

AN ANALYSIS OF ECONOMIC INTERDEPENDENCE AMONG THE ASIAN NICs, THE ASEAN NATIONS, AND JAPAN

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INTRODUCTION

CHANGES in the pattern of the international division of labor in Southeast Asia and the Far East in the 1960s and 1970s involving Japan can be summarized as a conspicuous development of economic integration in Asia. The present writer knows of no other period when interdependent relations among Japan, the Asian Newly Industrializing Countries (NICs), and the ASEAN countries have intensified so rapidly. The biggest contributory factor to these deepening relations is the industrializing efforts of the Asian NICs and the ASEAN nations, accelerating a horizontal division of labor particularly with Japan.

Rapid economic growth in the Asian NICs has been noteworthy, impressing us strongly with the endurance and persistence of the century-long surge of global industrialization. It was initiated in Great Britain, involved the European continent and the United States, then transmitted to Japan and Russia and has arrived on the shores of the developing world in the late twentieth century. This process of global industrialization will not stop at the Asian NICs. The economies of other Asian countries are sometimes described as stagnant when compared with the rapidly growing economies of the NICs, but such a contention contradicts known facts. Industrialization is indeed a persistent historical movement now engulfing not merely the NICs but all the Asian countries, particularly the ASEAN nations. It can be correctly maintained that this wave of industrialization is the most significant factor fostering economic integration in Asia during the past two decades.

We must emphasize that this process of economic integration will in future benefit all three parties involved for the following reasons. First, Japan will be able to promote its unavoidable task of correcting its self-sufficient manufacturing system and attaining a more sophisticated industrial structure by a greater horizontal trade with the Asian NICs. Second, the Asian NICs, the Republic of Korea (R.O.K.) and the Republic of China (Taiwan) particularly, will be able to be given the market essential for their heavy-chemical industrialization efforts and thus acquire the basis upon which to form a more sophisticated industrial and trade structure. Third, this enhanced division of labor between Japan and the Asian NICs will open the possibility for the ASEAN countries to supply the world market with not only their traditional resources and resource-intensive goods but also labor-intensive manufactured products.

This paper attempts first to argue that the substance of economic integration in Asia is the expansion of intra-industry international trade, which should rightly be seen as a horizontal division of labor, and to examine the growing horizontal division of labor among Japan, the Asian NICs, and the ASEAN nations in the past two decades (Section I). The paper then attempts to argue, in the context of the Japan-R.O.K. trade as a case in point, that the trade among various sectors of industry is centered on intermediate goods and that this trade has rapidly intensified an interdependent relationship between Japan and the Asian NICs (Section II). Thirdly, it will be shown that complementary relations between Japan and the Asian NICs are more rapidly established than the often-emphasized competitive relations between the two, and that the causes of this complementarity can be found in the development of the latter's structure of processed-exports-oriented industrialization. Lastly, it will be suggested that the promotion of horizontal trade will be an important task for the future of the Japanese economy.

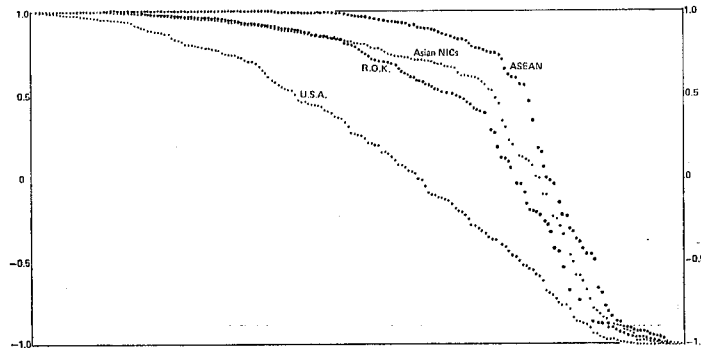
I. DEVELOPMENT OF HORIZONTAL TRADE IN ASIA

Let us outline the profile of Japan's horizontal trade relations with R.O.K., the Asian NICs (R.O.K., Taiwan, Hong Kong, and Singapore), the ASEAN nations (Thailand, Malaysia, Indonesia, and the Philippines), and the United States through coefficients of specialization in trade. These coefficients were calculated for Japan as of 1978 vis-à-vis its trade partners listed above for approximately two hundred manufactured items, and plotted on Figure 1 in the order of their levels from +1 to -1. The level of trade specialization for Japan is distinctly different vis-à-vis each group of trading partners.¹

With respect to the ASEAN countries, Japan almost wholly specializes in export for over half of the two hundred items surveyed. The coefficients of a great number of goods hit the ceiling of +1. There are fewer than twenty items for which the coefficients are in the range denoting horizontal trade between +0.5 and -0.5. The Asian NICs are at relatively high levels of industrialization in comparison with the ASEAN countries. Accordingly, the number of goods Japan wholly exports to the NICs is smaller than that to the ASEAN countries, and the number of items falling in the +0.5 to -0.5 range for Japan vis-à-vis the NICs is larger than that vis-à-vis the ASEAN nations. Among the NICs R.O.K. is seen to demonstrate the highest level of horizontal trade relations with Japan. Despite these variations, however, Japan wholly specializes in export of a considerable number of items vis-à-vis any of the ASEAN nations and Asian NICs, and has few items falling in the -0.9 to -1.0 range which signifies complete import specialization for Japan. On the other hand, Japan shows a rather balanced picture of trade specialization vis-à-vis the United States, indicating a far higher degree of horizontal relations than with the Asian countries.

¹ For a variety of arguments regarding Japan's horizontal international specialization, see articles compiled in [17].

Fig. 1. Japan's Coefficients of Trade Specialization vis-à-vis Its Trading Partners (1978)



Source: Japan Tariff Association, *Japan Exports and Imports: Country by Commodity*, December 1979.

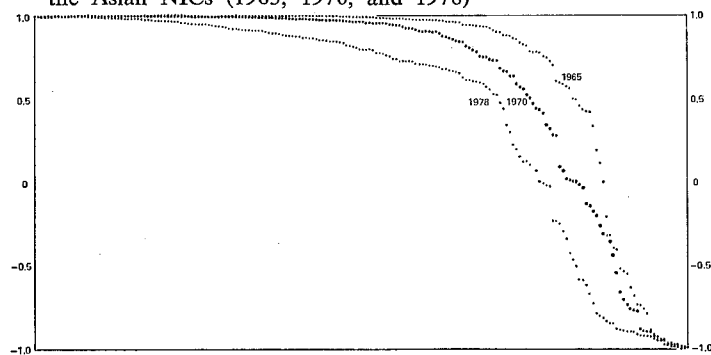
Notes: 1. The coefficient of trade specialization is shown as $(E_{ij} - M_{ij}) / (E_{ij} + M_{ij})$, where E_{ij} signifies Japan's export of goods i to its trading partner j , and M_{ij} Japan's import of goods i from its partner j . If Japan's export to partner j of category of goods equals its import from that partner of the same category of goods, the coefficient is zero and Japan's trade relationship with this country is understood to be horizontal. On the other hand, if Japan exports to country j but does not import a certain category of goods, the coefficient will be $+1$. The reverse situation with no export but only import will yield a coefficient of -1 . As this coefficient approaches zero from $+1$ or -1 , the level of horizontal division of labor between the two countries in that category of industry will be higher.

2. Singapore, for the purpose of our discussion here, is classified as belonging to the Asian NICs and not to the ASEAN group.

3. Products are excluded for which the combined export and import from and to Japan is below ¥500 million.

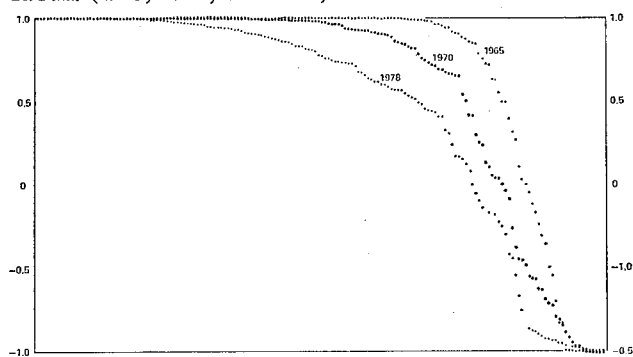
Japan's coefficients of trade specialization vis-à-vis the four groups of trade partners for 1965, 1970, and 1978 are shown in Figures 2 through 5. The essentially vertical trade relations between Japan and the other two subdivisions of Asian countries can easily be seen to have undergone rather rapid changes during this period. Vis-à-vis the four ASEAN countries Japan in 1965 had only five items whose coefficients of trade specialization fell between $+0.5$ and -0.5 , but this number increased to eight in 1970 and to nearly twenty in 1978. Vis-à-vis the Asian NICs the same number increased from twelve in 1965 to twenty-three and twenty-six in 1970 and 1978 respectively. On the other hand, trade between Japan and the United States changed little in the number of items falling

Fig. 2. Japan's Coefficients of Trade Specialization vis-à-vis the Asian NICs (1965, 1970, and 1978)



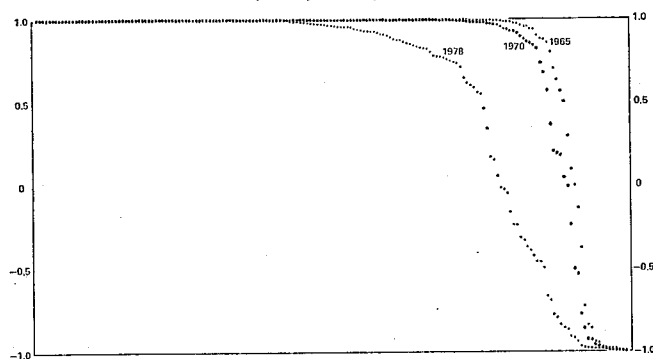
Source and notes: The same as Figure 1.

Fig. 3. Japan's Coefficients of Trade Specialization vis-à-vis R.O.K. (1965, 1970, and 1978)



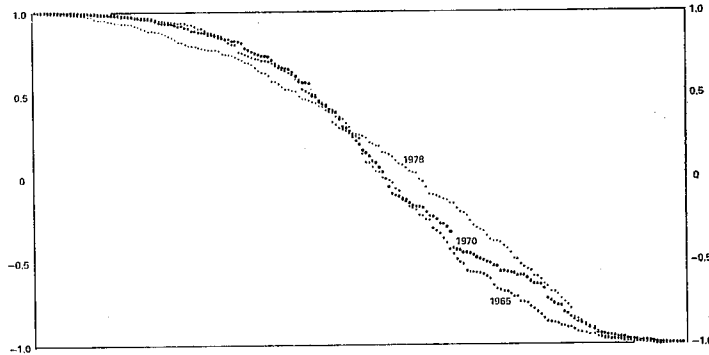
Source and notes: The same as Figure 1.

Fig. 4. Japan's Coefficients of Trade Specialization vis-à-vis the ASEAN Nations (1965, 1970, and 1978)



Source and notes: The same as Figure 1.

Fig. 5. Japan's Coefficients of Trade Specialization vis-à-vis the U.S.A. (1965, 1970, and 1978)



Source and notes: The same as Figure 1.

in the $+0.5$ to -0.5 range. The level of horizontal trade relations between these two countries can be said to have remained essentially unchanged between 1965 and 1978, at least in comparison with that with the two subgroups of Asian countries.

The movement toward more horizontal division of labor can be indexed quite profitably, to examine the differences among various categories of traded commodities. Table I shows the result of computation after having grouped the two hundred industrial items into twenty-two categories. A number of observations can be made from this Table. Firstly, this table confirms the observations derived from the above Figures. Japan has a higher index number measuring the level of horizontal division of labor vis-à-vis the United States, and lower index numbers vis-à-vis the two groups of Asian countries. But the speed at which this index rises is lower vis-à-vis the United States than vis-à-vis the Asian countries.

Secondly, industry-wide changes in the horizontal division of labor index can be examined in Table I. Quite understandably the index number for Japan vis-à-vis the United States is rather high in such producers' goods as machinery, metals, and chemicals, while Japan's index numbers of horizontality in division of labor vis-à-vis the Asian countries in producers' goods are relatively low. The rate of increase during the past decade or so has been rather slow between Japan and the United States in many heavy-chemical branches, with some branches even showing declining index numbers, while it is quite rapid between Japan and the two subgroups of Asian countries. The trend of this index toward horizontality was indeed quite marked vis-à-vis the NICs from 1965 through 1970 to 1978, particularly in such heavy-chemical branches as general machinery ($1.6 \rightarrow 1.3 \rightarrow 6.0$ in years 1965, 1970, and 1978 respectively), electric & electronic equipment ($3.8 \rightarrow 20.4 \rightarrow 22.4$), transportation equipment ($0.5 \rightarrow 6.8 \rightarrow 10.6$), precision instruments ($2.5 \rightarrow 3.3 \rightarrow 16.5$), coal products ($0 \rightarrow 47.8 \rightarrow 99.5$), nonmetallic products ($3.7 \rightarrow 11.1 \rightarrow 19.0$), primary iron ($0 \rightarrow 7.3 \rightarrow 13.0$), and metal products ($0.3 \rightarrow 12.2 \rightarrow 21.3$). On the other hand, there are areas where a rather high level of horizontality has been reached but remained stagnant between Japan and the

TABLE I
JAPAN'S HORIZONTAL DIVISION OF LABOR INDEX BY TRADE PARTNERS AND BY CATEGORIES OF GOODS (1965, 1970, AND 1978) (%)

	Asian NICs			R.O.K.			ASEAN			U.S.A.		
	1965	1970	1978	1965	1970	1978	1965	1970	1978	1965	1970	1978
05 Food	16.7	15.9	24.9	12.9	14.0	11.9	16.6	18.0	16.3	23.6	35.9	21.3
06 Beverages	—	—	—	—	—	—	0	0	0.3	12.6	19.0	45.1
07 Tobacco	—	—	—	—	—	—	—	—	—	0	0	0
08 Textile yarn	11.5	39.6	41.9	0.4	32.3	34.3	2.1	0.6	32.8	0.7	1.3	45.7
09 Textile products	24.1	31.6	25.8	27.4	31.2	28.9	4.8	19.0	30.7	9.6	14.4	34.6
10 Wooden products	18.2	27.8	21.6	19.9	36.5	17.1	4.5	21.4	21.7	23.0	6.1	22.5
*11 Pulp, paper	6.4	17.5	9.2	0	2.4	12.1	1.4	11.2	9.5	33.8	34.4	28.7
12 Printing, publishing	13.7	14.3	90.2	15.1	9.5	67.5	7.5	1.8	93.5	16.9	23.6	30.7
*13 Rubber products	20.7	37.7	37.8	2.8	27.6	41.2	0.3	0.1	17.6	21.1	12.6	29.9
*14 Chemicals	7.9	14.9	19.1	6.9	13.8	11.2	4.9	4.7	9.4	31.4	35.6	44.6
*15 Petroleum products	10.4	36.7	19.8	0	89.8	52.0	27.1	31.5	8.6	6.9	3.9	2.7
*16 Coal products	0	47.8	99.5	0	0	83.4	0	0	0	0	0	28.4
*17 Nonmetallic products	3.7	11.1	19.0	14.8	7.9	22.5	0	0.1	0.8	29.0	35.3	52.8
*18 Iron & steel	21.5	23.0	28.0	50.0	10.6	65.0	0	0	6.0	40.7	16.9	51.5
*19 Primary iron	0	7.3	13.0	0.1	5.3	23.7	0	0.3	4.6	11.4	2.8	1.5
*20 Primary nonferrous metal	12.7	15.0	20.9	6.2	19.5	15.3	1.0	1.5	3.6	34.9	36.6	22.0
*21 Metal products	0.3	12.2	21.3	0.3	2.2	23.0	0.1	0.2	0.9	28.0	15.7	24.4
*22 General machinery	1.6	1.3	6.0	1.1	0.6	9.7	0.3	0.2	1.6	7.4	43.7	47.0
*23 Electric-electronic equipment	3.8	20.4	22.4	2.8	13.2	34.9	0	0	6.4	52.4	50.6	55.9
*24 Transportation equipment	0.5	6.8	10.6	2.2	1.1	7.7	0	0	0.4	23.9	17.2	13.7
*25 Precision instruments	2.5	3.3	16.5	6.4	1.8	28.2	0	0	21.5	42.3	44.2	44.0
26 Other manufactures	25.5	44.0	51.0	21.2	56.9	53.4	18.0	30.0	38.4	29.3	30.6	53.0
Total manufactures	8.7	16.3	27.4	8.7	17.1	32.4	3.9	5.9	15.2	33.4	31.0	35.7

Source: See Figure 1.

Note: The index of horizontal division of labor can be obtained by $\frac{1}{n} \sum_{i=1}^n \left(\frac{E_{ij} + M_{ij} - |E_{ij} - M_{ij}|}{E_{ij} + M_{ij}} \right) \times 100$, where E_{ij} indicates Japan's exports to country j of goods i , and M_{ij} Japan's import from country j of goods i . We take it that if a certain industrial category includes n -number of individual commodity items, the horizontal division of labor index of that category is the arithmetic average of that of the commodities. If Japan's import from and export to country j in a category are equal, the index number in this category will be 100. If Japan has a complete export or import specialization vis-à-vis country j , this index will be zero.

* Indicates producers' goods.

Asian NICs, such as textile products (24.1→31.6→25.8) and wooden products (18.2→27.8→21.6); these coincide with areas of high trade volume. In this context, one can expect that the rise in the level of horizontality in international division of labor between Japan and the Asian NICs will occur mainly in the area of producers' goods. The same trends of a rapidly rising index of horizontality in heavy-chemical sectors and of stagnancy in textile and wooden products are even more marked in the relations between Japan and R.O.K.

These phenomena are apparent results of rapid industrialization and greater sophistication of industrial structure in the Asian NICs. Two additional factors, however, must be pointed out. First, the Asian NICs have left the stage of being marginal exporters in such labor-intensive manufacturing industries as textile-related products and have become one of the most powerful exporters of these products in the world. This has put countries importing these products very much on guard. Second, these Asian NICs have a limited supply of labor, and economic growth has produced a rapid rise in real wages. Greater emphasis on heavy-chemical industries in their export structure and on technology-intensive export is indeed a way of bypassing these limiting factors. They can thus only place even greater emphasis on these areas in coming years. It is then certain that the horizontal division of labor between Japan and the Asian NICs will center around the heavy-chemical sectors.

With respect to the ASEAN countries, their division of labor with Japan has rapidly become more horizontal: in pulp & paper (1.4→11.2→9.5), rubber products (0.3→0.1→17.6), iron & steel (0→0→0.6), electric & electronic equipment (0→0→6.4), precision instruments (0→0→21.5), textile products (4.8→19.0→30.7), and wooden products (4.5→21.4→21.7). Japan's trade relations with the ASEAN countries are characterized by rapid change since 1970, confirmed in Figure 4. The declining export of labor-intensive products by the Asian NICs and a greater sophistication in their trade structure can easily benefit these ASEAN countries as the latter are still marginal exporters of labor-intensive goods and have relatively low wages. Thus, trade relations between Japan and the ASEAN countries will become more horizontal primarily in labor-intensive industries.²

II. HORIZONTAL DIVISION OF LABOR AND INTERMEDIATE GOODS TRADE BETWEEN JAPAN AND THE ASIAN NICs: JAPAN-R.O.K.

The mention of international trade is apt to bring to mind the division of labor among differing industrial sectors, involving an exchange of goods produced in an industry in one country for goods produced in a different industry in another country. But the intra-industry division of labor across national boundaries is an entirely normal phenomenon in today's world, involving international trans-

² For changes in the trade structure among Japan, the Asian NICs, and the ASEAN countries, as well as suggestions for their future prospect, see [19].

actions of goods produced in the same industry in different countries. The marked expansion of trade among advanced countries in the 1960s was characterized by this phenomenon. The horizontal division of labor discussed above can be taken as another name for this intra-industry division of labor. As among advanced countries, this form of trade has been fairly well developed between Japan and other Asian countries, especially the Asian NICs.

Thus, we will refer to the intra-industry division of labor involving international trade of the same category of goods as horizontal division of labor, and maintain that this is the content of ever expanding world trade today. And we note that the "goods produced in the same industry" that are traded between nations consist primarily of intermediate goods. Marked development of production technology and a more complex production structure have expanded the process of roundabout production from downstream to midstream to upstream, defying comparison with older days. This has so greatly diversified the division of labor in the production of intermediate goods that international division of labor is inevitable between different levels of production processes.

The growth in size of technological units in production of intermediate goods and the resulting enlargement of production facilities embodying the technology have come to show their growing indivisibility. No one country can now produce the whole range of intermediate goods, and it is now beneficial for individual countries to specialize in the production of certain intermediate goods and trade for other items. The share of total trade taken by final goods is declining, because a longer processes of roundabout production and larger technological units of production have resulted in near impossibility for individual countries to have the complete production process through the final stages and in the inevitability of international division of labor in the process of intermediate goods production.

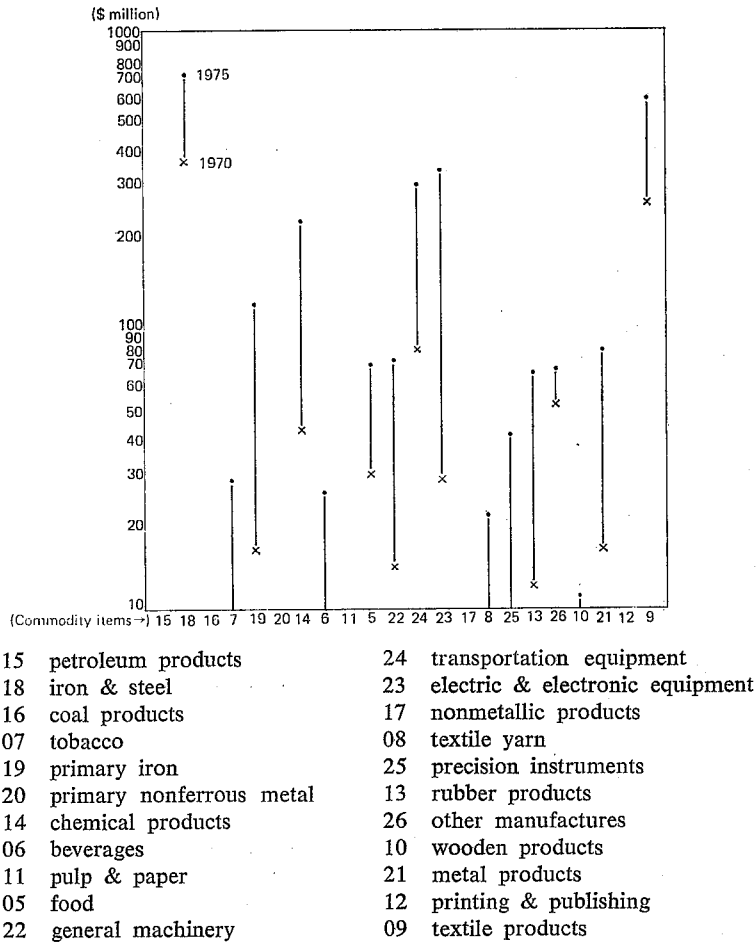
The intra-industry division of labor, essentially meaning trade in intermediate goods, needs an analysis that fully takes this factor into account. The ordinary method of identifying the flow of intermediate goods within one country is the use of the input-output table, but in our efforts to understand the flow structure of intermediate goods across national boundaries, input-output tables of a number of countries must be interlinked through trade statistics.³ Let us choose the case of R.O.K. whose input-output data are to be interlinked with that of Japan.⁴

Figures 6 and 7 show partial results of the calculation without going into the details of theoretical models or methods of actual calculation of international input-output tables. They indicate the increase in the total domestic output in Japan induced by an expansion of the final demand in particular industrial sectors of R.O.K., and conversely the increase in the total domestic output in R.O.K. induced by an expansion of the final demand in particular sectors of Japan. The induced output here includes both directly and indirectly induced

³ For analysis of international input-output tables in Japan, see [15] [14] [13] [6] [16] [5] [4].

⁴ See [11]. The calculation shown in this article is the result of the further development of the paper [19]. I acknowledge the assistance of the Computer Room of JETRO.

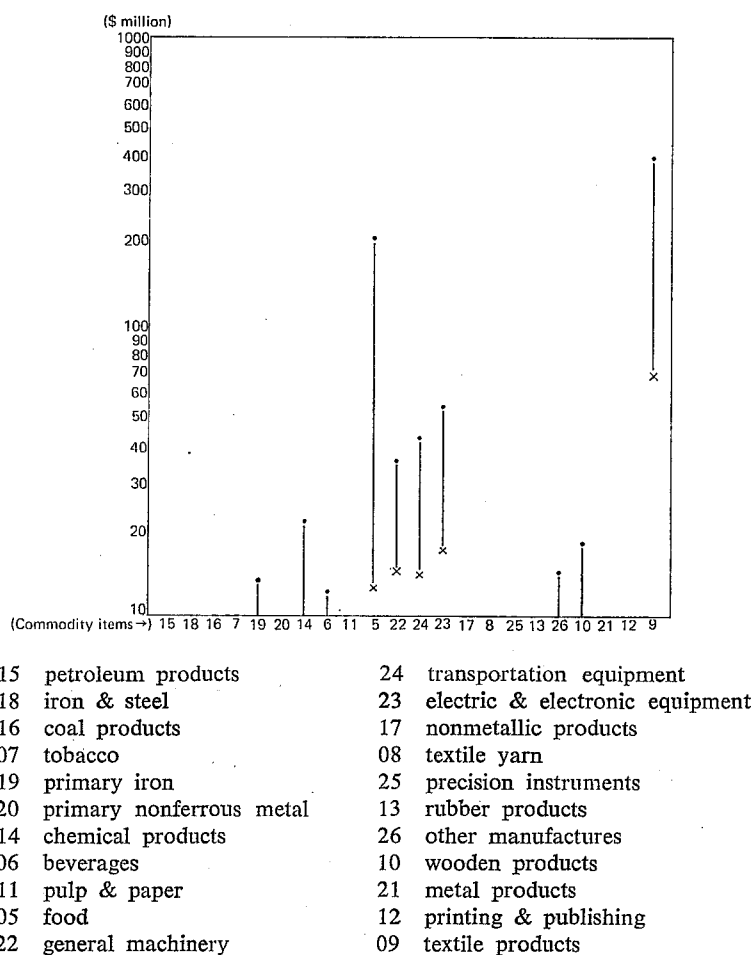
Fig. 6. The Increase in the Total Domestic Output in Japan Induced by an Expansion of the Final Demand in Particular Industrial Sectors of R.O.K.



Sources: Institute of Developing Economies and the Bank of Korea, *International Input and Output Table, Japan-Korea 1970*, IDE Statistical Data Services No. 18 (1976); Japan, Administrative Management Agency, *Input-Output Tables 1975* (Tokyo, 1980); and the Bank of Korea, *1975 Input-Output Tables* (Seoul, 1978).

output. An increase in the final demand in R.O.K. for a particular group of goods will call for a certain increase in the importation of intermediate goods from Japan. The amount thus called for is the directly induced incremental demand for Japan. This will in turn call for increased output in other related industrial sectors through the input-output network, which is referred to as the indirectly induced output. In the two figures, the most recent year in which the input-output tables for both countries are available is taken, i.e., the year 1975, but

Fig. 7. The Increase in the Total Domestic Output in R.O.K. Induced by an Expansion of the Final Demand in Particular Industrial Sectors of Japan



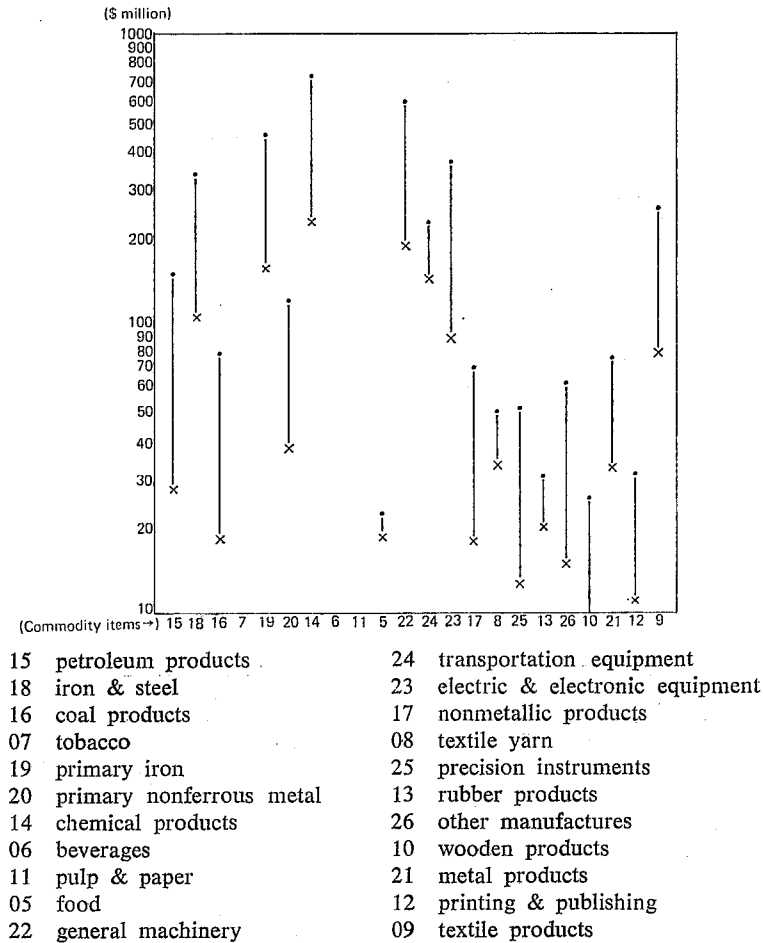
Source: The same as Figure 6.

for comparative purposes the results for 1970 are also plotted.⁵ The industrial sectors are arranged in order of per capita value added in Japan in 1975.

It is generally observable that the increase in the total domestic output in R.O.K. induced by Japanese final demand changes is considerably smaller than the changes induced in Japan from R.O.K. This can be seen as a reflection of the often-quoted "self-sufficient" structure of the Japanese industry and the processed-exports-oriented industrialization nature of the Korean economy. Rises in the final demands in various Japanese industrial sectors can largely met by its own intermediate goods producers, while in the case of R.O.K. the relatively

⁵ The 1970 figures are obtained from [3].

Fig. 8. The Induced Domestic Output in Particular Industrial Sectors of Japan as a Result of the Change in the Total Final Demand in R.O.K.

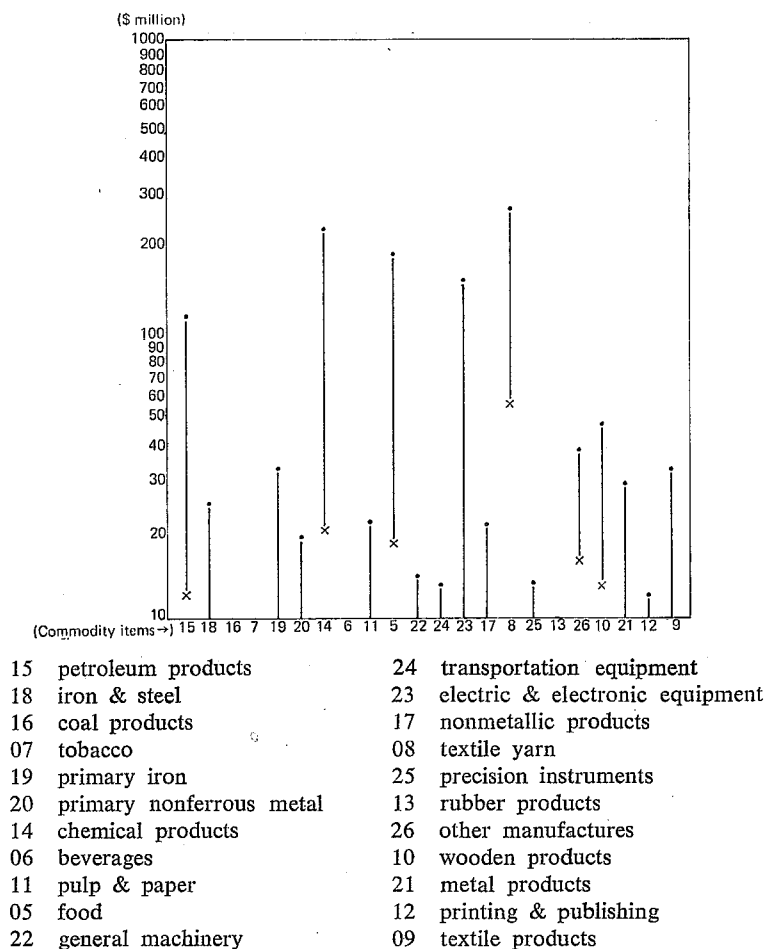


Source: The same as Figure 6.

small supply capacities in producers' goods sectors necessitate an immediate change in the importation of intermediate goods from Japan.

Such basic characteristics of the two economies, however, recently began to change in the direction of more mutual interdependence. As of 1975, changes in the final demand in R.O.K. induced strong output increases in the following sectors in Japan: (09) textile products, (23) electric & electronic equipments, (24) transportation equipment, (14) chemical products, and (19) primary iron. Conversely, changes in the final demand in Japan brought about strong induced output increases in R.O.K. in the following sectors: (09) textile products, (05) food, (23) electric & electronic equipment, (24) transportation equipment, and (22) general machinery. The three sectors (textile products, electric & electronic equip-

Fig. 9. The Induced Domestic Output in Particular Industrial Sectors of R.O.K. as a Result of the Change in the Total Final Demand in Japan



Source: The same as Figure 6.

ments, and transportation equipment) appear in both categories, signifying the promotion of the growth of interdependent relations between the two countries. What is important is the greater mutual impact of the changes in the final demands in 1975 in comparison with five years previously. This important change can be easily discerned from the two figures. We must conclude that mutual demands for intermediate goods are indeed enhancing the complementary relations between these two economies.

Figures 8 and 9 show the induced domestic output in particular industrial sectors of Japan as a result of the change in the total final demand in R.O.K., and vice versa. The impact of R.O.K. on Japan is considerable in such sectors as (14) chemical products, (19) primary iron, (18) iron & steel, (23) electric &

electronic equipments, and (09) textile products, while Japan has a strong impact on R.O.K. in the areas of (08) textile yarn, (14) chemical products, (05) food, (06) textile products, and (15) petroleum products. The induced domestic output in these industries in Japan in 1975 as a result of the change in the total final demand in R.O.K. was \$2,476.1 million, while the corresponding figure for Korean industry in the same year was \$780 million, or 31.5 per cent of the former. In 1970, the corresponding figures were \$808.5 million for Japan and \$52.2 million for R.O.K., the latter being only 6.5 per cent of the former. We conclude that the mutual demand for intermediate goods between Japan and R.O.K. is strengthening the interdependent nature of the two economies at an amazing pace. This expansion of mutual demand for intermediate goods is the largest factor in the growing level of horizontal division of labor between the two economies as shown previously in Figures 1 and 3 as well as in Table I.

III. PROCESSED-EXPORTS-ORIENTED INDUSTRIALIZATION IN THE ASIAN NICs AND INTERDEPENDENCE WITH JAPAN

Trade relations between Japan and the Asian NICs have often been characterized solely by their competitive nature, encapsulated in the expression that the latter is "catching up" with the former. The rapidity with which Japan has been deprived of its market share in such third country markets as the United States and EC by the Asian NICs is remarkable. The Japanese market itself is gradually increasing its share of products imported from these countries.⁶ Despite this rapid catching-up, however, Japan still maintains a large favorable trade balance with them; indeed the imbalance has grown cumulatively since the beginning of the 1970s.

The four Asian NICs together recorded in 1977 a trade deficit of \$3,822 million vis-à-vis the world as a whole, while this figure vis-à-vis Japan alone was \$6,242 million, far larger than their deficit vis-à-vis oil producing countries of \$2,832 million. In 1971, their trade deficit with Japan was \$2,340 million, indicating the exponential nature of their growing trade deficit with Japan. In the case of R.O.K., this trend is even more marked: its trade deficit with Japan was \$589 million in 1970, which grew six times to \$3,412 million by 1978. The popular debate about the Asian NICs rapidly catching up with Japan should not be allowed to blur this persistent imbalance in their trade relations with Japan. Alongside a challenge to the Japanese economy is a high degree of dependence on Japan, resulting from an economic development that is processed-exports-oriented industrialization.

Principal export items of the NICs in Asia are textile products, household electric & electronic equipment, sundry goods, wooden products, and other labor-intensive products of a light industrial nature. They are all final products lying in the downstream of the roundabout production process, being assembled and processed after having come through the stage of intermediate goods. The reason

⁶ On how the Asian NICs are catching up with Japan, see [19] [2] [1] [18].

for these Asian NICs to have initiated their industrializing efforts at the downstream lay in initially having only an inadequate basis and few supporting economic activities for indigenous production of intermediate goods, and capital goods. Generally speaking, the further an economy moves in the direction of upstream in the roundabout production system, the greater the optimal production scale and the higher the level of industrial specialization. Accordingly, it will be the more capital-intensive. With a small domestic market, little capital, and abundant labor force, they naturally had to start from labor-intensive final products in small-scale production units with low levels of specialization. Furthermore, production of final products calls for a high degree of dependence on imported production materials. This processed-exports-oriented industrialization structure of importing producers' goods and exporting final goods is common to all the NICs in Asia. The result is an extremely high degree of dependence on advanced countries, especially Japan, on the part of these intermediate countries.

In the case of R.O.K. trade with Japan, textile-related products and electronic equipment are two decisive categories of goods, and a close examination of the sectors producing these goods in terms of their coefficients of trade specialization reveals the following dependent relations vis-à-vis Japan. In the case of textile-related goods, R.O.K. specializes in exporting to Japan only the so-called apparel products of CCCN 60, 61, 62. On the other hand, producers' goods needing large-scale capital and intensive technology, such as synthetic and man-made fibre yarn and cloth are almost wholly imported. It goes without saying that R.O.K. imports wholly from Japan goods in the upstream beyond the yarn, such as ethyleneglycol, caprolactam, and acrylonitrile, as well as textile machinery.⁷

In the case of electronic equipment the intra-industry vertical division of labor is quite apparent between Japan and R.O.K. in accordance with the level of technology employed in the production process. This sector is usually divided into the following three subgroups: industrial electronic equipment, electronic equipment for home use, and electronic parts. TV sets, radio, audio equipment, electronic watches and clocks, desk-top calculators, and other electronic equipment for home use are assembled products, and are important export items for R.O.K. to Japan. Japan's coefficient of trade specialization vis-à-vis R.O.K. in electronic equipment for home use was already 0.25 in 1977. Electronic parts include nine items: condensers, resistors, transducers, audio parts, machine parts, electron tubes, semiconductor elements, ICs, and other electronic parts. Japan suffers a trade deficit vis-à-vis R.O.K. in condensers and ICs, whose production technologies have been most highly standardized. Japan is also net exporter of resistors, electron tubes, and semiconductor elements, but their coefficients of trade specialization are 0.23, 0.11, and 0.06, respectively, indicating a rather advanced state of horizontal trade between the two economies. On the other hand, transducers, machine parts, and audio parts with their need for high technology in production put Japan's coefficients of specialization at 1.00, 0.84, and 0.72 respectively vis-à-vis R.O.K. Furthermore, the same coefficient for industrial

⁷ For a superb development of this point, see [12].

electronic equipment is 0.81. Thus, in the case of electronic equipment the intra-industry vertical division of labor between the two countries is quite apparent in accordance with the levels of technology [9, pp. 108–12] [10, Part. II, Chap. 3]. It may be asserted that the advance of intra-industry vertical division of labor has been the biggest element promoting dependence of R.O.K. on Japan.

As pointed out above, wages in real terms in manufacturing are rapidly rising in the Asian NICs, so much so that comparative advantages in international trade can no longer be retained by these countries in such labor-intensive products as textile products, electric and electronic equipment, sundry goods, and wooden products. Foreign firms that have come to these countries in pursuit of low-wage labor have begun to move on to other areas where wages remain low, while newer foreign private corporations coming to these NICs tend more and more to be concentrated in capital and technology-intensive sectors, machinery in particular. Imports of labor-intensive light industrial products from the NICs in Asia are also soon restricted in advanced countries, accelerating the emigration of export bases from these countries to those still late comers whose exports are not subject to such rigid import restrictions.

Such behavior on the part of private enterprise from advanced countries, especially Japan, while promoting horizontal division of labor in the capital and technology-intensive sectors between Japan and the NICs, has come to place special emphasis on the ASEAN countries as their trade partners in the labor-intensive sector. Let us examine the state of affairs in the textile industry in the ASEAN countries, which remained one of the most important industries in these countries for the 1960s and the 1970s. Their pattern of industrialization clearly is undergoing a change from import substitution to export orientation, now leaving only Indonesia without exports. Exports of apparel in particular have risen fairly rapidly in the 1970s. In 1970, exports of apparel from the four ASEAN countries to the United States were almost nil, but in 1977 they amounted to over 70 per cent of Japan's apparel export to the United States. Japan's ratio of export over import of apparel from the ASEAN countries underwent a very rapid change from 137 in 1965 to 7 in 1970 to 0.2 in 1976, making Japan a deficit country vis-à-vis the ASEAN countries in this category of goods. Export of textile primary products, although small in scale now, will demonstrate a rapid growth in near future.

Rapidly rising real wages in the NICs and the rise of protectionism in advanced countries against labor-intensive goods have come to make it inevitable that the NICs gradually change emphasis in their export structure from labor-intensive goods with simple assembly and processing to ever more capital and technology-intensive goods. But the same constellation of economic forces has given the ASEAN nations the opportunity to open up part of the world market to their labor-intensive goods as well as their traditional resource-intensive products. Thus, new spheres of horizontal division of labor have been opened up in which Japan may have relations with these countries.

CONCLUDING REMARKS: HORIZONTAL DIVISION OF LABOR AND STRUCTURAL ADJUSTMENT IN JAPAN

After all this has been said, it still remains true that the degree to which Japan is engaged in horizontal division of labor is low in comparison with other advanced countries. Herein lies one of the important issues for Japan regarding its trade structure.

It has been claimed that Japan's industrial structure is strongly characterized by its self-sufficient nature in comparison with the United States and West Germany. Not only in the field of such labor-intensive final goods as textile-related and wood-related products but also in the areas of technology-intensive final goods (such as electric and electronic equipment and transportation equipment), capital goods (such as general machinery) and even primary input materials and intermediate products such as iron & steel, nonferrous metals, and basic chemical products, Japan depends minimally on foreign supplies, most needs being supplied domestically. This indeed seems an obvious feature of the Japanese industrial and trade structures.

Incorporating roundabout production from upstream to downstream as an all inclusive system in its industrial structure, Japan induces only small incremental increases in its imports corresponding to a unit expansion of domestic production of a certain category of goods. In 1977, the share of manufactured goods in the total import of Japan was 23 per cent, while the same ratio for West Germany was 58 per cent, Great Britain 55 per cent, Canada 73 per cent, France 59 per cent, Netherlands 54 per cent, and the United States 52 per cent. The 1977 per capita import of manufactured goods amounted to \$21 in Japan, less than half of \$41 in EC countries and \$50 in the United States. The self-sufficient nature of the Japanese economy in manufacture seems quite obvious.⁸

With the nearly total destruction productive facilities during World War II and a huge population to support, Japan naturally sought a basis for its economic activities first and foremost in the final products industries which were labor-intensive and capital-saving. Furthermore, for a long time in the postwar era Japan's economic growth was limited by the ceiling imposed by the balance of payments constraint, making it an important national goal to do away with this constraint. Development of iron & steel, chemical, metal, and other primary input material industries was precisely aimed at meeting this challenge, and it was on this basis that the key industry in current economic growth in Japan, i.e., the machinery manufacturing sector, subsequently came to flourish. In addition, Japan had a unified and huge domestic market of 100 million people, enough to support a complete set of industries from materials to final products. Japan also was a lone industrial state in the Far East with no neighboring industrial countries with which to effect a horizontal division of labor. Japan lacked the good fortune of having a regional organization for cooperation, like the European

⁸ On the self-sufficient nature of the Japanese industrial structure, see [8, Part 3, Chap. 1] [7] [19, Chap. 5, Sec. 4].

Community, in which a horizontal division of labor could be promoted. The self-sufficient nature of Japanese industry thus was only strengthened.

This characteristic of Japanese industry was also reinforced by a series of postwar protectionist policies. It was only around 1965 that Japan's international balance of payments started to show favorable figures on a continuous basis. The accumulating surplus thereafter did not bring forth a revaluation of the currency until December 1971 when the Smithsonian multinational currency adjustment took place. Between around 1965 and 1971, Japan maintained the yen at the rate of ¥360 to a dollar, which was indeed very favorable for Japan's competitiveness abroad, aiding for Japan's export promotion and import restriction. Japan was an obvious beneficiary of the IMF fixed exchange rate regime. Even after the institution of the float in March 1973, it is generally held, the Bank of Japan intervened in the exchange market to maintain a cheap yen for some time. Such a movement of the exchange rate apparently worked to orient not only industries with comparative advantage but also those with comparative disadvantage toward the export market. It also served as an important factor in making the Japanese industrial structure self-supplying by penalizing imports. Beyond these effects of the exchange rate, rather rigid non-tariff barriers in comparison with other advanced countries were imposed. These barriers remained in effect until about 1964 when Japan joined the GATT, but even after this date aluminium, computers, and other "protected industries" continued to enjoy protection. Effective until around the mid 1960s, they certainly served to reinforce the self-sufficient nature of Japan's industry.

Needless to say, the ideal structure of the industry of a country would be to specialize in commodities with comparative advantage in view of the country's endowment with such production factors as capital, labor, natural resources, and technology, to supply them to the domestic market, and also to export them, while curtailing production, and if possible stopping production altogether, of those commodities with comparative disadvantage, and importing them. In this context, the self-sufficient character of the Japanese industrial structure is not merely irrational but definitely a defect likely to cause trade frictions with other nations.

It seems high time that Japan should plunge into a new period when comparative advantage would dictate the pattern of industry and thus derive maximum benefit from trade and rational economic activities. The most powerful impetus propelling Japan in this direction has been provided by the rising NICs of Asia. Their industrializing efforts amount to the emergence of partners with whom Japan can expand the spheres of horizontal division of labor. Japan should take this newly emerging situation as a golden opportunity to accomplish policy objectives of industrial adjustment and expanding horizontal division of labor.

Making structural adjustments in declining industries in Japan affected by the challenge of the NICs does not seem so difficult. The potential for growth in Japan's industrial sectors seems far larger than that in other advanced countries, but more important in the light of the discussing above is the following. As has been described, the NICs in Asia are suffering from large and ever growing trade

deficits vis-à-vis Japan under their processed-exports-oriented industrialization pattern. Japan is faced with challenges from the Asian NICs in declining industries, but on the other hand, is enjoying a large-scale trade surplus with them, making Japan a beneficiary in this sense. The costs of industrial adjustment under such conditions would easily be matched by the benefits accruing from expanding exports of producers' goods.

Japan's failure in this respect would only perpetuate and magnify trade deficits of the Asian NICs, which then would possibly be forced to restrict imports of producers' goods from Japan and adopt a costly policy of rapidly attaining self-sufficiency in producers' goods. And the cost to Japan itself of sabotaging this needed adjustment would be the non-execution of its proper policy objective of attaining a horizontal division of labor.

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