

Trade, Investment and Division of Labor in East Asia

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—Contents—

Introduction	1
1. Mechanism of East Asia's Economic Development	1
1.1 Mechanism of virtuous cycle of investment and trade	1
1.2 Is development of East Asia efficient, or inefficient?	5
2. Direct Investment, Technology Transfer and Social Capability	7
2.1 Spreading process of Asia's industrialization	7
2.2 Technology transfer, technology absorptive capability and social capability	12
2.3 Technology transfer pattern in Asia	15
2.4 Asia's social capability	19
3. New Development of the Division of Labor in Asia	22
3.1 Rise of China and division of labor in Asia	22
3.2 Asian trade and regionalization	25
3.2.1 Effect of Free Trade Arrangement (FTA)	25
3.2.2 AFTA and its effect on Asian trade	27
3.2.3 Division of labor in Asia and regionalization: Promotion of ASEAN+3 framework	31
Conclusion	35

Introduction

The development of the East Asian economy up to the mid-1990s drew world attention as a “miracle.” The World Bank described the economic growth of the region as miracle since it achieved not only a “rapid growth” but also a “shared growth” (World Bank 1993).

It was not that no one raised questions about the miracle. For instance, points made by Krugman (Krugman 1994) are well known. Some people maintain that the currency crisis that broke out in 1997 and the economic stagnation in 1998 stemmed from the structural stain of the East Asian economy. However, many Asian countries saw their economy recover rapidly in and after 1999 and the emergence of China as an economic power has brought new challenges and a new dynamism to this region. Moreover, moves to establish new cooperative frameworks in Asia, such as free trade agreements and economic partnership agreements, are rapidly progressing. After the currency crisis, the Asian economy is facing new challenges but at the same time it has a new dynamism and potentials for development.

In this paper, I would like to highlight the region’s dynamism by analyzing the factors behind East Asia’s high growth up to around 1997, when the currency crisis broke out, from the aspect of capital accumulation, direct foreign investment, technology transfer, and the division of labor. I will also study what the new trends in East Asia are and what impacts they may have on future Asian economy and division of labor, and examine the possibility of Asia’s sustainable development and its condition.

1. Mechanism of East Asia’s Economic Development

1.1 Mechanism of virtuous cycle of investment and trade

Studies on economic development traditionally stress the importance of capital accumulation. The Harrod-Domar model and Lewis model are typical examples of such an approach. Studies made during the 1960s and the 1970s attached importance to technological progress. Recently, a new growth theory that analyzes the role of intellectual and human capital has been drawing attention. Although the importance of physical capital accumulation has relatively decreased, it is still one of the most important production factors. Moreover, it is often difficult to separate physical capital from technological progress.

For this reason, I would like to analyze the situation of capital accumulation as a starting point to understand the development process in East Asia. Under an open economic system, capital accumulation is financed not only by domestic but also by foreign savings, and positive utilization of foreign capital facilitates early realization of

economic take-off and high growth. Therefore, it is necessary to look at capital formation (investment), domestic savings, and foreign capital introduction at the same time. Viewed from these points, the development process in East Asia can be characterized as follows.

First, capital was accumulated rapidly in many East Asian countries. It was reflected in the sharp rise of the investment rate, or the rate of investment to gross domestic product (GDP) (Table 1). The investment rates of East Asian countries, except for Taiwan and the Philippines, stood at around 20% in the 1980s but rose to 30% or higher in 1990s. In the case of Taiwan, it can be said that the economy has reached a maturity stage, as capital accumulation was under way since the 1950s. On the other hand, in the case of the Philippines, investment activity and the economy as a whole remained stagnant until the mid-1990s due to its high-risk environment.

Second, the savings rate of each country also rose sharply. I cannot afford to spend time dwelling on the background behind the savings increase. But among its economic factors are the monetary policies that kept real interest rates on savings in positive territory (setting nominal interest rate at above inflation rate) and the spread of financial institutions. Cultural factors, such as the influence of Confucianism, can be cited. In any case, the fact that savings rate stayed high and kept rising for a long time is one of the main characteristics of East Asia and it supported expanding investment.

Table 1 Ratios of Saving (S) and Investment (I) to GDP in Asian Countries

		1970	1975	1980	1985	1990	1995	1999
South Korea	S	15.4	18.1	23.8	31.1	36.2	35.2	34.2
	I	25.4	18.1	31.7	31.2	36.9	35.2	26.8
	S-I	-10.0	0.0	-7.9	-0.1	-0.7	0.0	7.4
Taiwan	S	25.6	27.1	32.4	32.9	27.4	25.1	26.1
	I	25.6	27.1	33.8	32.9	22.4	24.2	24.3
	S-I	0.0	0.0	-1.4	0.0	5.0	-0.1	1.8
Thailand	S	22.3	20.6	27.1	24.8	31.4	33.7	32.8
	I	26.0	20.6	26.4	24.8	36.8	35.9	20.7
	S-I	-3.9	0.0	-4.7	0.0	-5.4	-2.2	12.1
Indonesia	S	10.6	21.0	29.2	29.8	37.4	30.2	19.5
	I	13.6	21.0	20.9	29.8	36.5	34.0	11.6
	S-I	-3.0	0.0	8.3	0.0	0.9	-3.8	7.9
Philippines	S	20.4	26.8	24.7	28.8	18.6	18.8	14.9
	I	20.0	26.8	30.7	18.8	22.5	15.7	18.6
	S-I	0.4	0.0	-6.0	0.0	-3.9	3.1	-3.7
Malaysia	S	na	23.8	32.9	32.7	32.3	42.6	47.0
	I	na	23.8	30.4	32.7	32.3	41.7	22.3
	S-I	na	0.0	2.5	0.0	0.0	0.9	24.7
China	S	na	na	na	34.5	38.7	41.4	39.0
	I	na	na	na	35.6	34.7	40.8	38.3
	S-I	na	na	na	-1.1	4.0	0.6	0.7

(Source) Asian Development Bank (various issues)

Third, investment rates rose faster than savings rate and it created a gap between savings and investment (saving deficit: negative S-I figures in Table 1). However, the savings-investment gap was reversed shortly after the current crisis, as the countries restrained investment. For example, Table 1 shows that the ratios of S-I to GDP became positive in 1999 and reached high levels in some of the countries.

However, since East Asian countries made investment in excess of savings for a long time, except for a time shortly after the currency crisis, in order to achieve high growth, they made up the savings shortage by introducing foreign capital. There are various types of foreign capital, including official development assistance (ODA), foreign direct investment (FDI), securities investment (indirect investment), and commercial loan, and the importance of each type of foreign capital varies depending on the stage of development.

ODA played an important role in each country until the early 1980s. Later, Asian newly industrializing economies (NIEs), such as South Korea and Taiwan, and advanced ASEAN countries, including Malaysia, “graduated” from ODA (that is to say, they are no longer eligible for aid). Instead, FDI came to play an important role. As Table 2 shows, the shares of FDI in capital formation of Asian countries were at a high level, except for South Korea and Taiwan. It is noteworthy that not only small-population countries like Singapore and Malaysia but also China actively introduced FDI. FDI contributed to the capital formation of the countries and it also promoted industrialization of the receiving countries through technology transfer and management know-how transfer. This point will be discussed in detail in the next section.

Table 2 Importance of FDI Inflows in Asian Countries (Ratio of FDI to capital formation)

	1988-1993 average	1994	1995	1996	1997	1998
China	6.4	17.3	14.6	14.3	14.6	12.9
South Korea	1.0	0.7	0.8	1.2	1.8	5.5
Taiwan	2.9	2.3	2.4	3.0	3.4	0.4
Hong Kong	16.5	20.1	14.6	21.7	19.8	29.6
Singapore	29.2	36.1	25.6	25.6	22.1	17.6
Malaysia	20.7	15.7	15.5	17.0	15.1	13.9
Thailand	5.4	2.3	2.8	3.2	7.8	25.1
Philippines	7.8	10.5	8.9	7.3	6.2	12.8
Indonesia	3.1	3.8	6.7	8.9	6.8	-0.8

(Note) Net-based FDI data (inflow minus outflow).

(Source) United Nations, *World Investment Report 2000*.

Incidentally, the development process of East Asia can be characterized by its integration with the world economy as well as its fast capital accumulation. This point is reflected in the steady rise of the trade dependency rate. For instance, during the period from 1980 to 1997, the ratio of exports of goods and services to GDP rose from 24% to 39% in Thailand, from 24% to 46% in the Philippines, and from 58% to 90% in Malaysia (Note 1). Imports also show a similar trend.

The high investment rate and trade dependency rate created a virtuous cycle in the course of Asian economy's development. That is to say, investment, exports and imports made their mutual increase possible, resulting in reproduction on an expanded scale. Investment enhanced productivity and increased the supply of new products through equipment replacement and establishment of new plants and this in turn increased the international competitiveness of exports. An increase of exports leads to an increase of foreign-currency supply, making it possible to import capital goods, intermediate goods and technology, and this in turn promotes domestic investment. Investment also strengthens the international competitiveness of exported goods. It can be said that this virtuous cycle supported the rapid growth.

What is important in this process is to keep the savings-investment gap and current account at a proper (controllable) level and to sensibly utilize foreign capital so that it would not lead to accumulated debts. There are no clear-cut standards as to the appropriate level of current account deficit and its ratio to GDP. It is generally said that we should keep an eye on current account deficit (savings-investment gap) when its ratio to GDP rise above 5%. However, even if the ratio is slightly higher, it would not pose a serious problem as long as it is financed by long-term capital, such as ODA. Meanwhile, in order to avoid accumulated debt, it is important to introduce foreign capital into the field of export-related industries (including construction of infrastructure for exports) and to increase domestic savings steadily so that they can replace foreign capital by stages (Note 2). It can be said that until the mid-1990s Asian countries were able to meet these conditions by and large, while achieving high economic growth.

Then, why did the macroeconomic instability and the currency crisis take place in many of the countries from 1997 to 1998? I would like to omit detailed explanation here, as the Hayashi report in the same series of this paper focuses on this point. As the cause of the currency crisis, I think the following points are particularly important: (1) Excessive investment based on overconfidence in future growth, (2) Rapid inflow of short-term foreign capital, excessive investment in real estate, and formation of

asset-inflated economy due to speed-before-quality liberalization, and (3) no establishment of modern financial system and increased investment in risky fields due to moral hazard. After 1999, those countries that improved these points achieved economic recovery.

1.2 Is development of East Asia efficient, or inefficient?

By the way, researchers are not necessarily of one accord with regard to the achievement of East Asia's economic growth. Whether Asia's growth was efficient or not has come to be studied actively since Krugman (Krugman 1994) raised questions on the matter, saying that the growth made little contribution to technological progress and was achieved mainly through input of labor and capital. I would like to give my views on this point, while referring to recent study results.

In order to determine if the economic growth was efficient or not, most of the studies measured total factor productivity (TFP) and developed arguments based on the result of the measurement (Note 3). TFP refers to the overall productivity of production factors obtained as the residual in the measurement of the contribution of labor and capital to income growth on the assumption that the real income of an economy is created by capital and labor. TFP serves as a yardstick to determine if an economy grew efficiently or not. Krugman's argument is based on the estimate made by Young (1994) showing that TFP of Singapore and other Asian countries was small. Crafts (Crafts, 1999, p. 149), which comprehensively surveyed various studies and reviewed the problem from a historical point of view reached following conclusions. First, Young's initial estimate tended to underestimate Asia's TFP, particularly in the case of Singapore. But later estimates also show that Asia's TFP is not so strong. Second, Asian Tigers (NIEs) failed to produce good results as compared with the results made by U.S., European countries and Japan in their golden age (1950-1973). Third, various estimates show sharp improvement in China's TFP, but this is due to serious overestimation contained in publicly announced data.

For these reasons, Crafts says his opinion is close to that of Krugman with regard to Asia's TFP, except for Singapore.

However, I would like to make following comments. It is true that, according to the data put together by Crafts, in all of the eight countries studied, the contribution to growth made by capital input was greater than TFP in the 1960-1994 period (1978-1995 in the case of China). On the other hand, in the U.S., European countries, and Japan, TFP was more important than capital input during the period from 1950 to 1973. However, this is a relative question. Capital input was larger than TFP in Asia, but the

contribution of TFP was not zero. In most of the countries, its contribution was about half the size of contribution made capital input. Asian countries' TFP was lower than that of the advanced countries, but I think the 1950-1973 period used for the advanced countries is too close to that used for Asian countries. An appropriate period should be the second half of the 19th century for the U.S. and European countries and the first half of the 20th century for Japan. The analysis made by Hayami (2000, Chapter 5) on the basis of Abramovitz's analysis of data for the more appropriate periods is more persuasive. According to Hayami, both the U.S. until the latter part of the 19th century (around 1890) and Japan of pre-1931 experienced growth dependent on physical capital accumulation and later shifted to growth dependent on technological progress, as the improvement of labor productivity exceeded a rise in capital equipment ratio (Note 4). Second, since growth accounting's estimation method to obtain TFP value contains many problems, it is difficult to discuss the quality of economic growth from the outcome of such estimation alone. The most important point is that the technological progress embodied in capital is not reflected in TFP. The non-detachability of capital and technology makes correct TFP estimation impossible. Chen (1997) and Economic Planning Agency (1998a) describe this point in detail.

Third, as will be discussed in the next section, East Asian countries actively absorbed technology and management know-how through the introduction of foreign direct investment in the course of their development. It would be hard to say that East Asia's economic development characterized by open-door policies combining the above point and the already-described high trade dependency is inefficient.

Table 3 Source of Asian Countries' Economic Growth (1960-1994)
(% year)

	Gross production	Capital	Labor	TFP
China	7.5	3.1	2.7	1.7
Thailand	7.5	3.7	2	1.8
Malaysia	6.8	3.4	2.5	0.9
Indonesia	5.6	1.9	2.9	0.8
Philippines	3.8	2.1	2.1	-0.4
Taiwan	8.5	2.1	2.4	2.0
South Korea	8.3	4.3	2.5	1.5
Japan (1950-1973)	9.2	3.1	2.5	3.6

(Note) TFP stands for total factor productivity.

(Source) Crafts (1999).

In short, TFP cannot prove logically as well as empirically that the development of

East Asia was inefficient for a long time.

2. Direct Investment, Technology Transfer and Social Capability

During and after the 1950s, the economic development of East Asia spread from Japan to South Korea and Taiwan, then to advanced ASEAN countries like Malaysia and Thailand, and to China and Vietnam. Behind this lies the fact that the change in factor endowments (per-worker capital increase and technological advancement) of less-developed countries in the region was faster than that of advanced countries. In Asia, the change in factor endowments was accelerated by active factor movements among them as well as by accumulation of factors (capital and technology). It can be said that the active factor movements were the source of Asia's dynamism. In particular, activities of multinational corporations promoted active capital and technology movements, accelerating the development of Asia.

Here, I would like to focus on technology factors and discuss what characteristics its movement (technology transfer) had in Asia and how it contributed to the industrialization of the region. Since technology is not confined to production technology but is interpreted in a broader sense, including management know-how and marketing ability, we can analyze the effect of direct investment as well by focusing on technology. This point of view also allows us to examine other forms of transfer. The central hypothesis here is that although technology transfer is induced by changes in the industrial structure of technology supplying countries and changes of factor costs, whether the technology transferred will stay in place and contribute to the industrialization of the receiving country depends on the country's social capability.

2.1 Spreading process of Asia's industrialization

The Asian economy that posted rapid growth from around 1960 and in particular from the beginning of the 1970s has many characteristics. Especially, the following two points draw attention. First, industrialization made rapid progress. The change of each country's rate of industrialization, as measured by the ratio of the manufacturing industry to GDP (rate of industrialization of production) and by the share of industrial products in total exports (rate of industrialization of exports), is remarkable. For example, Table 4 shows that the rate of industrialization of exports in four ASEAN countries and China rose sharply from 1980 to 1999.

Second, the rapid industrialization drastically increased the share of industrial products manufactured by Asian countries (excluding Japan) in the world market (Table 5). Since Japan's share increased sharply until the 1980s, its share decreased in and after

the 1990s due partly to catch-up by ASEAN countries and China. Still, East Asia's share (including Japan's) in the world market for industrial goods rose from 18% in 1980 to 28% in 1999.

Table 4 Industrial export by ASEAN and China and their share in total exports

(Unit: \$ million, %)

	1980		1990		1994		1999	
Thailand	2,702	42.4%	15,502	67.2%	32,719	72.6%	45,233	77.4%
Malaysia	3,842	29.7%	17,053	58.0%	43,930	74.7%	69,405	82.1%
Indonesia	1,489	6.8%	11,363	44.3%	20,083	50.1%	25,676	52.8%
Philippines	2,395	41.6%	6,149	76.0%	10,599	79.7%	32,692	93.3%
ASEAN 4	10,428	22.2%	50,067	58.1%	96,732	66.7%	140,314	61.9%
China	8,683	47.9%	48,148	77.5%	101,331	83.7%	175,033	89.8%

(Note) Rate of industrialization of exports is ratio of industrial products to total exports.

(Source) UN Trade Data.

Third, Japan, NIEs and some ASEAN countries depended much on the United States as their export market until the 1980s, but their shift to intra-Asia trade became conspicuous in the 1990s (Table 6). This means that the intra-regional market expanded as a result of the long-term high economic growth of Asian countries, making it possible to absorb products manufactured within the region. Incidentally, China, whose dependence on the Asian market was already high in and around the 1980s, decreased its dependence on Asia in the 1990s as it diversified its export markets to the United States and other countries.

Fourth, the industrialization of Asian countries was not uniform. Rather, it was a catch-up process, starting with Japan, followed by South Korea and other NIEs, advanced ASEAN countries like Thailand and Malaysia, and then by Indonesia and Vietnam. The biggest characteristic of Asian economies after the 1980s is that China and advanced ASEAN countries have been closely catching up with Japan and South Korea. Vietnam has joined the catch-up process in the 1990s. This phenomenon is called the "flying-geese-pattern" of development of the Asian region or a multilevel catch-up process (Watanabe 1985, Shinohara, Nishigaya 1996, Kojima 1998b, Tran 1999, etc.).

Table 5 East Asia's Industrial Exports and Share in the World Market

	Industrial exports (in \$ million)			Share (%)		
	1980	1996	1998	1980	1996	1998
World	1,218,950	4,210,615	4,150,602	100.0	100.0	100.0
Japan	134,789	412,462	364,651	11.1	9.8	8.8
South Korea	16,691	118,835	120,405	1.4	2.8	2.9
Taiwan	18,729	115,342	102,782	1.5	2.7	2.5
Hong Kong	19,478	171,772	166,120	1.6	4.1	4.0
Singapore	10,201	110,269	94,510	0.8	2.6	2.3
NIEs-4	65,099	516,218	483,816	5.3	12.3	11.7
Malaysia	3,841	62,326	57,911	0.3	1.5	1.4
Thailand	2,702	39,115	40,297	0.2	0.9	1.0
Philippines	2,395	17,743	26,473	0.2	0.4	0.6
Indonesia	1,489	28,765	21,981	0.1	0.7	0.5
Vietnam	40	3,156	3,744*	0.0	0.1	0.1
ASEAN-5	10,467	151,105	150,406*	0.9	3.6	3.6
China	8,683	133,233	159,914	0.7	3.2	3.9
East Asia	219,038	1,213,018	1,158,788	18.0	28.8	27.9

(Note) * Vietnam's ratio of industrial goods to exports is estimated at 40%.

(Source) UN and World Bank trade data.

This is a phenomenon of industry (manufacturing industry) seen as a whole and the result of successive transplantation of individual industries from developed countries to advanced developing countries and then to less-developing countries. For example, the textile industry was transplanted from Japan to NIEs in the 1960s and 1970s and then from NIEs to China and ASEAN countries in, and after, the 1980s. The home electronics industry, such as television showed a similar phenomenon about 10 years later, followed by the automobile and information-related industries. As a consequence, industrial structures of the countries in the region have been advanced and the division of labor among Asian countries has undergone a rapid transformation.

This so-called flying-geese-pattern of international industrial development stands out not only in the sense that the wave of industrialization spread to the whole region but also in the sense that it accelerated the advancement of each country's industrial structure.

This widening and deepening of the wave of industrialization is exactly the dynamism of Asia.

Table 6 East Asia's Export Market (%)

	Asia		North and Latin America		Western Europe	
	1980	1996	1998	1980	1996	1998
Japan	34.1	37.2	36.3	37.0	23.4	19.1
South Korea	37.2	41.3	37.2	22.9	17.8	19.9
Taiwan	41.4	51.2	42.3	34.9	12.8	13.9
Hong Kong	44.1	49.7	28.6	27.2	21.2	16.9
China	68.8	49.9	9.7	23.6	10.7	16.6
Singapore	48.4	51.0	24.4	22.5	17.4	18.3
Malaysia	59.0	50.8	18.6	24.2	16.7	17.7
Thailand	38.6	45.0	25.7	26.0	24.8	20.5
Philippines	35.9	37.1	41.5	38.6	19.5	21.9
Indonesia	66.6	52.8	14.4	18.4	12.7	17.9
Vietnam	43.8	43.9	0.2	8.4	7.9	37.4
Myanmar	79.9	62.6	3.0	17.5	9.6	16.4
Cambodia	90.5	45.8	0.0	37.1	4.8	16.6
Laos	85.4	78.0	1.7	3.8	10.6	17.5

(Note) For Japan, 1990 and 1999 statistics were used.

(Source) For Japan, *Foreign Trade Overview, December 1990* for the year 1990 and Web site of the Ministry of Finance for the year 1999. For other countries and regions, *ADB Key Indicators of Developing Asian and Pacific Countries, 2000 edition*.

What made the dynamism possible is that, aside from direct investment induction policy and multinational corporations' activities, the countries adopted an extroverted industrialization strategy and behind this lies their efforts toward trade liberalization. To illustrate this point, Asian countries' tariff-burden ratios (the ratio of tariff revenues to total imports) decreased steadily. For example, from 1972 to 1990, the ratio dropped from 14.0% to 4.8% in Malaysia, from 20.3% to 11.6% in Thailand and from 13.2% to 6.9% in Indonesia (Note 5). Thanks to the efforts toward import liberalization, the trade dependency (ratio of total trade to GDP) of the economies in the region increased, promoting the globalization in the field of trade. A study of trade dependency in the period from 1980 to 1999 shows that although it did not change much in countries like South Korea and Taiwan that had already seen a rise by the 1970s, it posted a remarkable rise in ASEAN countries and China. In this process, emergence of new industries with comparative advantage and adjustment of industries with comparative disadvantage were repeated in the countries, resulting in accelerating the division of labor in Asia.

Behind the background of the dynamic division of labor are the facts that Asian countries shifted from export substitution to export-oriented industrialization strategies and that they actively introduced foreign direct investment. The policy change began to take place in NIEs like Taiwan and South Korea in the late 1960s and in ASEAN in the 1970s and picked up steam in and after the 1980s (Note 6).

China enacted the foreign capital introduction law in 1979 and established special economic zones in Guangdong and Fujian provinces the following year and economic

and technology development zones in other coastal provinces in 1984 in order to invite export-oriented direct investment. These policies expanded China's industrial exports and sharply increased the share of industrial products to the country's total exports (Table 4). In particular, foreign-capital corporations made a big contribution. The share of foreign-capital corporations, which stood at almost zero in 1980, rose to 13% in 1990 and to 44% in 1998 (Note 7).

By the way, this flying-geese-pattern spread of industrialization in Asia can be explained by modifying the framework of the Heckscher-Ohlin theorem, a conventional international economic theory, to make it more concrete. In other words, the flying-geese-pattern spread of industrialization is a result of the transformation of each country's comparative advantage structure, and the international transplantation of individual industries is a result of the shift of the industry's comparative advantage from one country to another. And the change or shift of the comparative advantage is a result of a change in each country's factor endowments.

The idea about factor endowments traditionally centers on labor and capital and attaches importance to capital-labor ratio (factor proportion). The characteristic of developing countries is that this ratio is low. Therefore, in order to catch up with advanced countries, they have to raise the factor proportion. On the other hand, division of labor in the industries with different factor intensity is possible between two countries with different factor proportion. For instance, countries with abundant labor force produce and export labor-intensive products and import capital-intensive products from countries with abundant capital. However, as the Leontief paradox suggests, the traditional factor proportion theory does not necessarily explain actual trade patterns. The reason is that in order to prove the factor-proportions theory, various conditions have to be met. One of the main conditions (and perhaps the most important one) is that the technical standard of each country has to be at the same level, which is an unrealistic condition. Since technical gap does exist in reality, it is possible that trade flows in the direction opposite to what the factor-proportions theory suggests. The reason why Japan, which was blessed with relatively abundant capital, was able to export the textile industry, a labor-intensive industry, to labor-abundant Thailand in the 1960s is that there was a technical gap between the two countries. However, if we look at it from another angle, it can be said that trade will begin to move in line with the factor-proportions theory, once the technical gap in an industry decreases or disappears.

Given this perspective, it can be said that the multi-level catch-up process in Asia was a series of efforts on the part of less-developed countries to promote capital accumulation and to reduce technical gap with advanced countries. The shortcut to

narrowing the gap is introduction or transfer of technology from advanced countries. Watanabe (1985) brought up the compression stroke of the Asian countries' development by citing Gerschenkron's "advantage of backwardness" proposition. The advantage of backwardness can be obtained mainly from technology transfer. Since Asia's less-developed countries can save technology development time and cost by introducing technologies from advanced countries like Japan, they can shorten the industrial development and industrialization process and catch up with advanced countries rapidly. Incidentally, the term "technology introduction" is a concept to understand the activities of corporations in less-developed countries, while the term "technology transfer" is often used to understand the process of technology transfer from technology-supplying countries to receiving countries by multinational corporations. Since the main body is different, its activities could be different. However, since transfer is not possible without introduction and since introduction and transfer produce the same results, the two concepts have the same meaning. In this paper, the term "technology transfer" will be used in principle.

2.2 Technology transfer, technology absorptive capability and social capability

Now, it is necessary to clearly define the meaning of technology and technology transfer. Technology is scientific knowledge and method to realize or improve production and distribution of goods and services. Here, I would like to analyze not only narrowly defined production technology (or hardware technology) but also software technologies, including as management skills and management know-how. Technology is embodied in physical capital, such as machinery and equipment, and human capital, such as engineers and specialists, as well as in documents. It is (international) technology transfer that the above scientific knowledge and methods transfer from one country to another.

By the way, how is technology transferred, and through what channels? The most important channels are licensing agreements (LA) and foreign direct investment (FDI). LA is basically transfer of only production technology. On the other hand, FDI is a channel through which managerial resources, including production technology, management techniques and management know-how, are transferred in a package and, in many cases, capital as well. Since FDI is transfer of management resources from a multinational corporation to its joint venture or wholly owned subsidiary, it can be characterized as on-going technology transfer (transferring related technology developed by a parent company to its joint venture and subsidiary sequentially).

Through which channel a particular technology will be transferred is determined by

various factors, including multinational corporation's strategy and receiving country's policy. Since I cannot afford to dwell on this point due to space limitation, only important points will be described below. First of all, what is often pointed out with regard to activities of multinational corporations is asymmetry of information. That is to say, since the buyer cannot realize the value of technology at the same level as the seller, a market is often not viable. For this reason, the transaction cost of transferring technology through LA channels is high. Therefore, in order to overcome the imperfection of the technology market and to save transaction costs, multinational corporations tend to favor intra-firm technology transfer, namely the FDI channel (i.e., technology transfer from a parent company to a subsidiary). This is especially true in the case of advanced technology. However, in the case of transfer of standardized technology, the LA channel can be chosen, as its transaction cost is low. When the receiving country's risk (political and social unrest, etc.) is high, LA would be better than FDI for multinational corporations. When the technology supplier does have production technology but not other managerial resources, like in the case of plant makers, FDI cannot be adopted (Note 8).

On the other hand, developing countries receiving technology transfer could enhance the international competitiveness of industry in a short period and shorten the catch-up process of industrialization by adopting the FDI channel, as FDI is a package transfer of managerial resources and thus is more effective than LA in terms of production increase and overseas market access (Tran 1992 Chapter 3). However, since FDI could lead to economic dominance by multinational corporations, developing countries stay away from FDI or limit equity participation of foreign corporations. This trend was particularly strong until the 1970s. It is against this background that developing countries are advised to adopt new channels (LA or other non-FDI channels, which will be described later). In other words, they are advised to adopt unpackaged transfer of resources. For instance, they should introduce only what they don't have, instead of adopting a package transfer of managerial resources and, in the case of introducing many managerial resources, introduce them from various suppliers one by one. In this case, there is no possibility of being dominated by multinational corporations, but industrialization cannot be achieved rapidly. Tran (1992, Chapter 3) introduced the concept of "catch-up in managerial resources" and advocates a strategy to avoid economic dominance while actively utilizing FDI. It is more efficient if developing countries' dependence on multinational corporations is at various levels in accordance with different stages of industrial development. When its industry is still in an infantile stage, the developing country should make the most of resources and

functions of multinational corporations. But, later it should strive to replace the managerial resources of multinational corporations by accumulating its own managerial resources and reduce its dependence on multinational corporations.

We have just examined two channels – LA and FDI. There are other channels of technology transfer. Among them are turn-key plant contract, under which a foreign company designs, builds, and completes a plant and hands it to the receiving country; original equipment manufacture (OEM) method, under which a foreign company transfers production technology, has a local firm manufacture products, buys up the products and sell them under its own brand; production sharing and contractual business cooperation methods, under which a foreign company carries out projects in cooperation with local government or companies without establishing its own local subsidiary; and build-operation-transfer (BOT) method, under which a foreign company constructs infrastructures, such as highways and bridges, operates them and, after recovering investment and reaping returns on investment, transfers them to local interests. Enterprises, retailers and trading houses of advanced countries can transfer quality improvement and other know-how to companies of developing countries through consignment production and contractual processing.

There are technical gap between advanced countries and developing countries. If technology is transferred through the various channels discussed above, less-developed countries would be able to catch up. However, technology does not necessarily spread from an advanced country to a less-developed country, even if there are technical gap between them. Technical gap offer an opportunity to catch up, but they are not a sufficient condition. What is important is whether less-developed countries are capable of efficiently absorbing advanced countries' technology. The question in this connection is if less-developed countries have technology absorptive capacity.

Technical absorptive capacity is the ability to use introduced technology efficiently and put it firmly in place in the country. However, in order to be successful in introducing technology from advanced countries and catching up in industrialization, the receiving country has to have the ability to spread the introduced technology to the national economy and to shift from standardized technology to advanced technology sequentially. Therefore, what is a more appropriate concept is social capability that encompasses wider fields than technology absorptive capacity.

What is social capability? This concept was first brought up by Kuznets (1968) to explain the success of the Japanese economy. Watanabe (1979, Chapter 1) analyzed the capability of “advanced developing Asian countries' challenge” by classifying social capability into skilled labor, corporate management skills, strong government, and

policy-transformation capability. Abramovits cited educational level, stability of governance, improvement of systems and institutions, and administrative capability to effectively establish and implement rules governing economic behavior as specific components of social capability (Note 9). Minami (1992, pp. 99-100) pointed out human resources, modernization of management organizations and development of information network as Japan's social capability. Inokuma and Mitani (1986) looked at social capability from two aspects. One is individual ability, which is built through long-term education and training at school and the office. The other is organizational ability. To be more specific, it means efficiency of organizations and group-oriented implementing ability, etc. This writer (Tran, 1997, pp.23-28) analyzed the society by dividing it into five constituents or groups (political leaders, bureaucrats, business managers, labor force and intellectuals) and concluded that the capability of each constituent or group and its inter-relationship define social capability. Business managers' capability is entrepreneurship and labor force capability is educational level. But whether they can display their capability depends on the capability of political leaders and bureaucrats. What is required of politicians is the ability to define national goals (catch-up strategy), appoint people of talent from the standpoint of promoting development, and display leadership to muster social energy for development. It goes without saying that bureaucrats must have administrative capability and be morally upright. If politicians and bureaucrats possess such capabilities, it will prompt businesses to actively introduce technology, create environments to start venture businesses, and increase labors' motivation for work under well-defined laws and systems. It was because the above social capability was high that Japan was able to actively introduce technology and created a phenomenon of "investment calling for investment" during the years of high economic growth.

As just described, various opinions on the concept and significance of social capability are virtually in agreement. Components of social capability are understandable but the problem is that they cannot be quantified. For this reason, the best we can do would be to analyze quantifiable education-related indicators (literacy rate, academic backgrounds of labor force, etc.) and make qualitative studies of other factors.

2.3 Technology transfer pattern in Asia

Let's take a look at the actual condition of technology transfer in Asia from the mid-1980s to recent years and its factors, keeping in mind the above-mentioned channels of technology transfer, multinational corporations' activities, and receiving

countries' policies. Multinational corporations' technology transfer became active in the 1960s, when the industrialization process in Asia picked up steam. However, in this paper, I would like to focus on the time in and after the second half of the 1980s, when the yen's steep appreciation and the emergence of NIEs as new technology suppliers stood out. It was also after 1985 that the progress of economic globalization started in full scale.

Around the middle of the 1980s, three trends or incidents had major impacts on technology transfer in Asia. First, Asian countries began to review the role of multinational corporations, as the prolonged world recession triggered by two oil shocks in the 1970s spread to Asian developing countries and as the economic slump began to show signs of long-term stagnation following a decrease in the flow of FDI triggered by restriction on the activities of multinational corporations. Up to the 1970s, multinational corporations were seen as the agents of advanced countries to control and exploit developing countries but now they are seen as the engine for development. Second, the yen's steep appreciation that was triggered by the Plaza Accord (September 1985) created a new wave of Japan's direct investment in Asia, spurring active industrial transplantation and technology transfer. Third, NIEs, including Taiwan and South Korea, shifted in earnest from the countries introducing capital and technology to the countries supplying them and this has resulted in diversifying choice of technology for less-developed countries.

The technology transfer in Asia during this period and its implications can be summarized as follows. First, the expansion of FDI was remarkable. As Table 7 shows the amount of FDI introduced by East Asia accounted for nearly half of the total FDI introduced by developing countries. According to Table 2, the percentage of FDI in each country's capital formation was high. In particular, the FDI share in China, Indonesia and the Philippines posted a long-term rising trend and reached high levels. Japanese corporations aggressively moved into the region as suppliers of FDI. Since money value differs from one period of time to another, it is difficult to make a simple comparison. Still, the direct investment in Asia made by Japanese manufacturers during the period from 1986 to 1989 was larger than the cumulative amount (total of 1951-80 amounts and 1981-1985 amounts) of direct investments made prior to 1985 and the direct investment made in the first eight years of the 1990s was five times as much as the investment made during the period from 1986 to 1989 (8). Not only Japan, but Taiwan and South Korea also, began to make direct investment in Asia in earnest. For example, the accumulated amount of Taiwan's direct investment in ASEAN, which stood at 86 million dollars at the end of 1987, increased by as much as 27 times to stand

at 2.3 billion dollars at the end of 1993. FDI's contribution to Asia's capital formation was important, but more importantly, Asia's economy made rapid growth as the FDI accelerated technology transfer, promoted replacement and new investment through technology transfer, strengthened ASEAN's international competitiveness, and expanded exports. The Asian economy centering on ASEAN during this period is characterized as "direct investment-led growth" (Shinohara and Nishigaya 1996, Kojima 1998b, Urata 1999).

Second, channels of technology transfer other than FDI were also important. Although statistics and materials in this field are limited, fragmentary information can show some of their characteristics. For instance, according to Tran (1990), Japan's technology transfer to Asia not only became active in the second half of the 1980s but also diversified its channels to include FDI, LA, OEM, and consignment production. According to the findings (included in Tran 1993 and Tran 1999) of a questionnaire survey (conducted in October 1990) on Japanese machinery-related companies' technology transfer to Asia, FDI accounted for 56%, LA for 40% and other channels for 4% of the total number of technology transfer to Asia. (Responses were obtained from 342 of the 474 Japanese companies surveyed). As will be described later, the machinery industry was the main supplier of FDI from Japan. But in the course of the sharp increase of technology transfer through FDI, technology transfer through LA also became active.

Third, unlike the period up until the first half of the 1980s, when labor-intensive industry and resources- and capital-intensive industries stood out, the main supplier of FDI to Asia rapidly shifted to the machinery industries in and after the second half of the 1980s, with its share reaching nearly 50% of the Japanese manufacturing FDI to Asia on an approving and reporting basis. In particular, the electric and electronic industry was the leading player, with its share rising to 27% from 10% in the previous period (Table 8). Taiwan's FDI to ASEAN also shows a similar pattern. The electric and electronic industry accounted for 11% of the accumulated amount of manufacturing FDI as of the end of 1987 but its share rose to 26% as of the end of 1993 (Tran 1999). The machinery industry includes labor-intensive fields as it has diversified kinds of products and processes, but it is mainly technology- and skill-intensive industry. The industry-by-industry technology transfer in Asia has been changed in quality.

Table 7 FDI Inflows to Asian Countries

(\$ million)

Order	Country name	1988-93	1994	1995	1996	1997	1998	1999
1	South Korea	956	991	1,357	2,308	3,088	5,215	10,340
2	Taiwan	1,160	1,375	1,559	1,864	2,248	222	2,962
3	Hong Kong	3,689	7,828	6,213	10,460	11,368	14,776	23,068
4	Singapore	3,982	8,550	7,206	8,984	8,085	5,493	6,984
5	Asian NIEs	9,787	18,744	16,335	23,616	24,789	25,706	43,354
6	Malaysia	3,320	4,581	5,816	7,296	6,513	2,700	3,532
7	Thailand	1,899	1,343	2,000	2,405	3,732	7,449	6,078
8	Philippines	770	1,591	1,459	1,520	1,249	1,752	737
9	Indonesia	1,269	2,109	4,346	6,194	4,677	-356	-3,270
10	Vietnam	319	1,936	2,349	2,455	2,745	1,972	1,609
11	Cambodia	44	69	151	294	168	121	135
12	Laos	10	59	88	128	86	45	79
13	Myanmar	137	126	277	310	387	315	300
14	ASEAN 8 countries	7,768	11,814	16,486	20,602	19,557	13,998	9,200
15	China	8,852	33,787	35,849	40,180	44,236	43,751	40,400
16	East Asia's total	26,407	64,345	68,670	84,398	88,582	83,455	92,954
17	Asia's total	27,113 (58)	65,954 (63)	71,654 (64)	87,952 (61)	93,518 (52)	87,158 (49)	96,148 (46)
18	Developing countries' total	46,919	104,920	111,884	145,030	178,789	179,481	207,619

(Note) Asia excludes West Asia and Central Asia. Figures in parentheses in "Asia's total" are Asia's proportions in developing countries' total.

(Source) UNCTAD, *World Investment Report 2000*

Table 8 Japan's Direct Investment in Asia: 1951-2001 (Notified amount, \$ million)

	1951-80	1981-85	1986-89	1990-97	1998-2001	2001
Manufacturing	4,571	2,946	8,074	42,442	17,153	3,849
1. Food	148 3.2%	108 3.7%	795 9.8%	1,541 3.6%	1,713 10.0%	586 15.2%
2. Textile	920 20.1%	262 8.9%	387 4.8%	3,212 7.6%	687 4.0%	90 2.4%
3. "Other" manufacturing	524 11.5%	272 9.2%	1,010 12.5%	6,462 15.2%	1,803 10.5%	372 9.7%
4. Light industry (1 + 2 + 3)	1,592 34.8%	642 21.8%	2,192 27.1%	11,215 26.4%	4,204 24.5%	1,049 27.2%
5. Lumber - pulp	142 3.1%	49 1.7%	260 3.2%	830 2.0%	277 1.6%	38 1.0%
6. Chemical	701 15.3%	591 20.1%	786 9.7%	6,796 16.0%	2,595 15.1%	563 14.6%
7. Iron/nonferrous metal	1,032 22.6%	665 22.6%	881 10.9%	4,546 10.7%	2,251 12.9%	394 10.2%
8. Heavy chemical (5 + 6 + 7)	1,895 41.5%	1,285 43.6%	1,927 23.9%	12,172 28.7%	5,087 29.7%	995 25.9%
9. Machinery	273 6.0%	307 10.4%	806 10.0%	3,625 8.5%	1,271 7.4%	278 7.2%
10. Electrical	544 11.9%	289 9.8%	2,515 31.1%	11,230 26.5%	3,983 23.2%	1,034 26.9%
11. Transportation	267 5.8%	425 14.4%	633 7.8%	4,198 9.9%	2,606 15.2%	492 12.8%
12. Machinery total (9 + 10 + 11)	1,084 23.7%	1,021 34.7%	3,954 49.0%	19,002 44.8%	7,861 45.8%	1,805 46.9%

(Note) Percentage figures are proportions in manufacturing industry. Yen-based data were converted at year-end rate.

(Source) Ministry of Finance. Figures for 1998 through 2001 are from the Ministry of Finance website (<http://www.mof.go.jp>).

2.4 Asia's social capability

When we examine Asia's social capability, I think we should investigate not only each country's social capability, such as the labor force's education level and corporations' R&D activities but also the impact of the dynamism of the region as a whole on each country's social capability. In this section, I would like to look at Asia's social capability from two angles.

First, let's take a look at Asian countries' educational standard and human resource development. In Asia, education is emphasized, especially in the northeast region, like South Korea, due to the influence of Confucianism and in the southeast region, like Malaysia, due to the influence of overseas Chinese or the development performance of the northeast region, as show by the Look-East policy. Asia's educational indicators, such as the adult literacy rate and advancement rates in junior and senior high schools are higher than in other regions and have been rising from a long time (data of ADB). It is often pointed out that these results helped accelerate economic development. For instance, the World Bank (1993) cited education-focused policies as one of the main

factors that have brought about East Asia's miracle and presented figures showing higher education standards in East Asian countries than in other countries with the same level of per-capita income. According to ADB (1997, p.174), government spending on higher education in East Asian countries posted an average annual growth rate of 7%, far higher than in other regions. As a result of these efforts, UNDP (1999) classified Asian NIEs as a "high human development" group along with advanced countries. China and ASEAN countries are classified as a "medium human development" group.

Many studies show that human resource development, including education, accelerates economic growth through its contribution to higher productivity (Note 10). For less-developed countries, such human resources are an important condition to utilize the advantage of backwardness, centering on technology transfer. As stated by Rosenberg (1982, pp.247-249), who has great achievements for his profound insight into the history of technology and economic development, countries that have been most successful in introducing technology from other countries are those countries whose people are well educated.

Another characteristic is that in the course of enhancing educational standards, Asian countries sent many students to advanced countries, mainly to the United States. According to Yasuba (2000), the number of students studying abroad is extremely high in East Asia, standing at 0.122 per population of 1,000, almost 10 times as much as the average in other regions, which stands at 0.014.

Although the overall characteristic of human resources in Asia is as mentioned above, a detailed study shows that it varies from one country to another. As Low (1998) points out, there is not much difference among the countries in the region with regard to the spread of elementary and secondary education, as they have same levels of access to official development assistance. However, the situation differs greatly among the countries with regard to higher education. Tran (1986) shows that South Korea not only caught up rapidly with Japan in terms of the advancement rate in high schools, its content was also extremely favorable to the industrialization of the country. In other words, the composition of South Korean university and graduate school students shows that the ratio of science and engineering students and the percentage of students studying abroad are higher than those in other countries.

By contrast, for instance, labor market mismatch is often pointed out in Thailand, where the so-called educated unemployment of college graduates is on the increase, while there is a serious shortage of engineers and middle management executive at Japanese-affiliated companies.

In order to assimilate and improve technologies introduced, it is necessary for local

companies and government to promote research and development. Asia can be evaluated highly on this point as well. According to a study, the ratio of R&D expenditure to GDP in East Asia stood at 0.75% for the period from 1960 to 1992, three times as high as the average for other regions (Yasuba 2000). In particular, the comparable ratio in South Korea stood above 2% in and after the 1980s. (Note 11)

Next, let's take a look at the relations between regional interaction and social capability.

It can be said that the following three factors, that characterize the development process of over thirty years of the Asian region as a whole, accelerated technology transfer by strengthening and enhancing each country's social capability, leading to the spread of industrialization.

First, it is the demonstration effect of policies. The success of Japanese economic development strategies, such as industrial policies in the 1950s and 1960s, inspired South Korea and Taiwan and stirred their nationalism. They first adopted an import substituting industrialization strategy but shifted to an export-oriented industrialization strategy in view of the constraint of the size of their domestic markets and world market opportunity. The policy shift of South Korea and Taiwan had demonstration effects on ASEAN countries like Thailand and Malaysia that had been adopting import substituting industrialization strategies and restrictive policies against the activities of multinational corporations, and finally stimulated economic reform and open policies of China and Vietnam. Since these policies were "market-friendly" (World Bank 1993) and helped build an environment encouraging investment by private companies, including multinational corporations, technology transfer was accelerated. Improvement of policies and systems are an essential factor for the enhancement of social capability.

Second, since wealth of economic information was collected, analyzed and communicated extensively as a result of the aggressive promotion of regional cooperation, it helped greatly to reduce corporations' investment risks. Over the last 30 years or so, various forums to analyze and discuss Asia's economy from various angles were established, including the Pacific Trade and Development Conference (PAFTAD), the Pacific Economic Cooperation Council (PECC), and the Asia Pacific Economic Cooperation (APEC). Since the outcome of the discussions and analyses were extensively communicated, it broadened people's knowledge on economic and social situations and policies, reduced future uncertainties, and promoted private-sector investment, including multinational corporations' activities.

Third, the transfer cost, on which the hypothesis that technology transfer cost is low in Asia, does not mean royalties paid for technology, but ancillary costs to transfer and

absorb the technology. There are personnel costs and communication and transportation costs concerning explanation of the basic characteristics of technology before the start of commercial production, various trainings, and improvement of the technology. According to Teece (1977), these transfer costs account for 19% of the total cost for an average technology transfer project. In addition, if something unexpected happens, it may become necessary to communicate with the technology supplier by phone or telex, or dispatch experts. If these points are taken into account, it can be said that the transfer cost between countries with close geographical and cultural proximity is low. This is especially true in East Asia. But, various examples show that a similar effect can be expected in other regions. For instance, in the case of technology transfer from NIEs to ASEAN, the transfer costs can be reduced by using the networks of overseas Chinese. In the case of technology transfer from Japan, transfer costs can be reduced by using corporate networks in Japan (relations between general trading companies and manufacturing companies, corporations in the same business groups, etc.) or networks of Japanese-affiliated companies in Asia established through accumulated investment since the 1960s.

It can be said that these factors formed regional interaction or regional externalities in Asia, beefed up each country's social capability and thereby accelerated technology transfer.

3. New Development of the Division of Labor in Asia

The Asian economy has entered a new phase due to the following two movements since the second half of the 1990s. One is the rise of China and the other is the development of regionalism.

3.1 Rise of China and division of labor in Asia

The Chinese economy has been affecting the world economy and the Asian economy, in particular, with its sheer size and the speed at which it is developing. On the other hand, the Japanese economy has remained stagnant since the beginning of the 1990s and its influence on the world economy has been declining. For example, from 1990 to 2000, Japan's share of world exports dropped from 8.5% to 7.6%, while China's share rose from 1.9% to 4.4%. What impact does the rise of China have on the division of labor in Asia? Let's look at it from both trade and direct investment aspects.

First of all, it can be pointed out that Chinese products, backed by rapid industrial development, have expanded their shares in leading markets in the world, eroding the shares of ASEAN and other countries with the same comparative advantage structure.

For example, China's influence has increased in the Japanese market. China's share in Japan's total imports exceeded that of the United States in 2002, making China the largest exporter to Japan. In addition, due to the Chinese offensive, the shares of ASEAN countries have decreased, mainly in labor-intensive fields. In 1990, China's share in Japan's imports was half that of the combined share of five ASEAN countries (Thailand, Malaysia, the Philippines, Indonesia, and Singapore), but in 2000, the Chinese share exceeded that of ASEAN. In textiles and clothing, China has come to account for 70% of Japan's imports. In the case of home electric appliances, China's share, which was only about one-third that of ASEAN in 1990, reached the same level as ASEAN in 2000.

This trend will further increase, as China joined the World Trade Organization (WTO) in 2001. There are at least two reasons for this. First, since various forms of discrimination that Chinese products suffered will be eliminated (the United States gave China most-favored-nation status in September 2000 ahead of the country's entry in the WTO), it will make it easy for Chinese goods to enter the world market. Second, since China opens its various service markets as a result of its entry in the WTO, it will promote introduction of foreign capital to its export/import operations and this, in turn, will enhance the efficiency of export operations, leading to strengthening China's international competitiveness.

Meanwhile, Asian countries' exports to China are also expected to increase, as entry into the WTO will increase China's imports. However, since China's imports of manufactured goods are mostly in the high-tech field and capital goods, the countries reaping greater benefits in the medium term will be limited to those having high technological standards, such as Japan and South Korea. In order for ASEAN countries to increase their share in the Chinese market, it will be necessary to upgrade their industrial structure and commodity export structure.

Next, let's examine what impact the rise of China would have on direct investment.

Amid the yen's steep appreciation triggered by the Plaza Accord of September 1985, Japanese companies rapidly expanded their businesses into East Asia. First, they advanced into NIEs, such as South Korea and Taiwan, and from around 1987 into Thailand, Malaysia and Indonesia.

In the 1990s, Japanese and other countries' companies began to focus on China as the market for direct investment. According to a questionnaire survey conducted by JETRO in April 1993, China topped the list of favored investment destinations of Japanese companies in all of the 18 categories of industry covered. By contrast, ASEAN, though it remained the second favored destination for six of the 18 industries,

lost its ranking in other industries (Aoki 2001, p.7).

Direct investment in ASEAN increased again in 1994-95, as the yen again appreciated sharply, but since the currency crisis it began to show a downward trend. Instead, investment in China increased sharply. The year 1992-93 symbolized the shift of foreign direct investment to China. The amount of direct investment in five advanced ASEAN countries posted a year-to-year increase of 31% to 29.3 billion dollars (on an approval basis) in 1992, but it suffered a year-to-year decrease of as much as 41% to 17.2 billion dollars in 1993. By contrast, the approved amount of direct investment in China in 1992 posted a five-fold increase to 58.1 billion dollars and it nearly doubled to 111.4 billion dollars in 1993.

According to the above-mentioned Table 7, the average annual amount of direct investment in ASEAN-8 was larger than that in China during the 1986-91 period but the tide was reversed in 1992 and the gap widened, resulting in investment in China standing four times as much as that in ASEAN in 1999. As just described, foreign direct investment was concentrated in China during the 1990s. But this does not mean that investment in other Asian countries remained stagnant, with the exception for Indonesia, after the currency crisis. Though China remains a big pressure, it is possible to introduce direct investment to other Asian countries by ensuring currency stability and developing investment environments.

Although direct investment in China is expanding due to the sheer size of the market and on great expectations of accelerating economic reform and open door policies brought on by the country's entry in the WTO, expectations for ASEAN will also remain great. The findings of various studies made recently show that ASEAN countries are still viewed as promising investment markets, as they, like China, have abundant cheap labor, the possibility of expansion of the local markets, and the accumulation effects brought on by the advance of Japanese-affiliated companies. Although China has advantages, there is also a tendency to attach importance to ASEAN, as concentrating investment in China is not advisable from the standpoint of diversifying risks. Incidentally, according to a survey (multiple choice) conducted by the Japan Center for Economic Research in September 2002, 70% of responding corporations operating in China chose "sudden policy change" as the risk involved in doing business in China. Around 40% of the respondents chose intensifying competition and violation of intellectual property rights.

Japan Bank for International Cooperation conducts a survey every year, asking Japanese corporations which country they view as a promising investment market in the medium term (three years). The findings of the survey in the last five years (1997-2001)

show that China and the United States ranked first and second due mainly to their economic magnitude. However, five larger ASEAN countries including Vietnam always came within top ten, except for 2001, when the Philippines yielded 10th place to Singapore.

Although the rise of China has drastically changed Asian trade, if ASEAN and other Asian countries improve environments for direct investment and upgrade their industrial structures, they can take advantage of the opportunity in the Chinese market and continue to introduce direct investment.

3.2 Asian trade and regionalization

As we have discussed so far, Asian economies have deepened relationships of interdependence. A de facto integration of the economies has advanced through trade and investment. In other words, it can be said that a regional economic zone has been formed by market force in Asia.

However, in the 1990s, Asia made progress toward institutional integration of the economies and the move was rapid, particularly in the late 1990s. The first case of institutional integration is the ASEAN Free Trade Area (AFTA). Recently, Japan, South Korea and China have intensified their efforts to create a free trade area. In the rest of this paper, I would like to analyze the effect of AFTA on Asian trade and introduce Chinese and Japanese moves, after describing the Free Trade Area (FTA) theoretically.

3.2.1 Effect of Free Trade Arrangement (FTA)

The FTA is designed to abolish discriminatory tariff barriers and non-tariff barriers for domestic companies and companies of other member countries to liberalize intra-region trade. As a result, a member country will decrease its inefficient product and imports from other member countries capable of producing more efficiently. This is trade creation effect. However, while abolishing trade discrimination against member countries, FTA creates new discrimination in trade with countries outside the region. In other words, since member countries maintain tariff and non-tariff barriers against countries outside the region, there is a possibility of diverting imports from conventional exporting countries outside the region to inefficient-production countries within the region. This is called a trade diversion effect. Since the trade diversion effect means member countries importing goods at higher prices and reducing trade with countries outside the region, it will bring about an inefficient division of labor. If the trade creation effect is strong enough to offset it, the FTA can be justified.

In order for the trade creation effect to be strong, the tariff and non-tariff barriers of

members countries have to be high and member countries have to be main trading partners with each other before the establishment of an FTA. And in order for trade diversion effect to be weak, the export structure of main countries outside the region has to be different from the export structure of member countries.

Note that the above argument is an analysis of static effects by taking only one-time change into consideration. FTA also has the following long-term dynamic effects.

Firstly, the establishment of an FTA expands the markets of the whole area beyond a small market of one country and this will create economies of scale in production. In this connection, production tends to be consolidated into locations where finished goods and intermediate goods can be produced efficiently. This concentration effect of production will strengthen the international competitiveness of goods produced by countries within the region, producing a dynamic trade creation effect.

Secondly, the establishment of an FTA will increase direct investment from countries outside the region and promote technology transfer and industrial transplantation, raising expectations for economic development and export expansion of the countries within the region. This is due to the following three reasons. One of the reasons is that since companies outside the region can not only supply goods to the intra-region market efficiently by taking advantage of the above economies of scale, but also produce competitive final products by using intermediate goods and parts procured in the countries in the region at low costs (free of duty) and export them to the market outside the region, it will induce direct investment. The second reason is that the trade diversion effect increases direct investment. In other words, since conventional exports become difficult for companies outside the region, they substitute direct investment for exports. This is a kind of direct investment diversion effect and a shift from investment and production in countries outside the region to investment and production within the region. Another reason is that since the establishment of an FTA is expected to reduce the country risk and uncertainties of the countries in the region, it will increase direct investment by companies both within and outside the region.

Thirdly, since competitive pressures within the region intensify, member countries have to strive for the improvement of productivity and use efficient production and management methods. In addition, the inefficient industrial structure under protectionist system before the establishment of an FTA is expected to shift to efficient distribution of resources. FTA member countries must strive for structural adjustment, economic reform, elimination of various regulations, and liberalization.

3.2.2 AFTA and its effect on Asian trade

The AFTA concept was put forward by then Thai Prime Minister Anand Panyarachun in June 1991 and its establishment was agreed upon at the ASEAN summit held in Singapore in January 1992. The AFTA Council at a meeting in December 1992 decided to implement the Common Effective Preferential Tariff (CEPT) scheme as a means to liberalize intra-regional trade starting in January 1993. But due to domestic adjustment by member countries, the scheme came into force in January 1994.

Under the initial plan, import tariffs on all industrial goods, including agricultural processed products, were to be reduced gradually to 5% or lower by 2008. Later, ASEAN stepped up its efforts to promote AFTA in response to the rapid change in world situations, including the establishment of the EU and NAFTA. Due to the end of the Cold War, ASEAN had to seek the significance of its existence in the economic field. Against this background, the ASEAN Economic Ministerial Council and ASEAN Summit at a meeting held in Bangkok in December 1995 agreed to accelerate the implementation of AFTA (the target year was moved up from 2008 to 2003) and liberalize farm products and services trade that had been excluded from the original list.

In recent years, the deregulation of trade within the ASEAN region made further progress. The ASEAN Summit at a meeting held in December 1998 decided to inaugurate AFTA one year earlier in 2002 and adopted a plan to totally abolish intra-region tariffs by 2018. Incidentally, in the case of new members, Vietnam, Laos, Myanmar, and Cambodia, the target year for the implementation of the AFTA scheme is 2006, 2008 and 2010, respectively. (Note 12) As a whole, AFTA has been implemented aggressively. Although ASEAN countries are recovering from the currency crisis and economic stagnation, some of them are still suffering from slow growth and they need to promote various structural adjustments, including disposal of non-performing loans and establishment of financial systems. In addition, countries like Indonesia and the Philippines have no choice but to give priority to domestic political problems. Against this background, ASEAN countries as a whole have become somewhat lukewarm about trade liberalization. For instance, due to the effect of the currency crisis, Malaysia has announced that it will put off the planned tariff cuts on finished cars and completely knocked down (CKD) cars until 2005 from the standpoint of protecting domestic industry. During the meeting of ASEAN economic ministers held in Cambodia in May 2001, the Philippines and Indonesia called for putting off tariff cuts on petrochemical products scheduled for 2002.

However, such moves are limited to certain commodity items. As will be

described later, since advanced ASEAN countries have made rapid progress in their industrialization, they have increased their industrial products that are competitive on the international market. As a result, since the deregulation of intra-regional trade in industrial products progressed, the implementation of CEPT tariff cuts as a whole also made progress. Items for which postponement of the implementation of CEPT was called for are mostly in the fields that are not internationally competitive, such as import substitution industries.

Table 9 is a matrix of industrial product trade by ASEAN-5 and three main countries outside ASEAN (Japan, China, South Korea). From the table, we can see the growth of industrial product exports by eight East Asian countries (ASEAN5+3) and changes in market-by-market structure from the time before the AFTA was created (1992) to the time when the latest data are available (2000). It shows the following characteristics. First, ASEAN countries' industrial exports (to the world) increased by 2-3 times, faster than the industrial exports by Japan and South Korea. In particular, the performance of the Philippines is remarkable. Second, ASEAN countries' exports to intra-ASEAN region increased faster than their exports to the world, but their exports to the three main East Asian countries outside ASEAN (China, Japan, South Korea) was much faster. During the period under review, exports by ASEAN-5 increased 2.7 times to the world and 3.1 times to ASEAN-5 (intra-regional exports), but their exports to ASEAN+3 posted an increase of 3.3 times. In particular, exports by ASEAN-5 to South Korea and China expanded by 4.4 times and 5.6 times, respectively. Third, the proportions of each ASEAN country's exports to intra-ASEAN region are generally small. The average proportion of the five countries was 19% in 1992 and 22% in 2000, posting an increase of only 3 percentage points in eight years. If exports to Singapore, which accounts for more than 50% of each country's intra-ASEAN exports, are excluded, the proportion comes to much smaller.

Next, let's examine what impact (or trade diversion effect) the realization of the CEPT scheme by the AFTA had on non-ASEAN countries trade with ASEAN. The same industrial trade matrix (Table 9) shows that the industrial exports to ASEAN by the main countries outside the region, such as China and South Korea, increased. South Korea's exports to ASEAN-5 expanded by 2.1 times from 1992 to 2000, almost the same pace as its industrial exports to the world. Japan's industrial exports to the world increased 40%, while its exports to ASEAN-5 increased 60%. What is of particular note is China's performance. During the period under review, the country's industrial exports to the world increased by 3.3 times, its exports to ASEAN jumped by 5.1 times.

Table 9 Industrial Trade Matrix of ASEAN5+3

(upper figures: 1992, lower figures: 2000, in \$ million)

Imports Exports	Thailand	Malaysia	Singapore	Indonesia	Philippines	ASEAN5	Japan	China	South Korea	Vietnam	ASEAN5 +3	Taiwan	Hong Kong	U.S.	World
Thailand	-	572	2,382	96	137	3,187	3,120	76	181	40	6,564		1,145	5,744	22,105
Malaysia		2,298	4,728	880	975	8,881	7,399	1,721	865	621	18,866	2,104	2,884	12,249	53,976
Singapore	635	-	6,960	209	183	7,987	2,081	268	304	32	10,640		1,361	7,065	26,921
Indonesia	2,494		16,103	1,086	1,411	21,093	9,038	2,078	1,880	348	34,090	2,946	4,062	19,339	80,615
Philippines	2,762	6,023	-		630	9,415	2,879	661	966		13,920		3,409	12,899	50,155
ASEAN5	5,529	22,008			2,757	30,293	9,037	4,494	4,617	984	48,441	7,646	8,201	23,351	120,002
Japan	185	238	2,189	-	71	2,683	2,107	648	524	61	5,962		567	2,784	15,688
China	716	1,420	4,921		527	7,584	4,930	1,062	786	295	14,362	958	1,253	6,789	36,267
South Korea	94	101	205	31	-	431	934	79	91	25	1,535		365	3,225	7,380
ASEAN5 +3	1,176	1,306	2,878	131		5,493	4,815	498	1,042	58	11,847	2,773	1,740	10,840	35,112
Taiwan	3,677	6,934	11,736	337	1,021	23,704	11,120	1,730	2,066	158	38,620		6,847	31,717	122,250
Hong Kong	9,916	27,033	28,631	2,097	5,669	73,345	35,219	9,853	9,190	2,306	127,607	16,426	18,139	72,568	325,971
U.S.	10,116	8,017	12,664	5,454	3,408	39,659	-	11,498	17,032	414	68,189	20,327	19,983	95,949	334,287
World	13,422	13,600	20,411	7,443	10,159	65,036		29,466	29,561	1,903	124,062	35,109	26,527	142,952	472,338
	648	358	1,019	291	139	2,455	6,321	-	1,135	87	9,911		34,795	7,427	67,949
	1,905	2,083	4,957	2,340	1,222	12,507	33,601		8,428	1,232	54,536	4,508	41,372	50,111	223,784
	1,286	1,117	2,893	1,880	682	7,858	9,152	2,540	-	395	19,549		5,438	17,855	71,793
	1,942	3,427	5,058	3,122	3,061	16,610	14,835	16,292		1,585	47,737	7,479	9,214	36,726	157,712
	15,727	16,427	28,312	7,961	5,249	73,675	26,592	15,769	20,233	1,055	136,269	20,327	67,063	152,948	596,280
	27,185	46,142	59,057	15,002	20,112	167,497	83,656	55,611	47,179	7,026	353,943	63,522	95,252	302,358	1,179,805

(Note) Indonesia's import data for 1999 is substituted by that for 1998.

(Source) UN Trade Data

What impact does the gradual realization of AFTA have on the flow of direct investment? Since 2002 is the year when advanced ASEAN countries completed the implementation of the CEPT scheme, it is too early to judge the impact of AFTA on direct investment. However, direct investment in ASEAN decreased in the second half of the 1990s, when tariff cuts were going on. The decrease was due to the influence of the currency crisis, indicating that the stability of currency and macro economy is more important than the effect of AFTA. In order to see the impact of the establishment of AFTA on the flow of direct investment into member countries from a different angle, consider how Japanese corporations are dealing with AFTA, or in other words, how Japanese corporations' investment strategy toward ASEAN has changed.

The Japan Center for Economic Research conducted a questionnaire survey on Japanese corporations (374 companies responded) in September 2001. According to the results of the survey, 70% of the respondents said they are "greatly interested" or "interested" in AFTA. However, asked what measures they have taken in preparations for the realization of AFTA, only slightly more than 30% said "product strategy fitting with the specific characteristics of each Asian market" or "review or restructuring of the supply system." As many as 40% of the respondents said they are "not making preparations." Slightly less than 30% of the respondents already operating in ASEAN said they are "not making preparations." In a word, the implementation of AFTA does not have much impact on the behavior of Japanese corporations. Reasons for this are as follows.

First, though Japanese (manufacturing) companies have been undertaking direct investment in ASEAN countries since the 1960s, the joint ventures that they established by the first half of the 1970s were import substitute firms. Home electric appliance-related companies are typical import substitute firms. Since this field is covered by the fast track scheme of the AFTA, tariff cuts have been implemented faster. Therefore, companies that had been exposed to import competition have already integrated production and streamlined operation bases. On the other hand, since the joint ventures or wholly owned subsidiaries established by Japanese corporations in and after the second half of the 1970s, particular in and after the 1980s, when the yen appreciated sharply, were mostly export-oriented companies, there were not particularly subject to tariff cuts under the AFTA system. Automobiles and automobile parts are also import substitute types of industry, but they will not be liberalized any time soon because tariff cuts have yet to begin in earnest and because countries in the region intend to protect such industries.

Second, since Japanese-affiliated companies established by big parent companies in

and after the second half of the 1980s were positioned as part of the framework for division of labor in East Asia as a whole, not within the ASEAN region, they are not likely to be relocated even if AFTA is fully established. Since a completed framework for division of labor cannot be established within the ASEAN region, it must be established across Asia. Moreover, many of the Japanese companies investing in ASEAN are small and medium-sized enterprises and they have only one or two subsidiaries in ASEAN. Since many of such subsidiaries were established in and after the 1980s, they are mostly export-oriented companies.

3.2.3 Division of labor in Asia and regionalization: Promotion of ASEAN+3 framework

After summing up the points that came to light in the above analysis, I would like to introduce Chinese and Japanese moves toward regional cooperation and examine the future course of the ASEAN+3 framework. There are the two points characterising new trends in the division of labor in Asia.

First, the rise of China was the most important event for Asia's economy in the 1990s. The progress of industrialization in China was faster than ASEAN's and China increased its share in various markets. Is this a threat or opportunity for ASEAN? ASEAN's industrial exports, though not as much as China's, increased considerably. Advanced ASEAN countries sharply increased their exports to China (Table 9). As was already pointed out, the inflow of direct investment into China increased drastically, but this does not mean that investment in ASEAN was stagnant. Seen from this angle, China's development is not at least a zero-sum game for ASEAN.

However, given the size and fast growth of its economy, China is highly likely to impact on ASEAN in the future. In order to ease the impacts of China's growth, it will become necessary to upgrade the industrial structure of ASEAN and promote industrial adjustments at the regional level. With regard to the former, there is a pressing need to increase the supply of skilled labor and foster engineers and administrators. In Thailand and other ASEAN countries, there have been mismatches between a shortage of demand for unskilled labor and a shortage of supply of skilled labor and engineers. There are many things that Japan can do to cooperate in this field.

Second, at this stage, the effect assumed by the free trade area (FTA) concept does not seem to have worked on AFTA. Though intra-ASEAN trade increased, trade with extra-regional countries increased faster. Though it is not clear to what extent the AFTA had an impact on increased direct investment, it seems other factors (macroeconomic environment such as currency stability) had greater importance. The sharp increase in

direct investment from Japan was before the establishment of AFTA and direct investment from Japan became rather stagnant in the second half of the 1990s, when the CEPT implementation plan got under way.

The reason why AFTA did not produce expected effects can be attributed to the unique characteristic of AFTA. Unlike the EU and NAFTA, ASEAN depends less on the countries within the region and more peripheral broader economic zone, including Japan, South Korea and China. If the cooperative framework for AFTA is completed in the future, this structure will not change much.

However, we cannot say that the creation of AFTA was meaningless. We cannot ignore the efficient distribution of resources brought about by the deregulation of trade and the decreased risks and uncertainties achieved through commitments to the improvement of policy environments. These efforts were, and are, necessary in order to keep ASEAN's position in the dynamism of East Asia as a whole. As will be discussed in detail below, since future international and regional environments need a broader-based Asian cooperative framework, unlike the time when the creation of AFTA was decided, and since it has become increasingly possible to establish such a framework, it is advisable to shift to the establishment of a broader Asian cooperative framework, including AFTA.

Viewed from the purpose of this paper, which limits its study on problems involved in the development of the real economy, this broader cooperative framework should have at least two objectives. One is, of course, maintaining the dynamism of the region by further promoting the deregulation of trade in the whole of East Asia and strengthening the virtuous cycle of investment and trade described in Section 1. The other is promoting industrial adjustment at the Asian regional level. In other words, it means preventing redundant investment and excessive production by promoting exchange of information concerning the direction of each country's industrial development and investment/production outlook, and supporting, through regional cooperation, the industrial adjustment (shifting from the industries whose production factors, such as labor, have lost competitiveness to the industries having comparative advantages) made necessary due to a change in the comparative advantage structure of the region as a whole (shift of the comparative advantage of an industry in one country to another country). Judging from the results of our analysis, in order to achieve these objectives, it is important to establish a cooperative framework among ASEAN+3, namely, ASEAN countries, China, South Korea and Japan.

Recently, Japan and China have been drawing attention for their moves toward the establishment of a cooperative framework.

Until recently, Japan based its policy on multilateralism rather than on bilateralism and actively participated in the activities of APEC, charactering it as an open regionalism encompassing the WTO or the United States. But, Japan recently changed its policy and is moving toward concluding a bilateral free trade agreement with Singapore and South Korea in Asia.

First, with regard to the Japan-Singapore free trade agreement, members of industry, government and academics of the two countries began discussions on free trade agreement in March 2000. Based on their report, "Economic Agreement between Japan and Singapore for Partnership in the New Age," the two countries began negotiations in January 2001. In January 2002, the two countries signed "the Japan Singapore Economic Partnership Agreement" and the agreement went into effect on November 30, the same year. The objectives of this agreement, based on the basic philosophy of liberalization, facilitation, and cooperation, are to bring about benefits through enhancement of the efficiency of economic activities of the two countries and creation of new market opportunities and to contribute to the development of Asian and world economies. "Liberalization" covers not only liberalization of goods but also liberalization of services, investment, information and movement of population and labor. It is aimed at eliminating various regulations hampering economic transactions between the two countries, such as tariff and non-tariff barriers to trade in goods and restrictions on the establishment of commercial bases for service trade. "Facilitation" is aimed at facilitating trade and investment by easing or abolishing regulations concerning customs procedures and standards and certification of goods. "Cooperation" is aimed at strengthening the competitiveness of the two countries' economies through promotion of information technology, exchanges in the education field, and nurture of small and medium-sized enterprises. The two countries will also promote cooperation to support economic development of developing countries, mainly in Asia through human resource development programs (Urata 2002).

Although Japan concluded an FTA proactively with Singapore, a country that does not have an agricultural sector, it is reluctant to conclude similar agreement with other ASEAN countries.

Japan and South Korea conducted research with the aim of concluding a free trade agreement. Research institutes of the two countries (Institute of Developing Economies of JETRO on the Japanese side) conducted joint research and issued a report in mid-2000. The two countries are expected to enter negotiations after harmonizing views between them, but at this stage, it seems to take a considerable long time before any specific cooperative framework is established. In particular, the public opinion in South

Korea is said to be against such an agreement. For instance, according to Fukagawa (2000), arguments in South Korea still tend to come to the traditional views that a free trade agreement with Japan will increase South Korea's trade deficits with Japan and thus lead to South Korea's subordination to Japan. In addition, since the start of exchanges with North Korea, South Korea has adopted international economic policies focused on China and North Korea rather than on Japan in the medium run. Moreover, South Korea's deep-rooted mistrust of Japan remains unchanged. In the absence of progress in a host of problems between the two countries, such as the proposed expansion of the use of Haneda airport to ease the badly congested Japan-South Korea air route and resident Koreans' voting rights in local elections, it is said that South Koreans have little interest in a bilateral free trade agreement with Japan.

Meanwhile, China has been rapidly making approaches to ASEAN. At the enlarged ASEAN Summit meeting held in Bandar Seri Begawan (Brunei) in November 2001, China made a three-point proposal for cooperation with ASEAN. The proposals are: 1) In light of the respective advantages of China and ASEAN, the two sides define agriculture, information communications, human resources development, two-way investment and the development of the Mekong River as the priority fields for cooperation. 2) China and ASEAN countries formally establish a free trade zone within 10 years, and 3) In political fields, China and ASEAN strengthen mutual trust and support. Among the items included in 1) are cooperation in the construction of the Kunming-Bangkok highway and the Pan-Asia railway, training of ASEAN personnel in information technology, and agricultural cooperation. In order to realize the proposals, China has made various concessions. For instance, China has promised to give most-favored-nation status to less-developed ASEAN countries that have yet to join the WTO, agree to the delay, if any, of their participation in the China-ASEAN FTA, provide 5 million dollars to support the development of the Mekong River Basin, and build a one-third section of the Kunming-Bangkok highway.

At the enlarged ASEAN Summit meeting held in Phnom Penh in November 2002, China further specified the concept of its cooperation with ASEAN. In the first instance, China and ASEAN signed the framework agreement on comprehensive economic cooperation between the two sides. The contents of the agreement can be summarized as follows: a) The China-ASEAN FTA will be established by China and six advanced ASEAN countries by 2010 and with four new members of ASEAN by 2015; b) The negotiations for tariff reduction or elimination will commence in early 2003 and be concluded by the end of June 2004. Products are classified into two groups – normal track products and sensitive track products – and tariffs on the products included in the

normal track will be gradually eliminated starting in 2005. c) The liberalization of products in the eight fields, including agricultural products and perishables, will be implemented ahead of other products. d) China will grant most-favored-nation status to Laos, Cambodia, and Vietnam. China also announced specific support measures for new ASEAN members, including debt forgiveness. Prior to the Phnom Penh meeting, China and ASEAN also agreed on agricultural cooperation, centering on human resource development. But this is in effect China's support for ASEAN, indicating China's strong wish to accelerate the FTA negotiations.

In the future, South Korea is highly likely to promote FTA with ASEAN, as Japan and China did. For the time being, Japan, China, and South Korea will strengthen cooperation with ASEAN respectively in the form of ASEAN+1. The framework of ASEAN+3 will be established next to that stage.

Conclusion

East Asia has achieved rapid progress in its industrialization and economic growth through the virtuous cycle of investment and trade and the active movement of capital, technology and management know-how. The basic factors behind this can roughly be divided into two. One is the social capability of each country in the region, including technology absorptive capability and policy changing capability. The other is open-door policy and market-friendly policy.

Since the 1990s, the rise of China and the progress of regionalism, aside from the outbreak of the currency crisis and its impacts, have been drawing attention as new trends in East Asia. China poses a big challenge to ASEAN countries, but they will be able to take the rise of China as a plus-sum game through their redoubled efforts toward structural transformation and with cooperation of Japan. It is desirable to maintain the dynamism of Asia through the establishment of the ASEAN+3 framework in the long run.

Notes

- 1) *World Development Report 1998/1999*, pp. 214-5. For each country's export dependency, see World Bank 1993, p. 39.
- 2) As for sensible use of foreign capital, see Tran (1996) pp. 177-9
- 3) Among representative studies are Chen (1997) and Crafts (1999). Also see related articles in references cited by Craft (1999). Economic Planning Agency (1998a). Yasuba (2000) also deals with various studies on TFP in East Asian countries and some advanced countries.
- 4) Professor Yujiro Hayami points out that Krugman is not aware that the United States also experienced the same growth pattern (based on increased material capital stock) as East Asia in the past (19th century). Hayami (1995) p. 141.
- 5) Data on the tariff burden ratio are from Urata (1995) p.13.
- 6) See Tran (1994), Harada and Ino (1998) for policy shift in Thailand, Koguro and Kobama (1995) and Aoki (1998) for policy shift in Indonesia and Malaysia.
- 7) See World Bank (2000) and World Bank (2001) for China's ratio of industrialization of exports and Aoki and Umaba (2000), p. 210 for the share of foreign-capital corporations to the country's total exports.
- 8) For detailed discussions concerning technology, technology transfer and transfer channel, see Sekiguchi (1998), Enos (1989), Tran (1992 Chapter 6), Kiyokawa and Tran (1994), Enos, Lall and Yun (1997).
- 9) This portion was quoted from Tsukada (1996), as this writer was unable to obtain Abramovits' article.
- 10) Gannicott (1990), a survey report on the economics of education seen from Asia and Pacific standpoint, is instructive. Also, Low (1999) is a recent excellent survey report on human resource development, including education problems, and economic development.
- 11) See Yasuba (2000) appended table for country-by-country ratio in 1969-1992, and Tran (1986) for detailed analysis of South Korea's ratio.
- 12) For the status of AFTA implementation, see Tran (2002a). For Vietnam and AFTA, see Tran (2002b)

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