Intra-Industry Trade and Direct Investment

By Dr. Wakasugi Ryuhei

Growth of intra-industry trade

The following two characteristics have been noted regarding Japan's international trade: (1) a noticeable growth in the industries with high income-elasticity such as automotive, home electric appliances and high-tech products including semiconductors and computers; and (2) an increase of import as well as export of these products. In contrast to the traditional trade theory that indicates "the more combinations of factor inputs invested in the manufacture of products differs and the more the factor endowment differs, international trade will be more lively," intra-industry trade, or trade in product sectors that employ comparatively similar combinations of production factors, is expanding.

This phenomenon can be understood by looking at Table 1, which shows the annual rate of increase (%) in imports since 1980. Exports of electrical machinery products, as well as imports, have increased and the rates of increase have all been higher than the total trade figures.

Changes in the intra-industry trade indices for the electrical machinery industry are shown by actual results in the graph which follows. This data leads us to deduce that intra-industry trade is developing rapidly because, while the figure was 0.25 prior to 1987, it rose to 0.35-0.4 during the early 1990s. (Note: Intra-industry trade indices are calculated by $1 - [\,|x-M|\,/\,(x+M)\,]$, where x is export and M is import.)

Horizontal and vertical division of labor

Intra-industry specialization between two countries occurs for two reasons. First, even when the labor force and capital required for production exists in equivalent quantities, and technological standards are equal, if manufacturing economies of scale exist it is possible for both countries to specialize in separate products. We can cite the following examples: Japan specializes in the semiconductor manufacturing of DRAMs and imports CPU and MPU from the U.S. Japan produces standard vehicles and imports luxury cars from Europe, and, imports color televisions from neighboring Asian countries and exports audio equipment, fax machines, and TV cameras to them. This can be thought of as international division (horizontal division) of labor among different product sectors within the same industry.

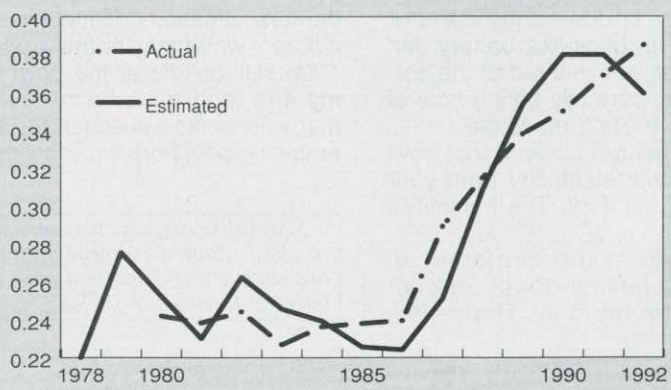
In contrast, international division of labor, such as importing parts for the VTRs, televisions, musical instruments, or computer components from other countries, then assembling them at home, and re-exporting them, or the reverse, producing the parts in Japan, exporting them, and then importing the finished products (vertical division), is another form of intra-industry trade. In this form of division there are not only profits from economies of scale, but differences in the quantities of labor and capital existing in both countries. When one country specializes in labor-intensive industries while the other concentrates on capital-intensive industries, manufacturing costs are reduced and profits are increased.

In order for this type of division of labor within the same industry to work it is a precondition that there be no disparities in technological levels between Japan and those of its trading partners because when there is a large technological gap neither specialized manufacturing of similar products nor international specialization of the production process for the same product sector can be achieved.

Table 1

	Total Trade		Electrical Machinery	
	Exports	Imports	Exports	Imports
1980-84	11.2	5.0	15.9	11.4
1985-89	10.3	9.7	13.0	25.2
1990-92	7.3	3.5	7.8	8.6

Graph 1 Intra-Industry Trade Trends



Japan has imported technical expertise from the U.S. and Europe, further refined it, and raised its technological level. As a result, there is no large disparity in technological standards between Japan, Europe, and the U.S. Disparities still exist, however, between technological standards in Japan and in the newly-developing nations of Asia. In order to eliminate these technology gaps technology transfers such as patent contracts and production know-how, replication and technical instruction through reverse engineering, and a variety of other methods may be undertaken. But the optimum method of transferring the expertise required in the manufacturing process is direct overseas investment. Direct overseas investment by Japanese corporations in Asia increased from the latter half of the 1980s and local manufacturing technology has improved markedly. This was not unrelated to the increase in intra-industry trade.

Strong yen and direct overseas investment

Direct overseas investment by the Japanese manufacturing industry has increased rapidly since 1986. The primary factor in this has been the shifting of manufacturing sites overseas where production costs are low. This new development was necessitated by the loss of international competitiveness brought on by a rise in the relative cost of labor due to the strong yen. Local companies comprise the largest percentage (with Japanese companies coming in second) of business partners (suppliers of capital goods and parts or sales customers) of the companies who have shifted manufacturing sites overseas. This can be seen in Table 2.

In 1990 the Japanese companies that invested in Europe and the U.S. procured more than 40% of their goods from Japan and those that had direct investments in Asia exported more than 10% of their sales to Japanese corporations. In this way direct overseas investment has enabled division between manufacturing processes and the horizontal division of product sectors in multinational firms, resulting in an expansion of intra-industry trade according to available trade statistics.

Intra-industry trade and direct overseas investment

So far I have developed the hypothesis that intra-industry trade has expanded due to factors such as changes in import-export structures caused by exchange rate fluctuations and expanded internal multinational corporation trade transactions as a result of increased direct overseas investment. In closing I would like to test whether or not this hypothesis can be supported statistically with previous data.

$$Trade_t = a_0 + a_1 EXCH_{t-1} + a_2 FDI_{t-1}.$$

Table 2

	North America	Europe	Asia
Supplier			
Local company	43.9	44.4	45.2
Japanese company	52.6	40.7	38.8
Other	3.5	4.9	6.0
Customer			
Local company	93.5	95.5	69.5
Japanese company	3.3	1.2	11.8
Other	3.2	3.3	18.6

Source: Ministry of International Trade and Industry, *Fourth Basic Survey on Japanese Business Activities Abroad*

An oft-seen pattern: after semiconductor manufacturers have completed technology-intensive processes in Japan, PCs undergo labor-intensive assembly in various ASEAN countries and are then shipped back for sale to Japan.

In this equation "$Trade_t$" refers to intra-industry trade indices at the period "t," "$EXCH_{t-1}$" means the exchange rates for the period "t-1," and "FDI_{t-1}" is the outstanding direct overseas investment at the end of period "t-1." Annual data for the electrical machinery industry from 1978 to 1992 was used for this estimation. As illustrated by the estimated figures in Graph 1, increases in intra-industry trade are sufficiently borne out by exchange rate fluctuations (the strong yen) and expanded direct overseas investment.

Assuming that Japan's trade structure will change in the future, an extremely interesting argument can be made that up until now the development of intra-industry trade has been brought about by direct overseas investment. In the future a large portion of Japan's international trade will undoubtedly depend upon expanded intra-industry trade based upon economies of scale. Therefore, Japanese corporate overseas development will be an indispensable element of expanded trade profits in the future. This conclusion contradicts the naive attitude that corporate multinationalization through direct overseas investment will "hollow out" the Japanese economy and reduce its profitability.

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