7	transportation	transportation	chemical
8	food	petroleum	nonmetals

Source: Made by author according to Table 4.2.

In order to further examine the role of FDI, we have used the ratios of numbers and added-value of foreign-funded enterprises to total enterprises and domestic enterprises. The ratio of numbers of foreign-funded enterprises to those of domestic enterprises is higher than 10% in garments, leather, textiles, stationery, chemical fibers, ferrous metals, medical, rubber, plastics, electric, and instruments. All but the first four sectors, are intermediate and capital goods. The ratios of added-value of foreign-funded enterprises to those of all domestic enterprises are higher than 10% in all of these sectors except for tobacco, petroleum and nonferrous metal. In the garment and leather sectors, which have a comparative advantage in China, the ratios are even higher than 100%. This means that in China's domestic market, goods made by foreign-funded enterprises make up of supply and exports. Stationery, electric and instruments also have slightly high ratios (70% or so). Foreign-funded enterprises invest not only in sectors where domestic products have no comparative advantage, such as electric sectors, but also in sectors where domestic products have comparative advantage, such as

textiles and garments. In the former sectors, foreign-funded enterprises have more advanced technologies than domestic ones. This allows them to control a large share of the domestic market. In the latter sectors, they mainly use the low cost of labor to take hold of some share of the international market. Overall, supply provided by foreign-funded enterprises amounts to 20% of domestic goods.

Table 4.5 Ratio of Foreign-funded to Total Enterprises in Numbers and Value-added

	to total enterprises		to domestic enterprises	
	number	added-value	number	added-value
consumer	most	middle	most	middle
intermediate	least	least	least	least
capital	middle	most	middle	most

Source: Made by author according to Table 4.2.

FDI's share of total revenue from sales in 1995 was 19.11%. A 12% or so share of the domestic market is controlled by FDI (one third of sales is exported by FDI). Although the total market share controlled by FDI is not high, its aim is changing from taking advantage of the low cost of labor and preferential policies to controlling China's market in some key sectors. Over the past few years, a large number of China's famous brands have disappeared due to a decrease in competitiveness in some leading or key sectors. This shows that quite a large number of foreign goods have some share of China's domestic market. For example, in the electric sector in 1995, the share of electric goods produced by FDI to all FDI was more than the share of domestic production to all domestic production. And for some advanced goods in the electric sector which can not be produced by domestic enterprises, foreign-funded enterprises have taken over a slightly high share of China's domestic market. For example, in the telecommunication sector, FDI has taken nearly 90% of the market.

In general, with the increase in FDI, a greater and greater share of the domestic market is being

controlled by FDI, particularly in some leading or key sectors. If China's manufacturing sectors can not adjust their composition of commodity, they will be subjected to increasing pressure from competition in the domestic market.

5. Two Bottlenecks for China's Trade Liberalization

In the two previous sections, the roles of trade liberalization have been discussed. We find that trade liberalization has played an ever increasing role in the development of China's trade patterns and economies. On the other hand, trade liberalization increases the level of competition in most manufacturing sectors. We need to consider further the following. Can China's manufacturing sectors catch trade opportunities and meet the challenge from trade liberalization? Will China be capable of regulating its trade liberalization? There are two questions which need to be answered. One is the technological development of China's manufacturing sectors. The other is the establishment of effective competitive systems.

5.1 Technological Development of China's Manufacturing Sectors

Trade liberalization is usually realized by reducing tariffs and abolishing NTBs. However, in this process, an economy has to take the level of industrial development into account. If an economy has the solid ability to upgrade its industrial structure, its manufacturing sectors will be internationally competitive. These sectors need not be protected. For example, the Unite States and Japan have set much lower tariff rates for automobiles than has China. They have rates of 0~4%, whereas in China, it has been set at 150%. In China, the automobiles are the infant industry, due to the low level of technological development. Therefore, the ability to upgrade the industrial structure may be an important factor to be considered.

The process of China's industrialization is moving in the same direction as other countries of the world. However, there are some questions which need to be settled. Most importantly, the

level of technological development needs to be improved. Otherwise, the following may happen: (1) the export patterns will be difficult to shift; (2) the pressure of imports will likely increase; and (3) international competitiveness may fall. Thus the positive role of trade liberalization will probably be lessened.

Let us examine the present level of technological development of manufacturing. We find that China's industrial development and changes in its trade patterns depend mainly not on improvements in technological development but rather on high capital inputs.

As shown in Table 5.1, the fastest growth of overall labor productivity (OLP) is in tobacco, followed by electric, petroleum, chemical, stationery, furniture, chemical fibers, paper and printing and beverages. The OLP growth has been slow in food, textiles, garments, timbers, medical, plastics, nonmetals, ferrous metals, machinery, transportation equipment, and metal products. Some of them have negative growth of OLP. In manufacturing, capital goods have shown faster growth than consumer and intermediate ones. If we consider changes in OLP as representative of changes in technological progress, we may reach some further conclusions. Faster changes in technological development have been concentrated in intermediate and capital goods. Key sectors such as machinery and transportation have experienced slow progress in technological development. The machinery manufacturing sector is tightly linked to industries and is the basis of industrial upgrading. Lack of technological development in their area can lead to a slow shift of trade patterns and the improvement of international competitiveness.

Table 5.1 **Changes in China's Manufacturing Sectors, 1993-1995**

sector	growth of output 95/93	growth of fixed assets original value 95/93	OLP 1995	growth of labor productivity 95/93	capital intensity 1995 (yuan per head)	growth of capital intensity 1993-95	import substitution 1993-95
food	1.81	37.02	17224.5	-0.87	58895.96	35.09	5.73
beverages	12.84	33.70	23850	13.39	68398.35	29.21	-0.08
tobacco	20.50	41.13	190951	21.89	127957.58	32.30	1.44
textiles	-2.79	27.43	10350	-0.83	41667.31	28.47	5.73
garments	3.34	32.24	12960	1.14	27186.29	28.02	1.82
leather	15.20	33.19	13411	6.75	30994.95	23.42	1.21
furniture	8.10	30.88	11470	10.65	30542.86	28.99	-0.40
stationery	18.19	37.15	12872	14.30	36417.95	26.16	1.94
timber	-0.14	32.38	9225	-1.64	34035.62	32.38	-0.25
paper and printing	13.71	32.61	12165.5	12.52	46890.43	29.10	5.40
petroleum	27.40	40.79	71586	19.26	199897.22	36.83	-1.34
chemical	17.43	32.95	19716	17.31	72692.96	29.18	6.71
medical	7.58	31.06	23080	1.76	54088.24	23.79	0.02
chemical fibers	17.99	28.82	36314	11.90	168187.23	23.22	5.57
rubber	4.95	34.66	14286	4.01	41538.96	33.78	4.57
plastics	3.86	33.02	14198	1.54	59990.83	28.05	8.67
nonmetals	0.12	39.03	11356	-2.12	65578.35	34.21	1.22
ferrous metals	-9.47	35.44	27295	-9.23	114896.24	34.46	-3.15
nonferrous metals	7.61	26.94	24946	4.93	95466.34	21.15	5.60
metal products	-1.83	34.64	13719	0.41	42104.66	34.29	4.41
machinery	3.30	29.31	13279.5	5.54	39704.94	30.67	8.21
transportation	7.40	37.11	19336	5.37	50800.00	31.04	-4.23
electric	18.26	37.59	26232.5	20.80	54887.98	30.99	5.15
instruments	-0.13	26.47	12903	5.87	35346.51	26.47	12.51
total	9.67	32.00	18477	9.28	68061.71	29.27	

Source: China's Statistical Yearbook, 1996.

Table 5.3 Changes of Industrial Structure in Three Groups

	output	labor productivity	capital formation	capital intensity	export growth	import growth
consumer	middle	middle	low	middle	slow	fast
intermediate	slow	slow	high	high	middle	slow
capital	fast	fast	middle	low	middle	middle

Source: Made by author according to Table 5.2.

On the other hand, most sectors have higher capital formation (growth of the original value fixed assets). This was one of reasons to bring about growth of exports. For example, a large amount of capital input leads to an increasing scale of economies in electric and transportation sectors. Thus these sectors have a higher export growth rate.

The present level of technological development results in the following questions. First, the leading export sectors have not shifted from labor-intensity to capital-intensity goods (see Table 5.2). One change in the export structure is that exports of electric products surpassed those of the garments and occupied first place for the first time in 1995. Due to the contribution of FDI, the electric sector has been generally changed from one of the greatest importers into major source of exports. However, most exports in the electric sectors are labor-intensive goods such as TVs, refrigerators and washing machines. For some immediate and capital goods, exports are much lower than imports. At the same time, a pattern existed of exporting low-technological products and importing the advanced products contained in them. For example, in the transportation equipment manufacturing sector, China has the capability to export vehicle parts. But it does not have the capability to export the entire cars. In machinery manufacturing, China exports low-technology machines. Therefore China is an exporter of labor-intensive goods. However, from the viewpoint of share of value-added, intermediate and capital goods(most of them are capital-intensive) are dominant in the industrial structure of

China's manufacturing sectors (1995). Production structure (share of value-added) has not led to changes in export patterns (share of exports). This reason is the lack of technology.

Second, the demand for imports of high-technology goods has not been slow to change. In order to analyze the effects of technological development on import patterns (mainly referring to intermediate and capital goods), we employ the rate of import substitution (see Table 5.1). Relatively rapid import substitution has taken place in petroleum, ferrous metals, and transportation equipment. The major reason is that FDI has performed an important role in improving the level of technological development and bringing increasing returns to scale of economies to transportation equipment manufacturing sector. Therefore, imports of transport equipment have decreased largely, with the growth of imports being negative between 1993 and 1995. Most intermediate and capital goods have shown a decreasing import substitution. The lowest is for instruments, followed by plastics, machinery, chemical, chemical fibers, nonferrous metals, paper and printing, electric, rubber, metal products, nonmetals. In the electric sectors, imports of advanced goods (29.04%) are much greater than exports (7.21%) and imports of low-technological goods (70.97%) are much smaller than exports (92.79%) (the above figures are calculated by the author). Imports have played an important role in industrial development, solving the problem of shortages in capital goods. Therefore, the success of import substitution in manufacturing sectors will depend on the improvement of technological development.

Third, in some leading or key sectors, we have found a decreasing international competitiveness. To show the competitiveness of manufacturing sectors, we use the index of revealed international competitiveness (RIC). This index is equal to exports minus imports divided by domestic production. When the index is positive, the sector is competitive. Otherwise, the sector has low competitiveness. As shown in Table 5.1, all consumer goods under study have positive RIC. In particular, garments, leather, furniture and stationery have strong RIC. Medical, nonmetals and metal products have fair RIC. Beverages, tobacco, medical and nonmetals are omitted from the study, since they are non-import-competing sectors. Most intermediate and all capital goods lack international competitiveness. The least

competitive are machinery, plastics and chemical fibers, followed by instruments, transportation equipment, and ferrous metals. In addition, although electric has been the largest export sector, it is not internationally competitive. The above lack of competitiveness in manufacturing sectors is mainly due to the shortage of technological development in these sectors. During the period 1993-1995, chemical, timber, chemical fibers, rubber, plastics, machinery and instruments showed decreasing RIC in the international market. Because of this, domestic products have been subjected to more and more severe competition from imports.

Table 5.4 Rank of Changes in Shares of Trade and Production Patterns by Type

	exports	imports	production
consumer goods	first	third	third
intermediate	second	second	first
capital goods	third	first	second

Source: Made by author according to Table 3.1.

In short, China's present level of technological development acts as a constraining factor on efforts to upgrade industrial structure and trade patterns. Therefore, it has had some efforts on China's further trade liberalization.

5.2 The establishment of Competitive Systems

Among members of APEC, China is the only economy that is in the process of transition from a planned to market economy. An effective competitive system has not yet been established in China. This keeps it from gaining the same benefits from trade liberalization as the market-oriented economies.

Generally speaking, the benefits of trade liberalization are gotten through:

(1) allowing enterprises to achieve economies of scale by taking advantage of market expansion, (2) enabling them to absorb technologies and knowledge through their participation in foreign markets, through importation of products incorporating advanced foreign technologies, and /or through foreign-invested ventures, (3) pressuring them to reduce X-inefficiency in order to cope with competition from foreign enterprises, and (4) forcing them to refrain from rent-seeking behavior. At the same time, (5) spreads higher productivity through inter-industry transaction "spillover effects", (6) helps to achieve efficient resource allocation as the domestic price level comes close to the international price level, (7) enables the country to import advanced capital goods as its exports expand removing foreign exchange constrains, all these leading to an increase in productivity. Over the long-term such dynamic benefits as (8) learning effects and (9) "externality in R&D" will be brought about (Grossman, G. M., and Helpman, E. 1991).

However, these are based on the premise of an effective competitive system in the domestic market for members of APEC. The nature of trade liberalization is to increase the level of competition in order to promote their economic development. Theory and practice have proven the advantage of free trade, especially for developing economies. But if we ask the reason why some economies such as Japan, Korea and Taiwan have succeeded in using outward-oriented trade strategy, the simple answer is that they have good economic systems of competition in their countries. This is not case for China.

In the process of trade liberalization, there is an argument that if industries are given high protection, sectors will succeed despite high costs of production and will not have sufficient incentives to improve technological development. If they are not well protected, however, these sectors will face a serious threat. At present, a reform of China's stated-owned enterprises is in process. But there are considerable differences between these enterprises and foreign-funded ones in many fields, such as incentives to compete and capability to compete. Thus the shortage of innovation and creativity will probably directly affect the efforts to increase international competitiveness. Therefore if China's economic system is not successfully transformed from a planned to market economy, its trade liberalization will be negatively affected.

The reason why FDI has been able to take over a share of the domestic market is that foreign-funded enterprises have more effective competitive mechanism than domestic ones. First, they have strong incentives to take part in competition. Second, they usually have access to more advanced technologies. These enterprises have stronger international competitiveness than domestic ones in a sector, and have easily taken a high share of China's domestic market, especially in technological-intensive sectors. Third, foreign-funded enterprises have more advanced management than domestic ones. It is therefore necessary to shift the operating mechanism of domestic enterprises.

The success of China's trade liberalization will depend largely on its own technological development and, moreover, on the continuing reform of its economic system. The most important function of tariff policy is to create a fair opportunities for development for all enterprises and to encourage domestic enterprises to take part in competition and to improve their levels of technological development.

6. Industrial Adjustment of China's APEC Policies and Major Conclusions

Based on the results of the above analyses, we might propose that trade policies by industry may take the following forms.

For the export sectors (food, garments and furniture), tariff rates should be gradually reduced. The reasons are as follows. First, compared to other sectors, these sectors have higher trade dependency and increasing RIC. Second, their capital-intensity is lower. OLP is lower than average, though the changes in OLP vary from sector to sector. For food, the change was negative, for garments, it was positive but low, whereas for furniture, it was high. The pace of tariff reductions should thus be different. For furniture, it should be fastest, followed by garments and food. At the same time, we must take into account the high ratio of added-value of foreign enterprises to domestic enterprises in garments. In order to improve international

competitiveness and create a few international brands, it will be necessary to shift some commodities in the garments manufacturing sector from labor-intensive to capital-intensive ones. However, up until now, thus shift of commodity composition has been limited to a few international brands. The garment sector, which is labor-intensive, is now one of the major sectors with the ability to absorb a large amount of China's labor.

In sectors competing with imports and exports (textiles, leather, stationery, petroleum, chemical, chemical fibers, rubber, plastics, ferrous metals, metal products, machinery, transportation, electric, and instruments), it is better to have trade policies that maintains effective competition. Tariffs and quotas in these sectors should be gradually reduced, depending on the level of industrial development. Some of the above 15 sectors will be able to play an important role in upgrading China's industrial structure and trade patterns. Due to long-term high protection and some shortcomings of the economic system, these sectors lack incentives to improve technological development levels. Therefore, it will be better to reduce tariffs in these sectors and permit the entry of FDI and imports. This will encourage these sectors to speed up the pace of technological progress and increase their international competitiveness. Experiences in some sectors show that increasing FDI has played an important role in speeding up import substitution. For example, the development of some electric goods provides good evidence. For some intermediate goods which need to be developed in domestic sectors, the tariff rate may be kept slightly higher than the cost of production. This will help domestic enterprises to enter the market. In short, due to the generally low levels of technology in these sectors, the tariff levels should be set at competitive levels.

Considering that natural resource shortages lead to increased demand for imports in import-competing sectors (paper and printing and nonferrous metals), these tariff rates may be decreased rapidly to zero to allow domestic enterprises to reduce their production costs and increase the welfare of consumers.

As referred to earlier, due to absolute advantage held in the domestic market in non-import-competing sectors (beverages, tobacco, medical and nonmetals), the quotas should be gradually changed into tariffs and the tariffs should be reduced to the optimal level in accordance with their market structure. This can help to reduce smuggling as much as possible in the tobacco sector and prevent the price of imported medical goods from rising irrationally.

Other proposals are as follows:

First, tariff protection should be concentrated on infant industries. It will be necessary to decrease the nominal tariff rate and increase the EPR in some key sectors. The management of tariffs should be enforced to allow them to play an effective role in adjusting industrial and trade structures. For instance, tariff revenue could be used for developing infant industries.

Second, import substitution should be done in just selected sectors and not in all sectors. And it should be combined with establishing China's international brands. Import substitution is not only useful for the industrialization for the developing economies to meet their own demands, but can also improve their international competitiveness. Creating some international brands should be combined with the process of import substitution in the developing economies. It has been shown by the process of import substitution in economies such as Japan and Korea.

Third, the strategy of offering access to the domestic market in exchange for technology should be made into a competitive strategy. The severe competition in modern market makes innovation and creativity crucial for all firms. Trade liberalization is to increase the level of competition not only in the international market of manufacturing sectors, but also in the domestic market. Thus foreign investors do not like to transfer their advanced technologies to the host country. In fact, China's manufacturing sectors have seldom received new technologies commensurate to the share of the domestic market they have lost. Therefore in order to make new trade gain, China will have to improve its economic system of incentives to force domestic enterprises to develop their own key technologies.

Fourth, policies that effectively increase technological development should be adopted. These should include offering subsidies to encourage domestic enterprises to improve their technological levels, learning selectively from the experience of foreign countries, improving national educational levels, and increasing the share of technological input in total GNP.

Fifth, in order to maintain effective competition, measures should be adopted to improve the market system, and formulate laws and regulations related to the market system.

The major conclusions are presented as follows:

First, China should speed up its trade liberalization. Since the strategy of was launched in 1992, China's trade opportunities have been expanded. Exports of these Chinese goods which are internationally competitive have increased further. The rapid growth of exports between 1993 and 1995 is good evidence of this. Meanwhile, imports of raw materials and high-technology goods will increase. These changes have been mainly contributed by trade liberalization policy. With increasing trade dependence in China's manufacturing sectors, China will get increased trade opportunities. At present, almost every developing member of APEC would like to achieve the goal of trade liberalization in advance of the target date (2020). For example, the members of ASEAN have decided to shorten their schedule for trade liberalization from 15 years (2008) to 10 years (2003). China is involved actively in realizing its own trade liberalization. However, China still lags in the field of trade liberalization compared with the other developing economies of APEC. It should achieve its goal of trade liberalization by 2020. In fact, It has to hasten the pace of its trade liberalization.

Second, China's trade liberalization should coincide with economic system reforms. If it does not reform its economic system, China will not be able to liberalize its trade and investment regimes. Its trade liberalization has been based on reforms of the administrative system of international trade. In the future, it will have to depend on the reform of the domestic economic system, and especially the reform of state-owned enterprises. To some extent, further trade liberalization will depend on the successful reform of the domestic economic system. Of

course, trade liberalization will also speed up the pace of domestic economic system reform and force domestic enterprises to face severe competition from foreign-funded enterprises. Thus it will be helpful to establish a good competitive system. In short, there will be interactions between the processes of China's trade liberalization and the transition of its economic system.

Third, trade liberalization policy should be combined with other economic policies, particularly industrial policy. As we know, there are considerable differences in levels of industrial development between manufacturing sectors. Each sector will play a role in economic development. At present, in China's industrial policy, the machinery and electric industry, petroleum industry, automobiles and airplane industry have been leading sectors. But these industries have neither increasing returns to scale nor international competitiveness. China's trade liberalization policy should be shifted to protect and promote the industrial development of these sectors.

Appendix

24 manufacturing sectors will be under consideration and classified into 3 groups. The standard of classification is to adopt the classification of industries of China's statistical

yearbook. Three groups are consumer goods, immediate and capital goods. Consumer goods include:

food (food processing and production sector),

beverage (beverage production sector),

tobacco (tobacco processing sector),

textile (textile industry),

garments (garments and other fiber products),

leather (leather, furs, down and related products),

furniture (furniture manufacturing and other straw products) and

stationery (stationery, educational and sports goods).

Intermediate goods consist of

timber (timber processing sectors),

paper and printing (paper making and paper products and printing and record pressing),

petroleum (petroleum processing and corking products),

chemical (raw chemical materials and chemical products),

chemical fibers,

medical (medical and pharmaceutical products),

rubber (rubber products),

plastic (plastic products),

nonmetal (nonmetal mineral products),

ferrous metal (smelting and pressing of ferrous metals),

nonferrous metal (smelting and pressing of nonferrous metals) and

metal products.

Capital goods comprise

machinery (ordinary and special machinery and equipment manufacturing),

transportation equipment (transportation equipment manufacturing),

electric (electric equipment and machinery and electronic and telecommunications), instruments (instruments, meters, cultural and official machinery).

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