



The Trade Structure in East Asia

Spiral Pattern of Development and Triangular Trade Structure as a Regional Manufacturing Platform

- from White Paper on International Economy and Trade 2005 -

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Outline

1. Questions
2. Trade Structure in East Asian countries
3. Hypothesis – “Spiral Pattern of Development”
4. Quality of Trade goods
5. “Triangular Trade Structure”
6. Conclusion – Strengthening regional production platform

1. Questions

Given that division of production process over the borders in East Asia has been highly developed, we face the following questions in analysis on East Asian economies;

Q1 How can we understand the sort of economic dynamism and development in East Asia? Are the conventional wisdoms such as “Flying-geese pattern of development” in East Asia still valid?

Q2 How is trade relations in East Asia formed? Whether is the economic structure in East Asia close in the region or open to the external region?

2. Trade Structure in East Asian countries

Start with categorizing trade goods according to production stage in order to reflect the economic structure in East Asia

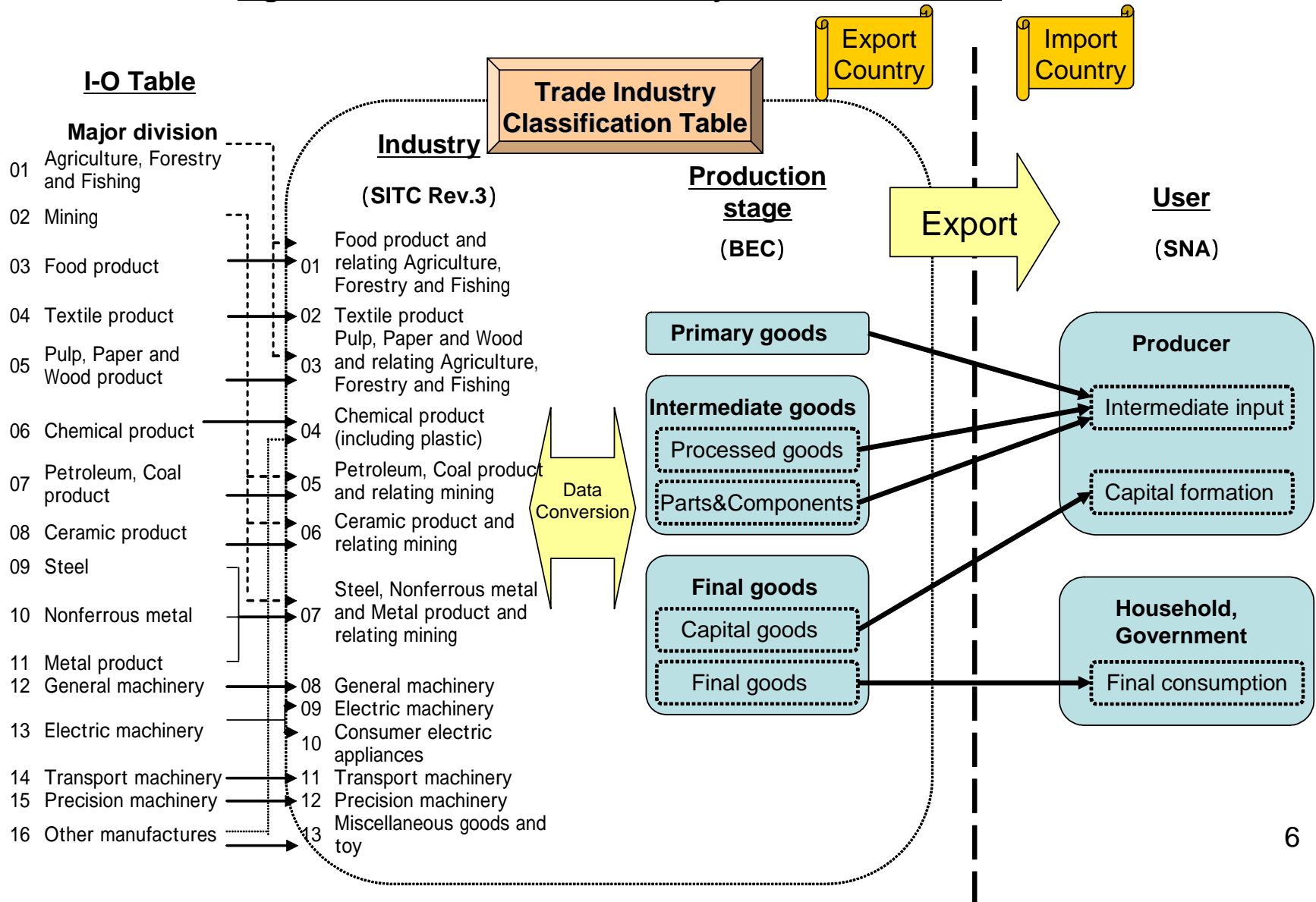
Figure 1: Classification of trade data according to production stage

Category	Sub-category	BEC code	BEC Title
Primary goods	Primary goods	111	Food and beverages, primary, mainly for industry
		21	Industrial supplies, n.e.s., primary
		31	Fuels and lubricants, primary
Intermediate goods	Processed goods	121	Food and beverages, processed, mainly for industry
		22	Industrial supplies, n.e.s., processed
		32	Fuels and lubricants, processed
	Parts & Components	42	Parts and accessories of capital goods, except transport equipment
		53	Parts and accessories of transport equipment
Final goods	Capital goods	41	Capital goods, except transport equipment
		521	Other industrial transport equipment
	Consumption goods	112	Food and beverages, primary, mainly for household consumption
		122	Food and beverages, processed, mainly for household consumption
		51	Passenger motor cars
		522	Other non-industrial transport equipment
		61	Durable consumer goods n.e.s.
		62	Semi-durable consumer goods n.e.s.
		63	Non-durable consumer goods n.e.s.

Note : This classification table classifies all trade goods under 5 production stages, correlating BEC-classified trade goods with SNA (System of National Account). In this table, "Capital goods" is a part of "Final goods" because trade transactions are sorted out under the production stage, although SNA has different categories for Capital goods (Capital formation) and for Final goods (Final consumption) respectively since SNA classifies commodity goods according to a main user (Producer and Household).

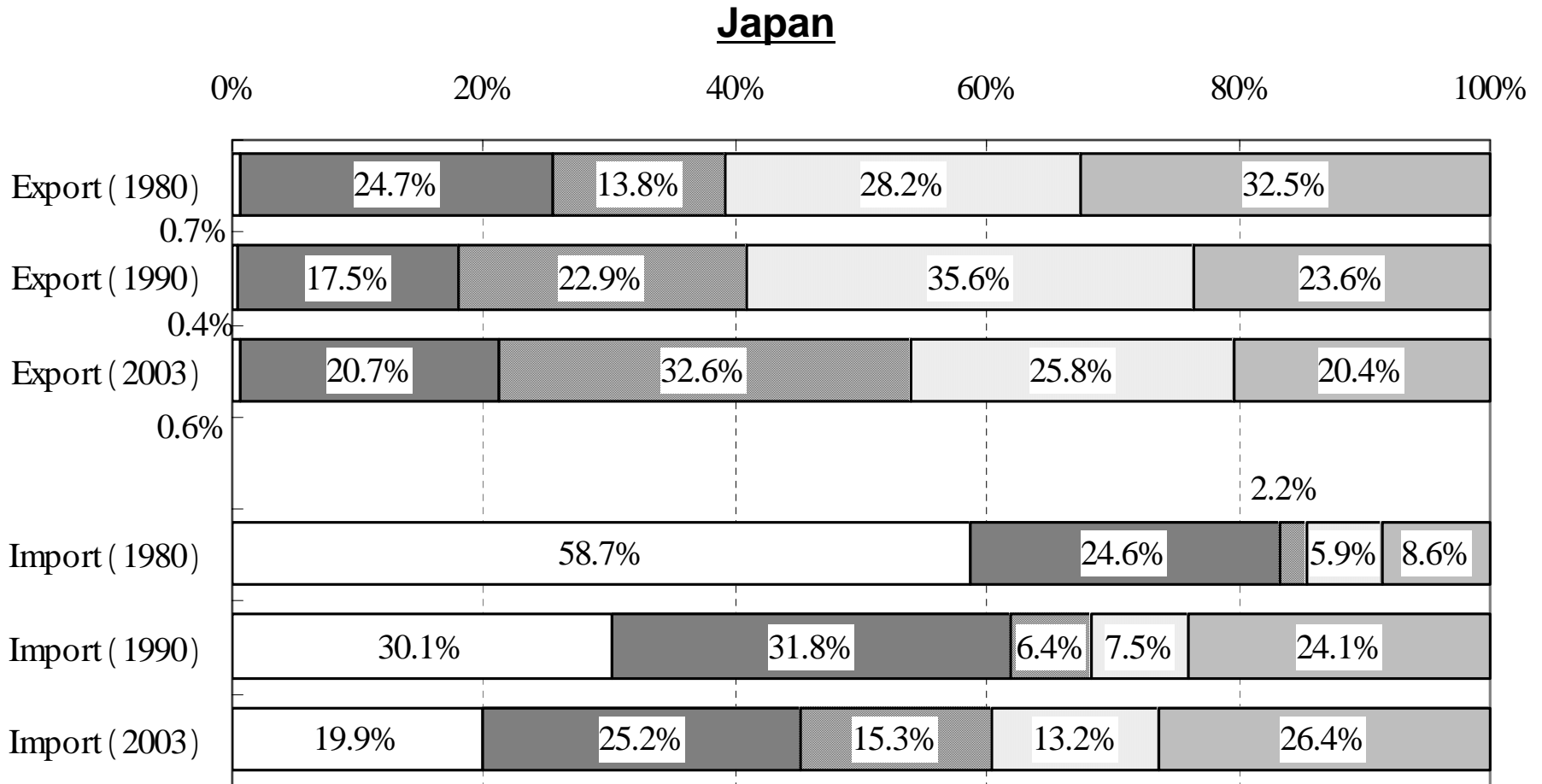
Classification adopted is compatible to I-O Table as well as SNA categories, expanding the capability for the future study.

Figure 2: Structure of Trade Industry Classification Table



The features of Japan's trade structure indicate that Japan exports domestically-produced Intermediate goods and Final goods, particularly P&C and Capital goods. Distinctive is decline in the export's share of Final goods.

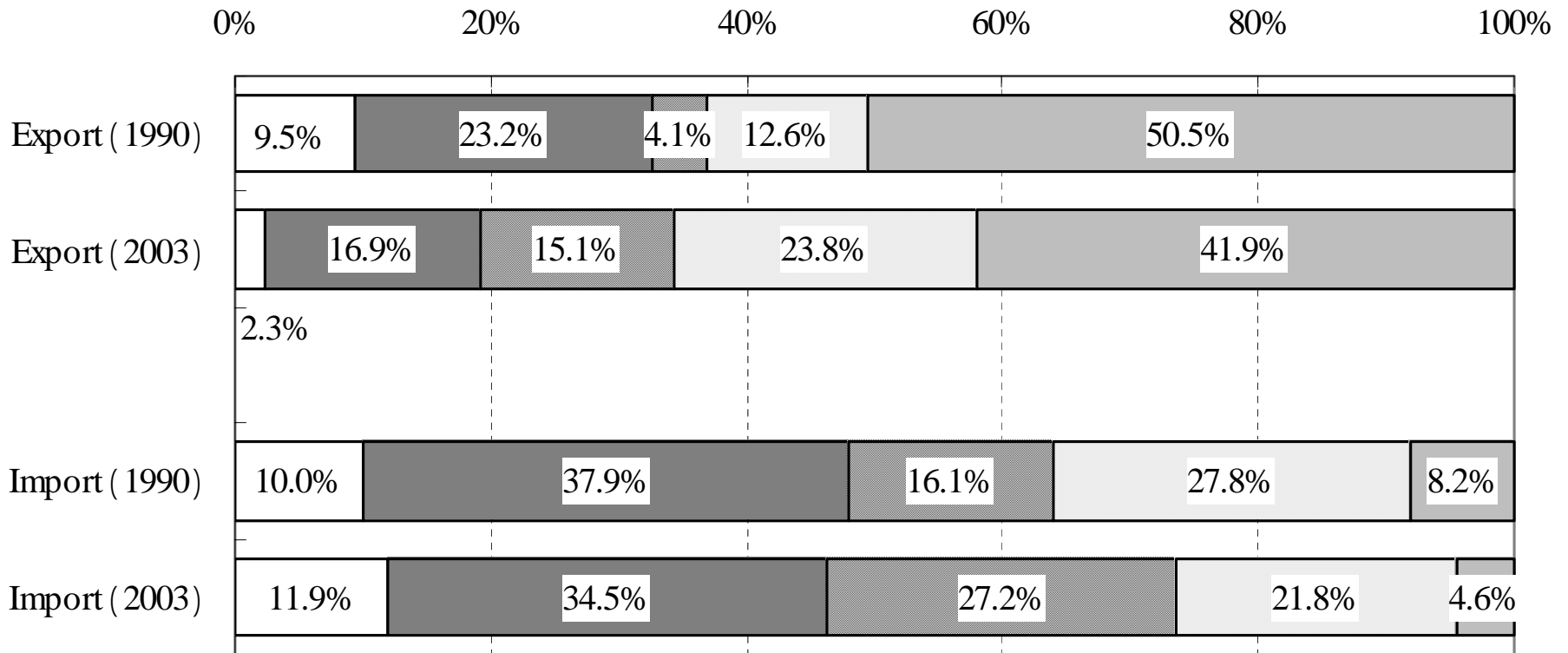
Figure 3: Trade Structures in East Asian countries according to the production stage



□ Primary goods ■ Processed goods ▒ Parts&Components □ Capital goods □ Consumption goods

China's trade structure is a real contrast to Japan's. Final goods dominates exports of China, and in import dominant is Intermediate goods.

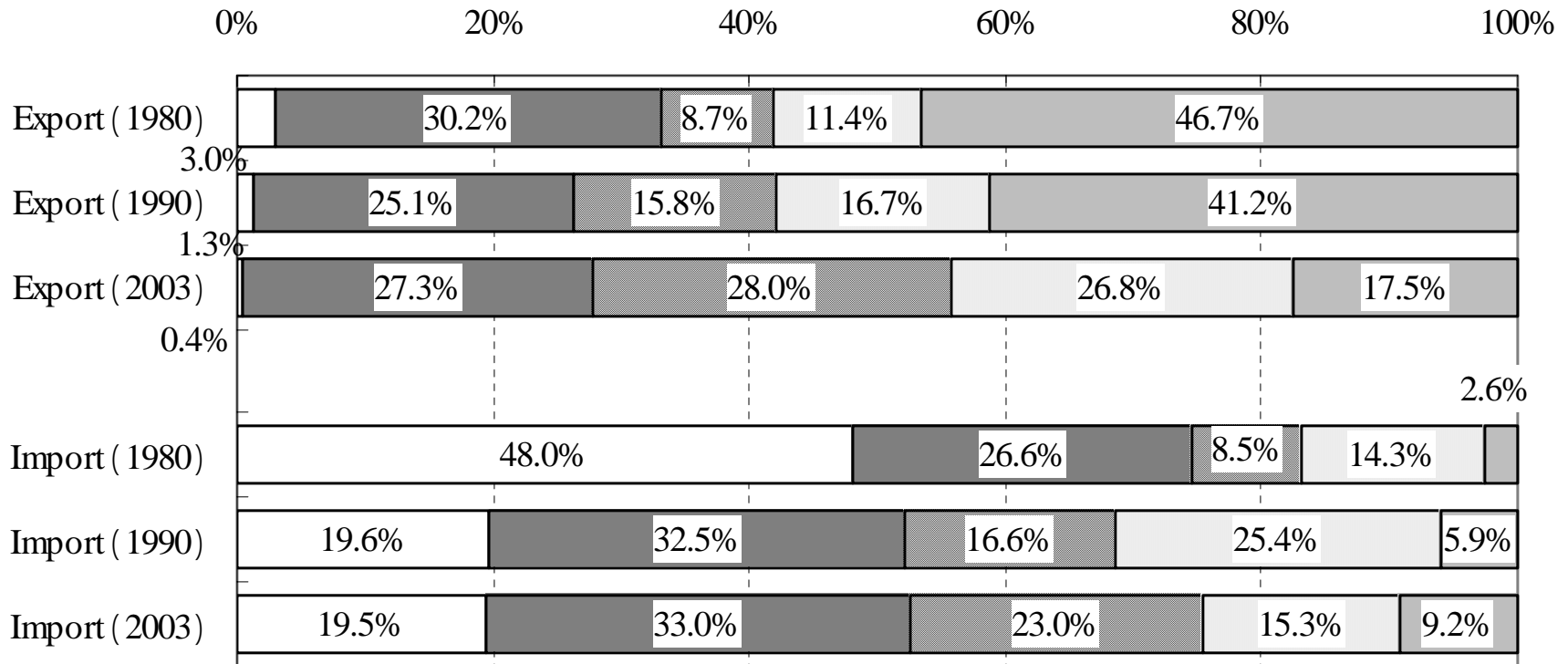
China



□ Primary goods ■ Processed goods ■ Parts & Components □ Capital goods ■ Consumption goods

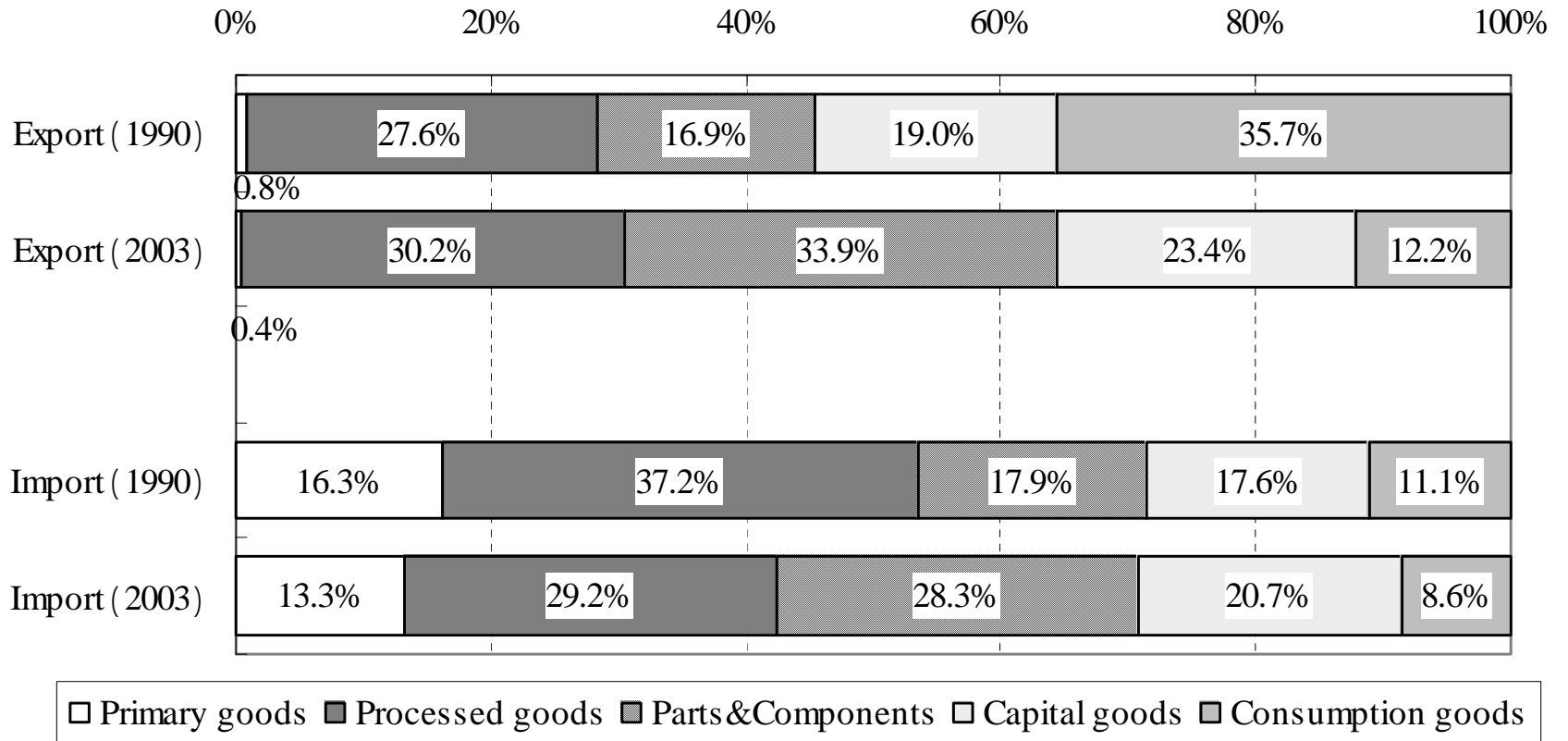
Korea and Taiwan show the middle feature of the trade structure between Japan and China. It is conceivable that these two economies are in the course of transforming assembly production type like China into overall production type like Japan.

Korea



□ Primary goods ■ Processed goods ▒ Parts & Components □ Capital goods □ Consumption goods

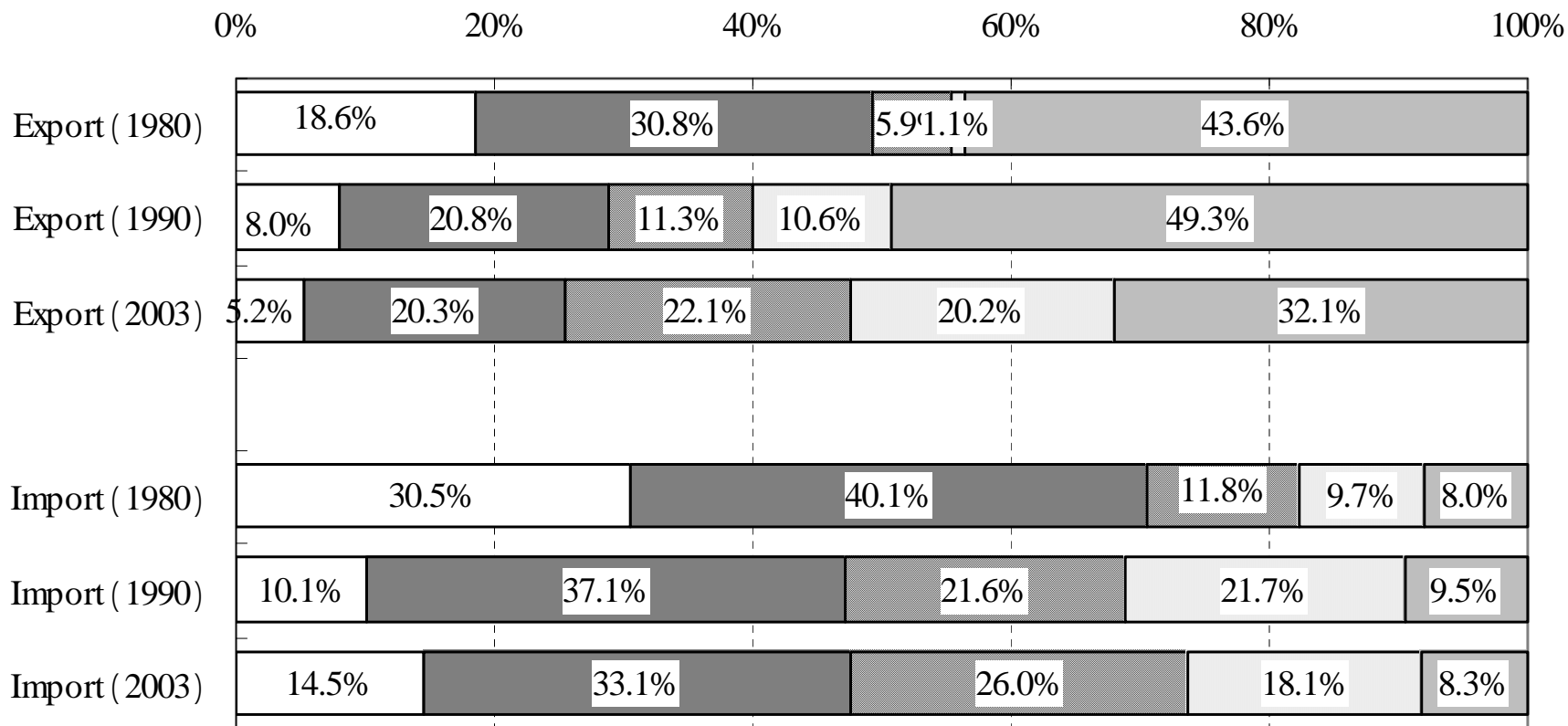
Taiwan



The countries of ASEAN4 have the high shares of Intermediate goods in both export and import.

Thailand has a feature of a high share of Final goods in export, in particular Consumption goods.

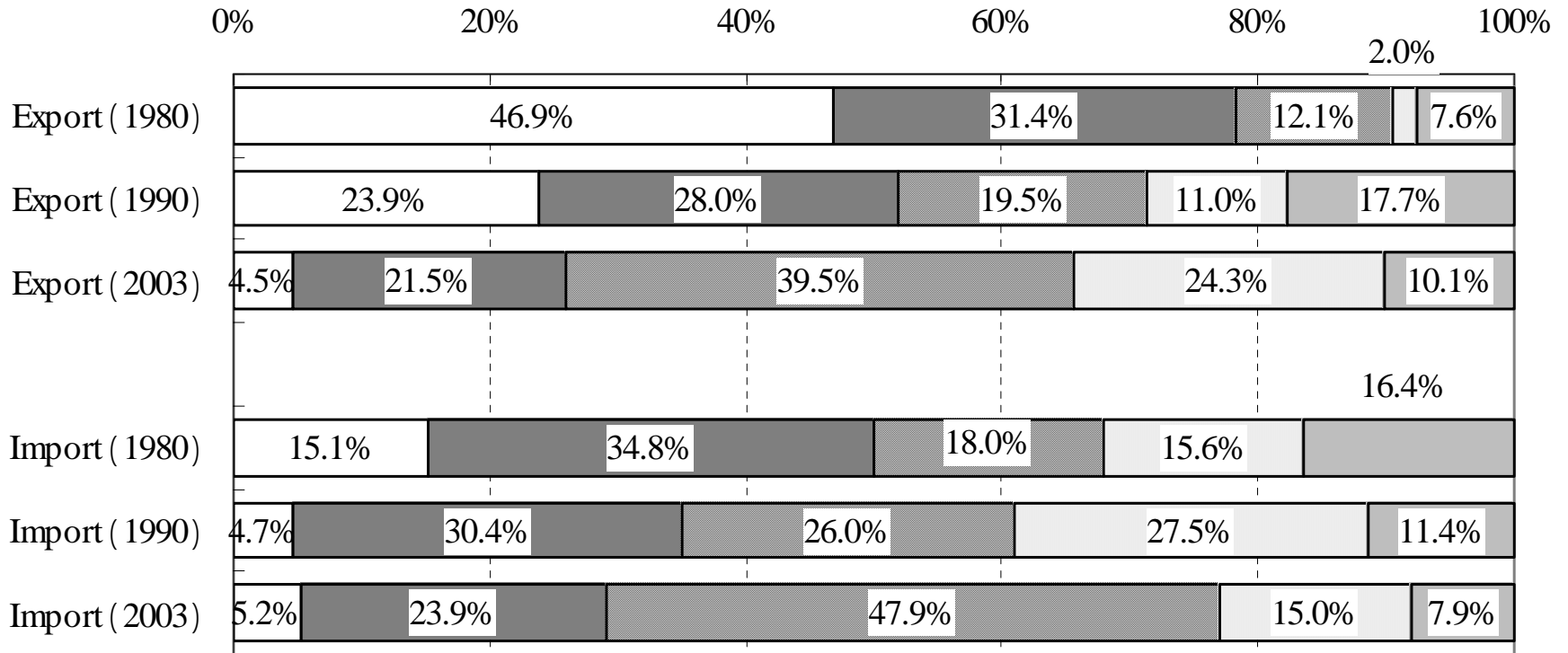
Thailand



□ Primary goods ■ Processed goods ▒ Parts & Components □ Capital goods □ Consumption goods

P&C has a high share in Malaysia.

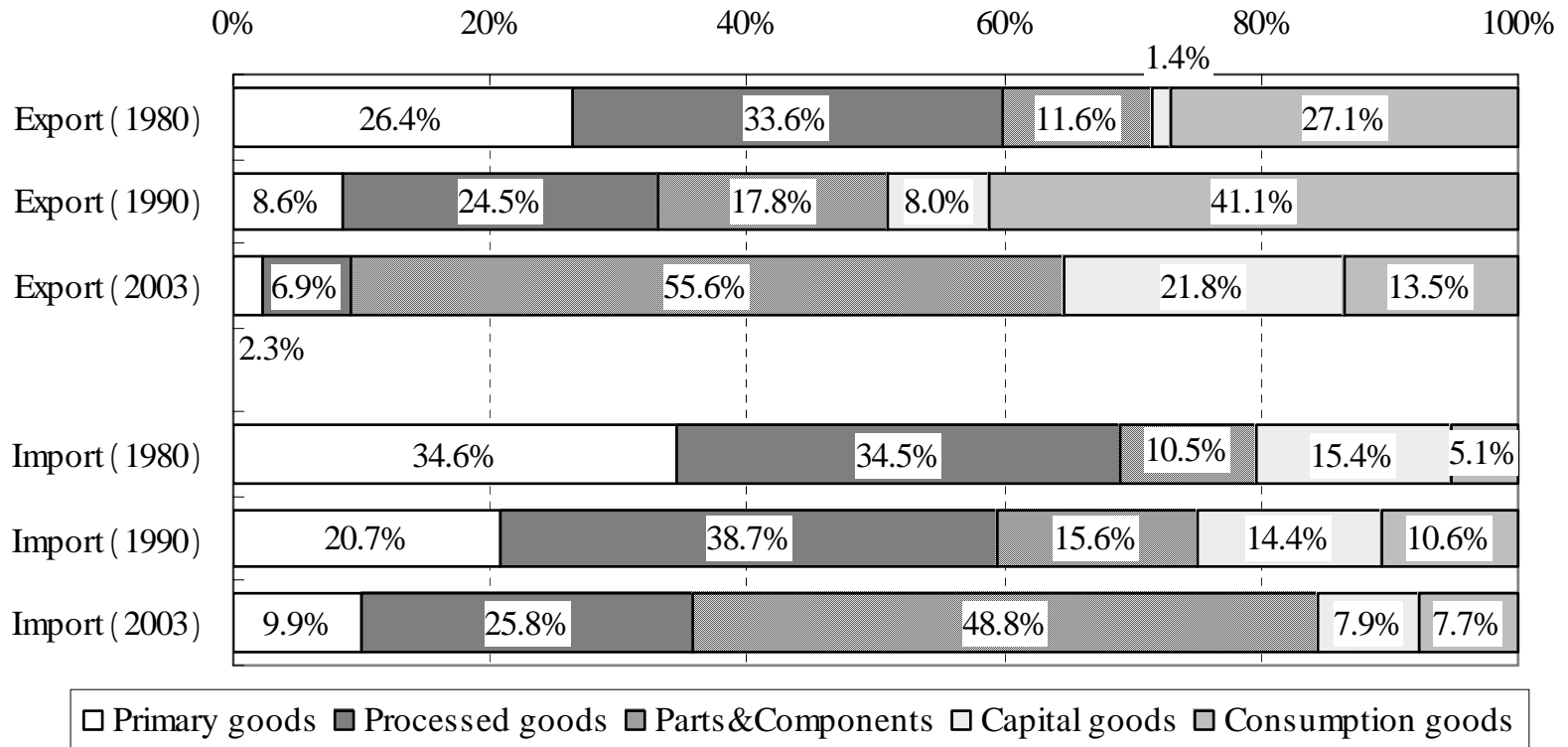
Malaysia



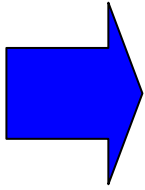
□ Primary goods ■ Processed goods ■ Parts & Components □ Capital goods ■ Consumption goods

P&C has a high share in the Philippines.

Philippines

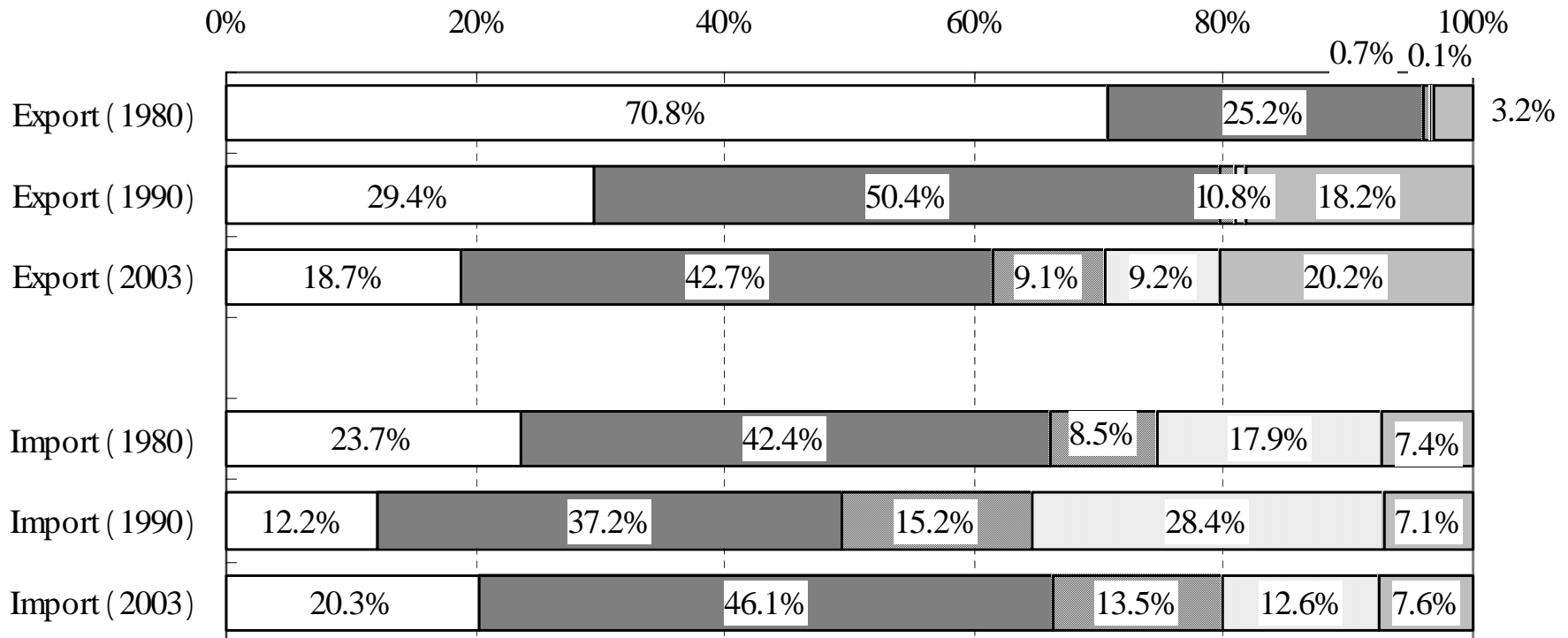


Processed goods has a high share in Indonesia.



These features of the ASEAN countries reflect that Processed goods such as Textiles, Pulp and Paper in Indonesia and P&C such as Electric Machinery and Consumer Electric Appliances in the Philippines and Malaysia are in active trade.

Indonesia



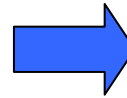
□ Primary goods ■ Processed goods ■ Parts & Components □ Capital goods □ Consumption goods

Findings

1. The analysis indicates that there are distinctive aspects in the trade structures of Japan, NIEs, China and ASEAN from a viewpoint of production stage.
2. It also implies the possibility that East Asia forms a complementary economic region with assembly production type and intermediate goods-specialized production type of the economy.

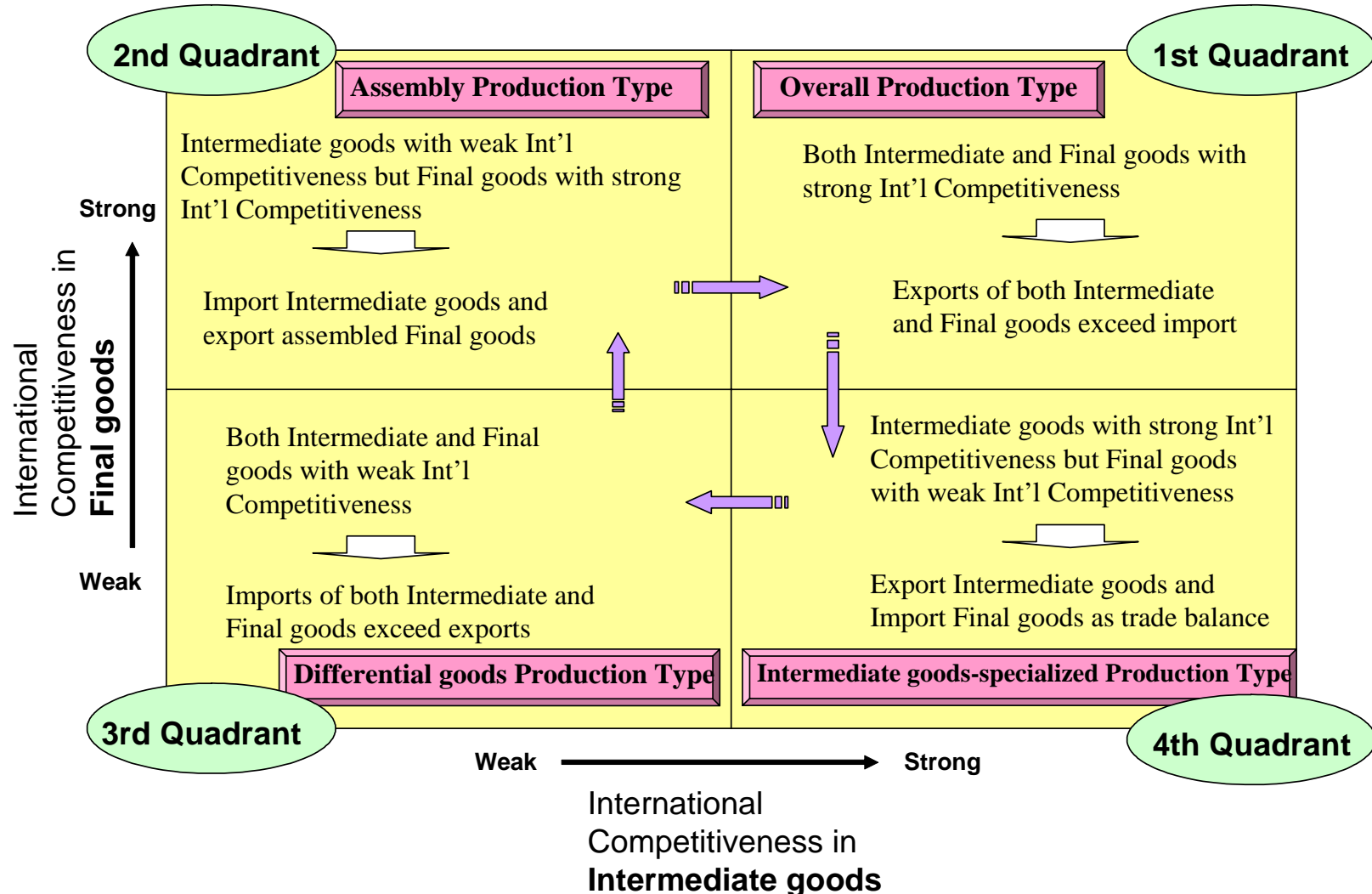
3. Hypothesis – “Spiral Pattern of Development”

Analyze the trade structure with the consideration of spread of production network in the region.



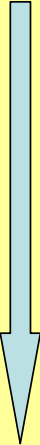
Needs to reflect the highly advanced division of production process.

Figure 3: How to read the Chart of International Competitiveness Index



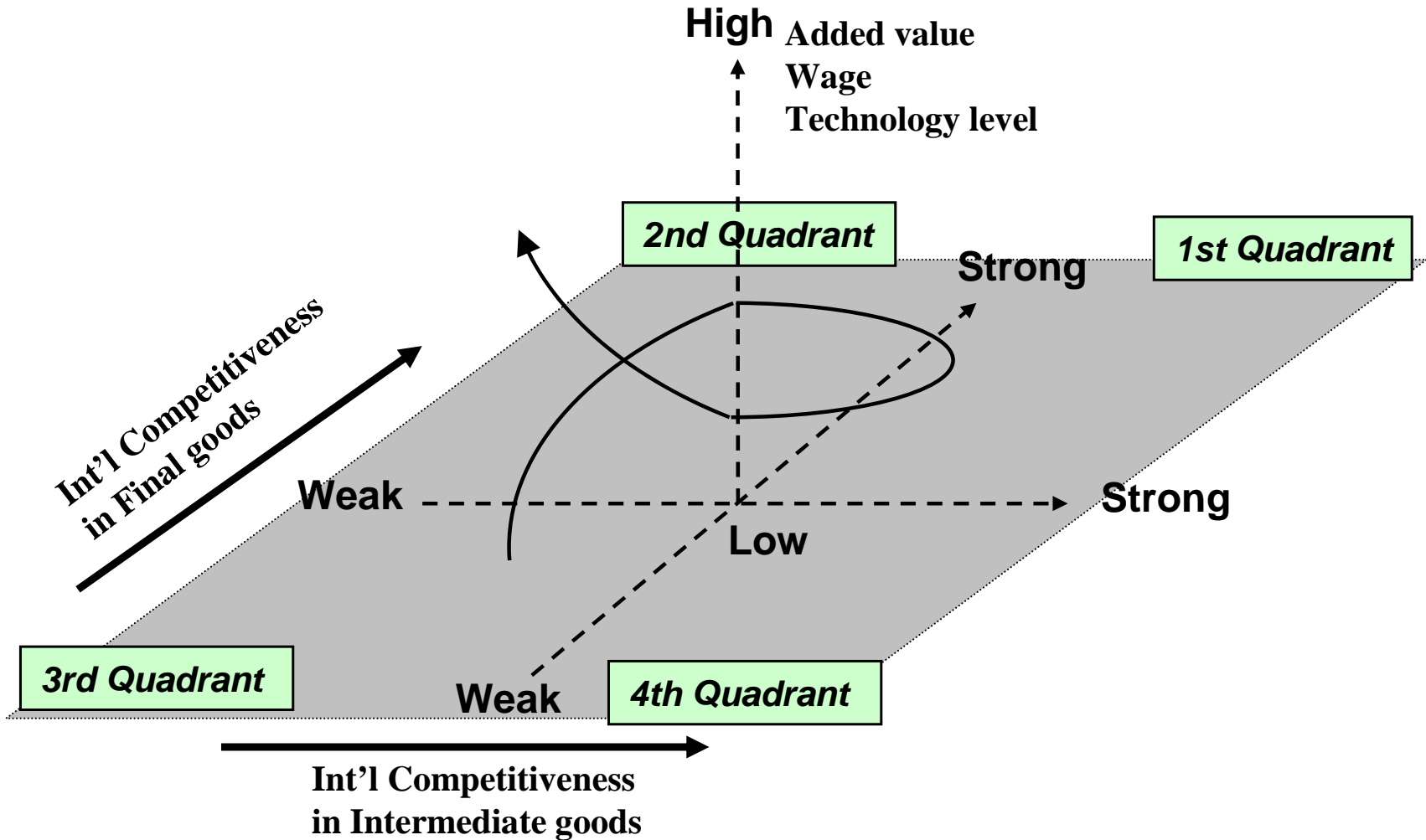
Note: International Competitiveness Index (ICI) = (Export – Import) / (Export + Import)

Figure 4: Hypothesis of Spiral Pattern Development Model

	Industrial Pattern	Location in Chart of Int'l Competitiveness Index	Added value Wage/Income Tech level	Development stage in the industry
	Domestic market Production Type	Third Quadrant	LOW  HIGH	Domestic demands for both Intermediate and Final goods exceed domestic productions. The industry has weak Int'l Competitiveness.
	Assembly Production Type	Second Quadrant		Development of capital accumulation and introduction of foreign technology makes the assembly process in the industry stronger in Int'l Competitiveness. The industry imports Intermediate goods because it does not have production technology for key Parts & Components. Industrial structure of so-called assembly production type is established.
	Overall Production Type	First Quadrant		In the course of the assembly production, the industry advances technology and then starts to produce key Parts & Components. The industry, acquiring Int'l Competitiveness in both Intermediate and Final goods, comes to the ripening period.
	Intermediate goods-specialized Production Type	Fourth Quadrant		Due to the constraints like rising labor cost, the industry loses comparative advantage in the assembly process which weakens Int'l Competitiveness in Final goods. Focusing on key Parts & Components with advanced technologies, the industry retains Int'l Competitiveness in Intermediate goods.
	Differential goods Production Type	Third Quadrant		The industry loses Int'l Competitiveness in Intermediate goods. It does not, however, mean the industry loses competitiveness completely. In general, the industry competes in both domestic and world markets by specializing the differential product with high quality and high function, utilizing the advanced technologies as well as the established brand names.

Note: The number from 1 to 5 corresponds to the same number respectively shown in Figure 2.

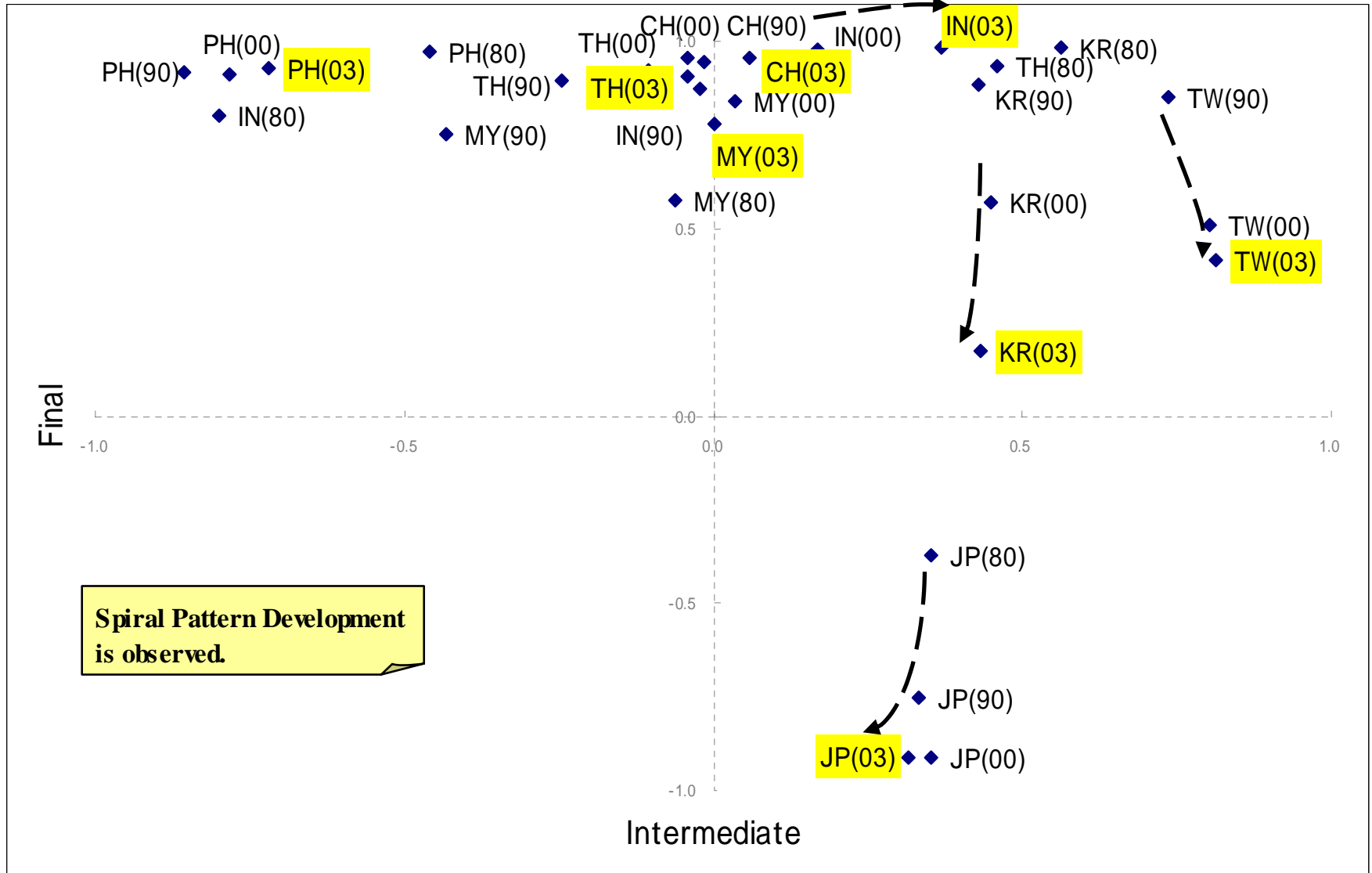
Figure 5: View showing a frame format of Spiral Pattern Development



Note: The number from 1 to 4 corresponds to the same number respectively shown in Figure 2 and 3.

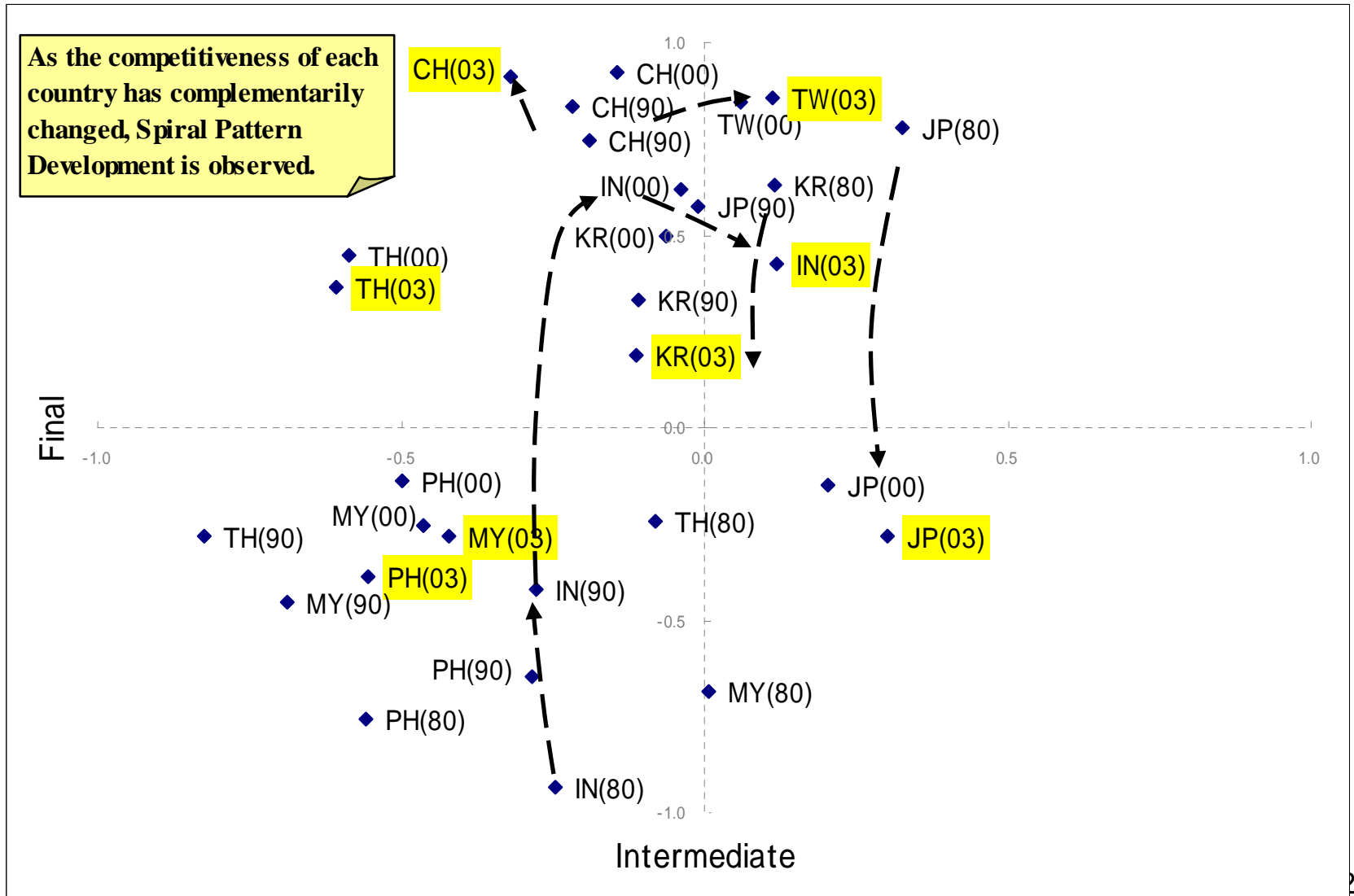
Figure 6: International Competitiveness Index – Industry

Textile



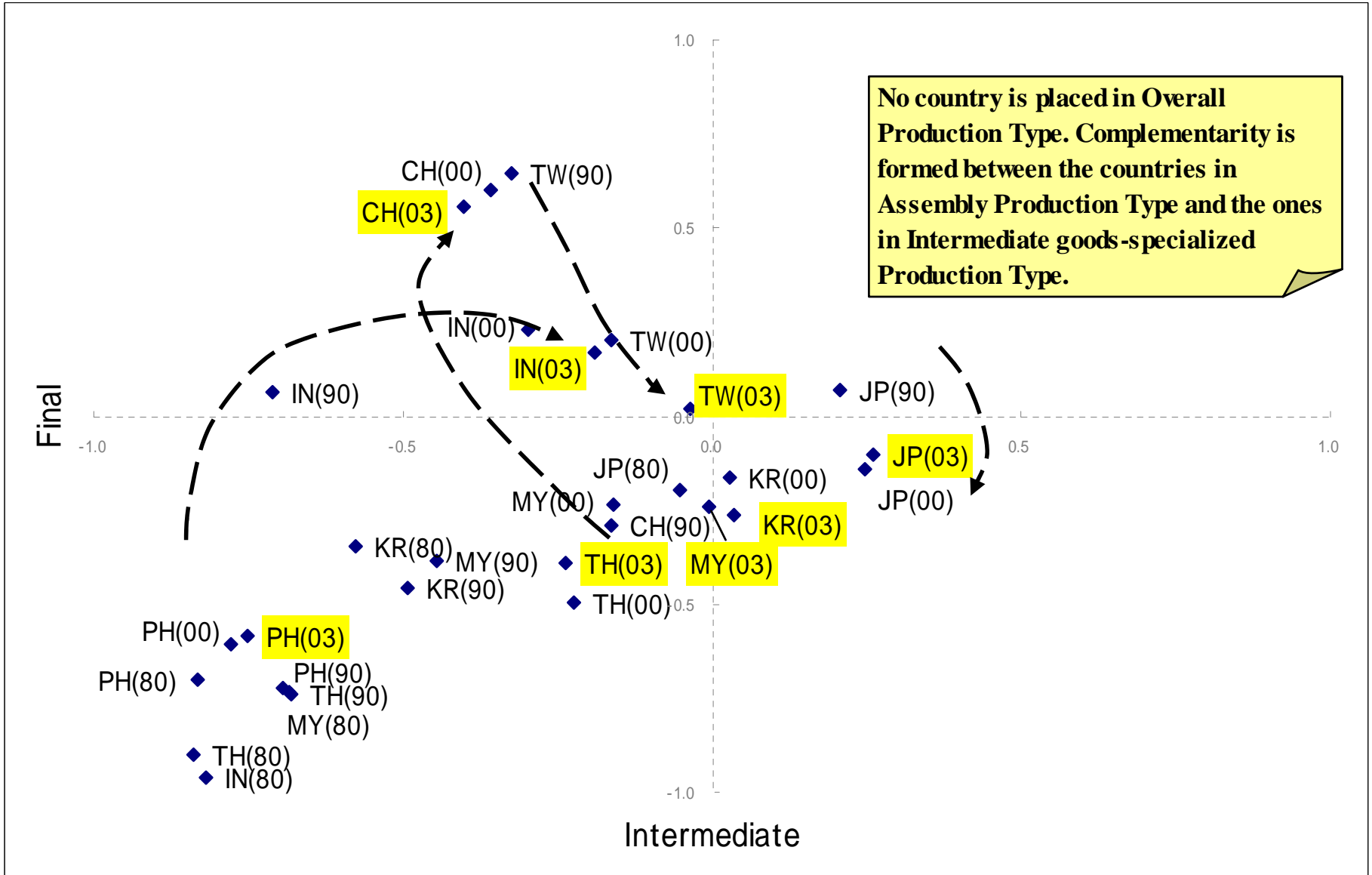
Note: JP: Japan, KR: Korea, CH: China, TW: Taiwan, TH: Thailand, MY: Malaysia, IN: Indonesia, PH: Philippines

Steel, Nonferrous metal and Metal product



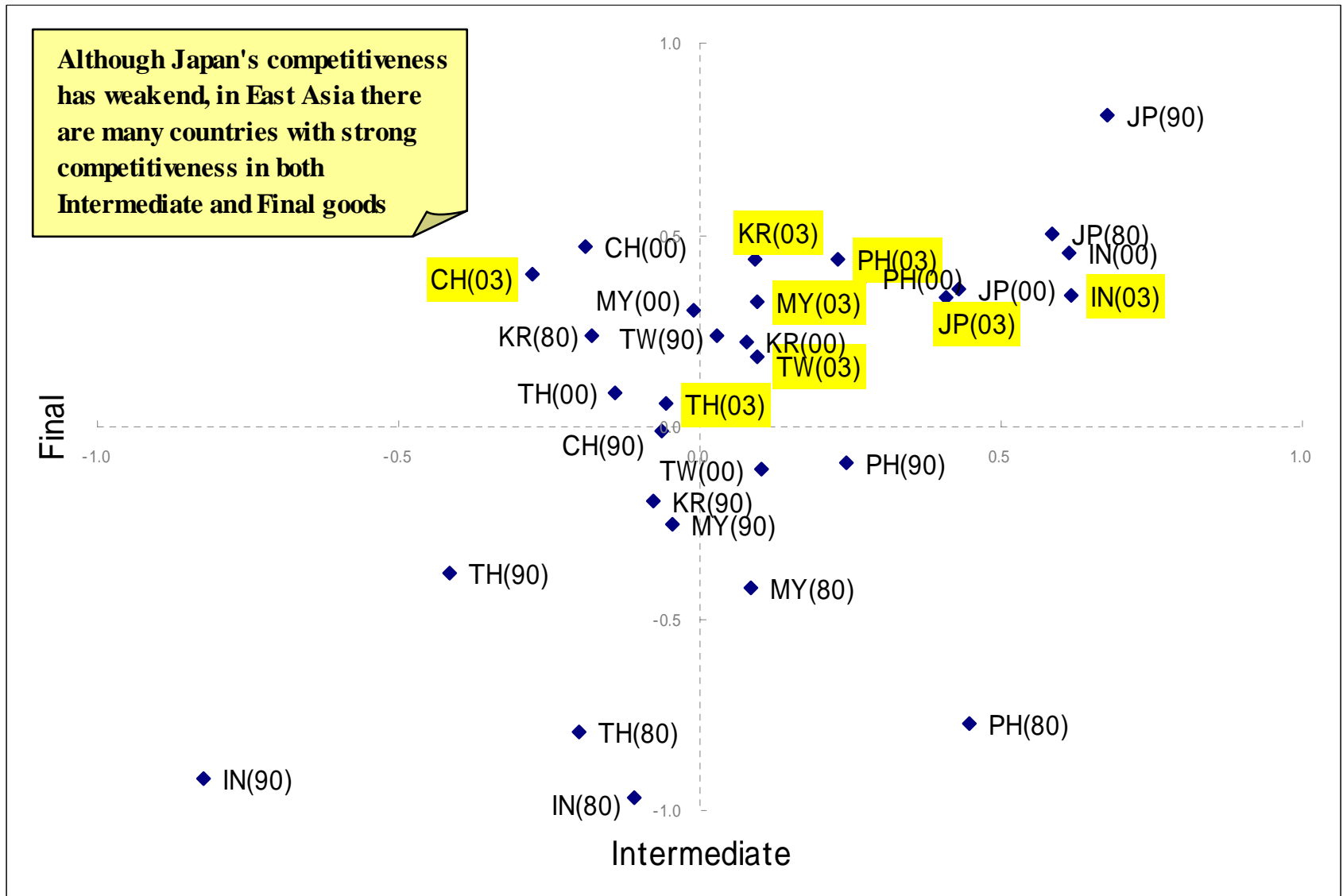
Note: JP: Japan, KR: Korea, CH: China, TW: Taiwan, TH: Thailand, MY: Malaysia, IN: Indonesia, PH: Philippines

Chemicals



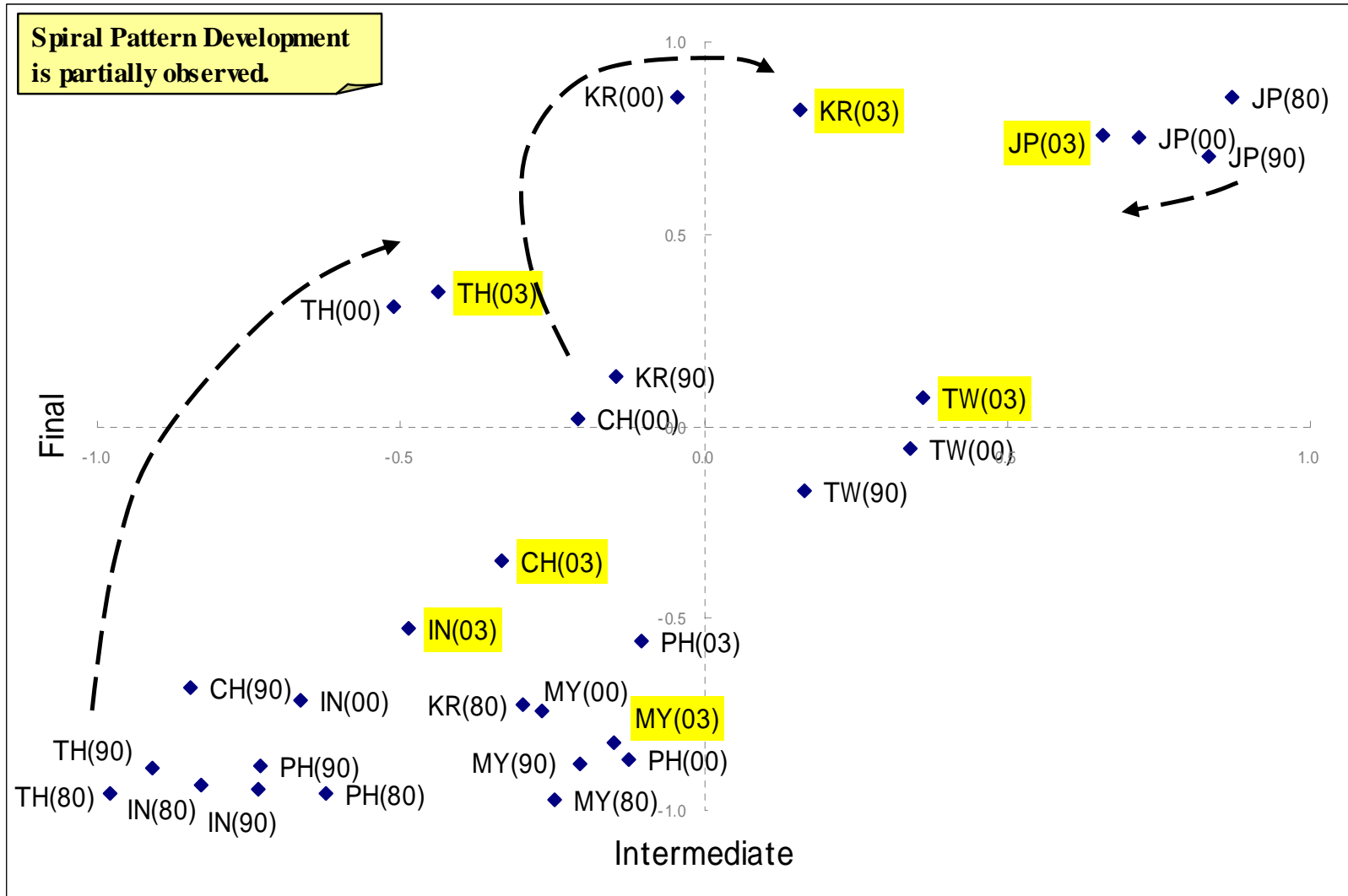
Note: JP: Japan, KR: Korea, CH: China, TW: Taiwan, TH: Thailand, MY: Malaysia, IN: Indonesia, PH: Philippines

Electric Machinery



Note: JP: Japan, KR: Korea, CH: China, TW: Taiwan, TH: Thailand, MY: Malaysia, IN: Indonesia, PH: Philippines

Transport Machinery



Note: JP: Japan, KR: Korea, CH: China, TW: Taiwan, TH: Thailand, MY: Malaysia, IN: Indonesia, PH: Philippines

Miscellaneous goods and Toy

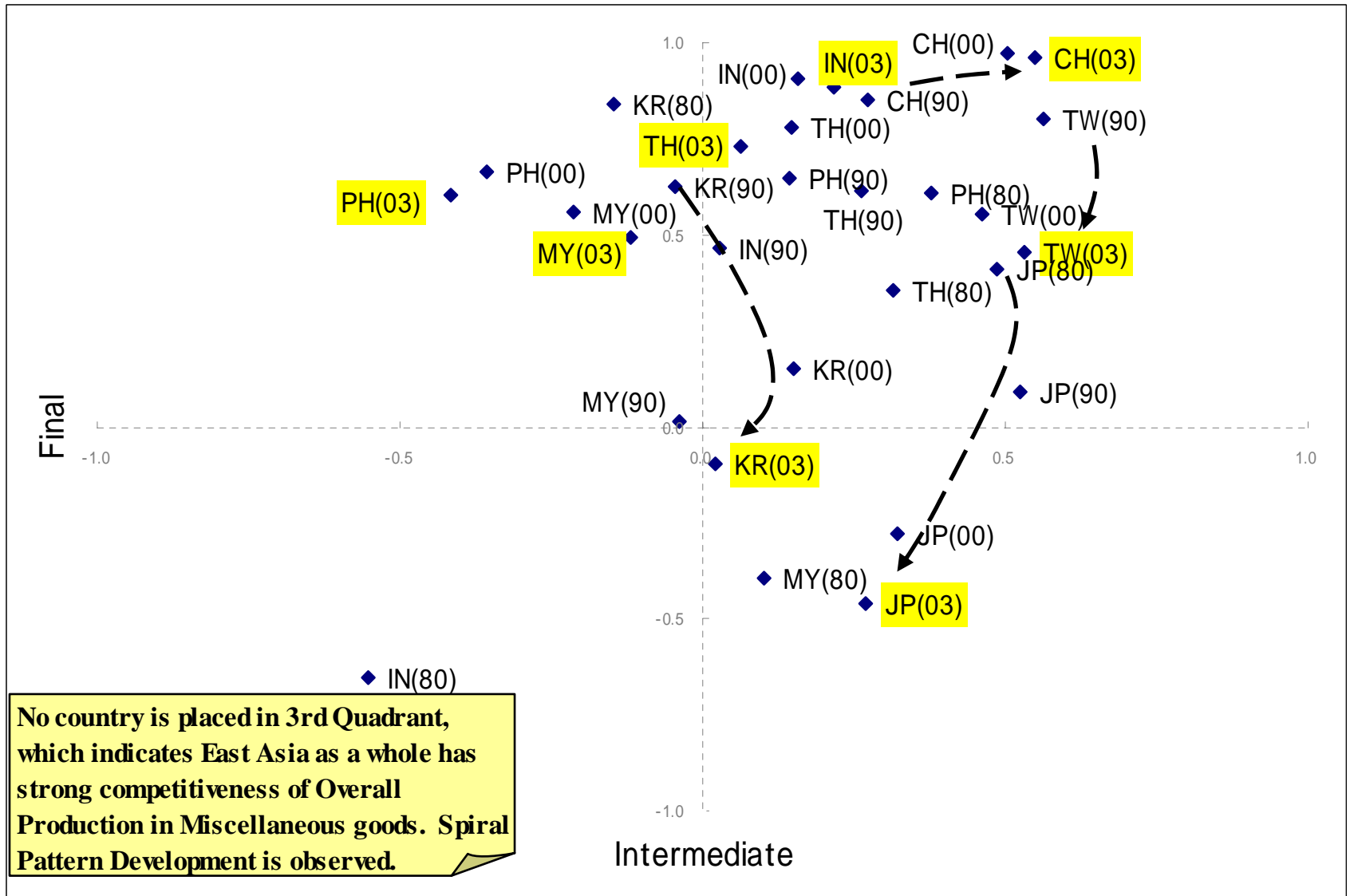
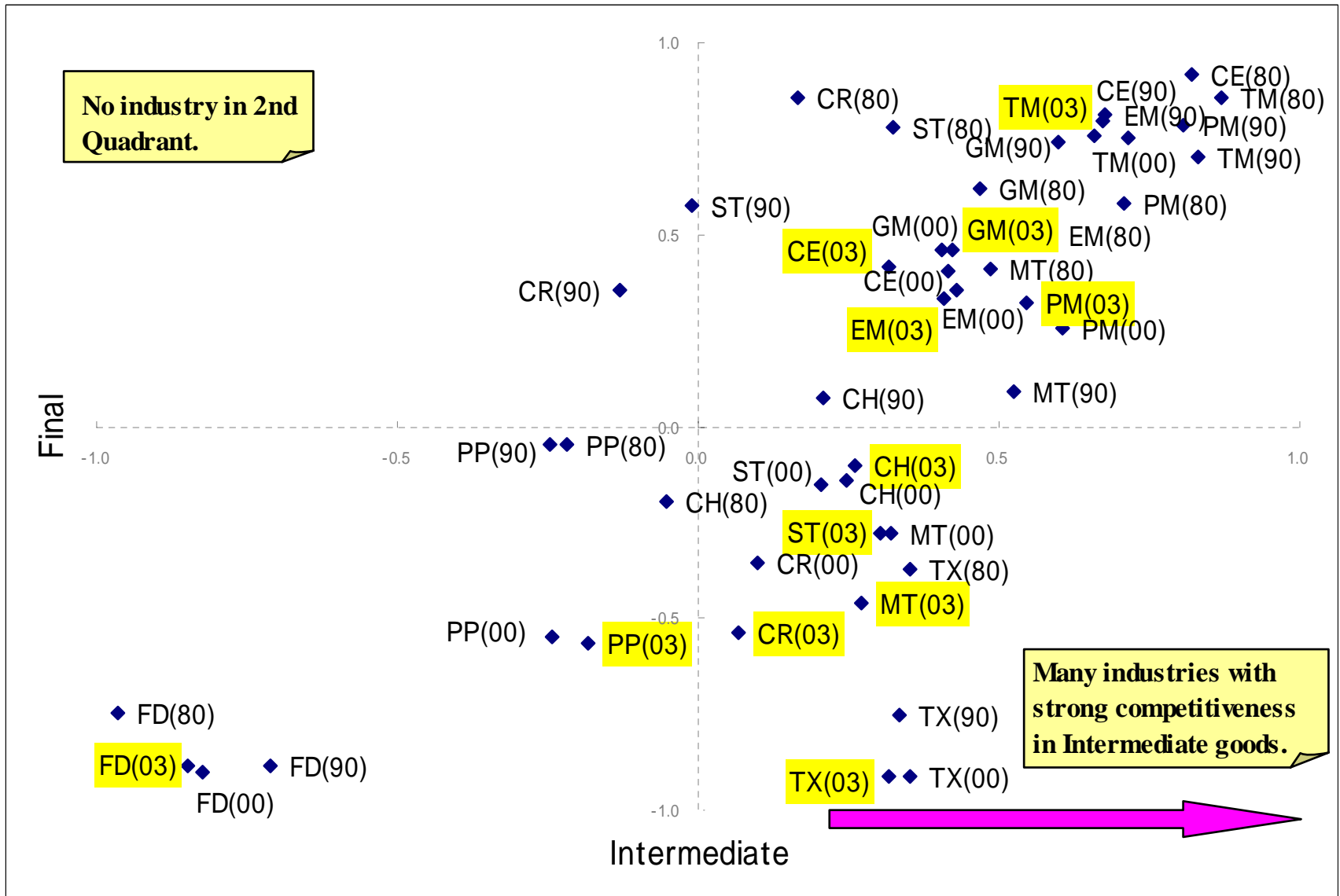


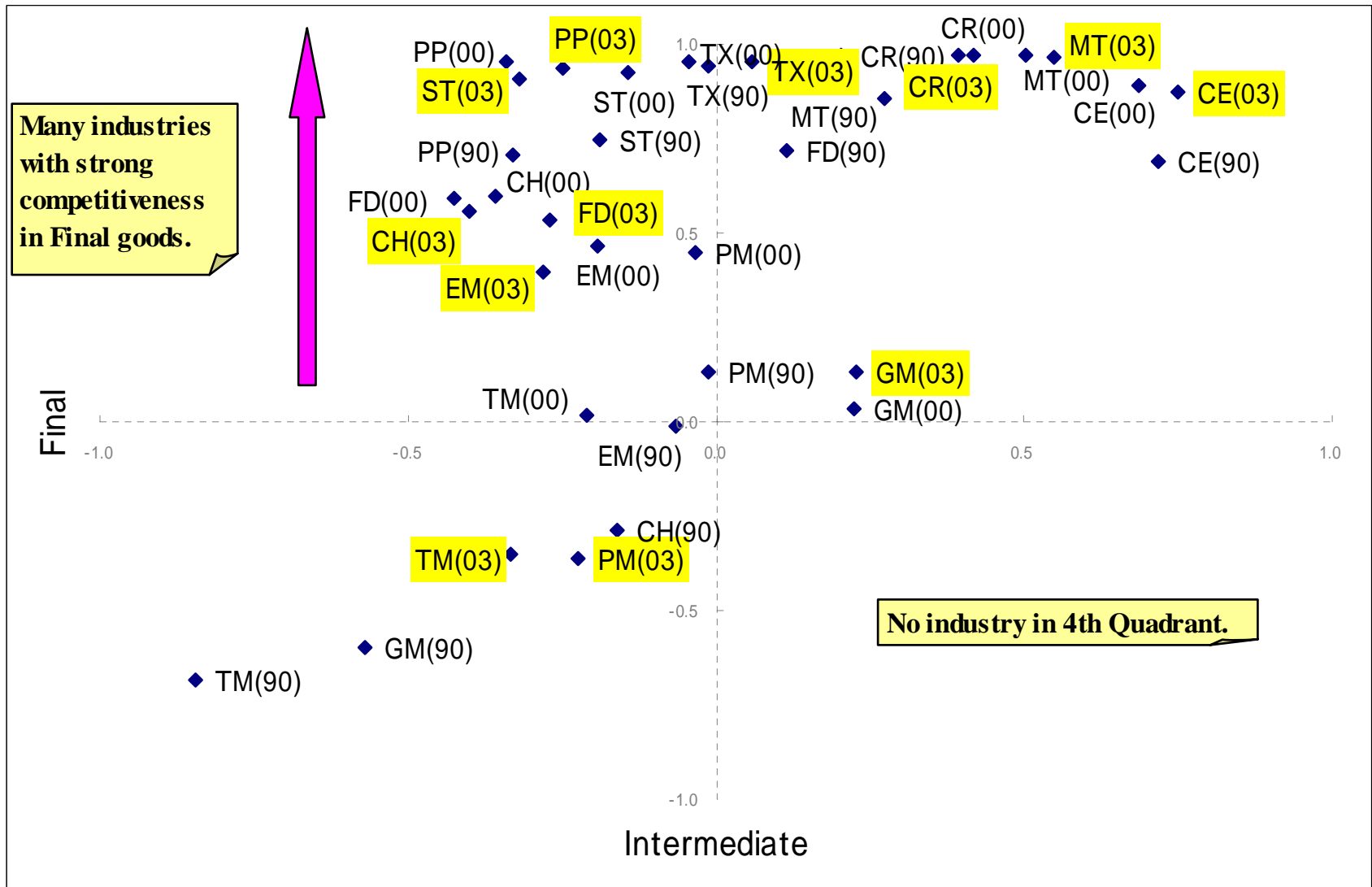
Figure 7: International Competitiveness Index – Country

Japan



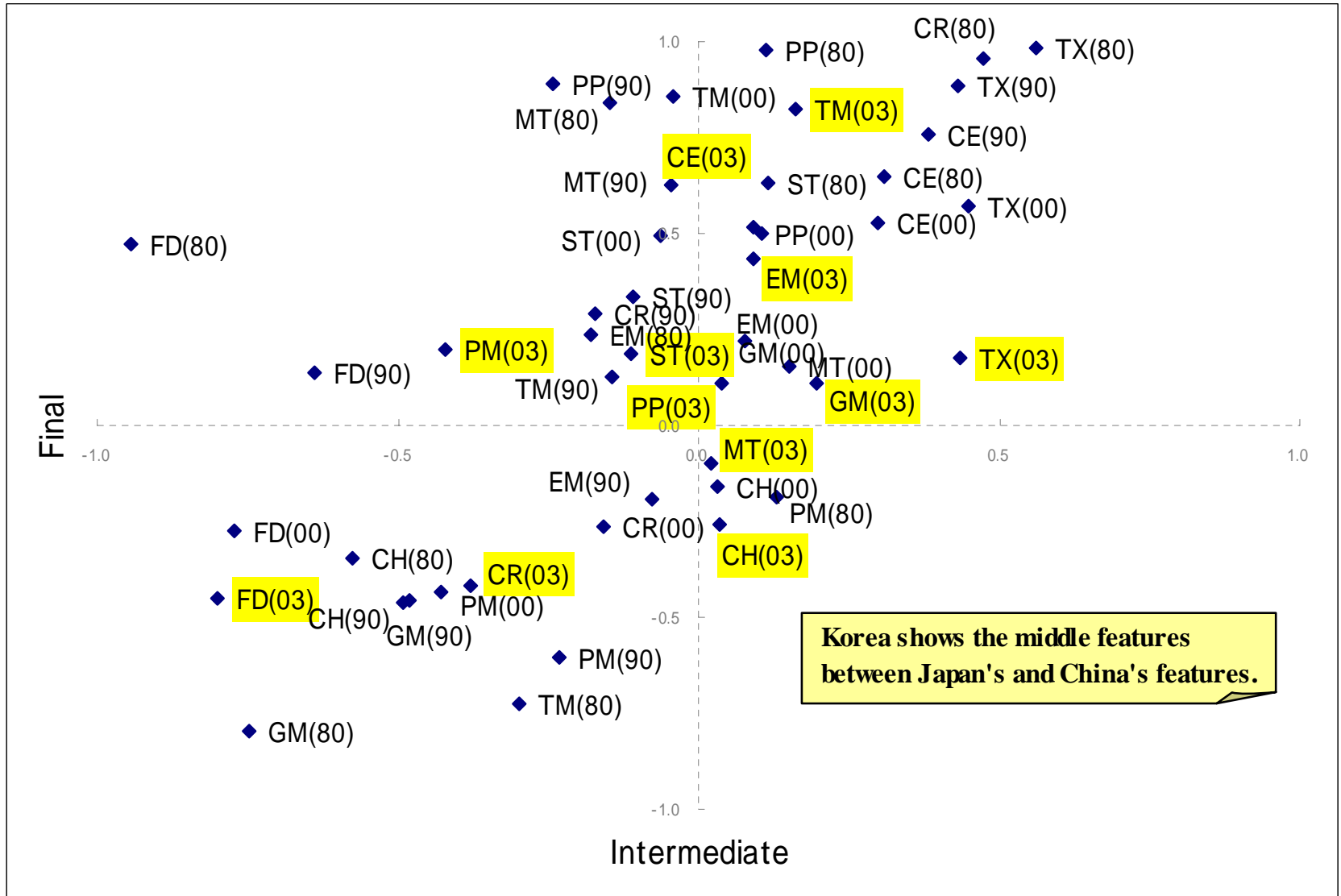
Note: FD: Food, TX: Textile, PP: Pulp, Paper and Wood, CH: Chemicals, CR: Ceramics, ST: Steel, Nonferrous metal and Metal, GM: General Machinery, EM: Electric Machinery, CE: Consumer Electric Appliances, TM: Transport Machinery, PM: Precision Machinery, MT: Miscellaneous goods and Toy.

China



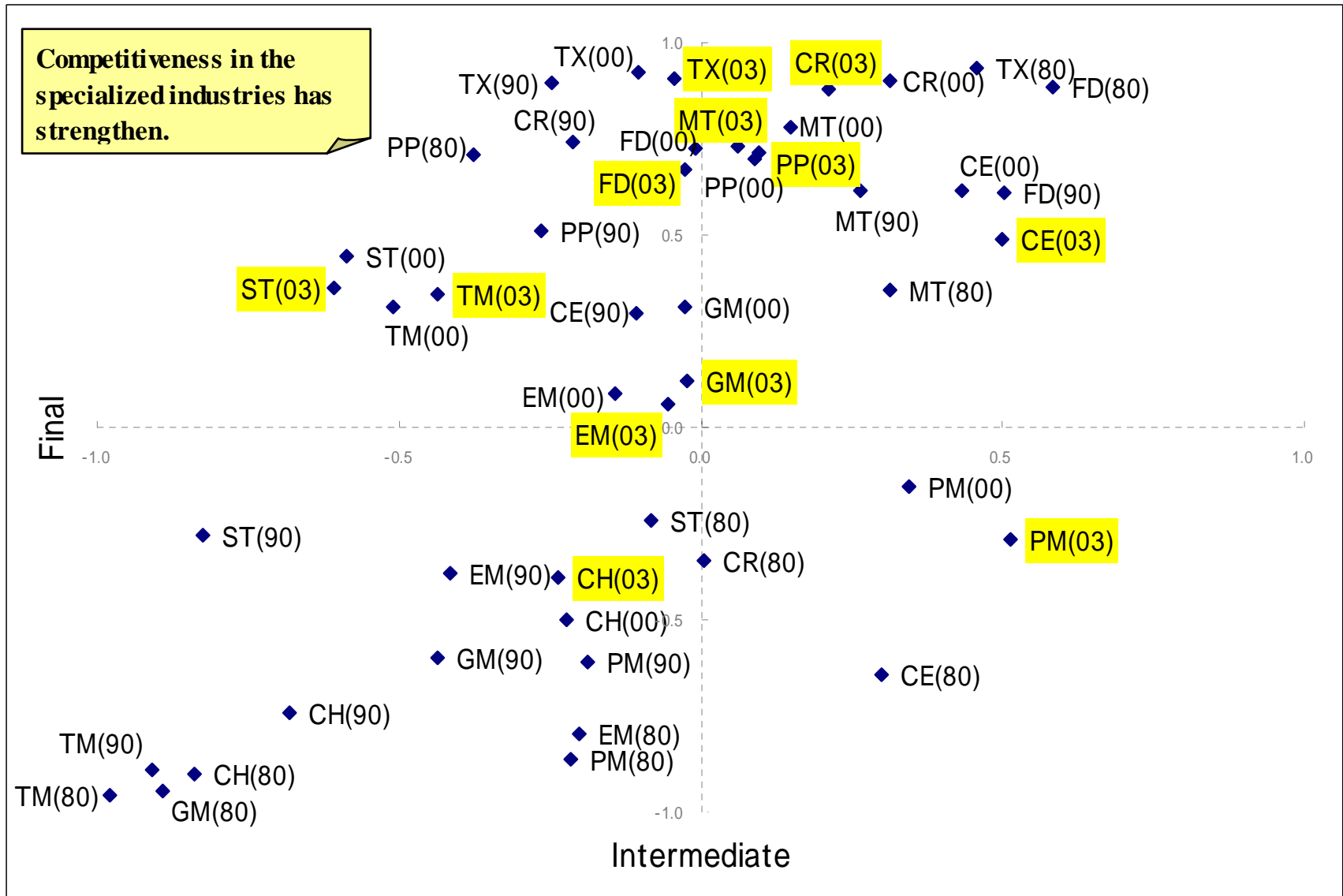
Note: FD: Food, TX: Textile, PP: Pulp, Paper and Wood, CH: Chemicals, CR: Ceramics, ST: Steel, Nonferrous metal and Metal, GM: General Machinery, EM: Electric Machinery, CE: Consumer Electric Appliances, TM: Transport Machinery, PM: Precision Machinery, MT: Miscellaneous goods and Toy.

Korea



Note: FD: Food, TX: Textile, PP: Pulp, Paper and Wood, CH: Chemicals, CR: Ceramics, ST: Steel, Nonferrous metal and Metal, GM: General Machinery, EM: Electric Machinery, CE: Consumer Electric Appliances, TM: Transport Machinery, PM: Precision Machinery, MT: Miscellaneous goods and Toy.

Thailand



Note: FD: Food, TX: Textile, PP: Pulp, Paper and Wood, CH: Chemicals, CR: Ceramics, ST: Steel, Nonferrous metal and Metal, GM: General Machinery, EM: Electric Machinery, CE: Consumer Electric Appliances, TM: Transport Machinery, PM: Precision Machinery, MT: Miscellaneous goods and Toy.

Findings

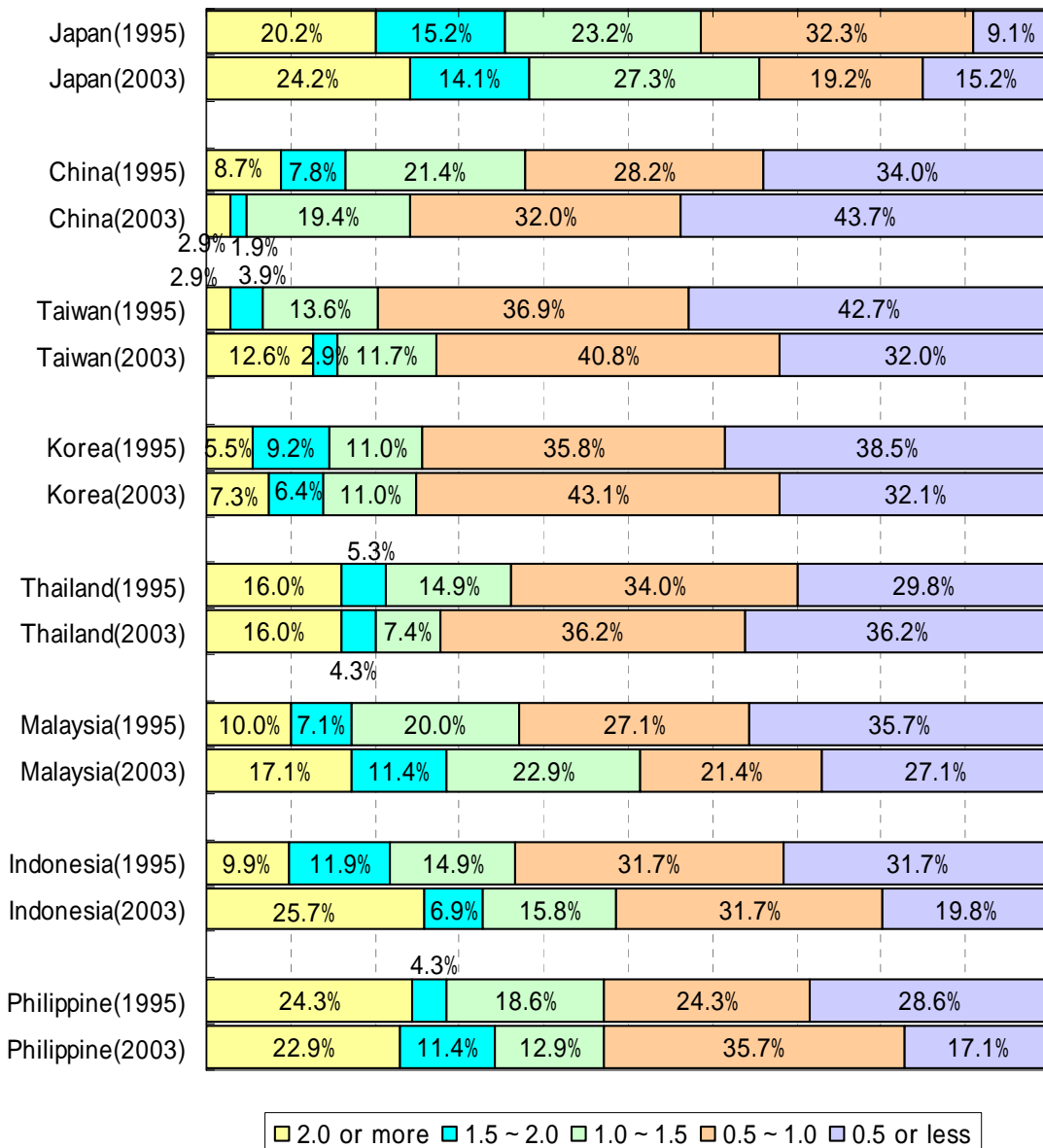
The comprehensive judgment through this analysis concludes that in East Asia;

- a) Japan, NIEs, China and ASEAN have different strengths so that complementarity in the region as a whole is observed.
- b) Besides the complementarity is not static but dynamically changing along with economic growth as well as the level of production technology.

4. Quality of Trade goods

Figure 8: Change of Unit Price in High Tech Products Trade

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%

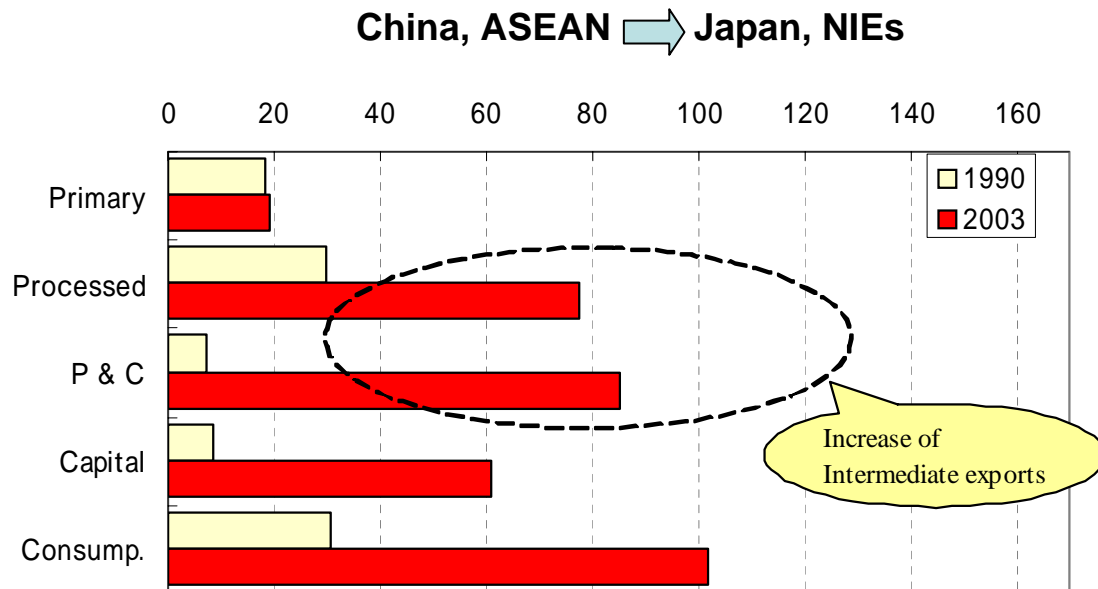
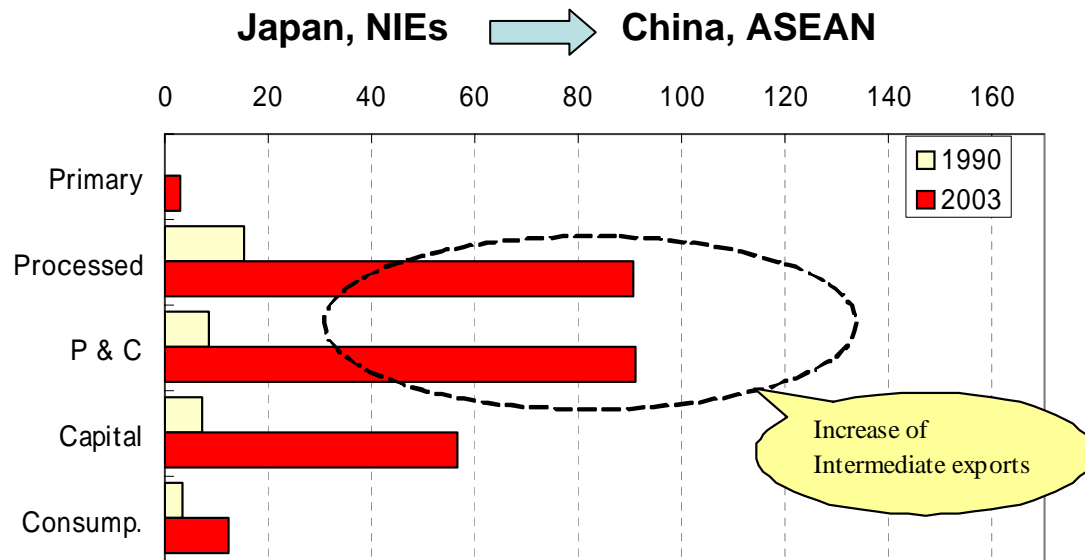


- a) Japan keeps competitive advantage among East Asian countries.
- b) The share of relatively high-priced goods produced in China is not large.
- c) Competitiveness among ASEAN and China is low.
- d) There is a possibility that ASEAN members produce relatively high-priced goods mainly for trade in the region.

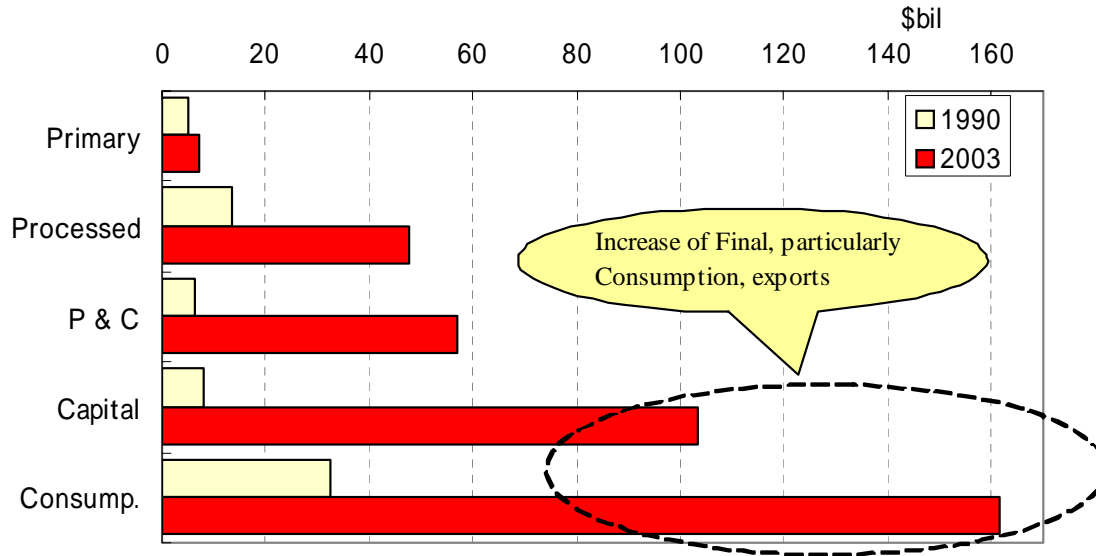
Note: This graph shows the share of Unit Price Index, the ratio of (Export unit price)/(Import unit price) for each high tech product. More than 1 of the value of Unit Price Index indicates that the country exports the product with more highly added value in comparison with the import goods. Therefore, if the country has a large share of the items with 1 or more of the value of Unit Price Index, it focuses on the higher value-added products in domestic production.

5. “Triangular Trade Structure”

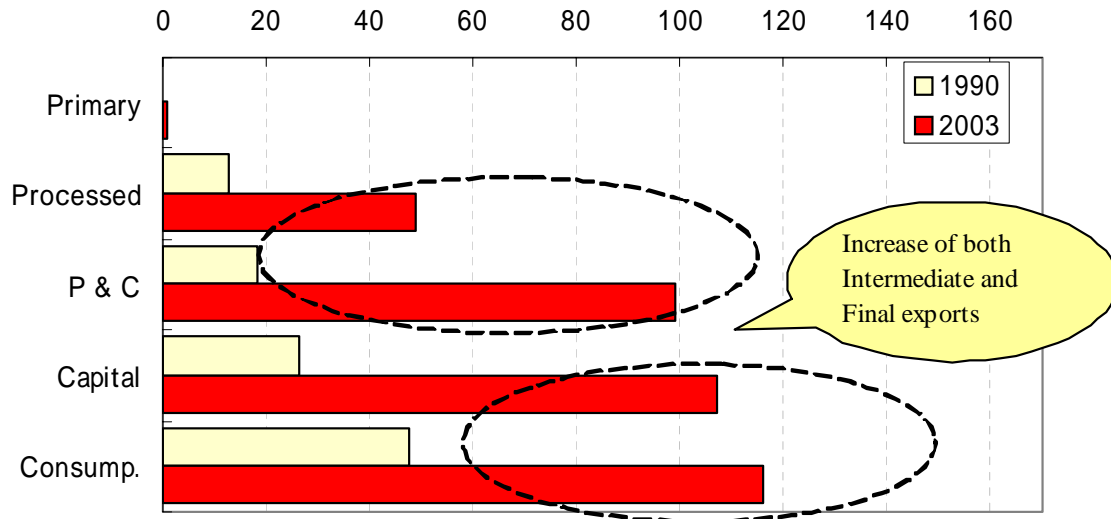
Figure 9: Change of Trade Value in Triangular Trade Structure



China, ASEAN → US, EU



Japan, NIEs → US, EU

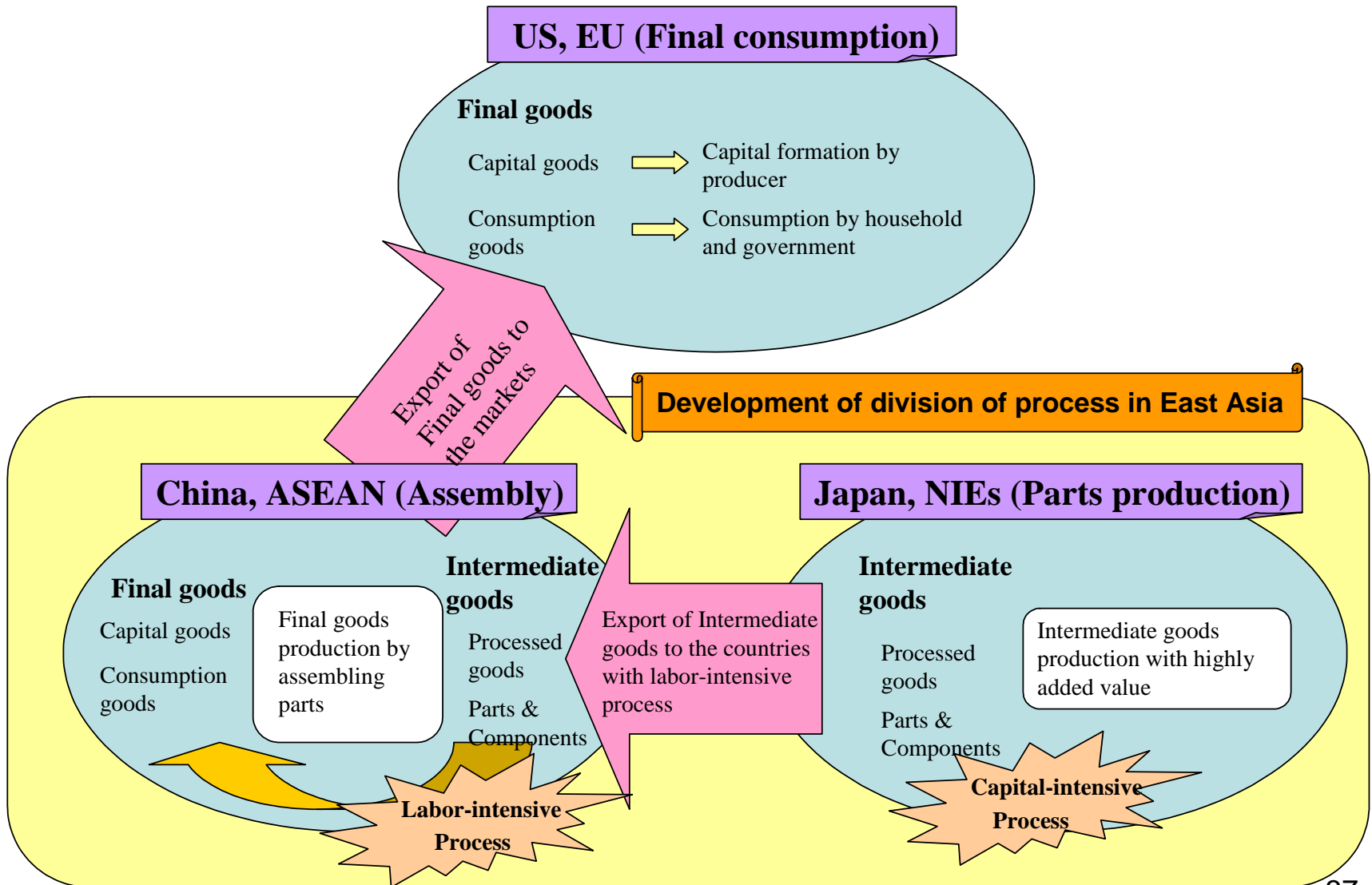


Findings

From the graphs above, it is observed that;

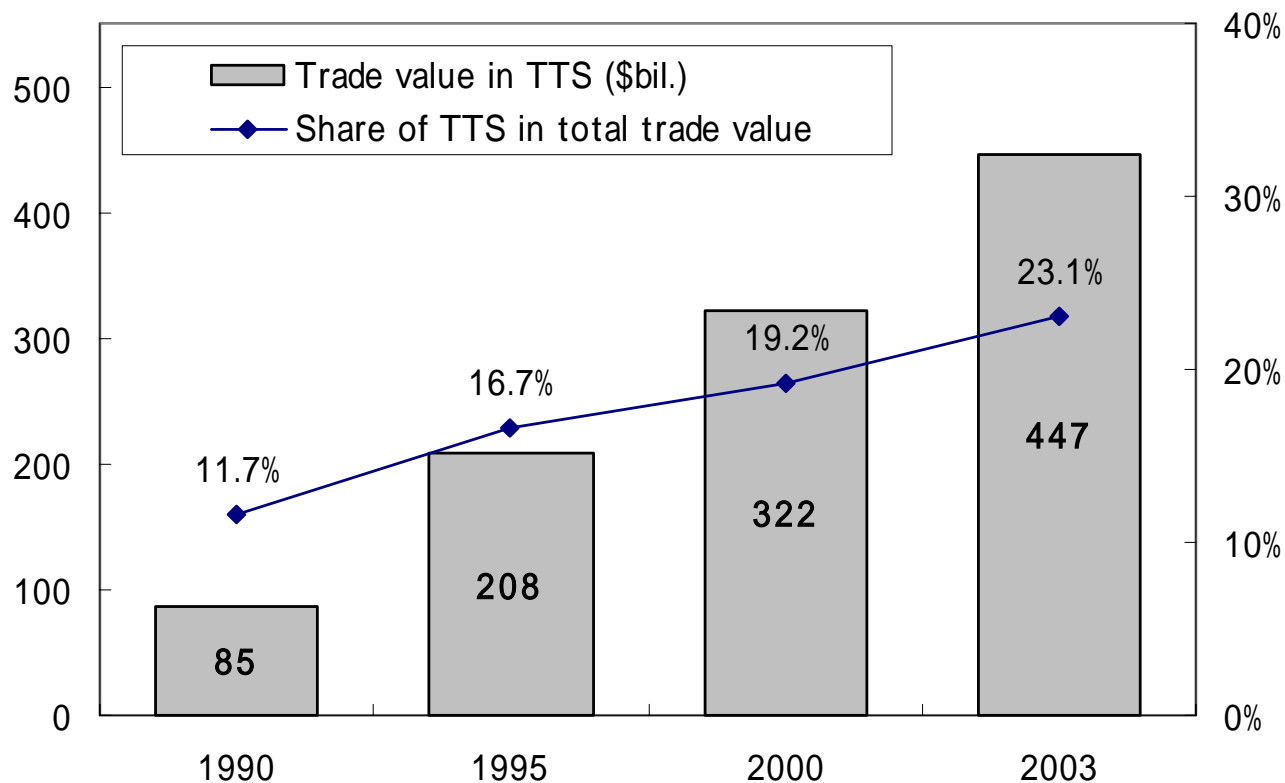
- a) Reciprocal trade of intermediate goods between Japan/NIEs and China/ASEAN has risen.
- b) Significant growth of export in final goods, particularly consumption goods, from China/ASEAN to US/EU.
- c) Steady growth in export of intermediate and final goods from Japan/NIEs to US/EU.

Figure 10: Model of Triangular Trade Structure



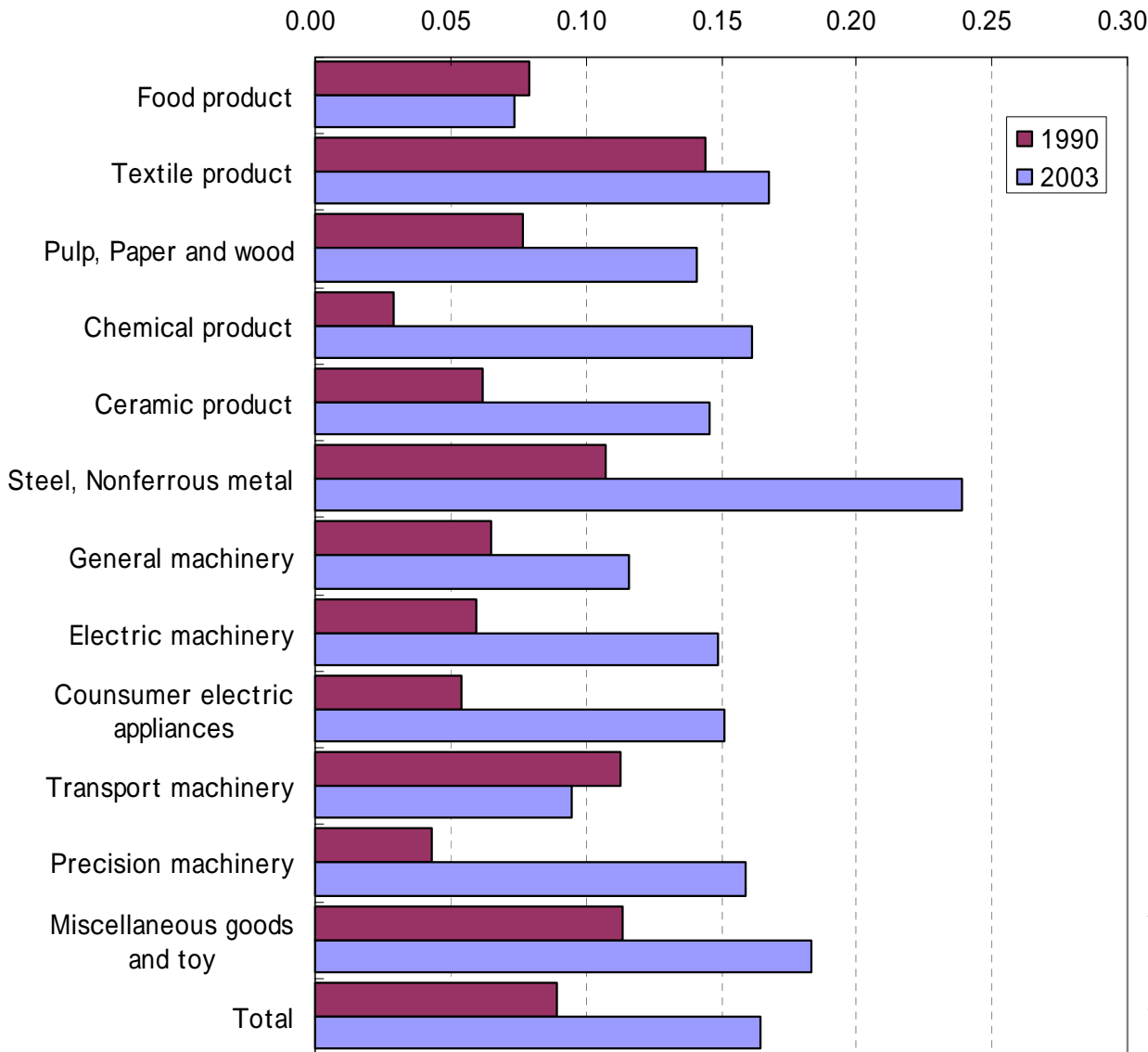
- a) Trade value in Triangular Trade Structure has increased.
- b) The share of TTS in the total trade value has also risen. Compared to the level of 1990, it increases more than double.

Figure 11: Change of Trade Value in Triangular Trade Structure

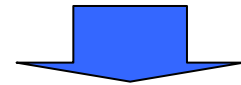


Notes: “Value of Triangular Trade” = (Intermediate goods export of Japan & NIEs to China & ASEAN) + (Final goods export of China & ASEAN to US & EU)
 “Share of Triangular Trade Structure in total trade” = (Value of Triangular Trade) / (All goods export of Japan & NIEs to World + All goods export of China & ASEAN to World)

Figure 12: Change of Triangular Trade Index for the Industry



In almost all the industries except Food and Transport Machinery, TTS has been intensified.



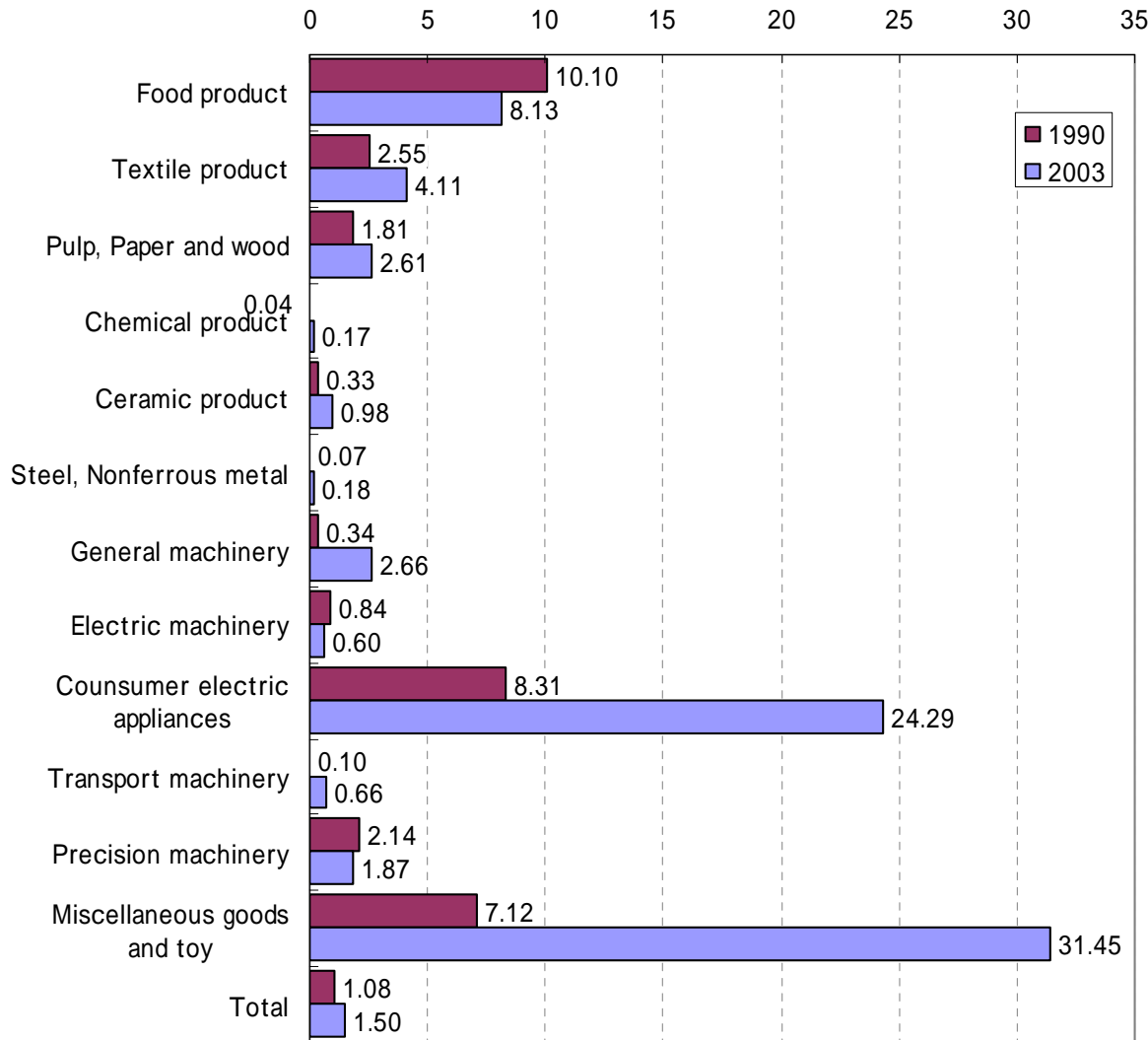
TTS has been formed across the industries.

$$\eta_i = \frac{Int_{i \text{ Japan} \cdot \text{NIEs}}^{\text{China} \cdot \text{ASEAN}}}{Int_{i \text{ Japan} \cdot \text{NIEs}}^{\text{World}}} \times \frac{Fin_{i \text{ China} \cdot \text{ASEAN}}^{\text{US} \cdot \text{EU}}}{Fin_{i \text{ China} \cdot \text{ASEAN}}^{\text{World}}}$$

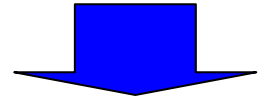
Int_{iEX}^{IM} : The value of export of Intermediate goods in "i" industry from EX (exporter) to IM (importer)

Fin_{iEX}^{IM} : The value of export of Final goods in "i" industry from EX (exporter) to IM (importer)

Figure 13: Trend of Local Contents in China and ASEAN Region for the Industry



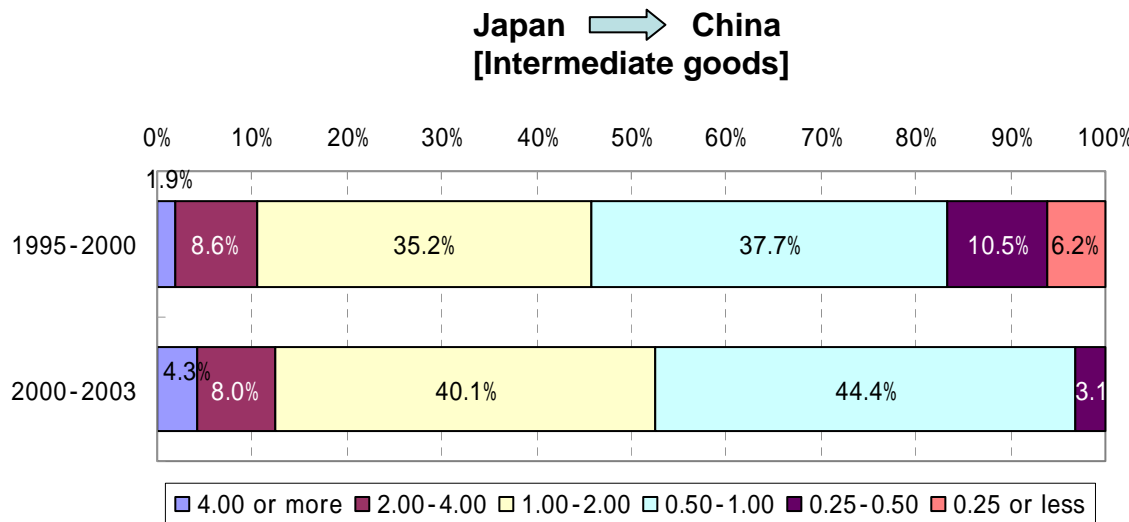
While local production of intermediate goods advances, TTS strengthen.



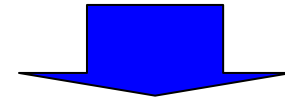
Export of intermediate goods from Japan/NIEs converges towards China/ASEAN, and export of Final goods from China/ASEAN to US/EU rises comparatively.

Note: Local Contents Index = (All goods export of China & ASEAN to World) / (Intermediate goods export of China & ASEAN to World)

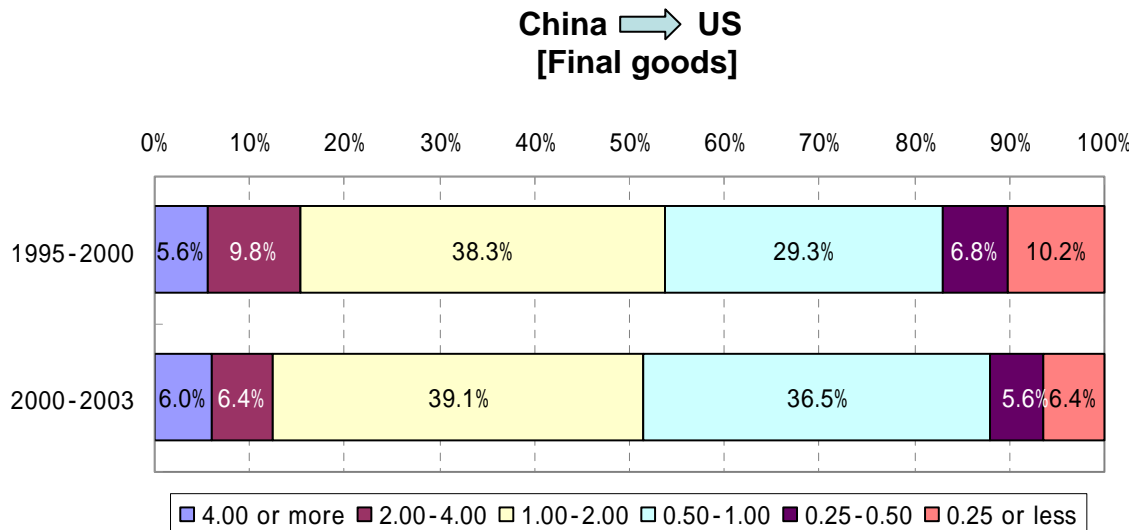
Figure 14: Relative Change of Unit Price in Triangular Trade Structure



Unit prices of intermediate goods of Japan's export to China as well as final goods of China's export to US have risen.

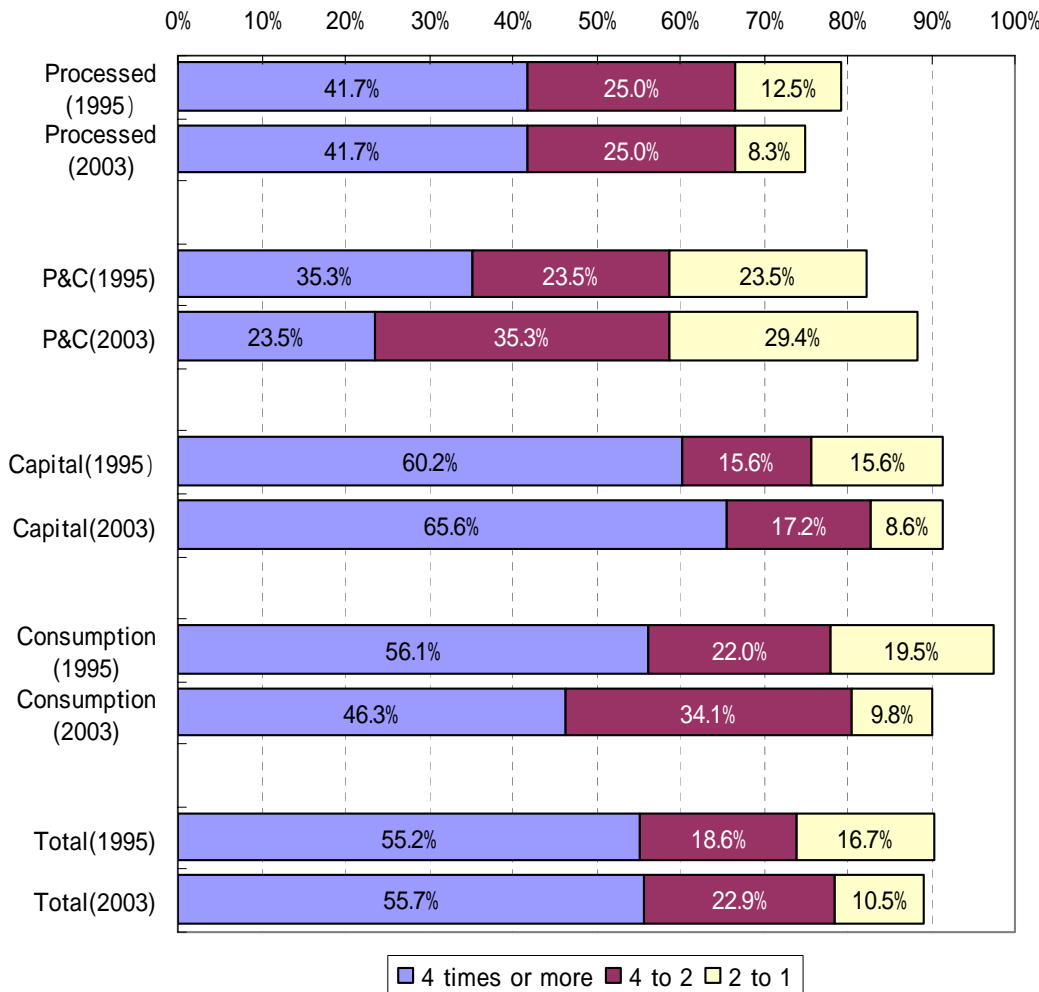


Not only economic relationship between East Asia and US/EU through trade has deepened, but sophistication of TTS has also progressed, reflecting high growth in East Asian economic region.

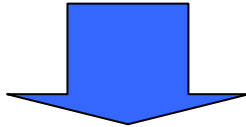


Notes: The upper graph compares the change in Unit Price of Machinery Intermediate goods export of Japan to China with the change in Unit Price of Machinery Intermediate goods export of Japan to World. If the rate of rise in Unit Price of Japan's export to China exceeds the rate of rise in Unit Price of Japan's export to World, the number of the comparative change becomes more than 1. Also the lower graph compares the change in Unit Price of Machinery Intermediate goods export of China to US with the change in Unit Price of Machinery Intermediate goods export of China to World. Further details are explained in the text of the paper.

Figure 15: Comparison of Unit Prices in Export of Japan to US and in Export of China to US



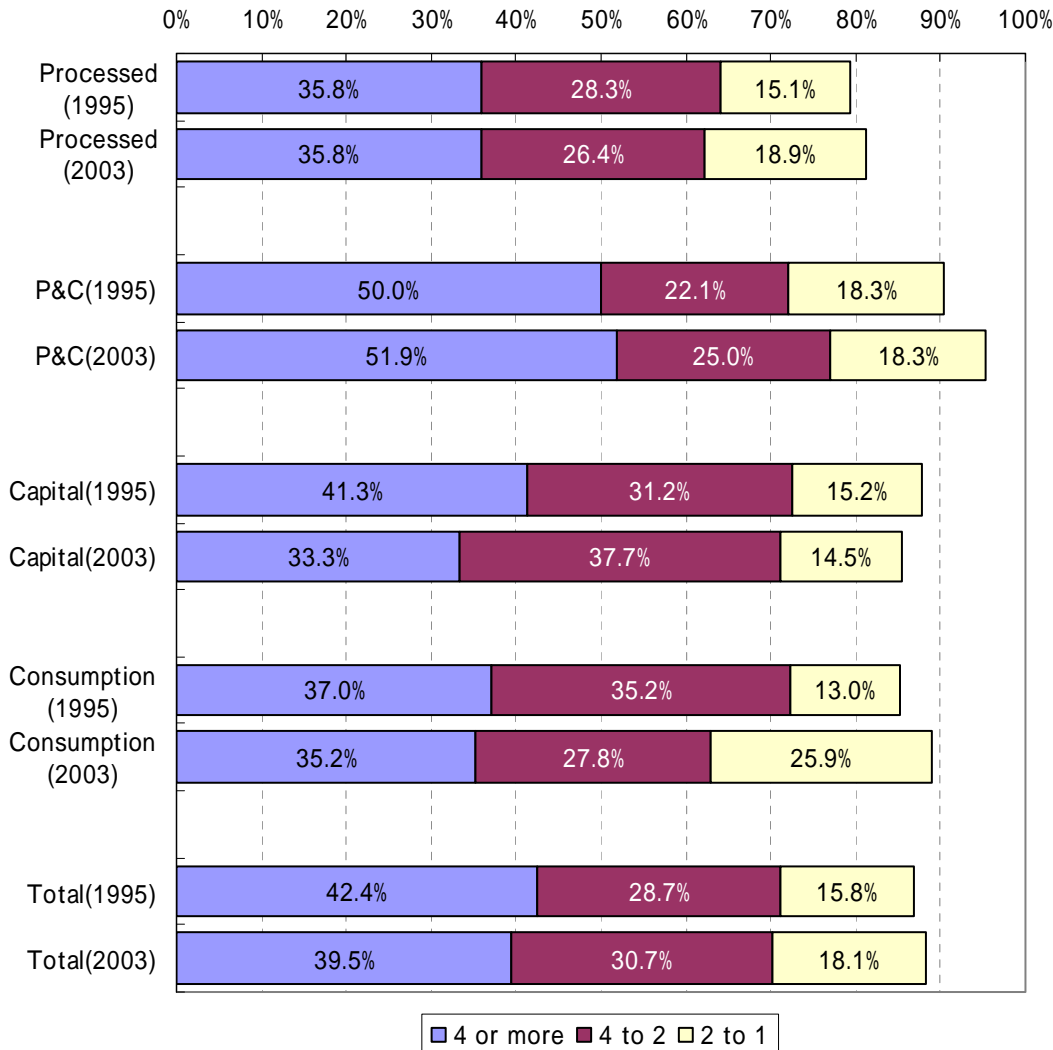
The number of the item of Japan's export with the higher unit price exceeds the one of China's overwhelmingly.



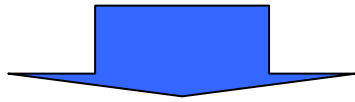
While both Japan's export to US and China's export to US rise, the same items with different add-values for each are traded in these two trade relations.

Notes: Unit Price Index = (Unit Price of Japan's export to US) / (Unit Price of China's export to US)
 3 categories of the bar in the above graph are based on the number of the items.

Figure 16: Comparison of Unit Prices in Export of Japan to China and in Export of China to Japan



The share of the items with higher unit prices of Japan's export to China than the ones of China's export to Japan is dominant.



Even when Japan and China trade categorically same products, such products have different added values.

Note: Unit Price Index = (Unit Price of Japan's export to China) / (Unit Price of China's export to Japan)
 3 categories in the bar of the above graph are based on the number of the items.

6. Conclusion

Strengthening regional production platform

- 1. The observed “Spiral Pattern of Development” suggests that the region where production network has spread over the borders such as East Asia needs analysis with consideration of production stage.**
- 2. The complementarity in East Asia across the industries not just exists but changes dynamically rather than statically.**
- 3. While the complementarity in the region has heightens, “Triangular Trade Structure” is formed between East Asia and US/EU.**
- 4. Advancement of TTS is a fruit of both development of supporting industries in East Asia and increasing depth in the capital-intensive industrial bases.**
- 5. TTS is not exclusive in East Asian region but becomes the source of dynamism to tug the growth in world economy through promoting trade relation with US/EU.**

Thank you!

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