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**REVEALED COMPARATIVE ADVANTAGE:  
AN ANALYSIS FOR INDIA AND CHINA**

*Amita Batra  
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AUGUST 2005



**INDIAN COUNCIL FOR RESEARCH ON INTERNATIONAL ECONOMIC RELATIONS**

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## **Foreword**

This paper is the first to attempt a systematic evaluation of the similarities of the patterns of revealed comparative advantage for India and China in the global market. The study is timely as India has made an extensive effort to liberalize its international trade since 1991 and the consequent increase in competitive pressures and technology transfers, is expected to have led to a restructuring of the economy such that the composition of exports reflects India's comparative advantage in the global economy.

The timeliness of the study is also reinforced by the fact that increased trade integration of China over the past few years is likely to have contributed to a shift in comparative advantage in labour intensive manufactures in the world market. This development is pertinent to India, as China and India are not just similar in size but also in factor endowments. It is important therefore, to explore the extent of similarity in the patterns of comparative advantage for the two economies.

The paper identifies the pattern of revealed comparative advantage using the Balassa (1965) index for export data. The index has been calculated at the sector and commodity level of the Harmonized System of classification. The paper also analyses comparative advantage according to factor intensity. The analysis shows broad similarities in the structure of comparative advantage for India and China. Both, India and China enjoy comparative advantage for labour and resource intensive sectors in the global market.

I do hope that this paper will serve as a useful source and provide valuable reference material for researchers and policymakers associated with and interested in export promotion strategy in India.

**Arvind Virmani**  
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ICRIER

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## 1 Introduction\*

Reduction of trade barriers creates competitive pressures and the potential for technology transfer so as to lead to productivity gains and restructuring of an economy toward its comparative advantage. India has undertaken a series of economic reforms towards opening up of the economy in the decade of the nineties. Notable among these has been the extensive effort to liberalize its international trade. It is therefore expected that trade liberalization in India would have led to changes in the composition of exports so as to reflect India's comparative advantage in the global economy. Further, a country's comparative advantage in international trade may be influenced by differential rates of change in accumulation of production factors or due to the increased trade integration of other countries. China's recent move towards export oriented development strategy may have altered the picture of comparative advantage for labor intensive manufactures in the world market. Across developing countries there is an ongoing debate and emerging concern about the threat and opportunity in relation to the rise of China and the consequent intensification of competition in labour intensive manufactures. The debate is even more pertinent in case of India, as China and India are not just similar in size but also with respect to factor endowments. It is important therefore, to explore the structure of comparative advantage of India and China and the extent to which the two economies compete with each other in the global market for manufacturing sector commodities. This paper makes an attempt to develop some insights on the subject.

Specifically, the paper examines the structure of comparative advantage enjoyed by India and China in the global market, individually and in a comparative framework. Following this, an analysis of the comparative advantage according to factor intensity for the two economies is undertaken. The pattern of comparative advantage is also examined for inter-temporal variation over the period 2000-2003. The analysis of comparative advantage has been undertaken using the Balassa (1965) index of revealed comparative advantage for the two and six digit level of HS classification. Comparative advantage

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\* I express my gratitude to Prof. Arvind Virmani who motivated me to take up this research study. Prof. Virmani made valuable suggestions which are reflected in the final paper. Thanks are also due to participants at the ICRIER seminar for giving useful comments

according to factor intensity has been analyzed at the two and three digit level of SITC (Rev. 3)<sup>1</sup> classification.

The paper is organized as follows. In the next section a precise specification of the objectives of our analysis is presented. In section three a selective review of literature is given. A brief introduction to the concept and measurement of comparative advantage is presented in section four. Static and dynamic comparative advantage analysis for India and China individually and within a comparative framework is undertaken in section five. Factor intensity analysis of the comparative advantage of the two economies is presented in section six. Section seven presents the main findings and conclusions.

## **2 Objectives**

Specifically the paper makes an attempt to analyze the following aspects :

- The pattern of comparative advantage for India and China in the global market.
- What are the leading manufacturing industries in terms of their revealed comparative advantage in India and China?
- If the pattern of comparative advantage has undergone a structural shift between 2000 and 2003 for India and/ or China?
- To what extent has export specialization shifted away from labour and natural resource intensive products to high value-added knowledge and technology intensive industries?
- To what extent is the pattern of specialization as observed in India and China competitive or complementary in the world market?

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<sup>1</sup> The SITC Rev. 3 was adopted in 1988 and maintains the basic 10-section structure of the previous editions; the sections are subdivided into 67 two-digit divisions, 261 three-digit groups, 1,033 four-digit groups, and 3,121 five-digit headings. The HS system of classification contains 21 sections, 97 chapters and 1,241 headings at the four-digit level, 930 of which are further divided in sub headings. The HS system includes a six-digit sub-heading that was introduced for more precise tagging of products. HS-1996 (revision 1) represents a total of 5,113 separate categories of goods identified by a six-digit code. Most of the countries that have adopted HS have added one or more digits to further classify products of particular national interest (8-digit or 10-digit level). International comparisons are therefore best when made at the six-digit sub-heading level.



### **3 Selective Review of Literature**

Several studies have been undertaken using the concept of revealed comparative advantage. A majority of these studies use data on export shares. Balassa (1977) has undertaken an analysis of the pattern of comparative advantage of industrial countries for the period 1953 to 1971. The evidence provided in the paper supports the available evidence on trade in research intensive products, indicating the continuous renewal of the product cycle, with the US maintaining its ever increasing technological lead. Based on the standard deviation of the RCA indices for different countries an association is also seen to hold between size and diversification of exports. Balassa's results show that while the extent of export diversification tends to increase with the degree of technological development a reversal takes place at higher levels. Yeats (1997) studies the possible distortions in trade patterns on account of discriminatory trade barriers that are characteristic of the RTAs. He uses the index of revealed comparative advantage in conjunction with the changes in the regional orientation of exports to identify any apparent inefficiencies in trade patterns for the Mercusor group of countries. Richardson and Zhang (1999) have used the Balassa index of RCA for the U.S to analyze the patterns of variation across time, sectors and regions. They find the patterns to differ across different parts of the world, over time as also for different levels of aggregation of the export data. Differentials are accounted for by factors like geographical proximity of trading partners and per capita income with the extent of influence of these factors varying over time and across sectors/sub sectors. Yue (2001) uses the RCA index to demonstrate the fact that China has changed its export pattern to coincide with its comparative advantage and that there are distinct differences in export patterns between the coastal regions and the interiors in China. Bender and Li (2002) examine the structural performance and shift of exports and revealed comparative advantage of the East Asian and Latin American regions over the period 1981-1997. It examines, if there is a relation between changes in export pattern among different regions and shifts in comparative advantage between regions. The Vollrath (1991) index that accounts for double counting in world trade has been used for analysis. Fertó and Hubbard (2002) assess the competitiveness of Hungarian agriculture vis-à-vis EU using four indices of

revealed comparative advantage. The four indices are -original Balassa index, relative trade advantage, relative export advantage, logarithm of the relative export advantage (original Balassa index) and relative competitiveness (difference of the log values of relative export and import advantage). A categorization of indices as cardinal (identifies the extent to which a country has comparative advantage/disadvantage), ordinal (provides a ranking of products by degree of comparative advantage), and dichotomous (a binary type demarcation of products based on comparative advantage/disadvantage) has been undertaken in their study. The results show that the indices were less cardinal in identifying whether Hungary has a comparative advantage in a particular product group, but were useful as a binary measure of comparative advantage. Leu's paper examines the systematic shift of comparative advantage in East Asian economies by computing and comparing revealed comparative advantage indices for ten selected East Asian economies in the U.S market. The results show that conventional wisdom of shifting comparative advantage in accordance with the level of development continues to hold true.

The dynamics of Chinese comparative advantage has been analyzed in several studies. Prominent among these is the Hinloopen and Marrewijk (2004) study. The study uses the Balassa index with some innovations to identify the dynamics. The pattern of China's revealed comparative advantage and its implications in terms of competition for other exporting countries has been analyzed using the methodology of market share changes. Weiss (2004), Lall and Albaladejo (2003) and Lall and Weiss (2004) analyze the aspect of threat/ opportunity in the context of China's economic relations with South East and East Asia. Lall and Weiss focus on the competitive threat to the Latin American economies.

There has thus far been no attempt to analyze the competitiveness that Chinese exports may pose for Indian exports in the global economy. Given the similarity in size, factor endowments and geographical proximity of the two economies it is imperative that an analysis of comparative advantage that India and China hold in the world market be undertaken. This paper is the first to attempt a systematic evaluation of the similarities of the patterns of revealed comparative advantage for India and China in the global market.

#### 4 Measuring Revealed Comparative Advantage

The concept of revealed comparative advantage (Balassa 1965, 1977, 1979, 1986) pertains to the relative trade performance of individual countries in particular commodities. On the assumption that the commodity pattern of trade reflects the inter-country differences in relative costs as well as in non-price factors, this is assumed to “reveal” the comparative advantage of the trading countries. The factors that contribute to movements in RCA are economic: structural change, improved world demand and trade specialization.

In this paper we use Balassa’s (1965) measure of relative export performance by country and industry/commodity, defined as a country’s share of world exports of a commodity divided by its share of total world exports. The index for country *i* commodity *j* is calculated as follows:

$$RCA_{ij} = (X_{ij}/X_{wj})/(X_i/X_w) \dots\dots\dots (2)$$

*Where*

- $X_{ij}$  = *i*th country’s export of commodity *j*
- $X_{wj}$  = world exports of commodity *j*
- $X_i$  = total exports of country *i*
- $X_w$  = total world exports

..... in either a designated market or in a region or for the whole world. The RCA is measured using post-trade data.

The index of revealed comparative advantage ( $RCA_{ij}$ ) has a relatively simple interpretation. If it takes a value greater than unity, the country has a revealed comparative advantage in that product.

The advantage of using the comparative advantage index is that it considers the intrinsic advantage of a particular export commodity and is consistent with changes in an economy’s relative factor endowment and productivity. The disadvantage, however, is

that it cannot distinguish improvements in factor endowments and pursuit of appropriate trade policies by a country.

## **5 Revealed Comparative Advantage - The Analysis**

In this paper Revealed Comparative Advantage (RCA) analysis has been undertaken at both the sector and product level. For the former RCA indices have been calculated for India and China in all the 97 chapters of the Harmonized System (HS - 1996) classification for the year 2000 and 2003<sup>2</sup>. As it is possible that the pattern of comparative advantage may differ across different levels of dis-aggregation and sectors in which a country's exports may be typically strong may often include disaggregated sub-products in which they are not and conversely, the paper also analyses revealed comparative advantage analysis at the more disaggregated level i.e. the 6 digit level of HS classification. The index of RCA (RCAI) is calculated using data on exports for both India and China as from UN COMTRADE.

Broad trends that emerge from this analysis for the two countries are discussed below.

### **5.1 India**

The index of RCA is greater than one for 41 sectors indicating that India holds comparative advantage in these sectors in the world market. At the disaggregated level RCAI is calculated for all 4664 commodities exported by India to the world in 2003. The index values suggest that India enjoys comparative advantage in 1512 commodities. As a percentage of total exports India enjoys comparative advantage in 32 per cent of its total exports, the same as in 2000. India's comparative advantage is focused in sectors like organic chemicals, cotton iron and steel, articles of apparel accessories, not knit or crochet etc. The commodity with the maximum comparative advantage is identified as flat rolled products of high speed steel  $\geq 600$ mm wide.

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<sup>2</sup> The focus of the analysis in the paper is on the RCA for 2003. The year 2000 is taken as reference, as this is the year immediately preceding China's accession to WTO.

### 5.1.1 Sector-wise

At the HS 2-digit level India holds comparative advantage in 41 sectors<sup>3</sup>. India enjoys maximum comparative advantage in HS-50 i.e. silk unlike as in 2000, where silk is the highest ranking sector only within the manufactured commodities sectors. The value of the index of RCA for this sector is 17.4. This is closely followed by Lac, gums, vegetable saps and extracts, pearls, precious stones, metals, coins, carpets and other textile floor coverings, cotton, other made textile articles, sets, worn clothing etc. Coffee, tea, mate and spices, works of art, collectors pieces and antiques, ores, slag and ash, vegetable textile fibres nes, paper yarn, woven fabric, are other sectors that appear in the top 10 sectors ranked according to the value of the RCA index.

**Table 5.1: India: Top ten sectors based on the RCAI**

Rank	HS code	Description
1	50	Silk
2	13	Lac, gums, resins, vegetable saps and extracts nes
3	71	Pearls, precious stones, metals, coins, etc
4	57	Carpets and other textile floor coverings
5	52	Cotton
6	63	Other made textile articles, sets, worn clothing etc
7	09	Coffee, tea, mate and spices
8	97	Works of art, collectors pieces and antiques
9	26	Ores, slag and ash
10	53	Vegetable textile fibres nes, paper yarn, woven fabric

The maximum numbers of commodities with comparative advantage in the world market are concentrated in sectors like organic chemicals. The organic chemicals sector, with 125 commodities<sup>4</sup> contributes about 8% of the total comparative advantage that India holds in the world market. This is followed by sectors like cotton, articles of apparel not knit or crochet, iron and steel, nuclear reactors, boilers, machinery all contributing around 5 per cent of total comparative advantage enjoyed by India in the world market. Sector 84 i.e. nuclear Reactors and Boilers and Machinery also contributes

<sup>3</sup> For a list of all sectors where India enjoys comparative advantage in world market in 2000 and 2003 refer Appendix Tables A.1 and A.3 respectively.

<sup>4</sup> Detailed list of sector-wise distribution of commodities in which India enjoys advantage in world market in 2000 and 2003 is presented in Appendix Tables A.2 and A.4 respectively.

about 5 per cent of total comparative advantage for India even though the sector, at the aggregate level is not advantageously placed.

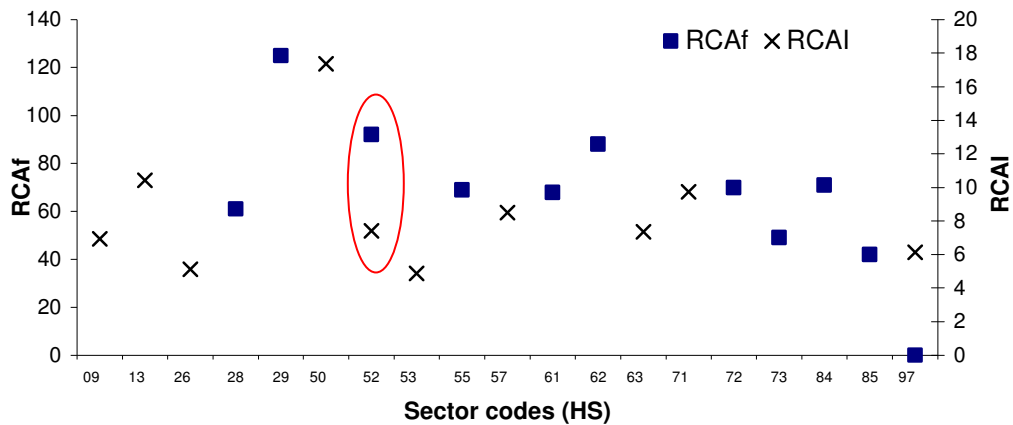
**Table 5.2 : India: Top ten sectors based on the constituent number of commodities with RCAI>1**

Rank	HS Code	Sectors	RCA <sub>f</sub> *	% Contribution to total RCA
1	29	Organic chemicals	125	8.3
2	52	Cotton	92	6.1
3	62	Articles of apparel, accessories, not knit or crochet	88	5.8
4 <sup>#</sup>	84	Nuclear reactors, boilers, machinery, etc	71	4.7
5	72	Iron and steel	70	4.6
6	55	Manmade staple fibres	69	4.6
7	61	Articles of apparel, accessories, knit or crochet	68	4.5
8	28	Inorganic chemicals, precious metal compounds, isotopes	61	4.0
9	73	Articles of iron or steel	49	3.2
10	85	Electrical , electronic equipment	42	2.8

# Nuclear reactors, boilers, machinery does not enjoy comparative advantage in the world market at the aggregate level

\*-number of constituent commodities with RCA>1

**Figure 1: India: Top sectors according to RCAI and RCA (>1)<sub>f</sub>: 2003**



Other than cotton, no other sector that ranks among the top ten according to the value of the RCAI is able to retain the same ranking of comparative advantage at the constituent six-digit commodity level. The pattern of comparative advantage therefore varies at different levels of dis-aggregation. This aspect is explored further, in the section 5.1.2.

### 5.1.2 Commodity- wise

At the six digit level, the trends observed are as follows. In terms of the value of the index of RCA flat rolled products of high speed steel  $\geq 600$ mm wide ranks at the top with an RCA value of 99.0. This is followed by items like lead carbonate (RCAI=98.19), dichlorotetra/penta-fluoroethanes (RCAI=92.23), opium sap, turmeric (curcuma) (RCAI=89.89), and coir yarn (RCAI=85.86) as the next five commodities ranked according to their RCAI values<sup>5</sup>.

The commodities that rank among the top 100 according to the index of RCA while being dispersed among various sectors, are largely drawn from sectors like organic chemicals, cotton, salt, sulphur, earth, stone, plaster, lime and cement and iron and steel. When sectors are ranked according to the number of constituent top ranking (top 100) commodities, organic chemicals ranks the highest.

**Table 5.3: India: Sector- wise distribution of commodities with RCAI rank  $\leq 100$**

Rank	HS code	Sector	Number of commodities
1	29	Organic chemicals	12
2	52	Cotton	11
3	25	Salt, sulphur, earth, stone, plaster, lime and cement	8
4	72	Iron and steel	7
5	57	Carpets and other textile floor coverings	5

There are also some sectors where India is comparatively disadvantageously positioned at the aggregate level but reveal significant comparative advantage at the constituent commodity (HS-six digit) level. Of the total 97 chapters, 46 are characterized in this manner. Among some of these chapters, commodities where India has a significant comparative advantage (i.e. can be placed among the top 100 commodities for RCAI) can be found. A list of these sectors is given below.

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<sup>5</sup> Complete list of commodities in which India enjoys advantage in the world market in 2000 and 2003 is available with the author.

**Table 5.4 : India : Sectors with a disadvantage at the aggregate level\* and advantage at the disaggregated level#: 2003**

Rank	HS Code	Sector	No. of Commodities
1	33	Essential oils, perfumes, cosmetics, toileteries	2
2	85	Electrical, electronic equipment	2
3	51	Wool, animal hair, horsehair yarn and fabric thereof	1
4	70	Glass and glassware	1
5	80	Tin and articles thereof	1
6	91	Clocks and watches and parts thereof	1

\*: HS-2 (RCAI<1) ; #: constituent HS-6 (RCAI>1 and rank in top 100)

## 5.2 China

In all China enjoys comparative advantage in the world market in 47 sectors and 1828 commodities out of 97 sectors and 4923 commodities exported respectively by China to the world. The sectors with the maximum number of commodities where China has comparative advantage in the world market are articles of electrical and electronic equipment, manufacture of leather, toys, organic chemicals, articles of apparel and cotton.

### 5.2.1 Sector-wise

At the HS 2-digit level China holds comparative advantage in 47 sectors<sup>6</sup>. Manufactures of plaiting material (HS-46) and bird skin, feathers, artificial flowers, human hair (HS-67) rank at the top with the highest index value of 10.3 and 10.1 respectively. These are closely followed by sectors like umbrellas, walking sticks, seat sticks and whips, articles of leather, animal gut, harness, travel goods and silk. Toys, games, sports requisites headgear and parts thereof, Footwear, Gaiters and the like, parts thereof and other made textile articles, sets, worn clothing etc are other sectors that figure in the top ten sectors ranked according to the value of the RCA index.

<sup>6</sup> For a list of all sectors where China enjoys comparative advantage in world market in 2000 and 2003 refer Appendix Tables A.5 and A.7 respectively.



**Table 5.5 : China: Top ten sectors based on RCAI**

Rank	HS Code	Sector
1	46	Manufactures of plaiting material, basketwork, etc.
2	67	Bird skin, feathers, artificial flowers, human hair
3	66	Umbrellas, walking-sticks, seat-sticks, whips, etc
4	42	Articles of leather, animal gut, harness, travel goods
5	50	Silk
6	95	Toys, games, sports requisites
7	65	Headgear and parts thereof
8	64	Footwear, gaiters and the like, parts thereof
9	63	Other made textile articles, sets, worn clothing etc
10	86	Railway, tramway locomotives, rolling stock, equipment

Within the sectors (HS-2 digit), we have further delineated the comparative advantage in the world market for China at the commodity level (HS-6 digit). A total of 1828 commodities are identified in this manner. Out of these, the maximum number of commodities where China holds comparative advantage in the world market are observed in the electrical and electronic equipment with 129 commodities, closely followed by organic chemicals and articles of apparel, not knit/crocheted with the number of commodities being 118 and 111 respectively<sup>7</sup>. Sectors like articles of apparel, knit/crocheted and inorganic chemicals also show significant presence in terms of number of commodities with comparative advantage in the world market. Articles of apparel knit/crocheted or not knit/crocheted (i.e. HS 61 and 62) together contribute maximum number of commodities and 11.2% share in the total comparative advantage identified for China in the world market.

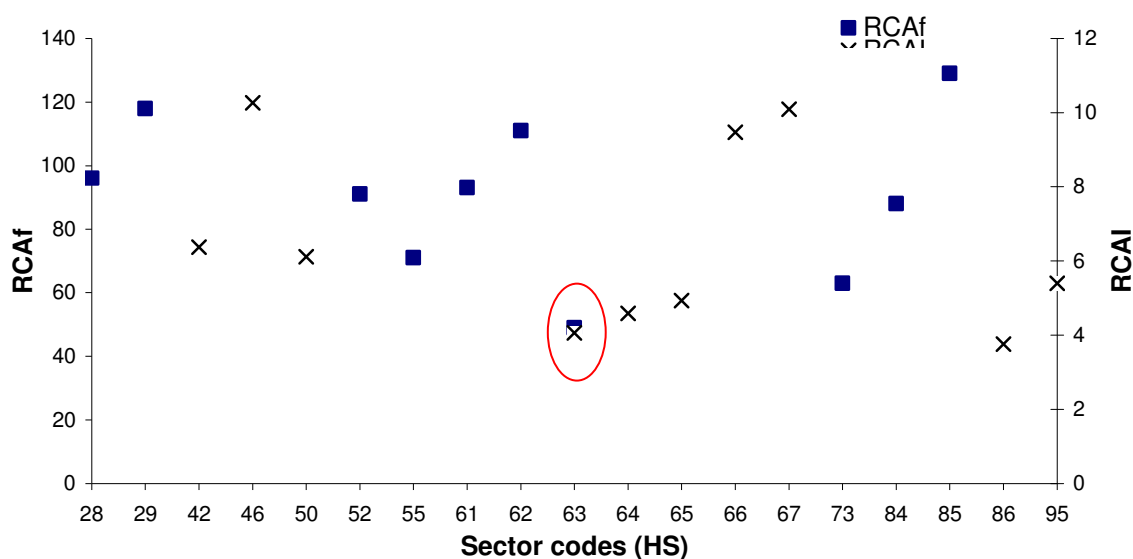
**Table 5.6 : China: Top ten sectors based on the constituent number of commodities with RCAI>1**

Rank	HS Code	Sector	RCA <sub>f</sub> <sup>*</sup>	% Contribution to total RCA
1	85	Electrical, electronic equipment	129	7.1
2	29	Organic chemicals	118	6.5
3	62	Articles of apparel, accessories, not knit or crochet	111	6.1
4	28	Inorganic chemicals, precious metal compound, isotopes	96	5.3
5	61	Articles of apparel, accessories, knit or crochet	93	5.1
6	52	Cotton	91	5.0
7	84	Nuclear reactors, boilers, machinery etc	88	4.8
8	55	Manmade staple fibres	71	3.9
9	73	Articles of iron or steel	63	3.4
10	63	Other made textile articles, sets, worn clothing etc	49	2.7

# Organic chemicals does not enjoy comparative advantage in the world market at the aggregate level, (RCAI: HS-29<1). \*-number of constituent commodities with RCA>1

<sup>7</sup> A detailed list of sector-wise distribution of commodities in which China enjoys advantage in world market in 2000 and 2003 is presented in Appendix Tables A.6 and A.8 respectively.

**Figure 2: China: Top sectors according to RCAI and RCA (>1): 2003**



As against India where cotton, i.e. HS-52 appears among the top ranking sector according to both the criteria of value of RCAI and the number of constituent commodities with comparative advantage, for China, the sector Other made textiles, sets, worn clothing i.e. HS- 63 is so positioned.

### 5.2.2 Commodity-wise

In terms of individual commodities (HS-6 digit), gallium, hafnium, indium, niobium, rhenium/thallium, unwrought, waste; powder with index value of 28.7 ranks the highest. It is followed by items like type writers, electric nes (RCAI =16.1), articles of human hair, nes (RCAI =13.80), raw silk (RCAI =13.62), lighting sets of a kind used for Christmas tree (RCAI =13.62) and pick up cartridges (RCAI =13.13) as the next five commodities ranked according to their index of RCA<sup>8</sup>.

<sup>8</sup> Complete list of commodities in which China enjoys advantage in the world market in 2000 and 2003 is available with the author

The commodities that rank among the top 100 according to RCA values while being dispersed across sectors are mainly drawn from organic and inorganic chemicals, cotton, nuclear reactors and articles of apparel knit/crocheted and not knit/crocheted.

**Table 5.7: China: Sector- wise distribution of commodities with RCAI rank  $\leq$  100**

Rank	HS code	Sector	Number of commodities
1	61	Articles of apparel, accessories, knit or crochet	11
2	29	Organic chemicals	6
3	28	Inorganic chemicals, precious metal compound, isotopes	5
4	52	Cotton	5
5	84	Nuclear reactors, boilers, machinery, etc	5

Again, there are some sectors where China is comparatively disadvantageously positioned but simultaneously reveals significant comparative advantage at the constituent commodity (HS-six digit) level. China is comparatively disadvantageously placed in 50 sectors out of the total 97 sectors. Of these 50 sectors, China is comparatively advantageously placed in 42 sectors at the commodity level. There are 13 commodities that rank among the highest top 100 for the RCAI and belong to sectors where China does not enjoy comparative advantage in the world market. Of course, the number of commodities with a relative advantage in these sectors is fewer than the number of commodities where India has a relative disadvantage

**Table 5.8 : China: Sectors with a disadvantage at the aggregate level\* and advantage at the disaggregated level#: 2003**

Rank	HS Code	Sector	Number of commodities
1	29	Organic chemicals	6
2	09	Coffee, tea, mate and spices	2
3	15	Oil seed, oleagic fruits, grain, seed, fruit, etc, nes	1
4	22	Animal,vegetable fats and oils, cleavage products, etc	1
5	39	Plastics and articles thereof	1
6	72	Iron and steel	1
7	87	Vehicles other than railway, tramway	1

\*: HS-2 (RCAI<1) and #: constituent HS-6 (RCAI>1 and rank in top 100)

## 6 Inter-temporal Variation in Revealed Comparative Advantage: 2000-2003

### 6.1 India

The number of sectors for which India enjoys comparative advantage remains roughly the same between 2000 and 2003. In 2000 India enjoyed comparative advantage in 42 sectors and in the year 2003 in 41 sectors. While 36 out of the 42 sectors retain their comparative advantage in 2003, 6 sectors lose their advantage. Five new sectors indicative of comparative advantage for India emerge in 2003. Prominent among these is sector HS-97 i.e works of art, collector's pieces and antiques, with a rank of eight. Two sectors each, have lost or gained more than ten ranks over this period.

**Table 6.1 : Inter-temporal movement of India's RCA**

<b>Total number of sectors for which India holds advantage</b>		
		2000: 42                      2003:41
<b>Number of sectors that have retained advantage: 36</b>		
<b>Number of sectors that have gained advantage: 5</b>		
Details	HS Code	Sector
	11	Milling products, malt, starches, inulin, wheat gluten
	28	Inorganic chemicals, precious metal compound, isotopes
	40	Rubber and articles thereof
	74	Copper and articles thereof
	97	Works of art, collectors pieces and antiques
<b>Number of sectors that have lost advantage : 6</b>		
Details	HS Code	Sector
	02	Meat and edible meat offal
	15	Animal,vegetable fats and oils, cleavage products, etc
	30	Pharmaceutical products
	36	Explosives, pyrotechnics, matches, pyrophorics, etc
	38	Miscellaneous chemical products
	80	Tin and articles thereof
<b>Number of sectors that have gained/lost more than ten ranks</b>		
<b>Sectors that have gained</b>	17	Sugars and sugar confectionery
	26	ores, slag and ash
<b>Sectors that have lost</b>	05	products of animal origin, nes
	58	Special woven or tufted fabric, lace, tapestry etc

Of the ten most competitive sectors for India in 2000, eight retain their advantage in 2003. While sectors like articles of leather, animal gut, harness, travel goods and vegetable plaiting materials, vegetable products nes drop out of the top ten set, sectors like works of art, collectors pieces and antiques and ores, slag and ash make an entry as India's most competitive sectors in 2003. Sectors that have experienced a loss of 10 or

more in their rank by RCAI are products of animal origin, nes and special woven or tufted fabric, lace, tapestry etc. Sugars and sugar confectionery has moved up by more than 10 levels. Only one sector i.e. Ores, slag and ash has moved up from 24 in 2000 to 9 in 2003.

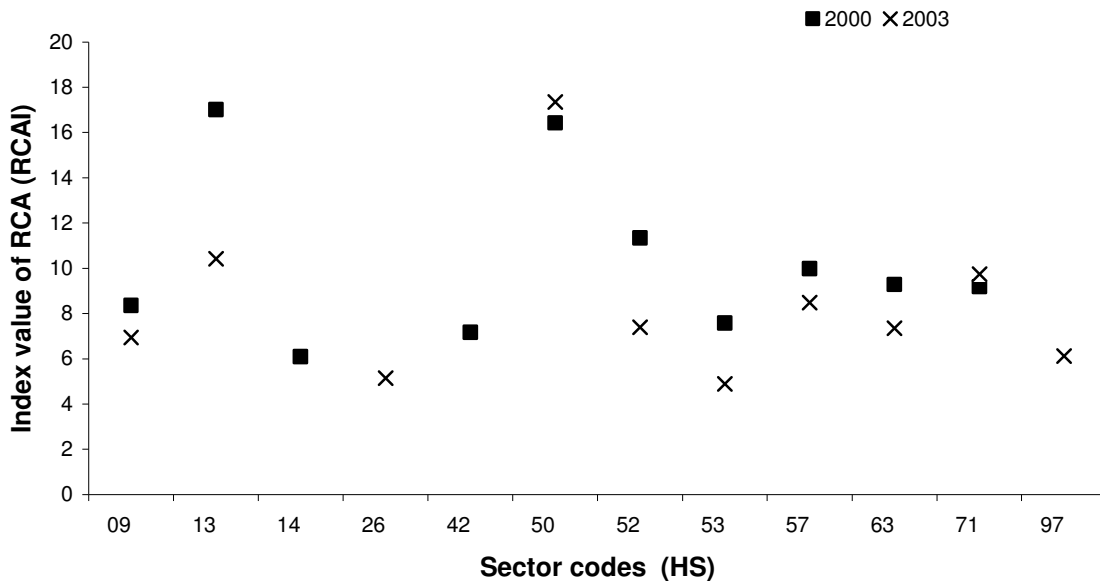
**Table 6.2 : India: Ten most competitive sectors over 2000-2003**

Number of sectors that continue to be in the top 10 in both 2000 and 2003: 8

HS Code*	2000	HS Code*	2003
13	Lac, gums, resins, vegetable saps and extracts nes	50	Silk
50	Silk	13	Lac, gums, resins, vegetable saps and extracts nes
52	Cotton	71	Pearls, precious stones, metals, coins, etc
57	Carpets and other textile floor coverings	57	Carpets and other textile floor coverings
63	Other made textile articles, sets, worn clothing etc	52	Cotton
71	Pearls, precious stones, metals, coins, etc	63	Other made textile articles, sets, worn clothing etc
09	Coffee, tea, mate and spices	09	Coffee, tea, mate and spices
53	Vegetable textile fibres nes, paper yarn, woven fabric	97	Works of art, collectors pieces and antiques
42	Articles of leather, animal gut, harness, travel goods	26	Ores, slag and ash
14	Vegetable plaiting materials, vegetable products nes	53	Vegetable textile fibres nes, paper yarn, woven fabric

\*sectors ranked in descending order.

**Figure 3: India: Ten most competitive sectors**



The picture is however different when the sectors are analyzed in terms of the number of constituent 6-digit items where India holds comparative advantage in the world market. India has maximum comparative advantage in organic chemicals, both in 2000 and 2003. Within organic chemicals, while the number of commodities with comparative advantage in 2003 has marginally increased in comparison with the number in 2000 (120), the share of the sector has fallen marginally. While in 2000 organic chemicals contribute about 9 per cent of total comparative advantage, this falls to 8 per cent in 2003. Organic chemicals is followed by sectors like - cotton, articles of apparel, accessories, not knit or crochet and nuclear reactors, boilers and machinery in both the years. Iron and steel emerges as a sector with comparative advantage for India in 2003. Nuclear reactors, boilers, machinery, etc continues to be the sector disadvantaged at the aggregate level and advantageously placed when disaggregated to commodity level. A more detailed sectoral analysis using the constituent six-digit commodities has been undertaken using the SRC coefficient in section 6.3.

Castor oil & its fractions ranks among the top ten commodities with advantage in the world market, but belong to the sector Animal, vegetable fats and oils, cleavage

products, etc which is disadvantageously placed in the world market. The RCAI for the sector is 0.84 in 2003.

## 6.2 China

As is true for India, the number of sectors for which China enjoys comparative advantage remains the same between 2000 and 2003. China enjoyed comparative advantage in 47 sectors in both 2000 and 2003. While 45 out of the 47 sectors retain their comparative advantage in 2003, Oilseeds (HS-12) and Live Animals (HS-01) lose their advantage. Two new sectors - glass and glassware and nuclear reactors, boilers, machinery, etc have gained comparative advantage in 2003. Sectors that have in the same period experienced a rise in their rank by 10 or more are Manmade filaments (HS-54) and special woven or tufted fabric, lace, tapestry etc (HS-58) while other sectors that have lost are salt, sulphur, earth, stone, plaster, lime and cement HS-25 and zinc and articles thereof (HS-79).

**Table 6.3 : Inter-temporal movement of China's RCA**

Number of sectors for which China holds advantage		
2000: 47		2003:47
Number of sectors that have retained advantage: 45		
Number of sectors that have gained advantage: 2		
Details	HS Code	Sector
	70	Glass and glassware
	84	Nuclear reactors, boilers, machinery, etc
Number of sectors that have lost advantage: 2		
Details	HS Code	Sector
	01	Live animals
	12	Oil seed, oleagic fruits, grain, seed, fruit, etc, nes
Number of sectors that have gained/lost more than ten ranks		
Sectors that have gained	54	Manmade filaments
	58	Special woven or tufted fabric, lace, tapestry etc
Sectors that have lost	25	Salt, sulphur, earth, stone, plaster, lime and cement
	79	Zinc and articles thereof

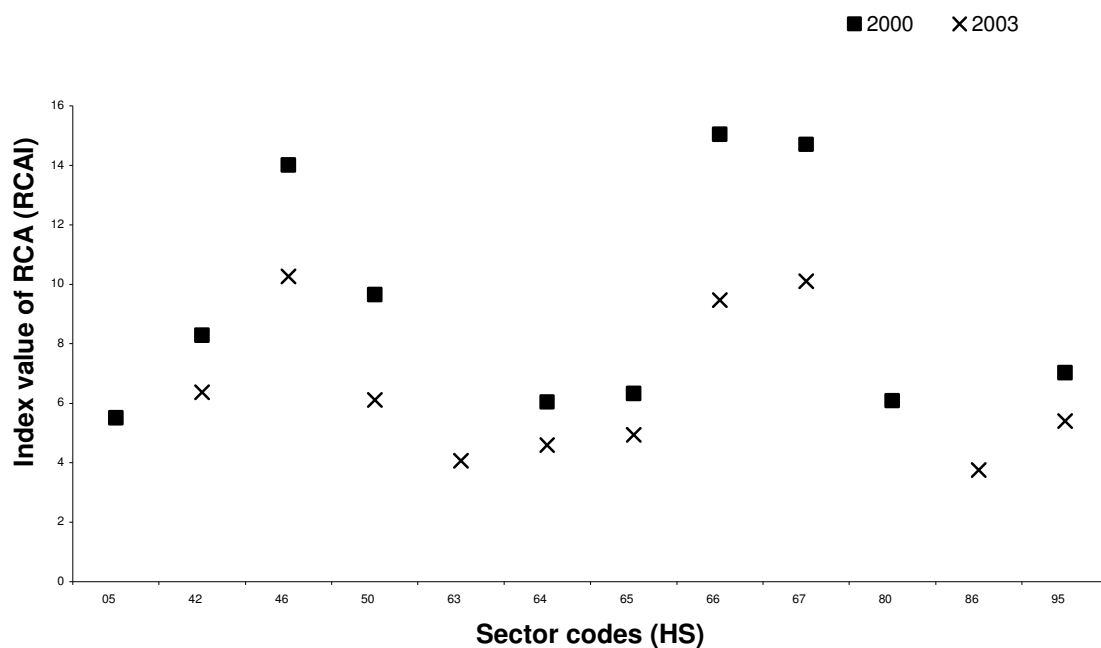
Of the ten most competitive sectors for China in 2000, eight retain their advantage in 2003. Sectors like tin and articles thereof and products of animal origin, nes drop out of the top ten set. While the sector - Tin and articles thereof has fallen from rank 8 to 28, Products of animal origin, nes has moved from 10 to rank 15 in the same period.

**Table 6.4 : China: Ten most competitive sectors over 2000-2003**

Number of sectors that continue to be in the top 10 in 2000 and 2003: 8

HS Code	2000	HS Code	2003
66	Umbrellas, walking-sticks, seat-sticks, whips, etc	46	Manufactures of plaiting material, basketwork, etc.
67	Bird skin, feathers, artificial flowers, human hair	67	Bird skin, feathers, artificial flowers, human hair
46	Manufactures of plaiting material, basketwork, etc.	66	Umbrellas, walking-sticks, seat-sticks, whips, etc
50	Silk	42	Articles of leather, animal gut, harness, travel goods
42	Articles of leather, animal gut, harness, travel goods	50	Silk
95	Toys, games, sports requisites	95	Toys, games, sports requisites
65	Headgear and parts thereof	65	Headgear and parts thereof
80	Tin and articles thereof	64	Footwear, gaiters and the like, parts thereof
64	Footwear, gaiters and the like, parts thereof	63	Other made textile articles, sets, worn clothing etc
05	Products of animal origin, nes	86	Railway, tramway locomotives, rolling stock, equipment

**Figure 4: China: Ten most competitive sectors**



In terms of the number of constituent 6-digit items where China holds comparative advantage in the world market, China maintains its maximum comparative advantage in electrical, electronic equipment, chemicals followed by articles of apparel.



Cotton gets drooped and replaced by organic chemicals. A more detailed sectoral analysis using the constituent six-digit commodities has been undertaken using the SRC coefficient in section 6.3.

In 2000, Green tea and anthraquinone are among some of the items that individually rank in the top ten commodities with advantage in the world market (RCAI-19.15 and 19.25 respectively), but belong to sectors that are disadvantageously placed in the world market. Green tea belongs to the sector- coffee, tea mate and spices that has an RCAI value of 0.88 and anthraquinone belongs to organic chemicals with an index value of 0.68. In 2003, coffee, tea mate and spices green tea continues to be disadvantageously placed in the world market and anthraquinone though not among the top ten commodities remains among the top 100.

### **6.3 Spearman Rank Correlation based Analysis**

Dynamic structural changes over 2000-2003 are analyzed using the Spearman Rank Correlation (SRC) coefficient for India and China. The SRC coefficient, a non-parametric test, is often used to test for independence between two random variables. The range of possible values is from  $-1$  to  $+1$ . A value close to  $+1(-1)$  will be interpreted to mean strong positive (negative) rank correlation while a value of zero indicates a complete lack of correlation. For the purpose of our analysis, a high rank correlation will be interpreted to mean the ranking of a country's industries by comparative advantage has changed little over time. A low coefficient will indicate the ranking has changed considerably, suggesting thereby rapid change. The SRC coefficient analysis has been undertaken for India and China for the manufacturing sector as a whole as well as for individual sectors within manufacturing. The two steps help analyze if there has been a structural shift in the economy as a whole as also within different sectors.

For the manufacturing sector as a whole, the SRC for India is 0.8 indicating no significant structural change over 2000 and 2003. For China the SRC value is 0.9, again implying that the structure of industries enjoying comparative advantage does not undergo any change between 2000 and 2003.

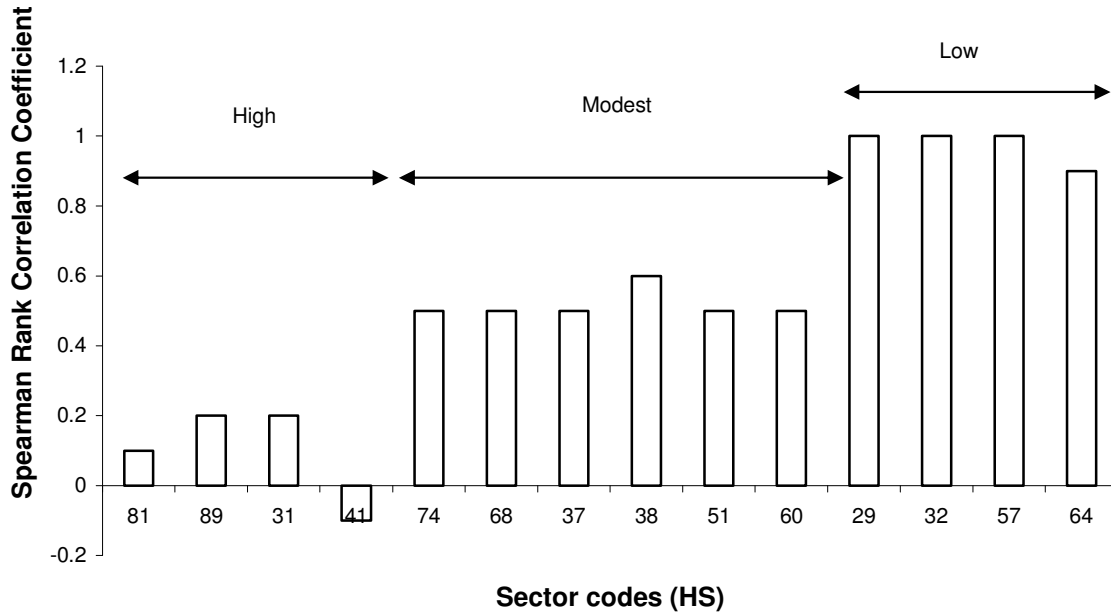
### 6.3.1 India

Within the manufacturing sector the value of SRC for sectors like other fertilizers, railway, tramway locomotives, rolling stock, equipment, Wool, animal hair, horsehair yarn and fabric thereof etc is small, leading us to conclude that these sectors have undergone structural change. Statistically, however the change is not significant. Maximum structural change is experienced by sectors like other base metals, cermets, articles thereof, ships, boats and other floating structures and fertilizers for which the SRC is the lowest (Refer Appendix Table A.9). For sector raw hides and skins (other than fur skins) and leather, SRC is negative. In this sector, 50 per cent of the commodities have either moved from disadvantage to advantage in the world market or gained in advantage in this period. For commodity 410619, India has lost advantage in 2003 as against 2000 when the value of the RCAI was 91. Sectors that have seen a modest change are copper and articles thereof, mica, etc articles, photographic or cinematographic goods, miscellaneous chemical products, wool, animal hair, horsehair yarn and fabric thereof and knitted or crocheted fabric. Sectors which have remained structurally same are organic chemicals, tanning, dyeing extracts, tannins, derivs, pigments etc , carpets and other textile floor coverings and footwear, gaiters and the like, parts thereof.

**Table 6.5: Structural change across sectors in India: 2000-2003**

Category	HS	Sector Description
<b>High Structural Change</b>	81	Other base metals, cermets, articles thereof
	89	ships, boats and other floating structures
	31	Fertilizers
	41	raw hides and skins (other than furskins)
<b>Modest structural change</b>	74	copper and articles thereof
	68	stone, plaster, cement, asbestos, mica, etc articles
	37	photographic or cinematographic goods
	38	miscellaneous chemical products
	51	wool, animal hair, horsehair yarn and fabric thereof
	60	knitted or crocheted fabric
<b>Low structural change</b>	29	organic chemicals
	32	tanning, dyeing extracts, tannins, derivs, pigments etc
	57	carpets and other textile floor coverings
	64	footwear, gaiters and the like, parts thereof.

**Figure 5: Structural change across sectors in India: 2000-2003**



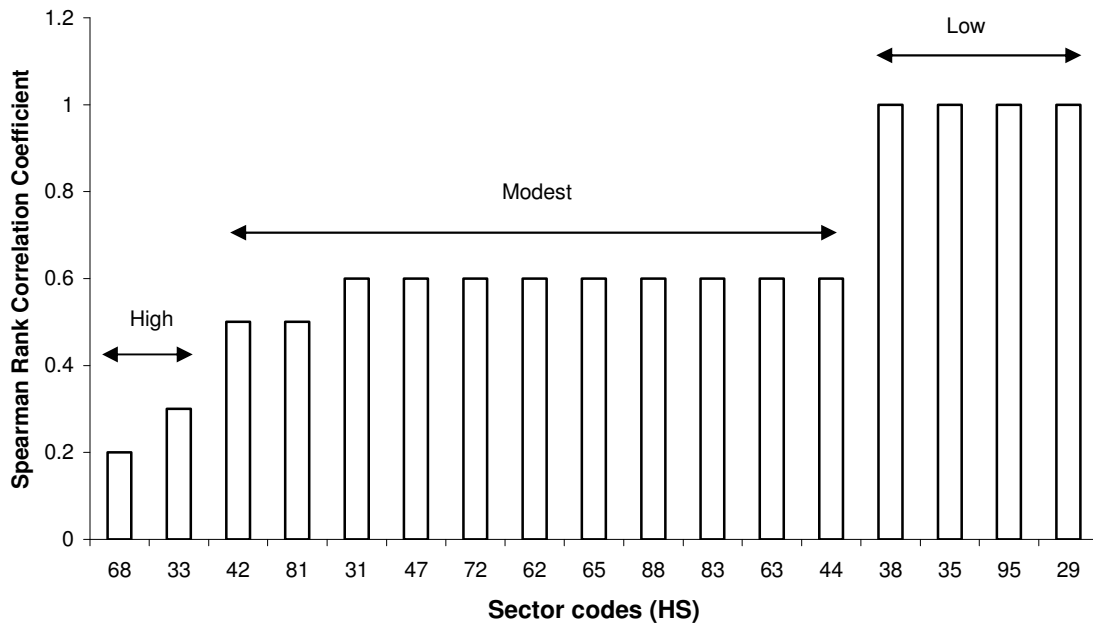
### 6.3.2 China

For China, the SRC coefficient between 2000 and 2003 for sectors stone, plaster, cement, asbestos, mica, etc, articles of leather, animal gut, harness, travel goods is small, indicating that these sectors have undergone structural change. Statistically, however the change is not significant. Maximum structural change is experienced by sectors like Stone, plaster, cement, asbestos, mica, etc articles, Essential oils, perfumes, cosmetics, toiletries and for which the SRC is the lowest (Refer Table Appendix A.10). Modest change is observed for sectors like fertilizers, iron and steel, headgear and parts thereof and aircraft, spacecraft, and parts thereof etc. Sectors which have remained structurally same are albuminoids, modified starches, glues, enzymes, toys, games, sports requisites, miscellaneous chemical products and organic chemicals.

**Table 6.6 : Structural change across sectors in China: 2000-2003**

	HS	Sector
<b>High structural change</b>	68	Stone, plaster, cement, asbestos, mica, etc articles
	33	Essential oils, perfumes, cosmetics, toileteries
<b>Modest Structural change</b>	42	Articles of leather, animal gut, harness, travel goods
	81	Other base metals, cermet, articles thereof
	31	Fertilizers
	47	Pulp of wood, fibrous cellulosic material, waste etc
	72	Iron and steel
	62	Articles of apparel, accessories, not knit or crochet
	65	Headgear and parts thereof
	88	Aircraft, spacecraft, and parts thereof
	83	Miscellaneous articles of base metal
	63	Other made textile articles, sets, worn clothing etc
	44	Wood and articles of wood, wood charcoal
<b>Low structural change</b>	38	Miscellaneous chemical products
	35	Albuminoids, modified starches, glues, enzymes
	95	Toys, games, sports requisites
	29	Organic chemicals

**Figure 6: Structural change across sectors in China: 2000-2003**



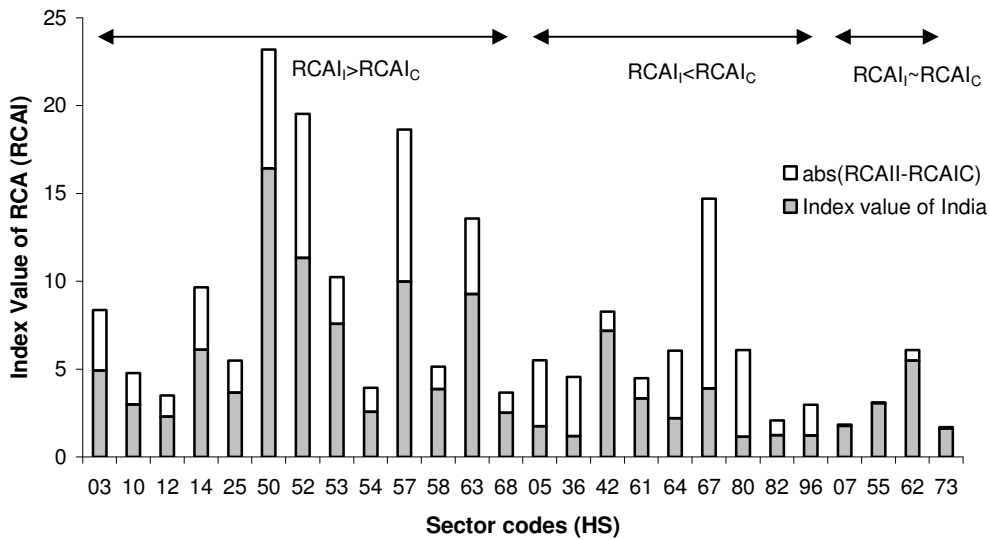
#### 6.4 India-China: A Comparative Analysis

There are 26 sectors where India and China both enjoy comparative advantage in 2000 vis-à-vis 24 in 2003. Of these in one sector i.e. special woven or tufted fabric, lace, tapestry etc India had a higher comparative advantage relative to China in 2000 but has lost this in 2003. India and China are equally advantageously placed in edible vegetables and certain roots and tubers and articles of apparel, accessories, not knit or crochet for 2000 and 2003. India is more advantageously placed than China in the world market in fish, crustaceans, molluscs, aquatic invertebrates nes, cereals, vegetable plaiting materials, vegetable products nes , salt, sulphur, earth, stone, plaster, lime and cement, silk , cotton , vegetable textile fibres nes, paper yarn, woven fabric, manmade filaments, manmade staple fibres, carpets and other textile floor coverings, other made textile articles, sets, worn clothing etc , and stone, plaster, cement, asbestos, mica, etc articles in both 2000 and 2003.

**Table 6.7 : A comparative analysis of RCA for India and China: 2000**

Category	HS Code	Sector
<b>India is more advantageously placed than China</b>	03	Fish, crustaceans, molluscs, aquatic invertebrates nes
	10	Cereals
	12	Oil seed, oleagic fruits, grain, seed, fruit, etc, nes
	14	Vegetable plaiting materials, vegetable products nes
	25	Salt, sulphur, earth, stone, plaster, lime and cement
	50	Silk
	52	Cotton
	53	Vegetable textile fibres nes, paper yarn, woven fabric
	54	Manmade filaments
	57	Carpets and other textile floor coverings
	58	Special woven or tufted fabric, lace, tapestry etc
	63	Other made textile articles, sets, worn clothing etc
	68	Stone, plaster, cement, asbestos, mica, etc articles
<b>China is more advantageously placed than India</b>	05	Products of animal origin, nes
	36	Explosives, pyrotechnics, matches, pyrophorics, etc
	42	Articles of leather, animal gut, harness, travel goods
	61	Articles of apparel, accessories, knit or crochet
	64	Footwear, gaiters and the like, parts thereof
	67	Bird skin, feathers, artificial flowers, human hair
	80	Tin and articles thereof
	82	Tools, implements, cutlery, etc of base metal
96	Miscellaneous manufactured articles	
<b>India and China are equally advantageously placed</b>	07	Edible vegetables and certain roots and tubers
	55	Manmade staple fibres
	62	Articles of apparel, accessories, not knit or crochet
	73	Articles of iron or steel

**Figure 7: A comparative analysis of RCA for India and China: 2000**

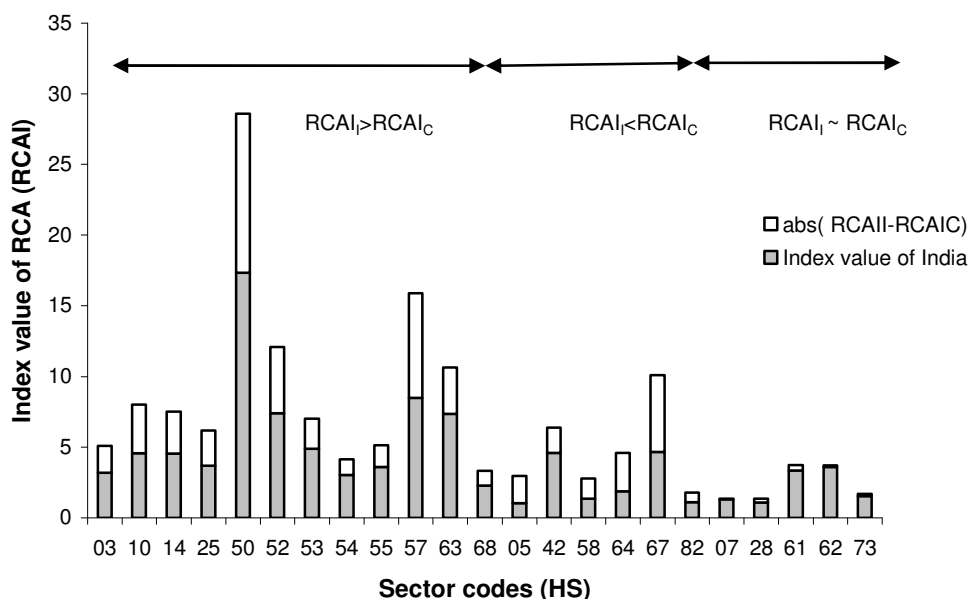


China is more advantageously placed than India in the world market in products of animal origin, nes, Articles of leather, animal gut, harness, travel goods, footwear, gaiters and the like, parts thereof, bird skin, feathers, artificial flowers, human hair, tools, implements, cutlery, etc of base metal and miscellaneous manufactured articles in both 2000 and 2003.

**Table 6.8 : A comparative analysis of RCA for India and China: 2003**

Category	HS Code	Sector
India is more advantageously placed than China	03	Fish, crustaceans, molluscs, aquatic invertebrates nes
	10	Cereals
	14	Vegetable plaiting materials, vegetable products nes
	25	Salt, sulphur, earth, stone, plaster, lime and cement
	50	Silk
	52	Cotton
	53	Vegetable textile fibres nes, paper yarn, woven fabric
	54	Manmade filaments
	55	Manmade staple fibres
	57	Carpets and other textile floor coverings
	63	Other made textile articles, sets, worn clothing etc
China is more advantageously placed than India	68	Stone, plaster, cement, asbestos, mica, etc articles
	05	Products of animal origin, nes
	42	Articles of leather, animal gut, harness, travel goods
	58	Special woven or tufted fabric, lace, tapestry etc
	64	Footwear, gaiters and the like, parts thereof
India and China are equally advantageously placed	67	Bird skin, feathers, artificial flowers, human hair
	82	Tools, implements, cutlery, etc of base metal
	07	Edible vegetables and certain roots and tubers
	28	Inorganic chemicals, precious metal compound, isotopes
	61	Articles of apparel, accessories, knit or crochet
	62	Articles of apparel, accessories, not knit or crochet
	73	Articles of iron or steel

**Figure 8: A comparative analysis of RCA for India and China: 2003**



India's comparative advantage is predominantly in the agriculture and allied products category. This is further consolidated in the year 2003. The other category where India consolidates its comparative position vis-à-vis China in the global market is resource based manufactures and also miscellaneous manufactures.

**Table 6.9 : Sectors where only India has comparative advantage**

Code	Description
<b>Agricultural and Allied Products</b>	
02	<i>Meat and edible meat offal</i>
8	Edible fruit, nuts, peel of citrus fruit, melons
9	Coffee, tea, mate and spices
11	<b>Milling products, malt, starches, inulin, wheat gluten</b>
12	<b>Oil seed, oleagic fruits, grain, seed, fruit, etc, nes</b>
13	Lac, gums, resins, vegetable saps and extracts nes
15	<i>Animal, vegetable fats and oils, cleavage products, etc</i>
17	Sugars and sugar confectionery
23	Residues, wastes of food industry, animal fodder
24	Tobacco and manufactured tobacco substitutes
<b>Mineral and Mineral Fuels</b>	
26	Ores, slag and ash
<b>Chemicals and Plastics</b>	
29	Organic chemicals
30	<i>Pharmaceutical products</i>
32	Tanning, dyeing extracts, tannins, derivs, pigments etc
38	<i>Miscellaneous chemical products</i>
<b>Manufactures Chiefly by Material</b>	
40	<b>Rubber and articles thereof</b>
41	Raw hides and skins (other than furskins) and leather
71	Pearls, precious stones, metals, coins, etc
72	Iron and steel
74	Copper and articles thereof
<b>Miscellaneous Manufactures</b>	
97	<b>Works of art, collectors pieces and antiques</b>

bold- sector in which India has advantage only in 2003, italic-sector in which India has advantage only in 2000

China on the other hand is relatively advantageously placed in the global market for both resource based manufactures as well as machine and equipments with the former comprising larger number of sectors than the latter. New gains in resource based manufactures have been acquired by China between 2000 and 2003. In 2003 China has gained comparative advantage in sectors like glass and glassware and tin and articles thereof. In the category of machinery and equipment China has attained comparative advantage in nuclear reactors, boilers, machinery, etc in 2003. In the chemicals and plastics category India outscores China. China is advantageously placed in the world market vis-à-vis India for only explosives, pyrotechnics, matches, pyrophorics, etc in 2003. The comparative advantage enjoyed by China in 2000 in inorganic chemicals, precious metal compound, isotopes is however lost in 2003. India on the other hand holds relative comparative advantage for organic chemicals and tanning, dyeing extracts, tannins, derivs, pigments etc.

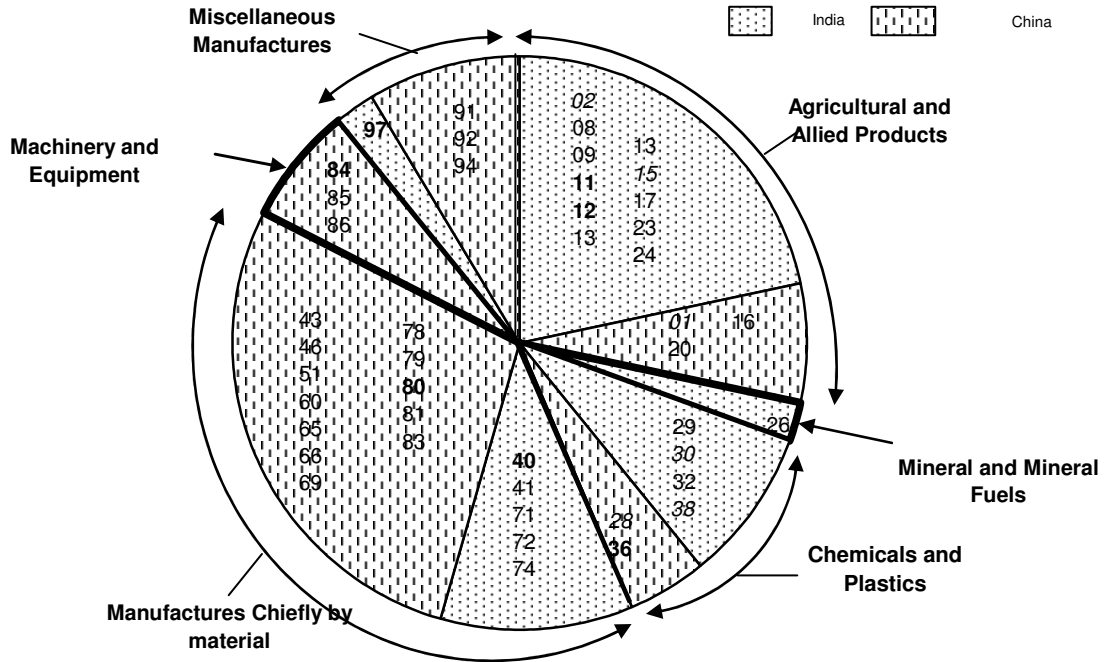
**Table 6.10 : Sectors where only China has comparative advantage**

Code	Description
<b>Agricultural and Allied Products</b>	
<i>01</i>	<i>Live animals</i>
16	Meat, fish and seafood food preparations nes
20	Vegetable, fruit, nut, etc food preparations
<b>Chemicals and Plastics</b>	
<i>28</i>	<i>Inorganic chemicals, precious metal compound, isotopes</i>
<b>36</b>	<b>Explosives, pyrotechnics, matches, pyrophorics, etc</b>
<b>Manufactures Chiefly by Material</b>	
43	Furskins and artificial fur, manufactures thereof
46	Manufactures of plaiting material, basketwork, etc.
51	Wool, animal hair, horsehair yarn and fabric thereof
60	Knitted or crocheted fabric
65	Headgear and parts thereof
66	Umbrellas, walking-sticks, seat-sticks, whips, etc
69	Ceramic products
<b>70</b>	<b>Glass and glassware</b>
78	Lead and articles thereof
79	Zinc and articles thereof
<b>80</b>	<b>Tin and articles thereof</b>
81	Other base metals, cermets, articles thereof
83	Miscellaneous articles of base metal
<b>Machinery and Equipment</b>	
<b>84</b>	<b>Nuclear reactors, boilers, machinery, etc</b>
85	Electrical, electronic equipment
86	Railway, tramway locomotives, rolling stock, equipment
<b>Miscellaneous Manufactures</b>	
91	Clocks and watches and parts thereof
92	Musical instruments, parts and accessories
94	Furniture, lighting, signs, prefabricated buildings
95	Toys, games, sports requisites

bold- sector in which China has advantage only in 2003, italic-sector in which China has advantage only in 2000



**Figure 9: Sectors where India/China has comparative advantage**



bold- sector in which India/ China has advantage only in 2003

italic-sector in which India/China has advantage only in 2000

## 7 Revealed Comparative Advantage According to Factor Intensity: Manufacturing Sector

In this section, comparative advantage has been analyzed according to factor intensity. The analysis has been undertaken for manufacturing sector in India and China as in both the economies total exports are pre-dominantly from the manufacturing sector. In 2003, 95 per cent of total Chinese exports comprised exports from the manufacturing sector while for India the sector's share in its total exports was 88 per cent.

### 7.1 Methodology

The factor intensity analysis has been undertaken using the SITC (Rev.3) classification. The SITC has been developed by the United Nations with the intention of classifying traded products not only on the basis of their material and physical properties,

but also according to the stage of processing, and their economic functions in order to facilitate economic analysis. The HS classification while having the advantage of detail and dis-aggregation is restricted only to a precise breakdown of the products' individual categories. For analyzing comparative advantage by factor intensity therefore SITC is a preferred classification.

As all calculations for RCA in this paper have been done using export data at the six-digit level of HS classification, as a first step, a concordance of the HS with the SITC system of classification has been undertaken. Commodities at the HS- 6 level have been mapped onto the five-digit SITC product classification using the UN COMTRADE classification registry. The set of five digit SITC commodities thus attained is then aggregated to three and two digit levels as the product classification by factor intensity is available only at this level of aggregation.

Factor intensity analysis at the two – digit level of classification has been undertaken using the UNCTAD, OECD and Anderson and Garnaut (1980) system of classifications. At the three digit level, the Empirical Trade Analysis (ETA), Williamson Davidson Institute (WDI) and world matrix of sectoral economic data (hwwa)<sup>9</sup> classification systems have been used. The discussion in this section is based largely on the UNCTAD at the 2 digit level and ETA and WDI at the 3 digit level of classification respectively as these are the most comprehensive systems of classification.

## **7.2 India**

As stated in the section 4.1.1, there are 1512 items where India enjoys comparative advantage in the world market at the HS-six digit code in 2003. All the 1512 commodities are mapped onto the SITC five - digit code. According to the SITC classification<sup>10</sup>, 112 items are classified in the category of Food and Live Animals and 128 items get classified in the primary category. 1272 items are categorized as manufactured items. The focus of the analysis in this section is on the 1272 manufactured

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<sup>9</sup> [http://www.hwwa.de/wmatrix/Technical\\_Description.html](http://www.hwwa.de/wmatrix/Technical_Description.html) (hwwa)

<sup>10</sup> SITC-0: Food and Live animals, SITC 1-4: Primary commodities, SITC 5-8: Manufactured items.

commodities. These 1272 commodities are then aggregated at the 2-digit and 3-digit level of SITC classification. This, then becomes the basis for the analysis of comparative advantage according to factor intensity.

#### *Factor Intensity Analysis at the Two Digit Level*

At the 2-digit level, three classification systems have been adopted. These are the UNCTAD, OECD, Anderson and Garnaut (1980) system of classification. The analysis in this section is undertaken using the UNCTAD classification (with some inputs based on OECD classification) system as it is the most comprehensive classification based on details relating to human capital, technology and capital intensity of the manufactured commodities. The following trends emerge.

India's comparative advantage is observed to be predominantly in the labor intensive and resource intensive commodity category. Of the total 1512 manufactures where India enjoys comparative advantage in the world market, 573 are resource and labor intensive as per the UNCTAD classification system. This is followed by the category (IV) in the UNCTAD classification. Category IV commodities are those, the manufacture of which, makes a high demand for the four criteria viz skill, technology, capital and scale in comparison with the categories II and III which demand low and medium levels respectively of these four criteria. Category IV has 301 commodities while there are 191 commodities in category II and 134 commodities in category III. The OECD system also classifies the maximum number of commodities i.e. 687 as resource (56) and labor intensive (631). (Refer Appendix Table A.12)

Among the resource and labor intensive manufactures based on UNCTAD classification, sectors like textiles (yarn, fabric, made-up articles n.e.s and related products) and articles of apparel and clothing accessories dominate.

**Table 7.1 : Top resource and labour intensive manufactures: India**

Rank	SITC	Description
1	65	Textile yarn, fabrics, made-up articles, n.e.s., and related products
2	84	Articles of apparel and clothing accessories
3	66	Non-metallic mineral manufactures, n.e.s

In the high demand of skill, technology, capital and scale category, i.e. UNCTAD-IV, the commodity category of organic chemicals has a conspicuous presence followed by inorganic chemicals.

**Table 7.2: Top manufactures requiring high demand of skill, technology, capital and scale: India**

Rank	SITC	Description
1	51	Organic chemicals
2	52	Inorganic chemicals
3	54	Medicinal and pharmaceutical products
4	88	Photographic apparatus, equipment and supplies and optical goods, n.e.s.; watches and clocks

The picture is roughly the same in 2000. The maximum number of commodities is from the resource and labour intensive category as per the UNCTAD and OECD classification systems. These are followed by sectors that make a high demand for skill, technology capital and scale for the UNCTAD classification and skill intensive in case of OECD classification systems. Within the category IV of UNCTAD classification the predominant position of organic chemicals is again evident. In fact the number of commodities in this category also remains the same in the two years. (Refer Appendix Table A.12 and A.13).

The OECD provides us with a useful insight by segregating science based manufactures. 67 product categories can be classified as science based manufactures. In the science based manufactured commodities, the predominant category is medicinal and pharmaceutical products, followed by photographic apparatus, equipment, and supplies and optical goods n.e.s; watches and clocks. In this category, office machines and automatic data-processing machines, has recorded highest increase between 2000 and

2003 in terms of the number of commodities for which India enjoys comparative advantage. (Refer Appendix Table A.14 and A.15).

**Table 7.3 : Top science based manufactures in which India is advantageously placed**

Rank	SITC	Description
1	54	Medicinal and pharmaceutical products
3	88	Photographic apparatus, equipment and supplies and optical goods, n.e.s.; watches and clocks
4	75	Office machines and automatic data-processing machines
2	87	Professional, scientific and controlling instruments and apparatus, n.e.s.

#### *Factor Intensity Analysis at the Three Digit Level*

At the three-digit level, three classification systems have been adopted. These are the ETA, WDI and the hwwa matrix. The WDI system provides the most comprehensive classification as it is based on details relating to human capital, technology and capital intensity of the manufactured commodities. ETA and hwwa are, on the other hand broad classifications. ETA classifies commodities as per their intensity of natural resources, unskilled labor, technology or human capital. The technology intensive commodities are further classified as either medium or high technology using the hwwa world matrix of classification. In this section, a brief review of the trends using ETA and hwwa are first presented, followed by an analysis in detail of India's international specialization according to factor intensity based on the WDI system.

#### *Comparative advantage based on ETA Classification*

According to the ETA system of classification, of the 1512 SITC manufactured commodities for which comparative advantage for India has been observed, 489 commodities are unskilled labor intensive, 412 commodities are technology intensive, 293 commodities are human capital intensive and 95 are natural resource intensive. The maximum advantage for India in 2003 therefore lies in the category of unskilled labour intensive manufactured goods. While the number of commodities for which India enjoys comparative advantage in each category has increased in comparison with that in 2000,

the maximum advantage for India is still observed for commodities that are intensive in unskilled labour.

**Table 7.4 : India’s comparative advantage in terms of factor intensity based on ETA**

	<b>2000</b>	<b>2003</b>
<b>Human Capital</b>	247	293
<b>Natural resource</b>	74	95
<b>Technology</b>	371	412
<b>Unskilled labour</b>	455	489
<b>Unclassified</b>	43	49

The 412 commodities classified as technology intensive according to ETA are further characterized as medium and high technology intensive manufactures using hwwa world matrix system. Based on this, 24 commodities are identified as intensive in high technology and 154 as medium technology intensive manufactures.

*Comparative Advantage based on WDI Classification*

According to the more comprehensive WDI system of classification, 69 items are classified as intensive in high technology and human capital. Within this 53 items are intensive in physical capital, and 16 items can be classified as intensive in labor capital. The dominant items in the category of high technology, human and physical capital are medicinal and pharmaceutical products (SITC-541) and other organic chemicals (SITC-516). In the category of high technology, human capital and labor intensive goods the dominant share is of the electrical machinery and apparatus (SITC-778), which is otherwise classified as medium skill and technology by the ETA system. 36 commodities are classified as low technology and human capital intensive, of which 10 are intensive in labour. Musical instruments and parts and accessories thereof has a dominant share in this category. Commodities are almost uniformly distributed across industries like starches, inulin and wheat gluten; albuminoidal substances; glues, rotating electric plant, and parts thereof, n.e.s, and perfumery, cosmetic or toilet preparations (excluding soaps). In the category characterized as medium technology, human capital, and capital intensive comprising of 145 products, SITC-523, i.e. metal salts and peroxy salts of inorg. has a

predominant share of 26 per cent. This is followed by shares of commodities like inorganic chemical elements, oxides and halogen salts (SITC-522), tubes, pipes and hollow profiles, and tube or pipe fittings, of iron or steel (SITC-679), synthetic organic colouring matter and colour lakes, and preparations based thereon (SITC-531), organo-inorganic compounds, heterocyclic compounds, nucleic acids and their salts, and sulphonamides (SITC-515) and essential oils, perfume and flavour materials (SITC-551). In comparison, the number of commodities in the medium technology, human capital and labor intensive is about 60 per cent of the number of the corresponding capital intensive category. 88 manufactured commodities constitute the category classified as medium technology, human capital and labor intensive by the WDI. A clear dominance in this case is observed in the tools for use in hand or machines category (SITC-695).

The largest two categories according to the WDI classification are again the labor intensive and the resource intensive categories. While the former has 524 items, the latter has 404 items with comparative advantage for India. Among the labor - intensive commodities, textile yarn has the maximum number of commodities with comparative advantage. Other prominent items in this group are made-ups articles, wholly or chiefly of textile materials, n.e.s. and women's, girls coats, capes and jackets etc. This category although largely reflective of India's advantage in the textile sector also has certain other items like motor cycles (including mopeds) and cycles, motorized and non-motorized; invalid carriages, household equipment of base metal, n.e.s., manufactures of base metal, n.e.s., footwear, watches and clocks, miscellaneous manufactured articles, n.e.s.. In the resource intensive category, again the dominant share is that of fabrics, woven, of man-made textile materials (not including narrow or special fabrics), cotton fabrics, woven (not including narrow or special fabrics).

**Table 7.5 : India's comparative advantage in terms of factor intensity based on WDI**

Category	2000	2003
<b>Resource Intensive</b>	350	404
<b>Human Capital High Technology</b>		
<i>Capital Intensive</i>	49	53
<i>Labour Intensive</i>	14	16
<b>Human Capital Labour Intensive</b>	1	1
<b>Human Capital Low Technology</b>	25	26
<b>Human Capital Low Technology Labour Intensive</b>	5	10
<b>Human Capital Medium Technology</b>		
<i>Capital Intensive</i>	132	145
<i>Labour Intensive</i>	64	88
<b>Labour Intensive</b>	481	524

No major or significant change is observed in 2003 in comparison to the year 2000, at two or three digit classifications based on factor intensity for India.

A detailed list of all three digit manufactured items with their factor intensity is presented in the Appendix Table A.16.

### 7.3 *China*

In the year 2003, at the HS-six digit level of HS classification there are 1828 items where China enjoys a comparative advantage in the world market. All the 1828 commodities have been mapped onto the SITC – five-digit code. According to the SITC classification 116 items are classified in the category - Food and Live Animals and 81 items get classified as primary. The remaining 1631 commodities are categorized as manufactured items and these are then classified according to factor intensity. Observed trends in China's international specialization according to factor intensity are as follows.

#### *Factor Intensity Analysis at the Two Digit Level*

For the two-digit SITC classification, the labor and resource intensive commodities dominate. Of the total 1631 manufactured items, 794 items belong to this category according to the UNCTAD classification. The labour and resource intensive categories are followed by categories IV, II and III of the UNCTAD classification, in that



order. In case of China there are 402 commodities in category IV and 196 and 172 commodities in category II and III respectively. (Refer Appendix Table A.17).

Among the resource and labour intensive manufactures, China is advantageously placed in textiles (yarn, fabric, made-up articles n.e.s and related products) and articles of apparel and clothing accessories<sup>11</sup>.

**Table 7.6 : Top resource and labour intensive manufactures: China**

SITC	Description
65	Textile yarn, fabrics, made-up articles, n.e.s., and related products
84	Articles of apparel and clothing accessories
66	Non-metallic mineral manufactures, n.e.s

In the high demand of skill, technology, capital and scale category of the (UNCTAD-IV), the commodity category of organic chemicals has a conspicuous presence followed by inorganic chemicals.

**Table 7.7 : Top manufactures requiring high demand of skill, technology, capital and scale: China**

Rank	SITC	Description
1	51	Organic chemicals
2	52	Inorganic chemicals
3	88	Photographic apparatus, equipment and supplies and optical goods, n.e.s.; watches and clocks
4	76	Telecommunications and sound-recording and reproducing apparatus and equipment

Broadly the picture is same in 2000. The maximum number of commodities are resource and labour intensive as per the UNCTAD and OECD classification systems. These are followed by sectors that make a high demand for skill, technology capital and scale for the UNCTAD classification and skill intensive in case of OECD categorization. Within category IV of UNCTAD, organic chemicals holds a predominant position. In fact the number of commodities in this category also remains the same.

<sup>11</sup> Detailed list of China's comparative advantage in terms of factor intensity based on UNCTAD classification is provided in Appendix Table A.18.

In the science based manufactures category as classified by the OECD system, photographic apparatus, equipment and supplies and optical goods dominates followed by medicinal and pharmaceutical products and professional, scientific and controlling instruments and apparatus both, with almost the same number of commodities. A smaller number is found in the category of office machines and automatic data processing machines. (Refer Appendix Table A.19 and A.20).

**Table 7.8 : Top science based manufactures in which China is advantageously placed**

Rank	SITC	Description
1	88	Photographic apparatus, equipment and supplies and optical goods, n.e.s.; watches and clocks
2	54	Medicinal and pharmaceutical producers
3	87	Professional, scientific and controlling instruments and apparatus, n.e.s.
4	75	Office machines and automatic data-processing machines

*Factor Intensity Analysis at the Three Digit Level*

*Comparative Advantage based on ETA Classification*

According to the ETA classification system, of the 1631 SITC manufactured commodities where China enjoys comparative advantage in the world market, 660 commodities are unskilled labor intensive(ULI), 600 are technology intensive, 334 commodities are human capital intensive and 94 are natural resource intensive. The maximum advantage for China in 2003 lies in the category of ULI manufactured goods. In comparison with 2000, the number of technology intensive commodities register an increase while that in the category of ULI fall in 2003.

**Table 7.9 : China's comparative advantage in terms of factor Intensity based on ETA**

	2000	2003
Human Capital	350	334
Natural resource	97	94
Technology	575	600
Unskilled labour	674	660
Unclassified	48	45

For the 600 commodities classified as technology intensive using the ETA system, a further delineation into medium and high technology is undertaken using the hwwa matrix. 49 commodities are thereby identified as high technology and 210 as medium technology intensive manufactures.

#### *Comparative Advantage based on WDI Classification*

According to the more comprehensive WDI system of classification, 112 items are classified as intensive in high technology and human capital. Within this 49 items are intensive in physical capital, and 63 items can be classified as intensive in labor capital. The dominant items in the category of high technology, human and physical capital are medicinal and pharmaceutical products (SITC-541) and other organic chemicals (SITC-516). In the category of high technology, human capital and labor intensive goods the dominant share is of the electrical machinery and apparatus (SITC-778), which is otherwise classified as medium skill and technology by the ETA. 59 items are classified as low technology and human capital intensive, of which 21 are intensive in labour. Musical instruments and parts has a dominant share in this category. Commodities are almost uniformly distributed across industries like perfumery, cosmetic or toilet preparations, explosives and pyrotechnics products, internal combustion piston engines, and radio broadcast receivers. In the category characterized as medium technology, human capital, and capital intensive comprising of 147 products, SITC-523, i.e. metal salts and peroxy salts of inorg. has a predominant share of 39 per cent. This is followed by shares of industries like Inorganic chemical elements, oxides and halogen salts (SITC-522), tubes, pipes and hollow profiles, and tube or pipe fittings, of iron or steel (SITC-679), Organo-inorganic compounds, heterocyclic compounds, nucleic acids and their salts, and sulphonamides, (SITC-515), and Other inorganic chemicals; organic and inorganic compounds of precious metals (SITC-524). In comparison, medium technology, human capital and labor intensive category has 198 manufactured commodities. A clear dominance in this case is observed in the tools for use in hand or machines (SITC-695) dominates this category followed by Household-type electrical and

non-electrical equipment, n.e.s. (SITC-775) and telecommunications equipment, n.e.s., and parts, n.e.s., and accessories of apparatus falling within division 76 (SITC-764).

The largest two categories according to the *WDI classification* are again the labor intensive and the resource intensive categories. While the former has 724 items, the latter has 370 items with comparative advantage for India. Among the labor - intensive commodities, textile yarn has the maximum number of commodities with comparative advantage. Other prominent items in this group are made-ups articles, miscellaneous manufactured articles, wholly or chiefly of textile materials, n.e.s., articles of apparel and women's, girls coats, capes and jackets etc. This category although largely reflective of China's advantage in the textile sector also has certain other items like watches and clocks, manufactures of base metal, baby carriages, toys, games and sporting goods and household equipment of base metal, n.e.s. In the resource intensive category, again the dominant share is that of fabrics, woven, of man-made textile materials (not including narrow or special fabrics) and cotton fabrics, woven (not including narrow or special fabrics).

**Table 7.10 : China's comparative advantage in terms of factor intensity based on WDI**

Category	2000	2003
<b>Resource Intensive</b>	376	370
<b>Human Capital High Technology</b>		
<i>Capital Intensive</i>	47	49
<i>Labour Intensive</i>	58	63
<b>Human Capital Labour Intensive</b>	-	-
<b>Human Capital Low Technology</b>	39	37
<b>Human Capital Low Technology Labour Intensive</b>	18	21
<b>Human Capital Medium Technology</b>		
<i>Capital Intensive</i>	162	147
<i>Labour Intensive</i>	181	198
<b>Labour Intensive</b>	565	724

A detailed list of all three digit manufactured items with their factor intensity is presented in the Appendix Table A.21.

## **7.4 India-China: Comparative Analysis**

### *7.4.1 Factor Intensity*

#### *Two Digit Level*

The resource and labour intensive manufactured commodities hold the dominant share in India and China's comparative advantage in the manufacturing sector. China's share of labor and resource intensive commodities of the total manufacturing sector increases marginally from 39 per cent in 2000 to 43 per cent in 2003. In contrast, India's share of the resource and labor intensive of the total manufacturing sector decreases from 39 per cent in 2000 to 37 per cent in 2003.

For both India and China science- based industries contribute less than 10 per cent of the comparative advantage in the manufacturing sector. While for India only about 5 per cent of the total manufactured products with comparative advantage can be characterized as science based in both 2000 and 2003, this percentage is greater in China. Science based manufactures constitute 7 per cent of China's comparative advantage in the manufacturing sector in 2000 as well as 2003. In absolute terms, China's science based industries is double the number in India. For 2000, there are 121 science based Industries in China in comparison with only 57 in India. In 2003, this number increases to 67 for India and 125 for China. Within the science-based manufactures India and China are advantageously placed in same commodity sectors. In terms of the number of manufactures in these sectors, China outscores India in all the sectors, except for medicinal and pharmaceutical products, in which India marginally exceeds China. In fact for India, medicinal and pharmaceutical products is the predominant category, while in China - photographic apparatus, equipment and optical goods dominates. In the leading science- based category China enjoys more than double the comparative advantage that India does in the same industry category. China's advantage in the leading science based industry is much stronger (in terms of the number of commodities) than that of India's in its leading science based industry. India has lost its distinct comparative advantage in aircraft launching gear; deck-arrestor or similar gear; ground flying trainers; parts of the foregoing in 2003. China on the other hand has gained comparative advantage in the

science based categories of gliders and hang-gliders, balloons, dirigibles and other non-powered aircraft and propellers and rotors, and parts thereof in 2003.

**Table 7.11: Manufactures in which India and China are advantageously placed in the science based category**

SITC	Description	Number of commodities	
		India	China
54	Medicinal and pharmaceutical products	31	26
75	Office machines and automatic data-processing machines	8	21
87	Professional, scientific and controlling instruments and apparatus, n.e.s.	3	24
88	Photographic apparatus, equipment and supplies and optical goods, n.e.s.; watches and clocks	25	51
792	Aircraft and associated equipment; spacecraft (including satellites) and spacecraft launch vehicles; parts thereof	-	3

In the UNCTAD IV – category of commodities with high demand for skill, scale, capital and technology, the picture for China is broadly similar to that for India, but for sector- telecommunications and sound recording and reproducing apparatus and equipment, where India enjoys comparative advantage for only two commodities in contrast with 30 for China.

### *Three Digit Level*

At the three digit level India reports growth in all categories of manufactures according to the ETA classification. China however witnesses an increase in the number of commodities only for the technology intensive category and a fall in the ULI category. In 2003 India attains the same level as that of China in natural resource intensive categories from 2000 to 2003. India has 95 (74 in 2000) commodities in the natural resource category in comparison to 94 commodities for China. In human capital category, India has significantly narrowed the difference with China in terms of the number of commodities for which it enjoys comparative advantage in the world market.

Based on hwwa matrix, India clearly dominates in motor cars and other motor vehicles principally designed for the transport of persons (other than motor vehicles for the transport of ten or more persons, including the driver), including station-wagons and racing cars), road motor vehicles, n.e.s., and medicaments (including veterinary medicaments), in medium technology manufacturing.

**Table 7.11 : Medium- tech manufacturing items where India has a distinct comparative advantage**

SITC-3	Description
511	Hydrocarbons, n.e.s., and their halogenated, sulphonated, nitrated or nitrosated derivatives
531	Synthetic organic colouring matter and colour lakes, and preparations based thereon
542	Medicaments (including veterinary medicaments)
551	Essential oils, perfume and flavour materials
574	Polyacetals, other polyethers and epoxide resins, in primary forms; polycarbonates, alkyd resins, polyallyl esters and other polyesters, in primary forms
721	Agricultural machinery (excluding tractors), and parts thereof
727	Food-processing machines (excluding domestic); parts thereof
735	Parts, n.e.s., and accessories suitable for use solely or principally with the machines falling within groups 731 and 733 (including work or tool holders, self-opening die-heads, dividing heads and other special attachments for machine tools); tool holders for any type of tool for working in the hand
781	Motor cars and other motor vehicles principally designed for the transport of persons (other than motor vehicles for the transport of ten or more persons, including the driver), including station-wagons and racing cars
783	Road motor vehicles, n.e.s.
784	Parts and accessories of the motor vehicles of groups 722, 781, 782 and 783

In the category of high tech manufacturing items India enjoys advantage only in electrodiagnostic apparatus for medical, surgical, dental or veterinary purposes, and radiological apparatus.

**Table 7.12 : High- tech manufacturing items where India has a distinct comparative advantage**

SITC-3	Description
774	Electrodiagnostic apparatus for medical, surgical, dental or veterinary purposes, and radiological apparatus

On the other hand China clearly dominates in measuring, checking, analysing and controlling instruments and apparatus, n.e.s., taps, cocks, valves and similar appliances for pipes, boiler shells, tanks, vats or the like, including pressure-reducing valves and

thermostatically controlled valves, transmission shafts (including camshafts and crankshafts) and cranks; bearing housings and plain shaft bearings; gears and gearing; ball screws; gearboxes and other speed changers (including torque converters); flywheels and pulleys (including pulley blocks); clutches and shaft couplings (including universal joints); articulated link chain; parts thereof.

**Table 7.13 : Medium- tech manufacturing items where China has a distinct comparative advantage**

SITC	Description
522	Inorganic chemical elements, oxides and halogen salts
716	Rotating electric plant, and parts thereof, n.e.s.
723	Civil engineering and contractors' plant and equipment; parts thereof
725	Paper mill and pulp mill machinery, paper-cutting machines and other machinery for the manufacture of paper articles; parts thereof
747	Taps, cocks, valves and similar appliances for pipes, boiler shells, tanks, vats or the like, including pressure-reducing valves and thermostatically controlled valves
748	Transmission shafts (including camshafts and crankshafts) and cranks; bearing housings and plain shaft bearings; gears and gearing; ball screws; gearboxes and other speed changers (including torque converters); flywheels and pulleys (including pulley blocks); clutches and shaft couplings (including universal joints); articulated link chain; parts thereof
751	Office machines
763	Sound recorders or reproducers; television image and sound recorders or reproducers; prepared unrecorded media
778	Electrical machinery and apparatus, n.e.s.
786	Trailers and semi-trailers; other vehicles, not mechanically-propelled; specially designed and equipped transport containers
873	Meters and counters, n.e.s.
874	Measuring, checking, analysing and controlling instruments and apparatus, n.e.s.

In high technology manufactures, Telecommunications equipment, n.e.s., and parts, n.e.s., and accessories of apparatus falling within division 76 and Optical instruments and apparatus, n.e.s a high technology manufacture China continues to gain advantage in the absence of India.

**Table 7.14 : High- tech manufacturing items where China has a distinct advantage**

SITC	Description
525	Radioactive and associated materials
764	Telecommunications equipment, n.e.s., and parts, n.e.s., and accessories of apparatus falling within division 76
871	Optical instruments and apparatus, n.e.s.



#### 7.4.2 *Degree of Export Competition*

The analysis in the previous section reveals similarities in the structure of international specialization for both India and China. Labour and resource intensive manufactured commodities dominate the comparative advantage scenario for in the export of manufactured commodities for both the countries. With an ongoing process of trade reform and common objective of garnering a larger share of the global market, it is only appropriate that we examine the extent of competition that India and China may pose to each other.

The degree and nature of competition between India and China in the world market is evaluated by calculating the Spearman's Rank Correlation (SRC) coefficients for RCA indices for India and China in the world market for manufacturing products. The aim is to identify, according to factor intensity, the sectors where India and China compete/complement in the world market. A higher and positive value of the coefficient reflecting the fact that both the countries are contesting for a share in the world market is indicative of a competitive relationship between the two countries in the export market. A high negative coefficient in a similar fashion is indicative of complementarity in export specialization between the two economies. A value of zero for the spearman correlation coefficient implies no relationship.

When calculated for the manufacturing sector as a whole in 2003, the SRC coefficient is zero indicating no relationship between manufacturing sector in India and China. Within manufacturing though, India and China have a competitive relationship in organic chemicals, inorganic chemicals- sectors that makes a high demand for capital, skill, technology, and scale, the resource intensive category of non-metallic mineral manufactures, n.e.s. and in manufactures of metals, n.es which is a low capital, skill, scale and technology commodity category (Refer Appendix Table A.11). In the category of road vehicles (including air-cushion vehicles) India and China compete with each other in 2003, even though the two countries were in a complementary relationship in this sector in 2000.

**Table 7.15 : Sectors where India and China compete for global market share**

Factor intensity <sup>@</sup>	SITC	Description	2000 SRC	2003 SRC
IV	51	Organic chemicals	0.02	0.25***
IV	52	Inorganic chemicals	0.11	0.41**
I	66	Non-metallic mineral manufactures, n.e.s.	0.06	0.31
II	69	Manufactures of metals, n.e.s.	0.38*	0.05

@-Based on UNCTAD classification, IV-high demand for capital, skill, technology and scale, II-low demand for capital, skill, technology and scale, I: labour and resource intensive

\*-significant at 1 %, \*\*significant at 5 %, \*\*\*-significant at 10%

SRC: Spearman Rank Correlation Coefficient.

A complementary relationship is evident in labour and resource intensive sectors like textile yarn, fabrics, made-up articles, n.e.s and related products and articles of apparel and clothing accessories. For photographic apparatus, equipment and supplies and optical goods, n.e.s.; watches and clocks and iron and steel both countries complement each other in 2003 but did not do so in 2000. Other sectors where a complementary relationship between the manufacturing sector in India and China is evident in 2000, but is not maintained in 2003 are medicinal and pharmaceutical products and footwear.

**Table 7.16 : Sectors where India and China are complementary in the global market**

Factor intensity <sup>@</sup>	SITC	Description	2000	2003
IV	54	Medicinal and pharmaceutical products	-.44	-
I	65	Textile yarn, fabrics, made-up articles, n.e.s., and related products	-0.02	-0.10
III;776:IV	77	Electrical machinery, apparatus and appliances, n.e.s., and electrical parts thereof (including non-electrical counterparts, n.e.s., of electrical household-type equipment)	-	-0.08
I	84	Articles of apparel and clothing accessories	-0.22**	-0.09
I	85	Footwear	-0.70**	-

@-Based on UNCTAD classification, IV-high demand for capital, skill, technology and scale, III-medium demand for capital, skill, technology and scale, I- labour and resource intensive

\*significant at 1 %, \*\*significant at 5 %, \*\*\*-significant at 10%

Sectors where competition or complementarity is statistically significant, a detailed analysis is undertaken to identify the commodities that contribute to this relationship. The analysis is based on the RCA index for constituent commodities in each sector. Commodities with maximum proximity in the value of the index of RCA are

suggestive of increasing competition and those with maximum difference are taken as making maximum contribution to a complementary relationship.

*A Disaggregated Analysis of Sectors where India and China Compete in the Global Market*

**Organic Chemicals (SITC-51):** Analysis at the commodity level reveals that sulphonamides in bulk, melamine, acyclic polycarboxylic acids and their derivatives, nes, unsaturated acyclic monocarboxylic acids and their derivatives, nes, gluconic acid, its salts and esters, diphenylamine and its derivatives; salts thereof, and Compounds with other nitrogen function, nes and phenazone (antipyrin) and its derivatives contribute to the competitive relationship between India and China in this sector in 2000. In 2003, both countries compete in commodities such as malonylurea (barbituric acid) and its derivatives; salts thereof, Compounds with other nitrogen function, nes, xylenols and their salts, derivs of phenols or phenol-alcohols, nes, cresols and their salts, acyclic polycarboxylic acids and their derivatives, nes, acetic acid salts nes, acyclic monoamines nes, and their derivatives; salts thereof. Except acyclic polycarboxylic acids and their derivatives, nes the items contributing to competition between India and China in this sector in the two years.

**Inorganic Chemicals (SITC-52):** At commodity level, India and China compete in potassium silicates, sulphides of metals nes; polysulphides of metals, aluminium sulphate, nitrites of metals, bromides and bromide oxides of metals nes, sulphates of metal nes, Complex cyanides of metals in 2000 and thiosulphates of metals, phosphates of metals nes, potassium permanganate, aluminum fluoride, sodium sulphites, fluorosilicates of sodium or of potassium, disodium carbonate, inorganic acids nes, and zinc chloride in 2003. It is observed that the set of commodities in which both the countries are similarly advantageously placed in the world market are different for both the years.

**Manufactures of metals (SITC-69):** In 2000, India and China are similar in their comparative advantage in this sector for commodities like nuts, iron or steel, nes, plaited bands, slings and the like of iron or steel, not elec insulated , pins, iron or steel, nes , tungsten (wolfram) and articles thereof nes , stone cuttg saw blades, friction discs for cuttg metals&oth saw blades , table, kitchen/oth household art&parts thereof, of cast iron nt enam nes , bolts o screws nes, with o without their nuts o washers, iron o steel, Articles, iron or steel, nes , razors including safety razors and open blade type, table, kitchen & household art, alum & parts, nes, eg pot scourers, gloves, etc , washers, iron or steel, nes, Electrodes, coated, of base metal, for electric arc welding and others listed in the table below. India and China compete in items like cloth, gril, netting, fencing, of aluminium wire, washers, iron or steel, nes, articles for use in the hand, i or s, similar to sewing needles or pins, safety razor blades, including razor blade blanks in strips, Sinks and wash basins, stainless steel, cloth, grill and netting of copper wire and expanded metal of copper, razors including safety razors and open blade type, threaded articles of iron or steel, nes, iron or steel wool, incl pot scourers, polishg pads, gloves&the like, i/s in 2003. Items like cloth, grill and netting of copper wire and expanded metal of copper Razors including safety razors and open blade type are competing in both the years. The number of commodities, contribute to competitive relationship, decreases from 2000 to 2003 leading to the decrease in competition at the sectoral level.

*A Disaggregated Analysis of Sectors where India and China complement in the Global Market*

**Articles of apparel and clothing accessories (SITC-84):** In 2000, at the commodity level, India and China complement each other in womens/girls jackets, of other textile materials, knitted, shawls, scarves, veils & the like, of other textile materials, not knitted, mens/boys bathrobes, dressing gowns etc of cotton, knitted, Mens/boys shirts, of wool or fine animal hair, not knitted, womens/girls dresses, of cotton, not knitted, womens/girls nightdresses & pyjamas, of other textile materials, knitted, mens/boys jackets and blazers, of cotton, knitted, mens/boys jackets and blazers, of other textile materials, knitted, womens/girls jackets, of synthetic fibres, knitted, womens/girls overcoats&sim articles, of impreg, ctd, etc, tex wov fab, and

womens/girls jackets, of other textile materials, knitted and gloves mittens&mitts,o/t for sport,of leather o of composition leather. In 2003, India and China complement each other in commodities such as mens/boys overcoats, anoraks etc, of cotton, knitted, womens/girls dresses, of wool or fine animal hair, not knitted, shawls,scarves,veils & the like,of other textile materials, not knitted and mens/boys jackets and blazers, of cotton, knitted.

**Footwear (SITC-85):** India and China complement each other in commodities like uppers and parts thereof, other than stiffeners, waterproof footwear, outer sole/upper of rubber/plastic, coverg knee, nes and footweal, outr sole/uppr of leather, strap across the instep/arnd big toe in 2000. In 2003, footwear, outr sole/ uppr of leathr, strap across the instep/ arnd big toe is the only commodity where both India and China continue to complement each other.

## **8 Main Findings and Conclusions**

In this paper revealed comparative advantage has been analyzed at both the two and six digit level of HS classification for both India and China. Our analysis reveals that the pattern of comparative advantage varies at different levels of commodity disaggregation. Sectors that rank among the top ten according to the value of the index of RCA are not necessarily able to retain their position when ranked according to comparative advantage at the 6 digit constituent commodity level. In the case of India, other than cotton, no other sector that ranks among the top ten according to the value of the RCAI retains its comparative ranking at the dis-aggregated level. For China, other made textiles, sets, worn clothing is so positioned. Simultaneously, there are also some sectors where either of the countries may be disadvantageously placed at the aggregate level but may enjoy comparative advantage at the constituent commodity level.

A the six digit level of classification, the commodities that rank among the top 100 according to the index of RCA while being dispersed across various sectors, are largely drawn from sectors like organic chemicals, cotton, salt, sulphur, earth, stone,

plaster, lime and cement and iron and steel in India and from organic and inorganic chemicals, cotton, nuclear reactors and articles of apparel knit/crocheted and not knit/crocheted in China.

Irrespective of the level of classification, India and China, both, enjoy maximum advantage in the category of manufactures chiefly by material followed by agriculture and allied products. While in the former China has greater advantage, in the case of the latter India has higher advantage.

The analysis of dynamic structural changes in comparative advantage for the manufacturing sector as a whole does not indicate any significant structural change over 2000 – 2003 for either India or China. Structural change is however evident for sectors within manufacturing. Maximum structural change is experienced by sectors like other base metals, cermets, articles thereof, ships, boats and other floating structures and fertilizers in India and stone, plaster, cement, asbestos, mica, etc articles, essential oils, perfumes, cosmetics, toiletries in China. Sectors which have remained structurally same in India are organic chemicals, tanning, dyeing extracts, tannins, derivs, pigments etc , carpets and other textile floor coverings and footwear, gaiters and the like, parts thereof. In case of China, sectors that have resisted any structural change are albuminoids, modified starches, glues, enzymes, toys, games, sports requisites, miscellaneous chemical products and organic chemicals.

In both 2000 and 2003, sectors where only India is advantageously placed lie predominantly in the agriculture and allied products category. This advantage has been further consolidated in the year 2003. The other category where India consolidates its comparative position vis-à-vis China in the global market is resource based manufactures and also miscellaneous manufactures. China on the other hand is relatively advantageously placed in the global market for both resource based manufactures as well as machine and equipments, with the former comprising a larger number of sectors than the latter. New gains in resource based manufactures have also been acquired by China between 2000 and 2003. In 2003, China gained comparative advantage in sectors like

glass and glassware and tin and articles thereof. In the category of machinery and equipment, China has attained comparative advantage in nuclear reactors, boilers, machinery, etc in 2003. In the chemicals and plastics category, China is advantageously placed in the world market vis-à-vis India only for explosives, pyrotechnics, matches, pyrophorics, etc in 2003. The comparative advantage enjoyed by China in 2000 in inorganic chemicals, precious metal compound, isotopes is however lost in 2003. India on the other hand holds relative comparative advantage for organic chemicals and tanning, dyeing extracts, tannins, derivs, pigments etc.

The analysis of comparative advantage for manufacturing sector according to factor intensity reveals substantial similarities in the structure of international specialization for both India and China. Across all levels and systems of classification the comparative advantage for both the countries is observed to be predominantly in the labor and resource intensive manufactures. Sectors like textiles (yarn, fabric, made-up articles n.e.s and related products) and articles of apparel and clothing accessories dominate in these categories for both the countries. The next largest category is that of manufactures that makes a high demand for skill, technology, capital and scale. Organic chemicals followed by inorganic chemicals occupies a predominant position in this category. At a more disaggregated level India's comparative advantage is observed to be in the unskilled labor intensive commodity category.

For the science-based manufactures India and China are advantageously placed in the same commodity sectors. Science- based industries contribute less than 10 per cent of the comparative advantage in the manufacturing sector in India and China. In absolute terms though, China's science based industries are almost double the number in India. In the Indian context, the category of medicinal and pharmaceutical products is predominant while in China the category- photographic apparatus, equipment and optical goods dominates. In the leading science- based commodity categories, China enjoys more than double the comparative advantage that India enjoys in the same category.

Despite the similarity in structure of comparative advantage, our analysis of the degree of competition reveals that there is no correlation between the manufacturing sectors of India and China in the global economy. Within manufacturing though, India and China have a competitive relationship in organic chemicals, inorganic chemicals-sectors that makes a high demand for capital, skill, technology, and scale, the resource intensive category of non-metallic mineral manufactures, n.e.s. and in manufactures of metals, n.es which is a low capital, skill, scale and technology commodity category. On the other hand, a complementary relationship is evident in labour and resource intensive sectors like textile yarn, fabrics, made-up articles, n.e.s and related products and articles of apparel and clothing accessories.



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## Appendix Tables

**India:**

2000

**Table A.1: Sectors where India enjoys comparative advantage**

Rank	HS Code	Sector Description	RCAI
1	13	Lac, gums, resins, vegetable saps and extracts nes	17.01
2	50	Silk	16.43
3	52	Cotton	11.34
4	57	Carpets and other textile floor coverings	9.98
5	63	Other made textile articles, sets, worn clothing etc	9.28
6	71	Pearls, precious stones, metals, coins, etc	9.18
7	09	Coffee, tea, mate and spices	8.35
8	53	Vegetable textile fibres nes, paper yarn, woven fabric	7.57
9	42	Articles of leather, animal gut, harness, travel goods	7.16
10	14	Vegetable plaiting materials, vegetable products nes	6.10
11	62	Articles of apparel, accessories, not knit or crochet	5.48
12	03	Fish, crustaceans, molluscs, aquatic invertebrates nes	4.91
13	67	Bird skin, feathers, artificial flowers, human hair	3.90
14	58	Special woven or tufted fabric, lace, tapestry etc	3.87
15	25	Salt, sulphur, earth, stone, plaster, lime and cement	3.67
16	61	Articles of apparel, accessories, knit or crochet	3.34
17	23	Residues, wastes of food industry, animal fodder	3.13
18	55	Manmade staple fibres	3.06
19	10	Cereals	2.97
20	08	Edible fruit, nuts, peel of citrus fruit, melons	2.92
21	41	Raw hides and skins (other than furskins) and leather	2.74
22	54	Manmade filaments	2.56
23	68	Stone, plaster, cement, asbestos, mica, etc articles	2.51
24	26	Ores, slag and ash	2.43
25	12	Oil seed, oleagic fruits, grain, seed, fruit, etc, nes	2.29
26	64	Footwear, gaiters and the like, parts thereof	2.20
27	32	Tanning, dyeing extracts, tannins, derivs, pigments etc	1.98
28	07	Edible vegetables and certain roots and tubers	1.77
29	05	Products of animal origin, nes	1.74
30	73	Articles of iron or steel	1.62
31	29	Organic chemicals	1.57
32	15	Animal, vegetable fats and oils, cleavage products, etc	1.53
33	30	Pharmaceutical products	1.32
34	72	Iron and steel	1.29
35	17	Sugars and sugar confectionery	1.25
36	24	Tobacco and manufactured tobacco substitutes	1.24
37	82	Tools, implements, cutlery, etc of base metal	1.23
38	96	Miscellaneous manufactured articles	1.21
39	36	Explosives, pyrotechnics, matches, pyrophorics, etc	1.18
40	80	Tin and articles thereof	1.15
41	02	Meat and edible meat offal	1.07
42	38	Miscellaneous chemical products	1.06

**Table A.2: Sector wise distribution of commodities with RCA>1**

HS Code	Sector	Number of constituent commodities
01	Poultry, live except domestic fowls, weighing not more than 185g	1
02	Meat and edible meat offal	9
03	Fish, crustaceans, molluscs, aquatic invertebrates nes	18
04	Dairy products, eggs, honey, edible animal product nes	6
05	Products of animal origin, nes	6
06	Live trees, plants, bulbs, roots, cut flowers etc	2
07	Edible vegetables and certain roots and tubers	12
08	Edible fruit, nuts, peel of citrus fruit, melons	9
09	Coffee, tea, mate and spices	23
10	Cereals	2
11	Milling products, malt, starches, inulin, wheat gluten	4
12	Oil seed, oleagic fruits, grain, seed, fruit, etc, nes	13
13	Lac, gums, resins, vegetable saps and extracts nes	5
14	Vegetable plaiting materials, vegetable products nes	4
15	Animal, vegetable fats and oils, cleavage products, etc	12
17	Sugars and sugar confectionery	6
19	Cereal, flour, starch, milk preparations and products	2
20	Vegetable, fruit, nut, etc food preparations	6
21	Miscellaneous edible preparations	2
22	Beverages, spirits and vinegar	1
23	Residues, wastes of food industry, animal fodder	6
24	Tobacco and manufactured tobacco substitutes	3
25	Salt, sulphur, earth, stone, plaster, lime and cement	31
26	Ores, slag and ash	6
27	Mineral fuels, oils, distillation products, etc	4
28	Inorganic chemicals, precious metal compound, isotopes	56
29	Organic chemicals	120
30	Pharmaceutical products	12
31	Fertilizers	1
32	Tanning, dyeing extracts, tannins, derivs, pigments etc	16
33	Essential oils, perfumes, cosmetics, toileteries	10
34	Soaps, lubricants, waxes, candles, modelling pastes	2
35	Albuminoids, modified starches, glues, enzymes	3
36	Explosives, pyrotechnics, matches, pyrophorics, etc	2
37	Photographic or cinematographic goods	7
38	Miscellaneous chemical products	11
39	Plastics and articles thereof	13
40	Rubber and articles thereof	20
41	Raw hides and skins (other than furskins) and leather	9
42	Articles of leather, animal gut, harness, travel goods	15
44	Wood and articles of wood, wood charcoal	4
45	Cork and articles of cork	1
48	Paper & paperboard, articles of pulp, paper and board	13

*Contd..*

49	Printed books, newspapers, pictures etc	3
50	Silk	6
51	Wool, animal hair, horsehair yarn and fabric thereof	9
52	Cotton	86
53	Vegetable textile fibres nes, paper yarn, woven fabric	15
54	Manmade filaments	34
55	Manmade staple fibres	59
56	Wadding, felt, nonwovens, yarns, twine, cordage, etc	11
57	Carpets and other textile floor coverings	17
58	Special woven or tufted fabric, lace, tapestry etc	19
59	Impregnated, coated or laminated textile fabric	7
60	Knitted or crocheted fabric	4
61	Articles of apparel, accessories, knit or crochet	72
62	Articles of apparel, accessories, not knit or crochet	87
63	Other made textile articles, sets, worn clothing etc	32
64	Footwear, gaiters and the like, parts thereof	12
65	Headgear and parts thereof	2
66	Umbrellas, walking-sticks, seat-sticks, whips, etc	1
67	Bird skin, feathers, artificial flowers, human hair	3
68	Stone, plaster, cement, asbestos, mica, etc articles	17
69	Ceramic products	8
70	Glass and glassware	10
71	Pearls, precious stones, metals, coins, etc	17
72	Iron and steel	50
73	Articles of iron or steel	46
74	Copper and articles thereof	16
76	Aluminium and articles thereof	12
79	Zinc and articles thereof	1
80	Tin and articles thereof	3
81	Other base metals, cermets, articles thereof	2
82	Tools, implements, cutlery, etc of base metal	24
83	Miscellaneous articles of base metal	5
84	Nuclear reactors, boilers, machinery, etc	61
85	Electrical, electronic equipment	26
86	Railway, tramway locomotives, rolling stock, equipment	1
87	Vehicles other than railway, tramway	20
88	Aircraft, spacecraft, and parts thereof	1
89	Ships, boats and other floating structures	1
90	Optical, photo, technical, medical, etc apparatus	6
91	Clocks and watches and parts thereof	14
92	Musical instruments, parts and accessories	2
93	Arms and ammunition, parts and accessories thereof	1
95	Toys, games, sports requisites	4
96	Miscellaneous manufactured articles	14

**Table A.3: Sectors where India enjoys comparative advantage**

Rank	HS Code	Sector	RCAI
1	50	Silk	17.35
2	13	Lac, gums, resins, vegetable saps and extracts nes	10.43
3	71	Pearls, precious stones, metals, coins, etc	9.75
4	57	Carpets and other textile floor coverings	8.49
5	52	Cotton	7.40
6	63	Other made textile articles, sets, worn clothing etc	7.35
7	09	Coffee, tea, mate and spices	6.94
8	97	Works of art, collectors pieces and antiques	6.13
9	26	Ores, slag and ash	5.14
10	53	Vegetable textile fibres nes, paper yarn, woven fabric	4.89
11	67	Bird skin, feathers, artificial flowers, human hair	4.67
12	42	Articles of leather, animal gut, harness, travel goods	4.60
13	10	Cereals	4.58
14	14	Vegetable plaiting materials, vegetable products nes	4.55
15	23	Residues, wastes of food industry, animal fodder	3.75
16	25	Salt, sulphur, earth, stone, plaster, lime and cement	3.68
17	62	Articles of apparel, accessories, not knit or crochet	3.59
18	55	Manmade staple fibres	3.57
19	61	Articles of apparel, accessories, knit or crochet	3.34
20	03	Fish, crustaceans, molluscs, aquatic invertebrates nes	3.17
21	54	Manmade filaments	3.03
22	41	Raw hides and skins (other than furskins) and leather	2.92
23	68	Stone, plaster, cement, asbestos, mica, etc articles	2.29
24	17	Sugars and sugar confectionery	1.94
25	12	Oil seed, oleagic fruits, grain, seed, fruit, etc, nes	1.91
26	64	Footwear, gaiters and the like, parts thereof	1.87
27	72	Iron and steel	1.84
28	32	Tanning, dyeing extracts, tannins, derivs,pigments etc	1.75
29	08	Edible fruit, nuts, peel of citrus fruit, melons	1.71
30	11	Milling products, malt, starches, inulin, wheat gluten	1.69
31	74	Copper and articles thereof	1.62
32	29	Organic chemicals	1.61
33	73	Articles of iron or steel	1.54
34	58	Special woven or tufted fabric, lace, tapestry etc	1.36
35	07	Edible vegetables and certain roots and tubers	1.31
36	24	Tobacco and manufactured tobacco substitutes	1.30
37	82	Tools, implements, cutlery, etc of base metal	1.11
38	96	Miscellaneous manufactured articles	1.10
39	28	Inorganic chemicals, precious metal compound, isotopes	1.09
40	05	Products of animal origin, nes	1.03
41	40	Rubber and articles thereof	1.03

**Table A.4: Sector wise distribution of commodities with RCA>1**

HS Code	Description	Number of constituent commodities
01	Live animals	2
02	Meat and edible meat offal	10
03	Fish, crustaceans, molluscs, aquatic invertebrates nes	16
04	Dairy products, eggs, honey, edible animal product nes	6
05	Products of animal origin, nes	7
06	Live trees, plants, bulbs, roots, cut flowers etc	2
07	Edible vegetables and certain roots and tubers	10
08	Edible fruit, nuts, peel of citrus fruit, melons	9
09	Coffee, tea, mate and spices	22
10	Cereals	6
11	Milling products, malt, starches, inulin, wheat gluten	7
12	Oil seed, oleagic fruits, grain, seed, fruit, etc, nes	10
13	Lac, gums, resins, vegetable saps and extracts nes	5
14	Vegetable plaiting materials, vegetable products nes	4
15	Animal,vegetable fats and oils, cleavage products, etc	7
16	Meat, fish and seafood food preparations nes	2
17	Sugars and sugar confectionery	8
19	Cereal, flour, starch, milk preparations and products	1
20	Vegetable, fruit, nut, etc food preparations	5
21	Miscellaneous edible preparations	3
22	Beverages, spirits and vinegar	1
23	Residues, wastes of food industry, animal fodder	6
24	Tobacco and manufactured tobacco substitutes	6
25	Salt, sulphur, earth, stone, plaster, lime and cement	29
26	Ores, slag and ash	11
27	Mineral fuels, oils, distillation products, etc	9
28	Inorganic chemicals, precious metal compound, isotopes	61
29	Organic chemicals	125
30	Pharmaceutical products	11
31	Fertilizers	1
32	Tanning, dyeing extracts, tannins, derivs,pigments etc	19
33	Essential oils, perfumes, cosmetics, toileteries	11
34	Soaps, lubricants, waxes, candles, modelling pastes	1
35	Albuminoids, modified starches, glues, enzymes	3
36	Explosives, pyrotechnics, matches, pyrophorics, etc	1
37	Photographic or cinematographic goods	3
38	Miscellaneous chemical products	16
39	Plastics and articles thereof	18
40	Rubber and articles thereof	28
41	Raw hides and skins (other than furskins) and leather	10
42	Articles of leather, animal gut, harness, travel goods	16
44	Wood and articles of wood, wood charcoal	9
48	Paper & paperboard, articles of pulp, paper and board	16
49	Printed books, newspapers, pictures etc	2

*Contd..*

50	Silk	7
51	Wool, animal hair, horsehair yarn and fabric thereof	13
52	Cotton	92
53	Vegetable textile fibres nes, paper yarn, woven fabric	14
54	Manmade filaments	38
55	Manmade staple fibres	69
56	Wadding, felt, nonwovens, yarns, twine, cordage, etc	14
57	Carpets and other textile floor coverings	18
58	Special woven or tufted fabric, lace, tapestry etc	17
59	Impregnated, coated or laminated textile fabric	7
60	Knitted or crocheted fabric	5
61	Articles of apparel, accessories, knit or crochet	68
62	Articles of apparel, accessories, not knit or crochet	88
63	Other made textile articles, sets, worn clothing etc	39
64	Footwear, gaiters and the like, parts thereof	12
65	Headgear and parts thereof	2
66	Umbrellas, walking-sticks, seat-sticks, whips, etc	1
67	Bird skin, feathers, artificial flowers, human hair	1
68	Stone, plaster, cement, asbestos, mica, etc articles	16
69	Ceramic products	9
70	Glass and glassware	15
71	Pearls, precious stones, metals, coins, etc	15
72	Iron and steel	70
73	Articles of iron or steel	49
74	Copper and articles thereof	23
75	Nickel and articles thereof	2
76	Aluminium and articles thereof	15
78	Lead and articles thereof	3
79	Zinc and articles thereof	3
80	Tin and articles thereof	3
81	Other base metals, cermets, articles thereof	4
82	Tools, implements, cutlery, etc of base metal	27
83	Miscellaneous articles of base metal	6
84	Nuclear reactors, boilers, machinery, etc	71
85	Electrical, electronic equipment	42
86	Railway, tramway locomotives, rolling stock, equipment	2
87	Vehicles other than railway, tramway	19
89	Ships, boats and other floating structures	2
90	Optical, photo, technical, medical, etc apparatus	13
91	Clocks and watches and parts thereof	18
92	Musical instruments, parts and accessories	3
95	Toys, games, sports requisites	4
96	Miscellaneous manufactured articles	16
97	Works of art, collectors pieces and antiques	2



**China:**

2000:

**Table A.5: Sectors where China enjoys comparative advantage**

<b>HS Code</b>	<b>Sector</b>	<b>RCAI</b>
66	Umbrellas, walking-sticks, seat-sticks, whips, etc	15.04
67	Bird skin, feathers, artificial flowers, human hair	14.70
46	Manufactures of plaiting material, basketwork, etc.	14.00
50	Silk	9.65
42	Articles of leather, animal gut, harness, travel goods	8.28
95	Toys, games, sports requisites	7.02
65	Headgear and parts thereof	6.32
80	Tin and articles thereof	6.08
64	Footwear, gaiters and the like, parts thereof	6.04
05	Products of animal origin, nes	5.50
86	Railway, tramway locomotives, rolling stock, equipment	5.13
63	Other made textile articles, sets, worn clothing etc	4.98
53	Vegetable textile fibres nes, paper yarn, woven fabric	4.92
62	Articles of apparel, accessories, not knit or crochet	4.88
36	Explosives, pyrotechnics, matches, pyrophorics, etc	4.55
61	Articles of apparel, accessories, knit or crochet	4.49
78	Lead and articles thereof	3.33
52	Cotton	3.14
55	Manmade staple fibres	3.09
43	Furskins and artificial fur, manufactures thereof	2.98
16	Meat, fish and seafood food preparations nes	2.97
96	Miscellaneous manufactured articles	2.95
91	Clocks and watches and parts thereof	2.92
79	Zinc and articles thereof	2.81
60	Knitted or crocheted fabric	2.80
92	Musical instruments, parts and accessories	2.62
58	Special woven or tufted fabric, lace, tapestry etc	2.61
14	Vegetable plaiting materials, vegetable products nes	2.53
81	Other base metals, cermets, articles thereof	2.52
51	Wool, animal hair, horsehair yarn and fabric thereof	2.47
69	Ceramic products	2.29
94	Furniture, lighting, signs, prefabricated buildings	2.24
82	Tools, implements, cutlery, etc of base metal	2.07
25	Salt, sulphur, earth, stone, plaster, lime and cement	1.87
07	Edible vegetables and certain roots and tubers	1.84
83	Miscellaneous articles of base metal	1.63
28	Inorganic chemicals, precious metal compound, isotopes	1.61
20	Vegetable, fruit, nut, etc food preparations	1.57
73	Articles of iron or steel	1.56
03	Fish, crustaceans, molluscs, aquatic invertebrates nes	1.45
68	Stone, plaster, cement, asbestos, mica, etc articles	1.34
57	Carpets and other textile floor coverings	1.32
85	Electrical, electronic equipment	1.22
54	Manmade filaments	1.18
10	Cereals	1.17
12	Oil seed, oleagic fruits, grain, seed, fruit, etc, nes	1.08
01	Live animals	1.02

**Table A.6 Sector wise distribution of commodities with RCA>1**

HS Code	Description	Number of constituent commodities
01	Live animals	4
02	Meat and edible meat offal	8
03	Fish, crustaceans, molluscs, aquatic invertebrates nes	29
04	Dairy products, eggs, honey, edible animal products nes	2
05	Products of animal origin, nes	6
06	Live trees, plants, bulbs, roots, cut flowers etc	1
07	Edible vegetables and certain roots and tubers	23
08	Edible fruit, nuts, peel of citrus fruit, melons	6
09	Coffee, tea, mate and spices	10
10	Cereals	6
11	Milling products, malt, starches, inulin, wheat gluten	7
12	Oil seed, oleaginous fruits, grain, seed, fruit, etc, nes	15
13	Lac, gums, resins, vegetable saps and extracts nes	4
14	Vegetable plaiting materials, vegetable products nes	4
15	Animal, vegetable fats and oils, cleavage products, etc	7
16	Meat, fish and seafood food preparations nes	12
19	Cereal, flour, starch, milk preparations and products	4
20	Vegetable, fruit, nut, etc food preparations	14
21	Miscellaneous edible preparations	3
22	Beverages, spirits and vinegar	3
23	Residues, wastes of food industry, animal fodder	6
24	Tobacco and manufactured tobacco substitutes	1
25	Salt, sulphur, earth, stone, plaster, lime and cement	32
26	Ores, slag and ash	1
27	Mineral fuels, oils, distillation products, etc	15
28	Inorganic chemicals, precious metal compound, isotopes	95
29	Organic chemicals	116
30	Pharmaceutical products	3
31	Fertilizers	5
32	Tanning, dyeing extracts, tannins, dyes, pigments etc	13
33	Essential oils, perfumes, cosmetics, toiletries	5
34	Soaps, lubricants, waxes, candles, modelling pastes	2
35	Albuminoids, modified starches, glues, enzymes	1
36	Explosives, pyrotechnics, matches, pyrophorics, etc	2
37	Photographic or cinematographic goods	4
38	Miscellaneous chemical products	14
39	Plastics and articles thereof	19
40	Rubber and articles thereof	11
41	Raw hides and skins (other than furskins) and leather	7
42	Articles of leather, animal gut, harness, travel goods	18
43	Furskins and artificial fur, manufactures thereof	10
44	Wood and articles of wood, wood charcoal	19
46	Manufactures of plaiting material, basketwork, etc.	6

*Contd..*

48	Paper & paperboard, articles of pulp, paper and board	15
49	Printed books, newspapers, pictures etc	3
50	Silk	10
51	Wool, animal hair, horsehair yarn and fabric thereof	17
52	Cotton	84
53	Vegetable textile fibres nes, paper yarn, woven fabric	17
54	Manmade filaments	32
55	Manmade staple fibres	76
56	Wadding, felt, nonwovens, yarns, twine, cordage, etc	12
57	Carpets and other textile floor coverings	8
58	Special woven or tufted fabric, lace, tapestry etc	30
59	Impregnated, coated or laminated textile fabric	7
60	Knitted or crocheted fabric	7
61	Articles of apparel, accessories, knit or crochet	100
62	Articles of apparel, accessories, not knit or crochet	114
63	Other made textile articles, sets, worn clothing etc	53
64	Footwear, gaiters and the like, parts thereof	23
65	Headgear and parts thereof	11
66	Umbrellas, walking-sticks, seat-sticks, whips, etc	6
67	Bird skin, feathers, artificial flowers, human hair	8
68	Stone, plaster, cement, asbestos, mica, etc articles	16
69	Ceramic products	13
70	Glass and glassware	21
71	Pearls, precious stones, metals, coins, etc	11
72	Iron and steel	24
73	Articles of iron or steel	63
74	Copper and articles thereof	12
76	Aluminium and articles thereof	3
78	Lead and articles thereof	3
79	Zinc and articles thereof	3
80	Tin and articles thereof	5
81	Other base metals, cermets, articles thereof	21
82	Tools, implements, cutlery, etc of base metal	45
83	Miscellaneous articles of base metal	24
84	Nuclear reactors, boilers, machinery, etc	82
85	Electrical, electronic equipment	117
86	Railway, tramway locomotives, rolling stock, equipment	5
87	Vehicles other than railway, tramway	17
89	Ships, boats and other floating structures	7
90	Optical, photo, technical, medical, etc apparatus	40
91	Clocks and watches and parts thereof	41
92	Musical instruments, parts and accessories	17
93	Arms and ammunition, parts and accessories thereof	1
94	Furniture, lighting, signs, prefabricated buildings	25
95	Toys, games, sports requisites	36
96	Miscellaneous manufactured articles	40

**China:**

2003:

**Table A.7: Sectors where China enjoys comparative advantage**

<b>HS Code</b>	<b>Description</b>	<b>RCAI</b>
46	Manufactures of plaiting material, basketwork, etc.	10.27
67	Bird skin, feathers, artificial flowers, human hair	10.10
66	Umbrellas, walking-sticks, seat-sticks, whips, etc	9.47
42	Articles of leather, animal gut, harness, travel goods	6.37
50	Silk	6.11
95	Toys, games, sports requisites	5.40
65	Headgear and parts thereof	4.93
64	Footwear, gaiters and the like, parts thereof	4.59
63	Other made textile articles, sets, worn clothing etc	4.06
86	Railway, tramway locomotives, rolling stock, equipment	3.76
61	Articles of apparel, accessories, knit or crochet	3.72
62	Articles of apparel, accessories, not knit or crochet	3.70
43	Furskins and artificial fur, manufactures thereof	3.39
36	Explosives, pyrotechnics, matches, pyrophorics, etc	3.05
05	Products of animal origin, nes	2.95
58	Special woven or tufted fabric, lace, tapestry etc	2.76
53	Vegetable textile fibres nes, paper yarn, woven fabric	2.76
52	Cotton	2.72
60	Knitted or crocheted fabric	2.58
92	Musical instruments, parts and accessories	2.53
81	Other base metals, cermets, articles thereof	2.50
96	Miscellaneous manufactured articles	2.48
16	Meat, fish and seafood food preparations nes	2.29
78	Lead and articles thereof	2.27
94	Furniture, lighting, signs, prefabricated buildings	2.18
69	Ceramic products	2.01
55	Manmade staple fibres	2.01
80	Tin and articles thereof	2.01
54	Manmade filaments	1.91
91	Clocks and watches and parts thereof	1.89
51	Wool, animal hair, horsehair yarn and fabric thereof	1.86
82	Tools, implements, cutlery, etc of base metal	1.79
14	Vegetable plaiting materials, vegetable products nes	1.59
79	Zinc and articles thereof	1.52
85	Electrical, electronic equipment	1.52
83	Miscellaneous articles of base metal	1.48
73	Articles of iron or steel	1.38
20	Vegetable, fruit, nut, etc food preparations	1.36
28	Inorganic chemicals, precious metal compound, isotopes	1.34
84	Nuclear reactors, boilers, machinery, etc	1.27
07	Edible vegetables and certain roots and tubers	1.26
68	Stone, plaster, cement, asbestos, mica, etc articles	1.26
03	Fish, crustaceans, molluscs, aquatic invertebrates nes	1.25
25	Salt, sulphur, earth, stone, plaster, lime and cement	1.17
10	Cereals	1.14
57	Carpets and other textile floor coverings	1.07
70	Glass and glassware	1.01

**Table A.8: Sector wise distribution of commodities with RCA>1**

<b>HS Code</b>	<b>Description</b>	<b>Number of constituent commodities</b>
01	Live animals	2
02	Meat and edible meat offal	3
03	Fish, crustaceans, molluscs, aquatic invertebrates nes	23
04	Dairy products, eggs, honey, edible animal product nes	2
05	Products of animal origin, nes	5
07	Edible vegetables and certain roots and tubers	22
08	Edible fruit, nuts, peel of citrus fruit, melons	8
09	Coffee, tea, mate and spices	8
10	Cereals	6
11	Milling products, malt, starches, inulin, wheat gluten	8
12	Oil seed, oleagic fruits, grain, seed, fruit, etc, nes	13
13	Lac, gums, resins, vegetable saps and extracts nes	2
14	Vegetable plaiting materials, vegetable products nes	3
15	Animal,vegetable fats and oils, cleavage products, etc	5
16	Meat, fish and seafood food preparations nes	11
19	Cereal, flour, starch, milk preparations and products	3
20	Vegetable, fruit, nut, etc food preparations	15
22	Beverages, spirits and vinegar	3
23	Residues, wastes of food industry, animal fodder	4
24	Tobacco and manufactured tobacco substitutes	1
25	Salt, sulphur, earth, stone, plaster, lime and cement	25
26	Ores, slag and ash	2
27	Mineral fuels, oils, distillation products, etc	8
28	Inorganic chemicals, precious metal compound, isotopes	96
29	Organic chemicals	118
30	Pharmaceutical products	3
31	Fertilizers	7
32	Tanning, dyeing extracts, tannins, derivs,pigments etc	10
33	Essential oils, perfumes, cosmetics, toileteries	5
34	Soaps, lubricants, waxes, candles, modelling pastes	2
35	Albuminoids, modified starches, glues, enzymes	1
36	Explosives, pyrotechnics, matches, pyrophorics, etc	2
37	Photographic or cinematographic goods	4
38	Miscellaneous chemical products	10
39	Plastics and articles thereof	17
40	Rubber and articles thereof	12
41	Raw hides and skins (other than furskins) and leather	5
42	Articles of leather, animal gut, harness, travel goods	18
43	Furskins and artificial fur, manufactures thereof	7
44	Wood and articles of wood, wood charcoal	18
46	Manufactures of plaiting material, basketwork, etc.	5
47	Pulp of wood, fibrous cellulosic material, waste etc	2
48	Paper & paperboard, articles of pulp, paper and board	13
49	Printed books, newspapers, pictures etc	4

*Contd..*

50	Silk	10
51	Wool, animal hair, horsehair yarn and fabric thereof	18
52	Cotton	91
53	Vegetable textile fibres nes, paper yarn, woven fabric	13
54	Manmade filaments	28
55	Manmade staple fibres	71
56	Wadding, felt, nonwovens, yarns, twine, cordage, etc	10
57	Carpets and other textile floor coverings	9
58	Special woven or tufted fabric, lace, tapestry etc	30
59	Impregnated, coated or laminated textile fabric	6
60	Knitted or crocheted fabric	10
61	Articles of apparel, accessories, knit or crochet	93
62	Articles of apparel, accessories, not knit or crochet	111
63	Other made textile articles, sets, worn clothing etc	49
64	Footwear, gaiters and the like, parts thereof	23
65	Headgear and parts thereof	11
66	Umbrellas, walking-sticks, seat-sticks, whips, etc	6
67	Bird skin, feathers, artificial flowers, human hair	7
68	Stone, plaster, cement, asbestos, mica, etc articles	11
69	Ceramic products	15
70	Glass and glassware	23
71	Pearls, precious stones, metals, coins, etc	9
72	Iron and steel	22
73	Articles of iron or steel	63
74	Copper and articles thereof	11
75	Nickel and articles thereof	1
76	Aluminium and articles thereof	5
78	Lead and articles thereof	1
79	Zinc and articles thereof	4
80	Tin and articles thereof	2
81	Other base metals, cermets, articles thereof	20
82	Tools, implements, cutlery, etc of base metal	44
83	Miscellaneous articles of base metal	21
84	Nuclear reactors, boilers, machinery, etc	88
85	Electrical, electronic equipment	129
86	Railway, tramway locomotives, rolling stock, equipment	3
87	Vehicles other than railway, tramway	20
89	Ships, boats and other floating structures	6
90	Optical, photo, technical, medical, etc apparatus	43
91	Clocks and watches and parts thereof	32
92	Musical instruments, parts and accessories	20
94	Furniture, lighting, signs, prefabricated buildings	26
95	Toys, games, sports requisites	36
96	Miscellaneous manufactured articles	35

**Table A.9: Spearman Rank Correlation Coefficient (SRC) for India: 2000-2003**

HS Code	Sector	SRC
<b>Maximum Structural Change</b>		
41	Raw hides and skins (other than furskins) and leather	-0.1
81	Other base metals, cermet, articles thereof	0.1
31	Fertilizers	0.2
89	Ships, boats and other floating structures	0.2
86	Railway, tramway locomotives, rolling stock, equipment	0.4
<b>Modest Structural Change</b>		
37	Photographic or cinematographic goods	0.5*
51	Wool, animal hair, horsehair yarn and fabric thereof	0.5*
68	Stone, plaster, cement, asbestos, mica, etc articles	0.5*
74	Copper and articles thereof	0.5*
60	Knitted or crocheted fabric	0.5**
38	Miscellaneous chemical products	0.6*
<b>Low Structural Change</b>		
26	Ores, slag and ash	0.7*
39	Plastics and articles thereof	0.7*
48	Paper & paperboard, articles of pulp, paper and board	0.7*
49	Printed books, newspapers, pictures etc	0.7*
55	Manmade staple fibres	0.7*
59	Impregnated, coated or laminated textile fabric	0.7*
70	Glass and glassware	0.7*
71	Pearls, precious stones, metals, coins, etc	0.7*
72	Iron and steel	0.7*
83	Miscellaneous articles of base metal	0.7*
84	Nuclear reactors, boilers, machinery, etc	0.7*
85	Electrical, electronic equipment	0.7*
90	Optical, photo, technical, medical, etc apparatus	0.7*
35	Albuminoids, modified starches, glues, enzymes	0.7**
27	Mineral fuels, oils, distillation products, etc	0.8*
28	Inorganic chemicals, precious metal compound, isotopes	0.8*
40	Rubber and articles thereof	0.8*
42	Articles of leather, animal gut, harness, travel goods	0.8*
52	Cotton	0.8*
53	Vegetable textile fibres nes, paper yarn, woven fabric	0.8*
54	Manmade filaments	0.8*
56	Wadding, felt, nonwovens, yarns, twine, cordage, etc	0.8*
58	Special woven or tufted fabric, lace, tapestry etc	0.8*
61	Articles of apparel, accessories, knit or crochet	0.8*
63	Other made textile articles, sets, worn clothing etc	0.8*
73	Articles of iron or steel	0.8*
76	Aluminium and articles thereof	0.8*
87	Vehicles other than railway, tramway	0.8*
91	Clocks and watches and parts thereof	0.8*
92	Musical instruments, parts and accessories	0.8*
94	Furniture, lighting, signs, prefabricated buildings	0.8*
95	Toys, games, sports requisites	0.8*
50	Silk	0.8**
25	Salt, sulphur, earth, stone, plaster, lime and cement	0.9*
30	Pharmaceutical products	0.9*
33	Essential oils, perfumes, cosmetics, toileteries	0.9*
34	Soaps, lubricants, waxes, candles, modelling pastes	0.9*
44	Wood and articles of wood, wood charcoal	0.9*
62	Articles of apparel, accessories, not knit or crochet	0.9*
64	Footwear, gaiters and the like, parts thereof	0.9*
69	Ceramic products	0.9*

*Contd..*

82	Tools, implements, cutlery, etc of base metal	0.9*
96	Miscellaneous manufactured articles	0.9*
29	Organic chemicals	1*
32	Tanning, dyeing extracts, tannins, derivs,pigments etc	1*
57	Special woven or tufted fabric, lace, tapestry etc	1*

\*-significant at 1%

\*\*\_significant at 5 and 10%

\*\*\*-significant at 10%



**Table A.10: Spearman Rank Correlation Coefficient (SRC) for China: 2000-2003**

HS Code	Sector	SRC
<b>Maximum Structural Change</b>		
68	Stone, plaster, cement, asbestos, mica, etc articles	0.2
33	Essential oils, perfumes, cosmetics, toileteries	0.3
<b>Modest Structural Change</b>		
42	Articles of leather, animal gut, harness, travel goods	0.5*
81	Other base metals, cermets, articles thereof	0.5**
31	Fertilizers	0.6*
47	Pulp of wood, fibrous cellulosic material, waste etc	0.6*
62	Articles of apparel, accessories, not knit or crochet	0.6*
72	Iron and steel	0.6*
44	Wood and articles of wood, wood charcoal	0.6**
63	Other made textile articles, sets, worn clothing etc	0.6**
65	Headgear and parts thereof	0.6**
83	Miscellaneous articles of base metal	0.6**
88	Aircraft, spacecraft, and parts thereof	0.6**
<b>Low Structural Change</b>		
56	Wadding, felt, nonwovens, yarns, twine, cordage, etc	0.7*
59	Impregnated, coated or laminated textile fabric	0.7*
61	Articles of apparel, accessories, knit or crochet	0.7*
67	Bird skin, feathers, artificial flowers, human hair	0.7*
76	Aluminium and articles thereof	0.7*
73	Articles of iron or steel	0.7*
82	Tools, implements, cutlery, etc of base metal	0.7*
90	Optical, photo, technical, medical, etc apparatus	0.7*
25	Salt, sulphur, earth, stone, plaster, lime and cement	0.8*
36	Explosives, pyrotechnics, matches, pyrophorics, etc	0.8*
39	Plastics and articles thereof	0.8*
41	Raw hides and skins (other than furskins) and leather	0.8*
45	Cork and articles of cork	0.8*
48	Paper & paperboard, articles of pulp, paper and board	0.8*
53	Vegetable textile fibres nes, paper yarn, woven fabric	0.8*
54	Manmade filaments	0.8*
55	Manmade staple fibres	0.8*
64	Footwear, gaiters and the like, parts thereof	0.8*
71	Pearls, precious stones, metals, coins, etc	0.8*
74	Copper and articles thereof	0.8*
75	Nickel and articles thereof	0.8*
78	Lead and articles thereof	0.8*
84	Nuclear reactors, boilers, machinery, etc	0.8*
87	Vehicles other than railway, tramway	0.8*
94	Furniture, lighting, signs, prefabricated buildings	0.8*
96	Miscellaneous manufactured articles	0.8*
26	Ores, slag and ash	0.9*
27	Mineral fuels, oils, distillation products, etc	0.9*
30	Pharmaceutical products	0.9*

*Contd..*

32	Tanning, dyeing extracts, tannins, derivs,pigments etc	0.9*
34	Soaps, lubricants, waxes, candles, modelling pastes	0.9*
43	Furskins and artificial fur, manufactures thereof	0.9*
46	Manufactures of plaiting material, basketwork, etc.	0.9*
49	Printed books, newspapers, pictures etc	0.9*
50	Silk	0.9*
52	Cotton	0.9*
57	Carpets and other textile floor coverings	0.9*
58	Special woven or tufted fabric, lace, tapestry etc	0.9*
60	Knitted or crocheted fabric	0.9*
69	Ceramic products	0.9*
70	Glass and glassware	0.9*
85	Electrical, electronic equipment	0.9*
86	Railway, tramway locomotives, rolling stock, equipment	0.9*
89	Ships, boats and other floating structures	0.9*
93	Arms and ammunition, parts and accessories thereof	0.9*
29	Organic chemicals	1 *
35	Albuminoids, modified starches, glues, enzymes	1 *
38	Miscellaneous chemical products	1 *
95	Toys, games, sports requisites	1 *

\*-significant at 1%

\*\*-significant at 5 and 10%

\*\*\*-significant at 10%

**Table A.11: Spearman Rank Correlation Coefficient (SRC) for India and China:  
Manufacturing Sector**

SITC code	Description	2000	2003
51	Organic chemicals	0.02	0.25**
52	Inorganic chemicals	0.11	0.4*
54	Medicinal and pharmaceutical products	-	-0.4
65	Textile yarn, fabrics, made-up articles, n.e.s., and related products	-0.03	-0.1
66	Non-metallic mineral manufactures, n.e.s.	0.06	0.3**
67	Iron and steel	0.41	-0.4
69	Manufactures of metals, n.e.s.	0.38***	0
77	Electrical machinery, apparatus and appliances, n.e.s., and electrical parts thereof (including non-electrical counterparts, n.e.s., of electrical household-type equipment)	-	-0.1
78	Road vehicles (including air-cushion vehicles)	-0.33	0.1
84	Articles of apparel and clothing accessories	-0.22*	-0.1
85	Footwear	-0.7*	
88	Photographic apparatus, equipment and supplies and optical goods, n.e.s.; watches and clocks	0.07	-0.2
89	Miscellaneous manufactured articles, n.e.s.	0.23	0

\*-significant at 5%, \*\*- significant at 10%, \*\*\*-significant at 1%

## Summary of India's Comparative Advantage according to factor Intensity based on:

At the 2-digit level

**Table A.12: UNCTAD system of classification**

Category*	2000	2003
Labour Intensive	532	573
<b>Demand for skill, capital, technology and capital</b>		
Low	158	191
Medium	111	134
High	319	301

\* I: labour intensive and resource intensive manufactures, II: low demand for skill, technology, capital, scale, III: medium demand for skill, technology, capital, scale, IV: high demand for skill, technology, capital, scale

**Table A. 13: Details of India's Comparative Advantage in terms of factor intensity based on UNCTAD classification**

SITC	Product Description	2000	2003	Category
51	Organic chemicals	106	107	IV
52	Inorganic chemicals	55	60	IV
53	Dyeing, tanning and colouring materials	16	19	IV
54	Medicinal and pharmaceutical products	29	31	IV
55	Essential oils and resinoids and perfume materials; toilet, polishing and cleansing preparations	12	12	IV
56	Fertilizers (other than those of group 272)	1	1	IV
57	Plastics in primary forms	7	11	IV
58	Plastics in non-primary forms	3	5	IV
59	Chemical materials and products, n.e.s.	15	17	IV
61	Leather, leather manufactures, n.e.s., and dressed furskins	12	12	I
62	Rubber manufactures, n.e.s.	16	22	III
63	Cork and wood manufactures (excluding furniture)	4	8	I
64	Paper, paperboard and articles of paper pulp, of paper or of paperboard	12	16	I
65	Textile yarn, fabrics, made-up articles, n.e.s., and related products	275	304	I
66	Non-metallic mineral manufactures, n.e.s.	41	48	I
67	Iron and steel	65	87	II
68	Non-ferrous metals	17	26	NFP
69	Manufactures of metals, n.e.s.	77	88	II
71	Power-generating machinery and equipment	9	12	III
72	Machinery specialized for particular industries	23	28	III
73	Metalworking machinery	14	13	III
74	General industrial machinery and equipment, n.e.s., and machine parts, n.e.s.	17	16	III
75	Office machines and automatic data-processing machines	3	8	IV
76	Telecommunications and sound-recording and reproducing apparatus and equipment	1	2	IV
77	Electrical machinery, apparatus and appliances, n.e.s., and electrical parts thereof (including non-electrical counterparts, n.e.s., of electrical household-type equipment)	24	38	III; 776:IV
78	Road vehicles (including air-cushion vehicles)	18	17	II; 781-784:III

Contd..

79	Other transport equipment	3	4	II; 792:IV
81	Prefabricated buildings; sanitary, plumbing, heating and lighting fixtures and fittings, n.e.s.	2	1	II
82	Furniture, and parts thereof; bedding, mattresses, mattress supports, cushions and similar stuffed furnishings	-	-	I
83	Travel goods, handbags and similar containers	6	6	I
84	Articles of apparel and clothing accessories	165	162	I
85	Footwear	12	12	I
87	Professional, scientific and controlling instruments and apparatus, n.e.s.	3	3	IV
88	Photographic apparatus, equipment and supplies and optical goods, n.e.s.; watches and clocks	22	25	IV
89	Miscellaneous manufactured articles, n.e.s.	45	51	894-I; 893-III

I: labour intensive and resource intensive manufactures, II: low demand for skill, technology, capital, scale, III: medium demand for skill, technology, capital, scale, IV: high demand for skill, technology, capital, scale

**Table A.14: OECD system of classification**

Category*	2000	2003
<b>Resource Intensive</b>	45	56
<b>Labour Intensive</b>	589	631
<b>Differentiated Products Specialized Suppliers</b>	164	207
<b>Skill Intensive</b>	272	270
<b>Science Based</b>	57	67
<b>Non-fuel Primary commodities</b>	17	26

\*-RI: resource intensive, labour intensive: LI, Differentiated Products requiring specialized suppliers: DPSS, SI: Scale Intensive., SB: Science Based Manufactures, NFP-Non fuel Primary commod.

**Table A.15: Details of India's Comparative Advantage in terms of factor intensity based on OECD classification**

SITC	Product Description	2000	2003	Category
51	Organic chemicals	106	107	SI
52	Inorganic chemicals	55	60	SI
53	Dyeing, tanning and colouring materials	16	19	SI
54	Medicinal and pharmaceutical products	29	31	SB
55	Essential oils and resinoids and perfume materials; toilet, polishing and cleansing preparations	12	12	SI
56	Fertilizers (other than those of group 272)	1	1	SI
57	Plastics in primary forms	7	11	SI
58	Plastics in non-primary forms	3	5	SI
59	Chemical materials and products, n.e.s.	15	17	SI
61	Leather, leather manufactures, n.e.s., and dressed furskins	12	12	LI
62	Rubber manufactures, n.e.s.	16	22	SI
63	Cork and wood manufactures (excluding furniture)	4	8	RI
64	Paper, paperboard and articles of paper pulp, of paper or of paperboard	12	16	SI
65	Textile yarn, fabrics, made-up articles, n.e.s., and related products	275	304	LI
66	Non-metallic mineral manufactures, n.e.s.	41	48	RI

*Contd..*

67	Iron and steel	65	87	DPSS
68	Non-ferrous metals	17	26	NFP
69	Manufactures of metals, n.e.s.	77	88	LI
71	Power-generating machinery and equipment	9	12	DPSS
72	Machinery specialized for particular industries	23	28	DPSS
73	Metalworking machinery	14	13	DPSS
74	General industrial machinery and equipment, n.e.s., and machine parts, n.e.s.	17	16	DPSS
75	Office machines and automatic data-processing machines	3	8	SB
76	Telecommunications and sound-recording and reproducing apparatus and equipment	1	2	DPSS
77	Electrical machinery, apparatus and appliances, n.e.s., and electrical parts thereof (including non-electrical counterparts, n.e.s., of electrical household-type equipment)	24	38	DPSS
78	Road vehicles (including air-cushion vehicles)	18	17	781-784:DPSS
79	Other transport equipment	3	4	DPSS; 792:SB
81	Prefabricated buildings; sanitary, plumbing, heating and lighting fixtures and fittings, n.e.s.	2	1	
82	Furniture, and parts thereof; bedding, mattresses, mattress supports, cushions and similar stuffed furnishings	-	-	RI
83	Travel goods, handbags and similar containers	6	6	LI
84	Articles of apparel and clothing accessories	165	162	LI
85	Footwear	12	12	LI
87	Professional, scientific and controlling instruments and apparatus, n.e.s.	3	3	SB
88	Photographic apparatus, equipment and supplies and optical goods, n.e.s.; watches and clocks	22	25	SB
89	Miscellaneous manufactured articles, n.e.s.	45	51	LI; 893:DPSS

\*-RI: resource intensive, labour intensive: LI, Differentiated Products requiring specialized suppliers: DPSS, SI: Scale Intensive., SB: Science Based Manufactures, NFP-Non fuel Primary commodities

At 3-Digit Level

**Table A.16: Details of India's Comparative Advantage in terms of factor intensity**

SITC	Description	2000	2003	WDI	ETA
511	Hydrocarbons, n.e.s., and their halogenated, sulphonated, nitrated or nitrosated derivatives	16	21	RI	TI
512	Alcohols, phenols, phenol-alcohols, and their halogenated, sulphonated, nitrated or nitrosated derivatives	18	16	RI	TI
513	Carboxylic acids and their anhydrides, halides, peroxides and peroxyacids; their halogenated, sulphonated, nitrated or nitrosated derivatives	23	20	RI	TI
514	Nitrogen-function compounds	18	21	RI	TI
515	Organo-inorganic compounds, heterocyclic compounds, nucleic acids and their salts, and sulphonamides	13	10	HKMTKI	TI
516	Other organic chemicals	18	19	HKHTKI	TI
522	Inorganic chemical elements, oxides and halogen salts	13	16	HKMTKI	TI
523	Metal salts and peroxy salts, of inorganic acids	32	38	HKMTKI	TI
524	Other inorganic chemicals; organic and inorganic compounds of precious metals	9	5	HKMTKI	HK, TI
525	Radioactive and associated materials	1	1	HKHTKI	TI
531	Synthetic organic colouring matter and colour lakes, and preparations based thereon	11	11	HKMTKI	HK, TI
532	Dyeing and tanning extracts, and synthetic tanning materials	3	4	HKMTKI	HK
533	Pigments, paints, varnishes and related materials	2	4	HKMTKI	HK, TI
541	Medicinal and pharmaceutical products, other than medicaments of group 542	21	23	HKHTKI	TI
542	Medicaments (including veterinary medicaments)	8	8	HKHTKI	TI
551	Essential oils, perfume and flavour materials	7	10	HKMTKI	HK, TI
553	Perfumery, cosmetic or toilet preparations (excluding soaps)	3	1	HKLT	HK
554	Soap, cleansing and polishing preparations	2	1	HKLT	HK
562	Fertilizers (other than those of group 272)	1	1	RI	TI
571	Polymers of ethylene, in primary forms	-	1	HKMTKI	-
572	Polymers of styrene, in primary forms	-	1	HKMTKI	-
573	Polymers of vinyl chloride or of other halogenated olefins, in primary forms	2	1	HKMTKI	-
574	Polyacetals, other polyethers and epoxide resins, in primary forms; polycarbonates, alkyd resins, polyallyl esters and other polyesters, in primary forms	2	1	HKMTKI	TI
575	Other plastics, in primary forms	3	6	HKMTKI	TI
579	Waste, parings and scrap, of plastics	-	1	HKMTKI	-
581	Tubes, pipes and hoses, and fittings therefor, of plastics	-	1	HKMTKI	-
582	Plates, sheets, film, foil and strip, of plastics	3	4	HKMTKI	TI
591	Insecticides, rodenticides, fungicides, herbicides, anti-sprouting products and plant-growth regulators, disinfectants and similar products, put up in forms or packings for retail sale or as preparations or articles (e.g., sulphur-treated bands, wicks and	1	2	HKHTKI	TI
592	Starches, inulin and wheat gluten; albuminoidal substances; glues	3	4	HKLT	TI
593	Explosives and pyrotechnic products	1	-	HKLT	-
597	Prepared additives for mineral oils and the like; prepared liquids for hydraulic transmission; anti-freezing preparations and prepared de-icing fluids; lubricating preparations	-	2	HKMTKI	-

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598	Miscellaneous chemical products, n.e.s.	10	9	HKMTKI	TI
611	Leather	9	9	RI	RI
612	Manufactures of leather or of composition leather, n.e.s.; saddlery and harness	3	3	LI	RI
613	Furskins, tanned or dressed (including heads, tails, paws and other pieces or cuttings), unassembled, or assembled (without the addition of other materials), other than those of heading 848.31	-	-	RI	RI
621	Materials of rubber (e.g., pastes, plates, sheets, rods, thread, tubes, of rubber)	1	2	LI	HK
625	Rubber tyres, interchangeable tyre treads, tyre flaps and inner tubes for wheels of all kinds	7	8	LI	HK
629	Articles of rubber, n.e.s.	8	12	LI	-
633	Cork manufactures	1	-	LI	RI
634	Veneers, plywood, particle board, and other wood, worked, n.e.s.	2	5	RI	RI
635	Wood manufactures, n.e.s.	1	3	RI	RI
641	Paper and paperboard	6	8	RI	HK
642	Paper and paperboard, cut to size or shape, and articles of paper or paperboard	6	8	LI	HK
651	Textile yarn	79	88	LI	UL
652	Cotton fabrics, woven (not including narrow or special fabrics)	60	59	RI	UL
653	Fabrics, woven, of man-made textile materials (not including narrow or special fabrics)	45	55	RI	UL
654	Other textile fabrics, woven	11	11	RI	TI,UL
655	Knitted or crocheted fabrics (including tubular knit fabrics, n.e.s., pile fabrics and openwork fabrics), n.e.s.	4	5	LI	UL
656	Tulles, lace, embroidery, ribbons, trimmings and other smallwares	9	9	LI	UL
657	Special yarns, special textile fabrics and related products	18	21	LI	UL
658	Made-up articles, wholly or chiefly of textile materials, n.e.s.	30	37	LI	UL
659	Floor coverings, etc.	19	19	RI	UL
661	Lime, cement, and fabricated construction materials (except glass and clay materials)	9	11	RI	RI
662	Clay construction materials and refractory construction materials	3	5	RI	RI
663	Mineral manufactures, n.e.s.	13	11	RI	RI
664	Glass	4	7	RI	UL
665	Glassware	5	7	RI	UL
666	Pottery	1	1	RI	UL
667	Pearls and precious or semiprecious stones, unworked or worked	6	6	LI	RI,TI
671	Pig-iron, spiegeleisen, sponge iron, iron or steel granules and powders and ferro-alloys	10	11	RI	RI
672	Ingots and other primary forms, of iron or steel; semi-finished products of iron or steel	3	6	RI	HK
673	Flat-rolled products of iron or non-alloy steel, not clad, plated or coated	10	15	RI	HK
674	Flat-rolled products of iron or non-alloy steel, clad, plated or coated	5	5	RI	HK
675	Flat-rolled products of alloy steel	6	8	RI	HK
676	Iron and steel bars, rods, angles, shapes and sections (including sheet piling)	14	21	RI	HK
677	Rails or railway track construction material, of iron or steel	1	-	RI	HK

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678	Wire of iron or steel	3	5	RI	HK
679	Tubes, pipes and hollow profiles, and tube or pipe fittings, of iron or steel	13	16	HKMTKI	HK
681	Silver, platinum and other metals of the platinum group	2	-	RI	RI
682	Copper	4	11	RI	RI
683	Nickel	-	2	-	-
684	Aluminium	6	7	RI	RI
685	Lead	1	3	RI	RI
686	Zinc	1	2	RI	RI
687	Tin	2	1	RI	RI
689	Miscellaneous	1	-	HKMTLI	RI
691	Structures and parts of structures, n.e.s., of iron, steel or aluminium	1	1	HKMTLI	HK
692	Metal containers for storage or transport	2	2	LI	HK
693	Wire products (excluding insulated electrical wiring) and fencing grills	7	8	RI	HK
694	Nails, screws, nuts, bolts, rivets and the like, of iron, steel, copper or aluminium	11	11	RI	HK
695	Tools for use in the hand or in machines	20	21	HKMTLI	HK
696	Cutlery	4	6	LI	HK
697	Household equipment of base metal, n.e.s.	13	16	LI	HK
699	Manufactures of base metal, n.e.s.	19	23	LI	HK
711	Steam or other vapour-generating boilers, superheated water boilers, and auxiliary plant for use therewith; parts thereof	2	4	HKLT	TI
712	Steam turbines and other vapour turbines, and parts thereof, n.e.s.	1	1	HKLI	-
713	Internal combustion piston engines, and parts thereof, n.e.s.	2	1	HKLT	TI
716	Rotating electric plant, and parts thereof, n.e.s.	2	3	HKLT	TI
718	Power-generating machinery, and parts thereof, n.e.s.	2	3	HKHTLI	TI
721	Agricultural machinery (excluding tractors), and parts thereof	3	3	LI	TI
722	Tractors (other than those of headings 744.14 and 744.15)	1	1	LI	TI
723	Civil engineering and contractors' plant and equipment; parts thereof	-	1	HKMTLI	TI
724	Textile and leather machinery, and parts thereof, n.e.s.	14	14	LI	TI
725	Paper mill and pulp mill machinery, paper-cutting machines and other machinery for the manufacture of paper articles; parts thereof	-	-	HKMTLI	TI
726	Printing and bookbinding machinery, and parts thereof	2	3	HKMTLI	TI
727	Food-processing machines (excluding domestic); parts thereof	3	3	HKMTLI	TI
728	Other machinery and equipment specialized for particular industries; parts thereof, n.e.s.		3	HKMTLI	TI
731	Machine tools working by removing metal or other material	5	3	HKMTLI	-
733	Machine tools for working metal, sintered metal carbides or cermets, without removing material	-	1	HKMTLI	-
735	Parts, n.e.s., and accessories suitable for use solely or principally with the machines falling within groups 731 and 733 (including work or tool holders, self-opening die-heads, dividing heads and other special attachments for machine tools); tool holde	1	1	HKMTLI	TI
737	Metalworking machinery (other than machine tools), and parts thereof, n.e.s.	8	8	HKMTLI	TI
741	Heating and cooling equipment, and parts thereof, n.e.s.	1	3	HKMTLI	TI

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742	Pumps for liquids, whether or not fitted with a measuring device; liquid elevators; parts for such pumps and liquid elevators	2	1	HKLT	TI
743	Pumps (other than pumps for liquids), air or other gas compressors and fans; ventilating or recycling hoods incorporating a fan, whether or not fitted with filters; centrifuges; filtering or purifying apparatus; parts thereof	3	4	HKLT	TI
744	Mechanical handling equipment, and parts thereof, n.e.s.	3	1	HKMTLI	TI
745	Non-electrical machinery, tools and mechanical apparatus, and parts thereof, n.e.s.	2	1	HKMTLI	TI
746	Ball- or roller bearings	2	3	HKMTLI	TI
747	Taps, cocks, valves and similar appliances for pipes, boiler shells, tanks, vats or the like, including pressure-reducing valves and thermostatically controlled valves	-	-	HKMTLI	TI
748	Transmission shafts (including camshafts and crankshafts) and cranks; bearing housings and plain shaft bearings; gears and gearing; ball screws; gearboxes and other speed changers (including torque converters); flywheels and pulleys (including pulley bloc	2	2	HKMTLI	TI
749	Non-electric parts and accessories of machinery, n.e.s.	2	1	HKMTLI	TI
751	Office machines	2	7	HKMTLI	TI
752	Automatic data-processing machines and units thereof; magnetic or optical readers, machines for transcribing data onto data media in coded form and machines for processing such data, n.e.s.		1	HKMTLI	-
759	Parts and accessories (other than covers, carrying cases and the like) suitable for use solely or principally with machines falling within groups 751 and 752	-	-	HKMTLI	TI
761	Television receivers (including video monitors and video projectors), whether or not incorporating radio-broadcast receivers or sound- or video-recording or reproducing apparatus	-	1	HKMTLI	-
762	Radio-broadcast receivers, whether or not incorporating sound-recording or reproducing apparatus or a clock	-	-	HKLT	HK
763	Sound recorders or reproducers; television image and sound recorders or reproducers; prepared unrecorded media	-	-	HKMTLI	HK, TI
764	Telecommunications equipment, n.e.s., and parts, n.e.s., and accessories of apparatus falling within division 76	1	1	HKMTLI	TI
771	Electric power machinery (other than rotating electric plant of group 716), and parts thereof	3	5	LI	TI
772	Electrical apparatus for switching or protecting electrical circuits or for making connections to or in electrical circuits (e.g., switches, relays, fuses, lightning arresters, voltage limiters, surge suppressors, plugs and sockets, lamp-holders and junc	4	8	HKMTLI	TI
773	Equipment for distributing electricity, n.e.s.	4	5	HKLT	TI
774	Electrodiagnostic apparatus for medical, surgical, dental or veterinary purposes, and radiological apparatus	2	6	HKMTLI	TI
775	Household-type electrical and non-electrical equipment, n.e.s.	2	3	HKMTLI	TI
776	Thermionic, cold cathode or photo-cathode valves and tubes (e.g., vacuum or vapour or gas-filled valves and tubes, mercury arc rectifying valves and tubes, cathode-ray tubes, television camera tubes); diodes, transistors and similar semiconductor devices	1	-	HKHTLI	TI
778	Electrical machinery and apparatus, n.e.s.	8	11	HKHTLI	TI

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781	Motor cars and other motor vehicles principally designed for the transport of persons (other than motor vehicles for the transport of ten or more persons, including the driver), including station-wagons and racing cars	2	2	HKMTKI	HK, TI
782	Motor vehicles for the transport of goods and special-purpose motor vehicles	-		HKMTKI	HK, TI
783	Road motor vehicles, n.e.s.	2	1	HKMTKI	HK, TI
784	Parts and accessories of the motor vehicles of groups 722, 781, 782 and 783	2	2	LI	HK, TI
785	Motor cycles (including mopeds) and cycles, motorized and non-motorized; invalid carriages	12	12	LI	HK
786	Trailers and semi-trailers; other vehicles, not mechanically-propelled; specially designed and equipped transport containers	-	-	LI	HK, TI
791	Railway vehicles (including hovertrains) and associated equipment	1	2	LI	HK, TI
792	Aircraft and associated equipment; spacecraft (including satellites) and spacecraft launch vehicles; parts thereof	1	-	HKHTLI	TI
793	Ships, boats (including hovercraft) and floating structures	1	2	HKLT	UL
812	Sanitary, plumbing and heating fixtures and fittings, n.e.s.	2	1	LI	UL
813	Lighting fixtures and fittings, n.e.s.	-	-	LI	TI
821	Furniture and parts thereof; bedding, mattresses, mattress supports, cushions and similar stuffed furnishings	-	-	LI	UL
831	Trunks, suitcases, vanity cases, executive cases, briefcases, school satchels, binocular cases, camera cases, musical instrument cases, spectacle cases, gun cases, holsters and similar containers; travelling bags, toilet bags, rucksacks, handbags, shopping	6	6	LI	UL
841	Men's or boys' coats, capes, jackets, suits, blazers, trousers, shorts, shirts, underwear, nightwear and similar articles of textile fabrics, not knitted or crocheted (other than those of subgroup 845.2)	27	27	LI	-
842	Women's or girls' coats, capes, jackets, suits, trousers, shorts, shirts, dresses and skirts, underwear, nightwear and similar articles of textile fabrics, not knitted or crocheted (other than those of subgroup 842.2)	38	39	LI	UL
843	Men's or boys' coats, capes, jackets, suits, blazers, trousers, shorts, shirts, underwear, nightwear and similar articles of textile fabrics, knitted or crocheted (other than those of subgroup 845.2)	22	20	LI	UL
844	Women's or girls' coats, capes, jackets, suits, trousers, shorts, shirts, dresses and skirts, underwear, nightwear and similar articles of textile fabrics, knitted or crocheted (other than those of subgroup 845.2)	33	30	LI	UL
845	Articles of apparel, of textile fabrics, whether or not knitted or crocheted, n.e.s.	22	22	LI	UL
846	Clothing accessories, of textile fabrics, whether or not knitted or crocheted (other than those for babies)	17	18	LI	UL
848	Articles of apparel and clothing accessories of other than textile fabrics; headgear of all materials	6	6	LI	UL
851	Footwear	12	12	LI	UL
871	Optical instruments and apparatus, n.e.s.	-	-	HKHTLI	TI
872	Instruments and appliances, n.e.s., for medical, surgical, dental or veterinary purposes	-	1	HKMTLI	TI
873	Meters and counters, n.e.s.	1	-	HKMTLI	TI
874	Measuring, checking, analysing and controlling instruments and apparatus, n.e.s.	2	2	HKHTLI	TI
881	Photographic apparatus and equipment, n.e.s.	-	3	HKMTLI	TI

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882	Photographic and cinematographic supplies	5	1	HKMTKI	TI
883	Cinematographic film, exposed and developed, whether or not incorporating soundtrack or consisting only of soundtrack	2	2	-	TI
884	Optical goods, n.e.s.	1	1	HKMTLI	TI
885	Watches and clocks	14	18	LI	HK
891	Arms and ammunition	1	-	LI	TI
892	Printed matter	3	2	LI	HK
893	Articles, n.e.s., of plastics	3	2	LI	TI
894	Baby carriages, toys, games and sporting goods	5	5	LI	UL
895	Office and stationery supplies, n.e.s.	7	9	LI	UL
896	Works of art, collectors' pieces and antiques	-	2	-	-
897	Jewellery, goldsmiths' and silversmiths' wares, and other articles of precious or semiprecious materials, n.e.s.	7	8	LI	HK
898	Musical instruments and parts and accessories thereof; records, tapes and other sound or similar recordings (excluding goods of groups 763 and 883)	5	10	HKLT, LI	HK
899	Miscellaneous manufactured articles, n.e.s.	14	13	LI	HK, TI

**WDI:** RI:resource intensive, LI: labour intensive, HKHTKI-high technology, human capital and physical capital intensive, HKHTLI: high technology, human capital and labour intensive, HKLI: human capital and labour intensive, HKLT: low technology and human capital , HKLTLI: low technology , human capital and labour intensive, HKMTKI: medium technology, human capital and physical capital intensive, HKMTLI: medium technology, human capital and labour intensive

**UN Comtrade:** A: primary, B: Resource and Labour intensive, C: Low skill and Technology Intensity, D: Medium skill and Technology Intensity, E- High skill and technology intensity, F: unclassified

**ETA:** HK: human capital, TI: technology intensive, UL: unskilled labour, RI: natural resource intensive

**Summary of China's Comparative Advantage according to factor Intensity based on:**

*At the 2-digit level*

**Table A.17: UNCTAD system of classification**

Category*	2000	2003
<b>Labour Intensive</b>	754	794
<b>Demand for skill, capital, technology and capital</b>		
Low	196	196
Medium	173	172
High	376	402

I: labour intensive and resource intensive manufactures, II: low demand for skill, technology, capital, scale, III: medium demand for skill, technology, capital, scale, IV: high demand for skill, technology, capital, scale

**Table A.18: Details of China's Comparative Advantage in terms of factor intensity based on UNCTAD classification**

SITC	Product Description	2000	2003	Category
51	Organic chemicals	96	96	IV
52	Inorganic chemicals	95	96	IV
53	Dyeing, tanning and colouring materials	14	10	IV
54	Medicinal and pharmaceutical products	24	26	IV
55	Essential oils and resinoids and perfume materials; toilet, polishing and cleansing preparations	6	6	IV
56	Fertilizers (other than those of group 272)	4	6	IV
57	Plastics in primary forms	3	2	IV
58	Plastics in non-primary forms	4	2	IV
59	Chemical materials and products, n.e.s.	18	15	IV
61	Leather, leather manufactures, n.e.s., and dressed furskins	14	11	I
62	Rubber manufactures, n.e.s.	11	11	III
63	Cork and wood manufactures (excluding furniture)	16	15	I
64	Paper, paperboard and articles of paper pulp, of paper or of paperboard	14	12	I
65	Textile yarn, fabrics, made-up articles, n.e.s., and related products	337	339	I
66	Non-metallic mineral manufactures, n.e.s.	52	47	I
67	Iron and steel	37	36	II
68	Non-ferrous metals	28	25	NFP
69	Manufactures of metals, n.e.s.	131	128	II
71	Power-generating machinery and equipment	11	11	III
72	Machinery specialized for particular industries	19	21	III
73	Metalworking machinery	12	8	III
74	General industrial machinery and equipment, n.e.s., and machine parts, n.e.s.	34	38	III
75	Office machines and automatic data-processing machines	15	21	IV
76	Telecommunications and sound-recording and reproducing apparatus and equipment	30	39	IV
77	Electrical machinery, apparatus and appliances, n.e.s., and electrical parts thereof (including non-electrical counterparts, n.e.s., of electrical household-type equipment)	81	83	III; 776:IV

*Contd..*

78	Road vehicles (including air-cushion vehicles)	16	19	II; 781-784:III
79	Other transport equipment	11	7	II; 792:IV
81	Prefabricated buildings; sanitary, plumbing, heating and lighting fixtures and fittings, n.e.s.	11	10	II
82	Furniture, and parts thereof; bedding, mattresses, mattress supports, cushions and similar stuffed furnishings	17	18	I
83	Travel goods, handbags and similar containers	12	12	I
84	Articles of apparel and clothing accessories	231	222	I
85	Footwear	22	23	I
87	Professional, scientific and controlling instruments and apparatus, n.e.s.	20	24	IV
88	Photographic apparatus, equipment and supplies and optical goods, n.e.s.; watches and clocks	62	51	IV
89	Miscellaneous manufactured articles, n.e.s.	146	141	894-I; 893-III

I: labour intensive and resource intensive manufactures, II: low demand for skill, technology, capital, scale, III: medium demand for skill, technology, capital, scale, IV: high demand for skill, technology, capital, scale

**Table A.19: OECD system of classification**

Category	2000	2003
<b>Resource Intensive</b>	85	80
<b>Labour Intensive</b>	882	864
<b>Differentiated Products Specialized Suppliers</b>	232	253
<b>Skill Intensive</b>	289	256
<b>Science Based</b>	121	125
<b>Non-fuel Primary commodities</b>	28	25

\*-RI: resource intensive, labour intensive: LI, Differentiated Products requiring specialized suppliers: DPSS, SI:

Scale Intensive., SB: Science Based Manufactures, NFP-Non fuel Primary commodities

**Table A.20: Details of China's Comparative Advantage in terms of factor intensity based on OECD classification**

SITC	Description	2000	2003	Category
51	Organic chemicals	96	96	SI
52	Inorganic chemicals	95	96	SI
53	Dyeing, tanning and colouring materials	14	10	SI
54	Medicinal and pharmaceutical products	24	26	SB
55	Essential oils and resinoids and perfume materials; toilet, polishing and cleansing preparations	6	6	SI
56	Fertilizers (other than those of group 272)	4	6	SI
57	Plastics in primary forms	3	2	SI
58	Plastics in non-primary forms	4	2	SI
59	Chemical materials and products, n.e.s.	18	15	SI
61	Leather, leather manufactures, n.e.s., and dressed furskins	14	11	LI
62	Rubber manufactures, n.e.s.	11	11	SI
63	Cork and wood manufactures (excluding furniture)	16	15	RI
64	Paper, paperboard and articles of paper pulp, of paper or of paperboard	14	12	SI
65	Textile yarn, fabrics, made-up articles, n.e.s., and related products	337	339	LI
66	Non-metallic mineral manufactures, n.e.s.	52	47	RI
67	Iron and steel	37	36	DPSS

*Contd..*

68	Non-ferrous metals	28	25	NFP
69	Manufactures of metals, n.e.s.	131	128	LI
71	Power-generating machinery and equipment	11	11	DPSS
72	Machinery specialized for particular industries	19	21	DPSS
73	Metalworking machinery	12	8	DPSS
74	General industrial machinery and equipment, n.e.s., and machine parts, n.e.s.	34	38	DPSS
75	Office machines and automatic data-processing machines	15	21	SB
76	Telecommunications and sound-recording and reproducing apparatus and equipment	30	39	DPSS
77	Electrical machinery, apparatus and appliances, n.e.s., and electrical parts thereof (including non-electrical counterparts, n.e.s., of electrical household-type equipment)	81	83	DPSS
78	Road vehicles (including air-cushion vehicles)	16	19	781-784:DPSS
79	Other transport equipment	11	7	DPSS; 792:SB
81	Prefabricated buildings; sanitary, plumbing, heating and lighting fixtures and fittings, n.e.s.	11	10	
82	Furniture, and parts thereof; bedding, mattresses, mattress supports, cushions and similar stuffed furnishings	17	18	RI
83	Travel goods, handbags and similar containers	12	12	LI
84	Articles of apparel and clothing accessories	231	222	LI
85	Footwear	22	23	LI
87	Professional, scientific and controlling instruments and apparatus, n.e.s.	20	24	SB
88	Photographic apparatus, equipment and supplies and optical goods, n.e.s.; watches and clocks	62	51	SB
89	Miscellaneous manufactured articles, n.e.s.	146	141	LI; 893:DPSS

\*-RI: resource intensive, labour intensive: LI, Differentiated Products requiring specialized suppliers: DPSS, SI:

Scale Intensive., SB: Science Based Manufactures, NFP-Non fuel Primary commodities

**Table A.21: Details of China's Comparative Advantage in terms of factor intensity**

SITC	Description	2000	2003	WDI	ETA
511	Hydrocarbons, n.e.s., and their halogenated, sulphonated, nitrated or nitrosated derivatives	8	10	RI	TI
512	Alcohols, phenols, phenol-alcohols, and their halogenated, sulphonated, nitrated or nitrosated derivatives	13	17	RI	TI
513	Carboxylic acids and their anhydrides, halides, peroxides and peroxyacids; their halogenated, sulphonated, nitrated or nitrosated derivatives	21	21	RI	TI
514	Nitrogen-function compounds	19	17	RI	TI
515	Organo-inorganic compounds, heterocyclic compounds, nucleic acids and their salts, and sulphonamides	16	12	HKMTKI	TI
516	Other organic chemicals	19	19	HKHTKI	TI
522	Inorganic chemical elements, oxides and halogen salts	31	29	HKMTKI	TI
523	Metal salts and peroxysalts, of inorganic acids	53	57	HKMTKI	TI
524	Other inorganic chemicals; organic and inorganic compounds of precious metals	9	8	HKMTKI	HK, TI
525	Radioactive and associated materials	2	2	HKHTKI	TI
531	Synthetic organic colouring matter and colour lakes, and preparations based thereon	7	6	HKMTKI	HK, TI
532	Dyeing and tanning extracts, and synthetic tanning materials	1	1	HKMTKI	HK
533	Pigments, paints, varnishes and related materials	6	3	HKMTKI	HK, TI
541	Medicinal and pharmaceutical products, other than medicaments of group 542	24	26	HKHTKI	TI
542	Medicaments (including veterinary medicaments)	-	-	HKHTKI	TI
551	Essential oils, perfume and flavour materials	3	3	HKMTKI	HK, TI
553	Perfumery, cosmetic or toilet preparations (excluding soaps)	2	2	HKLT	HK
554	Soap, cleansing and polishing preparations	1	1	HKLT	HK
562	Fertilizers (other than those of group 272)	4	6	RI	TI
571	Polymers of ethylene, in primary forms	-	-	HKMTKI	-
572	Polymers of styrene, in primary forms	-	-	HKMTKI	-
573	Polymers of vinyl chloride or of other halogenated olefins, in primary forms	1	-	HKMTKI	-
574	Polyacetals, other polyethers and epoxide resins, in primary forms; polycarbonates, alkyd resins, polyallyl esters and other polyesters, in primary forms	-	-	HKMTKI	TI
575	Other plastics, in primary forms	2	2	HKMTKI	TI
579	Waste, parings and scrap, of plastics	-	-	HKMTKI	-
581	Tubes, pipes and hoses, and fittings therefor, of plastics	-	-	HKMTKI	-
582	Plates, sheets, film, foil and strip, of plastics	4	2	HKMTKI	TI
591	Insecticides, rodenticides, fungicides, herbicides, anti-sprouting products and plant-growth regulators, disinfectants and similar products, put up in forms or packings for retail sale or as preparations or articles (e.g., sulphur-treated bands, wicks and	2	2	HKHTKI	TI
592	Starches, inulin and wheat gluten; albuminoidal substances; glues	3	4	HKLT	TI
593	Explosives and pyrotechnic products	1	1	HKLT	-
597	Prepared additives for mineral oils and the like; prepared liquids for hydraulic transmission; anti-freezing preparations and prepared de-icing fluids; lubricating preparations	-	1	HKMTKI	-
598	Miscellaneous chemical products, n.e.s.	12	7	HKMTKI	TI
611	Leather	7	5	RI	RI
612	Manufactures of leather or of composition leather, n.e.s.; saddlery and harness	2	2	LI	RI

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613	Furskins, tanned or dressed (including heads, tails, paws and other pieces or cuttings), unassembled, or assembled (without the addition of other materials), other than those of heading 848.31	5	4	RI	RI
621	Materials of rubber (e.g., pastes, plates, sheets, rods, thread, tubes, of rubber)	-	-	LI	HK
625	Rubber tyres, interchangeable tyre treads, tyre flaps and inner tubes for wheels of all kinds	6	6	LI	HK
629	Articles of rubber, n.e.s.	5	5	LI	-
633	Cork manufactures	-	-	LI	RI
634	Veneers, plywood, particle board, and other wood, worked, n.e.s.	6	6	RI	RI
635	Wood manufactures, n.e.s.	10	9	RI	RI
641	Paper and paperboard	4	3	RI	HK
642	Paper and paperboard, cut to size or shape, and articles of paper or paperboard	10	9	LI	HK
651	Textile yarn	77	76	LI	UL
652	Cotton fabrics, woven (not including narrow or special fabrics)	61	67	RI	UL
653	Fabrics, woven, of man-made textile materials (not including narrow or special fabrics)	77	76	RI	UL
654	Other textile fabrics, woven	19	20	RI	TI,UL
655	Knitted or crocheted fabrics (including tubular knit fabrics, n.e.s., pile fabrics and openwork fabrics), n.e.s.	7	10	LI	UL
656	Tulles, lace, embroidery, ribbons, trimmings and other smallwares	13	12	LI	UL
657	Special yarns, special textile fabrics and related products	22	19	LI	UL
658	Made-up articles, wholly or chiefly of textile materials, n.e.s.	51	49	LI	UL
659	Floor coverings, etc.	10	10	RI	UL
661	Lime, cement, and fabricated construction materials (except glass and clay materials)	10	6	RI	RI
662	Clay construction materials and refractory construction materials	4	6	RI	RI
663	Mineral manufactures, n.e.s.	11	9	RI	RI
664	Glass	12	10	RI	UL
665	Glassware	8	9	RI	UL
666	Pottery	5	5	RI	UL
667	Pearls and precious or semiprecious stones, unworked or worked	2	2	LI	RI,TI
671	Pig-iron, spiegeleisen, sponge iron, iron or steel granules and powders and ferro-alloys	12	12	RI	RI
672	Ingots and other primary forms, of iron or steel; semi-finished products of iron or steel	5	1	RI	HK
673	Flat-rolled products of iron or non-alloy steel, not clad, plated or coated	4	2	RI	HK
674	Flat-rolled products of iron or non-alloy steel, clad, plated or coated	-	-	RI	HK
675	Flat-rolled products of alloy steel	-	-	RI	HK
676	Iron and steel bars, rods, angles, shapes and sections (including sheet piling)	1	6	RI	HK
677	Rails or railway track construction material, of iron or steel	1	-	RI	HK
678	Wire of iron or steel	2	2	RI	HK
679	Tubes, pipes and hollow profiles, and tube or pipe fittings, of iron or steel	12	13	HKMTKI	HK
681	Silver, platinum and other metals of the platinum group	-	1	RI	RI
682	Copper	5	4	RI	RI
683	Nickel	-	1	-	-
684	Aluminium	-	1	RI	RI
685	Lead	3	1	RI	RI
686	Zinc	2	3	RI	RI
687	Tin	5	2	RI	RI
689	Miscellaneous	13	12	HKMTLI	RI
691	Structures and parts of structures, n.e.s., of iron, steel or aluminium	4	3	HKMTLI	HK
692	Metal containers for storage or transport	-	1	LI	HK
693	Wire products (excluding insulated electrical wiring) and fencing grills	9	10	RI	HK

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694	Nails, screws, nuts, bolts, rivets and the like, of iron, steel, copper or aluminium	13	9	RI	HK
695	Tools for use in the hand or in machines	30	28	HKMTLI	HK
696	Cutlery	14	15	LI	HK
697	Household equipment of base metal, n.e.s.	20	22	LI	HK
699	Manufactures of base metal, n.e.s.	41	40	LI	HK
711	Steam or other vapour-generating boilers, superheated water boilers, and auxiliary plant for use therewith; parts thereof	2	1	HKLT	TI
712	Steam turbines and other vapour turbines, and parts thereof, n.e.s.	-	-	HKLI	-
713	Internal combustion piston engines, and parts thereof, n.e.s.	1	1	HKLT	TI
716	Rotating electric plant, and parts thereof, n.e.s.	6	9	HKLT	TI
718	Power-generating machinery, and parts thereof, n.e.s.	2	-	HKHTLI	TI
721	Agricultural machinery (excluding tractors), and parts thereof	-	1	LI	TI
722	Tractors (other than those of headings 744.14 and 744.15)	1	1	LI	TI
723	Civil engineering and contractors' plant and equipment; parts thereof	2	3	HKMTLI	TI
724	Textile and leather machinery, and parts thereof, n.e.s.	14	12	LI	TI
725	Paper mill and pulp mill machinery, paper-cutting machines and other machinery for the manufacture of paper articles; parts thereof	1	1	HKMTLI	TI
726	Printing and bookbinding machinery, and parts thereof	-	-	HKMTLI	TI
727	Food-processing machines (excluding domestic); parts thereof	-	-	HKMTLI	TI
728	Other machinery and equipment specialized for particular industries; parts thereof, n.e.s.	1	3	HKMTLI	TI
731	Machine tools working by removing metal or other material	6	5	HKMTLI	-
733	Machine tools for working metal, sintered metal carbides or cermets, without removing material	-	-	HKMTLI	-
735	Parts, n.e.s., and accessories suitable for use solely or principally with the machines falling within groups 731 and 733 (including work or tool holders, self-opening die-heads, dividing heads and other special attachments for machine tools); tool holder	-	-	HKMTLI	TI
737	Metalworking machinery (other than machine tools), and parts thereof, n.e.s.	6	3	HKMTLI	TI
741	Heating and cooling equipment, and parts thereof, n.e.s.	5	6	HKMTLI	TI
742	Pumps for liquids, whether or not fitted with a measuring device; liquid elevators; parts for such pumps and liquid elevators	2	2	HKLT	TI
743	Pumps (other than pumps for liquids), air or other gas compressors and fans; ventilating or recycling hoods incorporating a fan, whether or not fitted with filters; centrifuges; filtering or purifying apparatus; parts thereof	3	3	HKLT	TI
744	Mechanical handling equipment, and parts thereof, n.e.s.	9	8	HKMTLI	TI
745	Non-electrical machinery, tools and mechanical apparatus, and parts thereof, n.e.s.	4	9	HKMTLI	TI
746	Ball- or roller bearings	3	2	HKMTLI	TI
747	Taps, cocks, valves and similar appliances for pipes, boiler shells, tanks, vats or the like, including pressure-reducing valves and thermostatically controlled valves	1	2	HKMTLI	TI
748	Transmission shafts (including camshafts and crankshafts) and cranks; bearing housings and plain shaft bearings; gears and gearing; ball screws; gearboxes and other speed changers (including torque converters); flywheels and pulleys (including pulley bloc	4	4	HKMTLI	TI
749	Non-electric parts and accessories of machinery, n.e.s.	3	2	HKMTLI	TI
751	Office machines	9	11	HKMTLI	TI
752	Automatic data-processing machines and units thereof; magnetic or optical readers, machines for transcribing data onto data media in coded form and machines for processing such data, n.e.s.	3	7	HKMTLI	-
759	Parts and accessories (other than covers, carrying cases and the like) suitable for use solely or principally with machines falling within groups 751 and 752	3	3	HKMTLI	TI

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761	Television receivers (including video monitors and video projectors), whether or not incorporating radio-broadcast receivers or sound- or video-recording or reproducing apparatus	1	3	HKMTLI	-
762	Radio-broadcast receivers, whether or not incorporating sound-recording or reproducing apparatus or a clock	6	7	HKLT	HK
763	Sound recorders or reproducers; television image and sound recorders or reproducers; prepared unrecorded media	8	9	HKMTLI	HK, TI
764	Telecommunications equipment, n.e.s., and parts, n.e.s., and accessories of apparatus falling within division 76	15	20	HKMTLI	TI
771	Electric power machinery (other than rotating electric plant of group 716), and parts thereof	6	4	LI	TI
772	Electrical apparatus for switching or protecting electrical circuits or for making connections to or in electrical circuits (e.g., switches, relays, fuses, lightning arresters, voltage limiters, surge suppressors, plugs and sockets, lamp-holders and junc	7	8	HKMTLI	TI
773	Equipment for distributing electricity, n.e.s.	5	4	HKLT	TI
774	Electrodiagnostic apparatus for medical, surgical, dental or veterinary purposes, and radiological apparatus	-	-	HKMTLI	TI
775	Household-type electrical and non-electrical equipment, n.e.s.	24	27	HKMTLI	TI
776	Thermionic, cold cathode or photo-cathode valves and tubes (e.g., vacuum or vapour or gas-filled valves and tubes, mercury arc rectifying valves and tubes, cathode-ray tubes, television camera tubes); diodes, transistors and similar semiconductor devices	7	13	HKHTLI	TI
778	Electrical machinery and apparatus, n.e.s.	32	27	HKHTLI	TI
781	Motor cars and other motor vehicles principally designed for the transport of persons (other than motor vehicles for the transport of ten or more persons, including the driver), including station-wagons and racing cars	-	-	HKMTKI	HK, TI
782	Motor vehicles for the transport of goods and special-purpose motor vehicles	1	-	HKMTKI	HK, TI
783	Road motor vehicles, n.e.s.	-	-	HKMTKI	HK, TI
784	Parts and accessories of the motor vehicles of groups 722, 781, 782 and 783	-	1	LI	HK, TI
785	Motor cycles (including mopeds) and cycles, motorized and non-motorized; invalid carriages	12	15	LI	HK
786	Trailers and semi-trailers; other vehicles, not mechanically-propelled; specially designed and equipped transport containers	3	3	LI	HK, TI
791	Railway vehicles (including hovertrains) and associated equipment	4	2	LI	HK, TI
792	Aircraft and associated equipment; spacecraft (including satellites) and spacecraft launch vehicles; parts thereof	-	3	HKHTLI	TI
793	Ships, boats (including hovercraft) and floating structures	7	2	HKLT	UL
812	Sanitary, plumbing and heating fixtures and fittings, n.e.s.	2	1	LI	UL
813	Lighting fixtures and fittings, n.e.s.	9	9	LI	TI
821	Furniture and parts thereof; bedding, mattresses, mattress supports, cushions and similar stuffed furnishings	17	18	LI	UL
831	Trunks, suitcases, vanity cases, executive cases, briefcases, school satchels, binocular cases, camera cases, musical instrument cases, spectacle cases, gun cases, holsters and similar containers; travelling bags, toilet bags, rucksacks, handbags, shopping	12	12	LI	UL
841	Men's or boys' coats, capes, jackets, suits, blazers, trousers, shorts, shirts, underwear, nightwear and similar articles of textile fabrics, not knitted or crocheted (other than those of subgroup 845.2)	35	34	LI	-
842	Women's or girls' coats, capes, jackets, suits, trousers, shorts, shirts, dresses and skirts, underwear, nightwear and similar articles of textile fabrics, not knitted or crocheted (other than those of subgroup 842.2)	44	42	LI	UL
843	Men's or boys' coats, capes, jackets, suits, blazers, trousers, shorts, shirts, underwear, nightwear and similar articles of textile fabrics, knitted or crocheted (other than those of subgroup 845.2)	25	25	LI	UL

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844	Women's or girls' coats, capes, jackets, suits, trousers, shorts, shirts, dresses and skirts, underwear, nightwear and similar articles of textile fabrics, knitted or crocheted (other than those of subgroup 845.2)	39	31	LI	UL
845	Articles of apparel, of textile fabrics, whether or not knitted or crocheted, n.e.s.	43	44	LI	UL
846	Clothing accessories, of textile fabrics, whether or not knitted or crocheted (other than those for babies)	28	28	LI	UL
848	Articles of apparel and clothing accessories of other than textile fabrics; headgear of all materials	17	18	LI	UL
851	Footwear	23	23	LI	UL
871	Optical instruments and apparatus, n.e.s.	7	6	HKHTLI	TI
872	Instruments and appliances, n.e.s., for medical, surgical, dental or veterinary purposes	1	1	HKMTLI	TI
873	Meters and counters, n.e.s.	2	3	HKMTLI	TI
874	Measuring, checking, analysing and controlling instruments and apparatus, n.e.s.	10	14	HKHTLI	TI
881	Photographic apparatus and equipment, n.e.s.	9	10	HKMTLI	TI
882	Photographic and cinematographic supplies	4	4	HKMTKI	TI
883	Cinematographic film, exposed and developed, whether or not incorporating soundtrack or consisting only of soundtrack	-	-	-	TI
884	Optical goods, n.e.s.	8	5	HKMTLI	TI
885	Watches and clocks	41	32	LI	HK
891	Arms and ammunition	1	-	LI	TI
892	Printed matter	3	4	LI	HK
893	Articles, n.e.s., of plastics	11	12	LI	TI
894	Baby carriages, toys, games and sporting goods	39	39	LI	UL
895	Office and stationery supplies, n.e.s.	15	14	LI	UL
896	Works of art, collectors' pieces and antiques	-	-	-	-
897	Jewellery, goldsmiths' and silversmiths' wares, and other articles of precious or semiprecious materials, n.e.s.	8	5	LI	HK
898	Musical instruments and parts and accessories thereof; records, tapes and other sound or similar recordings (excluding goods of groups 763 and 883)	18	21	HKLT, LI	HK
899	Miscellaneous manufactured articles, n.e.s.	51	46	LI	HK, TI

**WDI:** RI:resource intensive, LI: labour intensive, HKHTKI-high technology, human capital and physical capital intensive, HKHTLI: high technology, human capital and labour intensive, HKLI: human capital and labour intensive, HKLT: low technology and human capital , HKLTLI: low technology , human capital and labour intensive, HKMTKI: medium technology, human capital and physical capital intensive, HKMTLI: medium technology, human capital and labour intensive

**UN Comtrade:** A: primary, B: Resource and Labour intensive, C: Low skill and Technology Intensity, D: Medium skill and Technology Intensity, E- High skill and technology intensity, F: unclassified

**ETA:** HK: human capital, TI: technology intensive, UL: unskilled labour, RI: natural resource intensive