EXPORT STRUCTURES IN INDIA: A COMPARATIVE FRAMEWORK OF ANALYSIS THROUGH REVEALED COMPARATIVE ADVANTAGE WITH CHINA

5.1. INTRODUCTION

With more and more countries moving from protectionism to liberalization of trade barriers, have greatly paved the way for fostering productivity gains, thereby helping nations across the globe to restructure their economy towards gaining a comparative advantage. In this quest, India has taken up a number of policy initiatives to improve its trade potential to revive its economy and superimpose more exposure for its goods in the foreign market. Notable among these was the effort of Liberalization Policy that it undertook way back since 1991. It is therefore obvious 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. A country's comparative advantage is influenced by a wide range of factors like its factor endowments, production, GDP, consumption and increased trade integration with countries. China's move towards export-oriented strategy

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has altered the picture of comparative advantage through labor-intensive techniques in the world market which may be seen as a threat as well as an opportunity for other developing economies. The case may be far more relevant in case of India who shares similar factor endowments as that of China as well as are similar in size. It has therefore become increasingly important to study and explore the extent of similarity and dissimilarity in the patterns of comparative advantage for the two economies.

Thus, this chapter explores the structure of comparative advantage of both India and China in the world market and further a comparative analysis is made for the two economies.

5.2. TRADE AND OUTPUT GROWTH IN INDIA AND CHINA

To compute a comparative framework of revealed comparative advantage between India and China, analysis of trend of output and trade growth of these two economies is made from a period of 2000-2011. The analysis would provide a clear picture of GDP growth of the two economies and contribution of trade in the growth of their GDP. The output trends of India and China are given in figure 5.1 and 5.2.
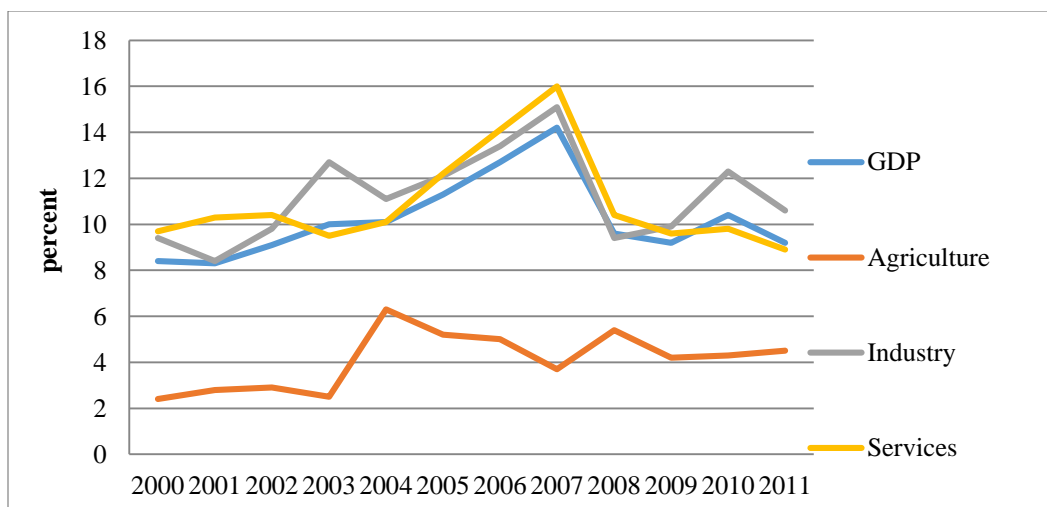

Figure 5.1: Share of GDP by Sector in China (percent of GDP), 2000-2011. **Source:** Asian Development Bank (ADB)

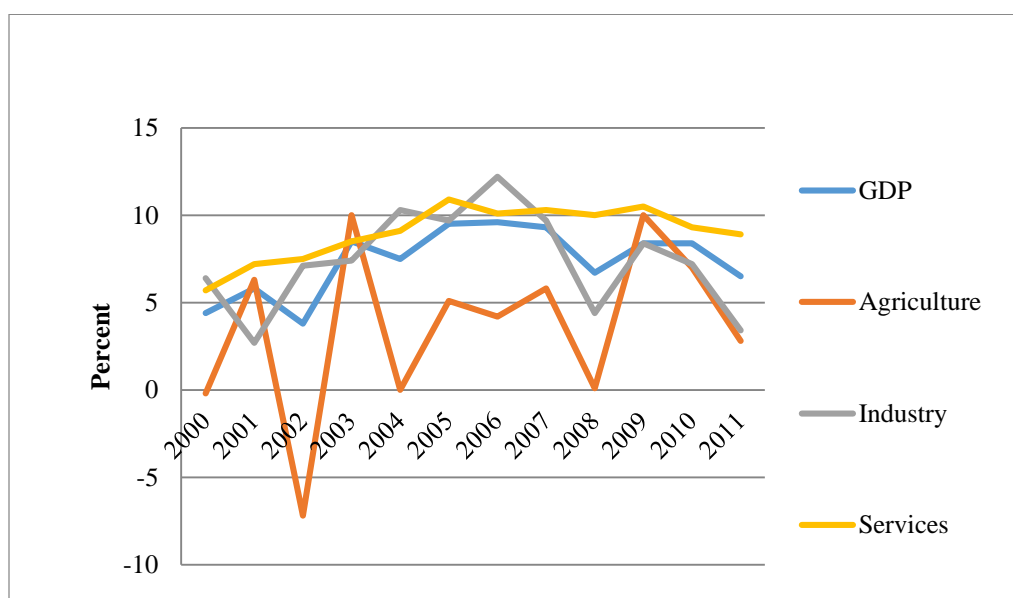**Share of GDP by Sector in India (2000-2011)**
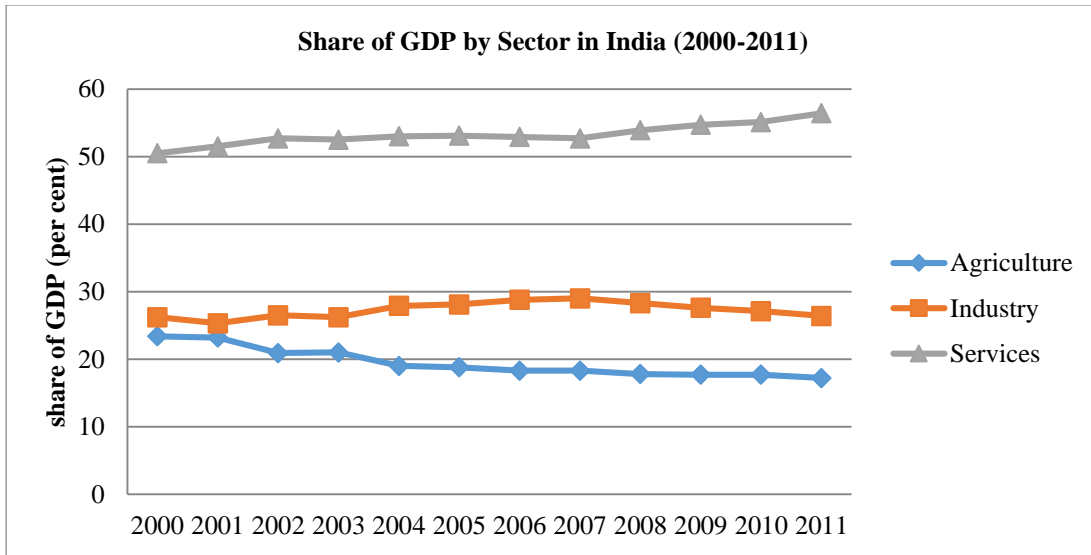
Figure 5.2: Share of GDP by Sector in India (percent of GDP), 2000-2011. **Source:** ADB

The importance of the industrial sector for China is clear in figure 5.1. This sector accounts for almost 50 per cent share of the country's output. The service sector is increasing in importance, accounting for nearly 40 per cent share in recent years. In comparison to China, the services sector in India is the key driver of economic activity, accounting to more than a 50 per cent share of GDP, as is evident from figure 5.2. The share of agriculture to GDP is around 20 per cent and 10 per cent for India and China, respectively, having declined more sharply in China following the industrialization drive.

The annual growth rates of the key sectors are given in figure 5.3 and 5.4 for both the countries. China has been growing at an annual average rate of nearly 9per cent. There has been steep rise in the growth rate of India from 2004-2007 (around 9 per cent). But the growth rate decelerated to around 6 per cent in 2011.

Figure 5.3: Share of GDP by Sector in China (percent of GDP), 2000-2011. **Source:** ADB


Figure 5.4: Share of GDP by Sector in India (percent of GDP), 2000-2011. **Source:** ADB

As noted, the industrial sector has been the key driver of economic growth in China at around 12 per cent. In case of India, it's the service sector which is the major contributor in the growth rate of the economy, which grew at around 9 per cent. The industrial sector has seen a sharp decline, growing at a pace of less than 5 per cent. A great extent of volatility is also observed in the agricultural sector, which grew at less than 3 per cent during 2010-11.
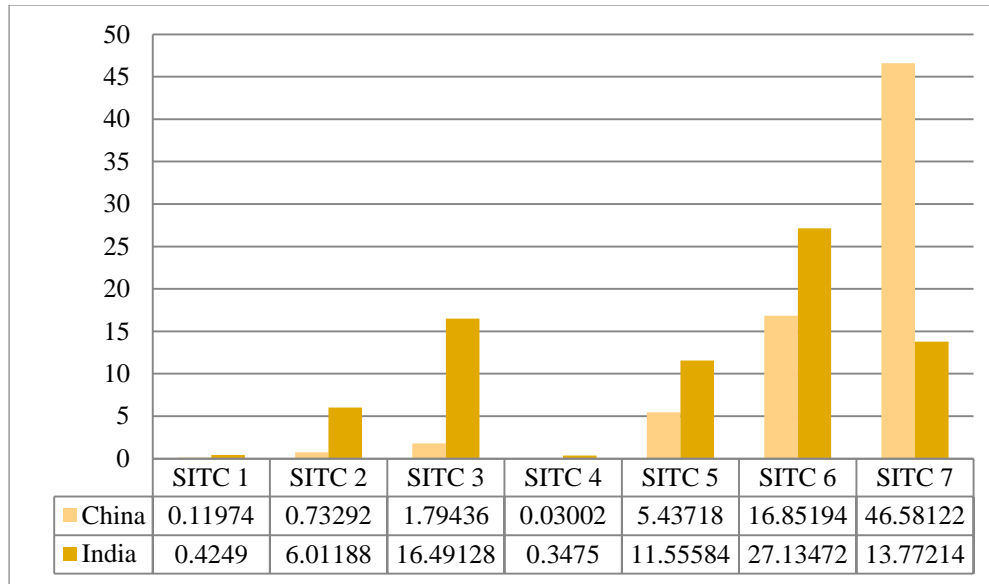
5.3. COMPARATIVE ADVANTAGE OF INDIA AND CHINA

5.3.1. Export Structures

Figure 5.5 illustrates the merchandize exports of India and China as a percent of world exports over the last 13 years. While India's share is fairly constant at around 2 per cent of world exports, China's export share is increasing rapidly in recent years from 4 per cent in 2000 to over 10per cent in 2012.
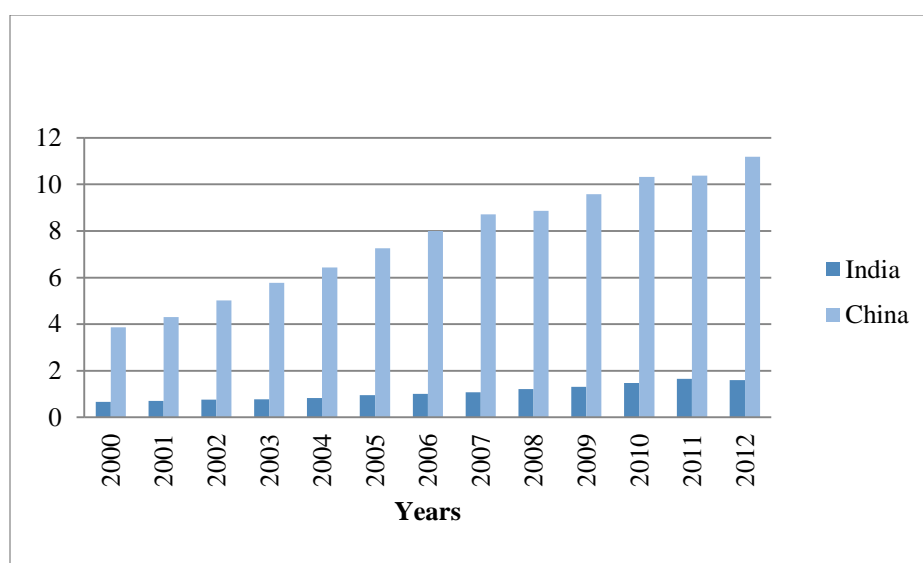
Figure 5.5: Share of China's and India's Exports to World Exports (per cent), 2000-2012 **Source:** UNCTAD

Figure 5.6 illustrates the export composition by SITC 1-digit classification (refer to Appendix, Table 5.1) from a period of 2007-11 for both these countries. As can be seen, China is emerging as a strong exporter in machinery and transport equipment. China's total export is also contributed through miscellaneous manufactured articles (SITC 8) and manufactured goods classified chiefly by material (SITC 6). The export structure for India on the other hand, is quite scattered. The major export category is seen to be manufactured goods (SITC 6). Although the picture seems to be scattered for India, it could be predicated that India exports diversified products compared to China, which is mostly confined to manufactured goods.

	SITC 1	SITC 2	SITC 3	SITC 4	SITC 5	SITC 6	SITC 7
China	0.11974	0.73292	1.79436	0.03002	5.43718	16.85194	46.58122
India	0.4249	6.01188	16.49128	0.3475	11.55584	27.13472	13.77214

Figure 5.6: Share of Exports by SITC 1-digit of India and China, 2007-2011. **Source:** UNCTAD TRAINS Database

5.3.2. Measuring Comparative Advantage

Many empirical studies in International Trade use RCA index to measure revealed comparative advantage (RCA) of countries. The concept of RCA talks about relative trade performance of individual countries in particular commodities. Among the RCA indices, Balassa's (1965) export performance is widely used as it has the advantage of computational simplicity, which is computed using actual data on trade, production and consumption.

In this paper, the Balassa's (1965) export share index has been used mainly due to its analytical and computational simplicity. If a country j exports product i to other countries, Balassa's RCA Index of country j on product i can be written as-

$$RCA_{ij} = (X_{ij} / \Sigma_i X_{ij}) / (\Sigma_j X_{ij} / \Sigma_i \Sigma_j X_{ij})$$

Where X_{ij} are exports of sector i from country j. The numerator gives the percentage share of country j's exports of sector i in country j's total exports. The denominator gives the percentage share of world exports of sector i in world total exports. If a country is non-

specialized in a sector, the RCA index ranges from 0 to 1. But if a country is specialized in a sector, the index ranges from 1 to ∞. The higher the value of this index above 1, the stronger is the country's specialization in the industry or the product.

5.3.3. Changing Comparative Advantage in China

The RCA indices for SITC 1-digit exports of China are summarized in figure 5.7 and 5.8. The RCA trends indicate that China is losing its comparative advantage over a row of products, other than manufactured goods classified as materials (SITC 6) and machinery and transport equipment (SITC 7). A declining trend in manufacture of miscellaneous materials (SITC 8) is also noticed, but China still seems to have a strong comparative advantage in this product category. The general RCA trends indicate that China is losing its comparative advantage in primary and labour-intensive industries but gaining more in capital intensive industries.
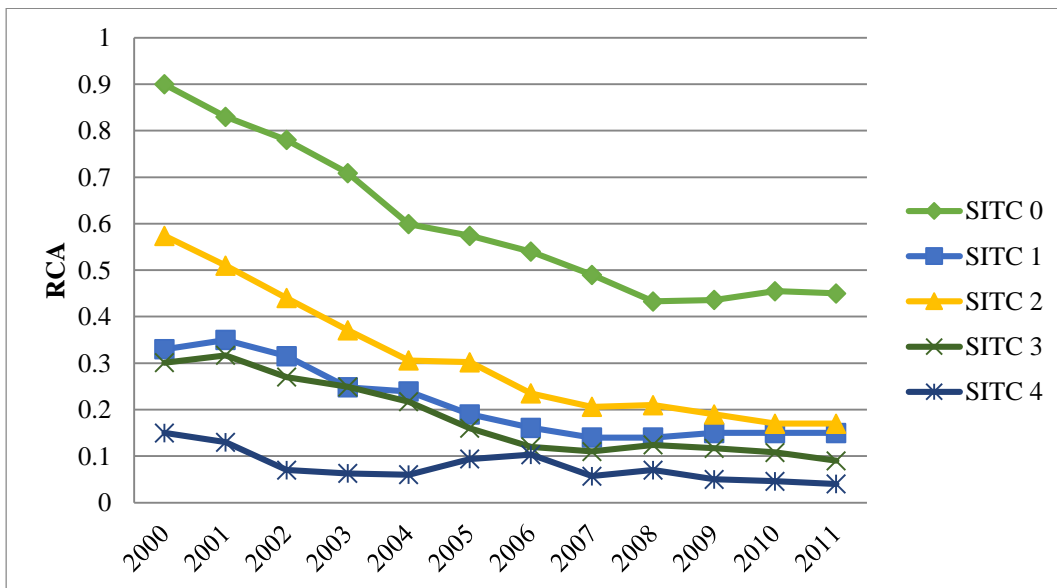

Figure 5.7: Calculated RCA for selected SITC 1-digit for China from 2000-11. **Source:** Author
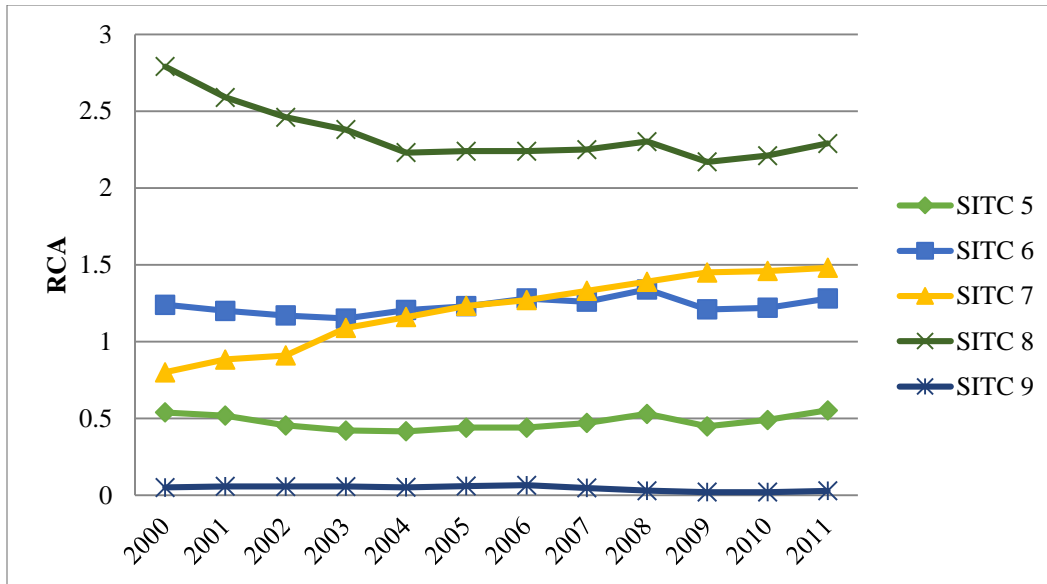
Figure 5.8: Calculated RCA for selected SITC 1-digit for China from 2000-11. **Source:** Author

To further analyze the changing comparative advantage of China, the RCA index at SITC 2-digit classification is computed for three product categories: manufactured goods classified as materials (SITC 6), machinery and transport equipment (SITC 7) and miscellaneous materials (SITC 8).
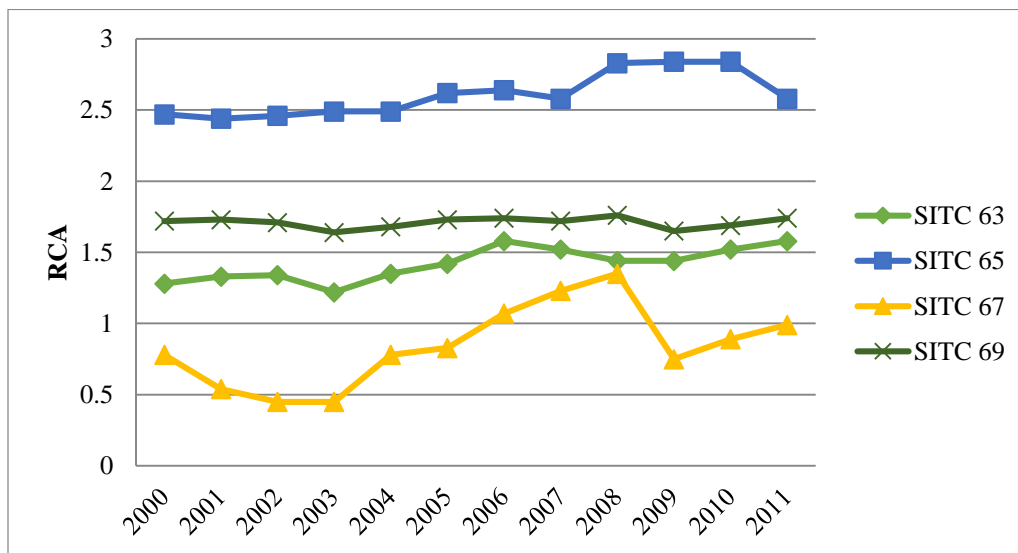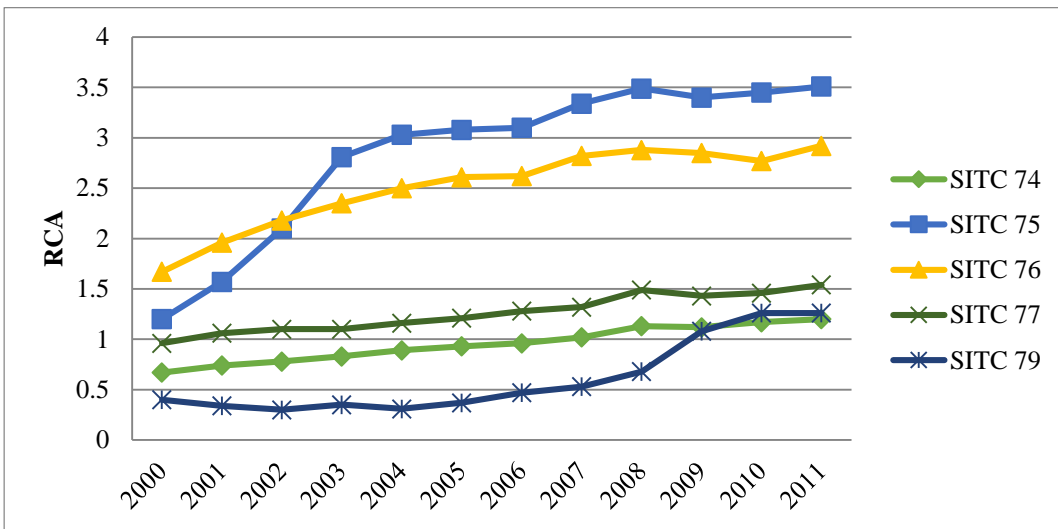

Figure 5.9 (a): Calculated RCA of sub-products in SITC 6 for China, 2000-11. **Source:** Author

The RCA index for sub-products for SITC-6 (figure 5.9 a) reveals that there are two key products which are driving the comparative advantage of manufactured goods classified as materials- SITC 65 (textile, yarn, fabrics) and SITC 69 (manufactures of metals).

In SITC 7 category (figure 5.9 b), it can be seen that there is dominance of 3 sub-products – SITC 75 (office machines), SITC 76 (telecommunications, sound recording, and reproducing apparatus) and SITC 77 (electrical machinery, apparatus & appliances). Both SITC 75 and SITC 76 categories show a strong upward trend, reflecting strong RCA over time.

Figure 5.9 (b): Calculated RCA of sub-products in SITC 7 for China, 2000-11. **Source:** Author
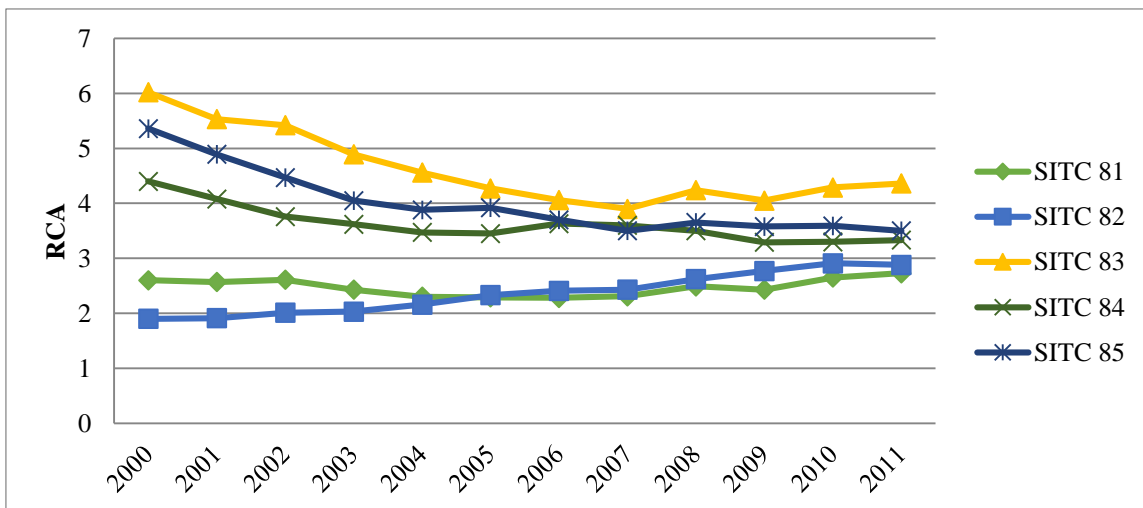

Figure 5.9 (c): Calculated RCA of sub-products in SITC 8 for China, 2000-11. **Source:** Author

117

In SITC 8 category, it can be seen that China has got strong comparative advantage on all the sub-products. Also, it is gaining a strong hold on SITC 82 (footwear) over time.

Table (Refer to Appendix, Table 5.2) at the end of the chapter summarizes some of the products which show a strong upward trend in their RCA, reflecting strong comparative advantage over time. It also reflects some of the items where China is gradually gaining in strong comparative advantage.

5.3.4. India's Changing Comparative Advantage

The RCA trends for India at broader classification of SITC 1-digit level is shown in figure 5.10 & 5.11. Compared to China, India seems to indicate a greater variation in its comparative advantage across the SITC 1-digit commodities. It is clear that India seems to have comparative advantage over a broader range of commodities (SITC 0, SITC 2, SITC 3, SITC 5, SITC 6, and SITC 8). India's RCA is still in resource, primary, and labour-intensive exports as relatively high RCA index values are observed in food and live animals (SITC 0). It is also interesting to note that India is gaining comparative advantage in exports of chemicals (SITC 5).
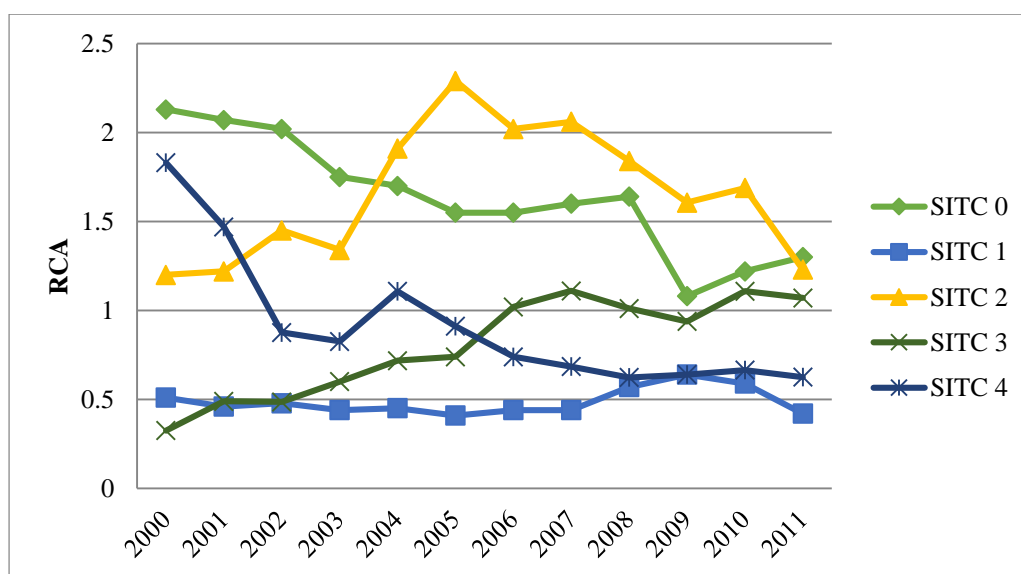

Figure 5.10: Calculated RCA for selected SITC 1-digit for India from 2000-11. **Source:** Author
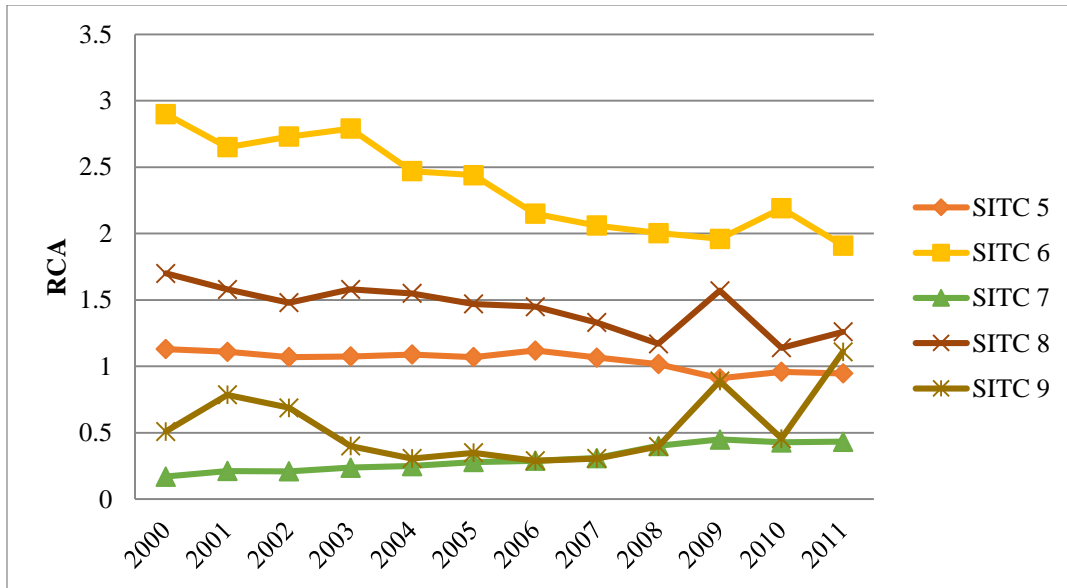
Figure 5.11: Calculated RCA for selected SITC 1-digit for India from 2000-11. **Source:** Author

To further understand the changing comparative advantage of India from labour-intensive manufactures to capital-intensive manufactures, RCA Index at 2-digit level is explored for SITC 5, SITC 6 and SITC 8.

From the figure below (5.12 a), it can be seen that although RCA is comparatively high for SITC 51 (organic chemicals) but India is gradually losing its ground in pharmaceutical products (SITC 54).
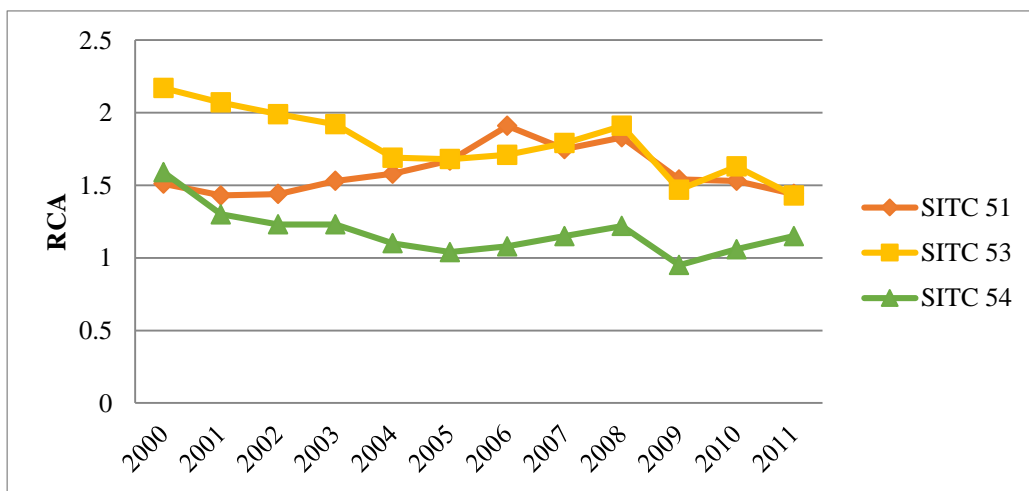
Figure 5.12 (a): Calculated RCA of sub-products in SITC 5 for India, 2000-11. **Source:** Author
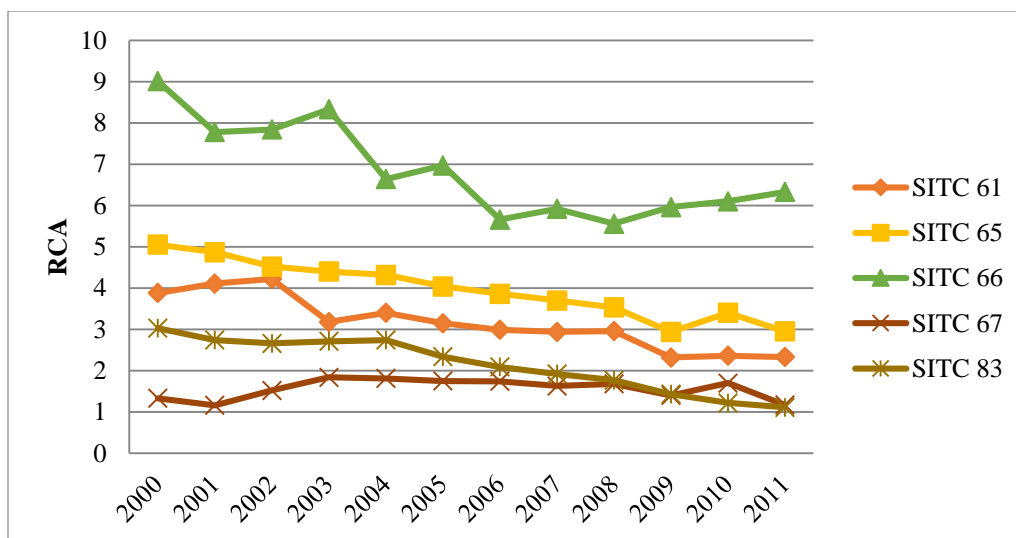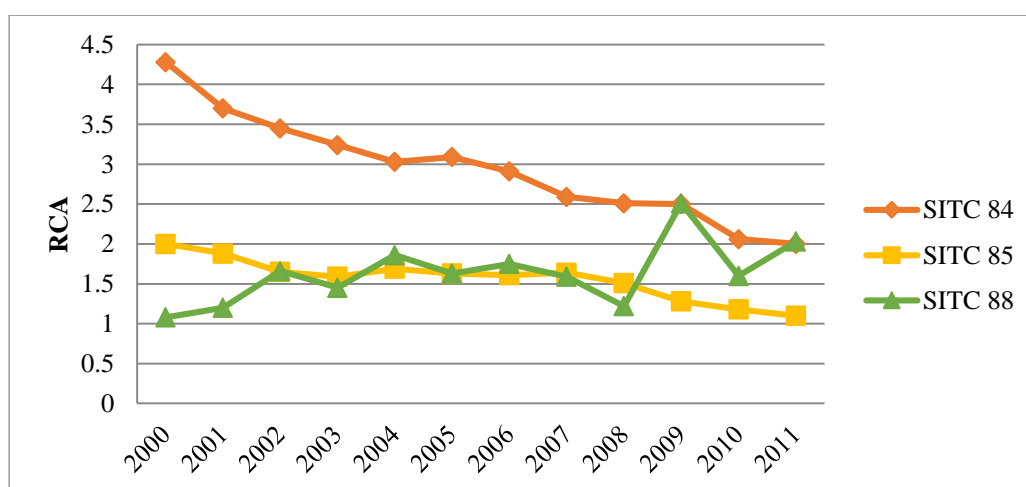
Figure 5.12 (b): Calculated RCA of sub-products in SITC 6 for India, 2000-11. **Source:** Author

India seems to have a fairly strong comparative advantage for SITC 6 category products (figure 5.12 b) and the key sub-products in this category are SITC 65 (textile, yarn, fabrics), SITC 66 (non-metallic mineral manufactures) and SITC 67 (iron and steel) (refer to Appendix, Table 5.3) which indicates that India has a strong comparative advantage in resource-based manufactures.

It is also evident from SITC 8 category sub-products (figure 5.12 c) that although India had a strong hold in this category of products, but it is gradually losing its ground from it. But it could be seen that India has been gaining comparative advantage in SITC 88 (miscellaneous manufactured articles).

Figure 5.12 (c): Calculated RCA of sub-products in SITC 8 for India, 2000-11. **Source:** Author

5.3.5. Substitutability of Exports

To further ascertain the degree of substitutability (complementarity) between India and China, Spearman's rank correlation coefficient is adopted to identify the degree and nature of association between RCA indices. The Spearman's rank correlation coefficient is calculated as:

$$\rho_s = 1 - \left[\frac{6\sum_i^n di^2}{n(n^2-1)}\right]$$

where, $i = 1, 2, \ldots, n$ is product category, d_i is the difference between ranks of RCA index for product i in two particular countries. A positive ρ_s implies that the countries are competing for the world export market. The closer ρ_s is to 1, the stronger is the competition for the export market between the countries. On the other hand, a negative ρ_s implies complementary export structures.

ρ_s have been computed for China and India using SITC 1-digit products in Table 5.1 below. While the correlation between the two countries from 2000 seems to be fairly high, indicating that both countries compete with each other in the world export market, but if we gradually move from year 2006 to 2011, we notice a declining trend in the correlation which suggests a fall in the neck-to-neck competition between the two economies which further indicates a low overlap between the RCA of the two giant economies.

Year	SITC 1-digit Level (n=10) China- India
2000	0.521
2001	0.461
2002	0.49
2003	0.46
2004	0.41
2005	0.35
2006	0.55
2007	0.40

2008	0.46
2009	0.40
2010	0.29
2011	0.28

Table 5.1: Spearman's Rank Correlation Coefficient of RCA indices for China-India (Period 2000-11). **Source:** Author

5.4.   FINDINGS OF THE STUDY

- The comparison between China and India indicates that there is little overlap of RCA across the commodities, and it appears that they do not specialize or compete in similar export categories.

- In particular, China has been gaining its export competitiveness strongly in the manufacture of machinery and transport equipment (SITC 7), while India seems to have no comparative advantage in this category at all.

- More importantly, India is still dominantly relying on its labor-intensive manufactures to make a niche in the world market.

- Comparing the RCA for SITC 6 with China reveals that India has a stronger comparative advantage in SITC 65 (textile, yarn and related products) and SITC 66 (non-metallic mineral manufactures). However, China seems to have stronger comparative advantage in SITC 69 (manufactures of metal).

- It is also evident that both India and China seem to have comparative advantage in SITC 8 miscellaneous manufactured article). In one side, India has comparative advantage in products like articles, footwear etc., but China has a strong comparative advantage in almost all the categories under SITC 8.

- The Spearman's Rank Correlation Coefficient indicates that the correlation between India and China was fairly high till 2000, which indicates that both the countries used to compete with each other in the world export market.

- But gradually with time, there seems to be a declining trend in the correlation which suggests a fall in the neck-to-neck competition between the two economies which further indicates a low overlap between the RCA of the two giant economies.

5.5. CONCLUSION

It has been seen from the study that while both economies have experienced a surge in merchandize trade, but there does not seem to be much overlap in the comparative advantage between India and China at both SITC 1-digit and 2-digit categories, suggesting limited neck-to-neck competition in the global market.

In conclusion, while India is opening up to the global economy since 1991, it lags from China quite significantly. It is evident that over the years, China has been rapidly been able to move from manufactured labor-intensive commodities to more capital-intensive commodities and so gaining comparative advantage on those items over other countries. Although India is equally competing well in the global market, but its export base is still predominantly dependent on labor-intensive manufactures.

5.6. APPENDIX

Table 5.1: Product Categories under SITC 1-digit classification

SITC 1-digit classification	Categories
0	Food and Live Animals
1	Beverages
2	Crude, inedible, except fuel
3	Mineral fuel, lubricant & related
4	Animal & Vegetable oil & fats
5	Chemicals
6	Manufactured goods by material
7	Machinery & transport equipment
8	Miscellaneous manufactured articles
9	Commodities & transactions n.e.s

Table 5.2: RCA for China under SITC 2-digit classification

SITC 2-digit Classification	Product Category (RCA >1)
63	Cork and wood manufactures (excluding furniture)
65	Textile yarn and related products
67	Iron and steel
69	Manufactures of metal, n.e.s.
74	Other industrial machinery and parts
75	Office machines & automatic data processing machines
76	Telecommunication and sound recording apparatus
77	Electrical machinery, apparatus & appliances, n.e.s.
79	Other transport equipment
81	Prefabricated buildings, sanitary, heating and lighting fixtures, n.e.s.
82	Furniture and parts thereof
83	Travel goods, handbags, etc.
84	Articles of apparel & clothing accessories
85	Footwear

Table 5.3: RCA for India under SITC 2-digit classification

SITC 2-digit classification	Product Category (RCA >1)
51	Organic chemicals
53	Dyeing, tanning and colouring materials
54	Medicinal and pharmaceutical products
61	Leather, leather manufactures and dressed furskins
65	Textile yarn and related products
66	Non-metallic mineral manufactures, n.e.s.
67	Iron and steel
83	Travel goods, handbags, etc.
84	Articles of apparel & clothing accessories
85	Footwear
88	Miscellaneous manufactured articles, n.e.s.