Initiatives towards for Enhancing and Ensuring Production Networks in the Asia-Pacific Region

Daisuke Hiratsuka*

Introduction

De facto economic integration has advanced in East Asia where there had been no free trade arrangement (FTA) until the 1990s. But, the de facto economic integration, which has been sometimes called as international production networks, or production fragmentation or regionalization, has two weak points. One is that the East Asia's regionalization has been mainly maintained by air and sea transportation. Road transportation across countries has not well developed. Another weakness is that the East Asia's regionalization has not been based on the secured system of the WTO disciplines. It is logically possible that exemption of import tax on intermediate goods is withdrawn in the case of trade war.

The East Asia's regionalization therefore needs regional public goods that facilitate trade and ensure the regionalization. FTAs have concluded and are under negotiation have not contained a trade facilitation measure that promotes road transportation across countries, which will reduce transportation costs, thereby increase production networks

* The author is Director General of Development Studies Center, Institute of Developing Economies (IDE-JETRO), and Visiting Professor of Ritsumeikan University in Kyoto.

across countries. More importantly, the FTAs in East Asia still contain a fragile element. China-ASEAN FTAs, implemented in July 2005 between the original ASEAN six members and China, has no dispute settlement mechanism, which allows the governments of ASEAN and China to withdraw import tax exemption such as the duty-drew back system and export processing zone concession provided to trade partner countries, without violating the WTO rule, Articles 2 which commits members to bind the most-favoured-nation (MFN)[1] treatment. The applied tariff rates and actual import tax revenues against total imports are far below the MFN tariff rates in ASEAN countries and China. China-Japan-Korea has not formed the FTA with the secure dispute settlement mechanism so far. What these means that there is a possibility that if trade war occurs in somewhere in East Asia, factories in the Asian Pacific region will stop through the international production networks.

This paper aims to consider how the Asian-Pacific countries, in particular, can enhance international production networks or regionalization in the era of globalization. Section 1 argues gravity forces which shapes international production networks. Section 2 sees the intra-regional trade by destination, and discusses why the intra-regional trade share of East Asia amounted to more than 50% of its total trade, and why the share is rising. The last two sections treat policy suggestions. Section 3 argues international production networks in which most of the Asian –Pacific countries, centering on East Asia, have participated. Section 4 discusses how to enhance international production networks in terms of production and transportation costs. The last section examines how to ensure the international production networks trade arrangement which contributes the international trade among Asian-Pacific region.

[1] Most-favoured-nation (MFN) treatment means treating one's trading partners equally on the principle of non-discrimination.

1. GRAVTY FORCES

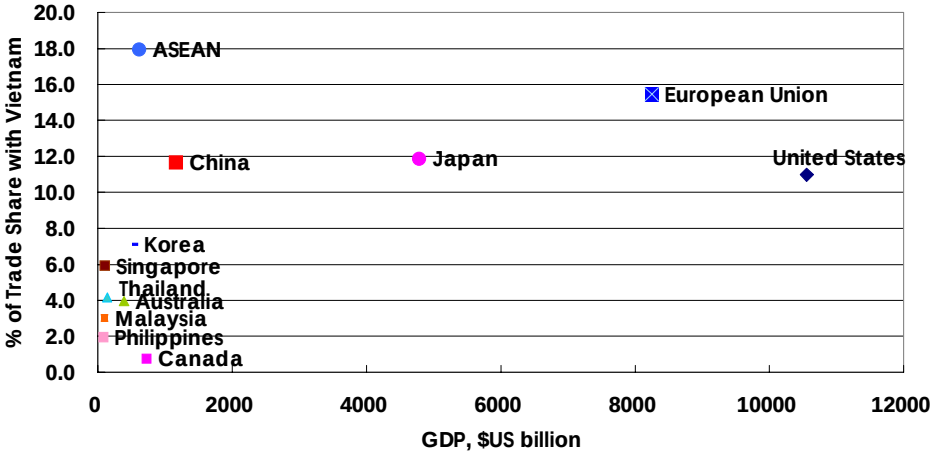
What does shape international trade pattern, more precisely speaking, location of industry or international production networks? We have a property of gravity framework that emphasizes market size and geographical distance in explaining trade and investment among trading partner countries. The trade between the two countries tends to be proportional to their economic size, and inversely proportional to the distance between countries (Krugman 2004). Precisely speaking, interaction of market, transportation costs, and fixed investment costs determines location of industry. (Krugman 1991a, and 1991b).

We can interpret that if the two economies are large, then the trade between countries tends to be large. As well, at least one economy among two grows fast, and then the trade between countries tends to grow fast. And if the geographical distance between the two countries is short (long), the trade between them tends to be large (small). Assuming ten thousands miles distance and one hundreds miles distance, the former will take cost more than the latter (Krugman 2004). That is, geographical distance does matter as transportation cost differs according to geographical distance if other conditions are equal.

Well then, does market size and geographical distance really matter in the real world? Figure 1 plots trade (exports plus imports) share of Vietnam by partner country/region in 2004 and the trade partner GDP size in 2001. Vietnam's largest trade partner region is ASEAN. Vietnam trade about 18% of its total trade with ASEAN meanwhile only 0.7% with Canada. ASEAN' GDP size, excluding Vietnam, was just 618 billion $US against 727 billion $US of Canada. Due to geographical proximity, Vietnam has the largest trade share with neighboring countries. In a similar way, Vietnam has large trade share with China where she has the long border with China. On

the other hand, Vietnam has large trade share with the EU, the United States and Japan where markets are large. If there were not any war between Vietnam and the United States, Vietnam' trade with the United States would be larger since the United State is the largest economy in the world as shown in Figure 1.

Figure 1. Trade Share of Vietnam by Partner Country/Region in 2004 and the Partners GDP in 2001



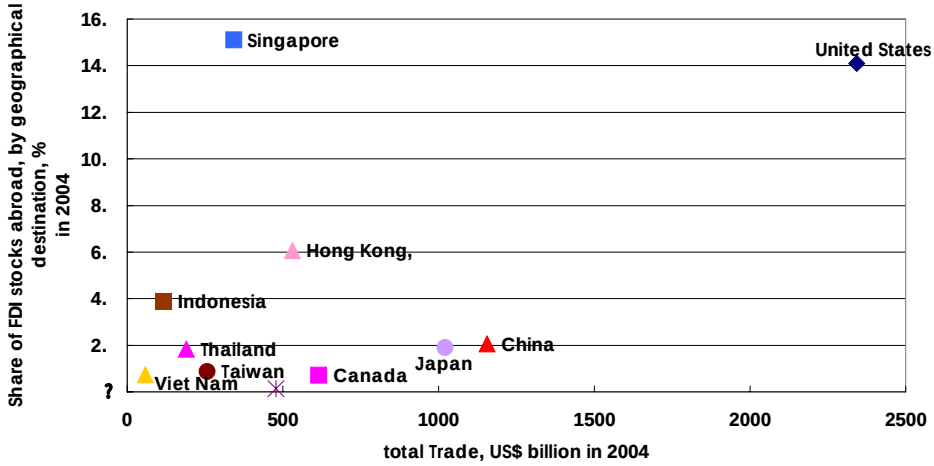
Source: caluculated trade share from IMF, Direction of Trade, CDROM, 2005, and GDP for IMF, World Economic Outlook Data Base.

The above gravity framework can be applied not only to trade but also to investment, precisely speaking foreign direct investment (FDI). Figure 2 shows share of FDI stock abroad from Malaysia by geographical destination, and total trade values of the destination country which is a proxy of economic size, in 2004 respectively. Malaysia took FDI to Singapore, 15.1% of total outward FDI of Malaysia, higher than figure to the United States, 14.1%. Share of FDI from Malaysia to Indonesia and Thailand are larger than those figures to Taiwan and Canada where the latter trade sizes are larger than the former.

These evidences support that gravity forces, that is, geographical distance and market size, are crucial determinants of both trade and outward FDI. In particular, geographical distance plays significant role in geographical distribution of them. For instance, New Zealand' s largest trade partner is Australia, and Thailand took very

large outward FDI to Singapore.

Figure 2. Share of FDI Stock Abroad from Malaysia by Geographical Destination



Source: FDI data from UNCTAD, and trade data from IMF, Direction of Trade, CDROM 2005.

2. REGIONALIZATION

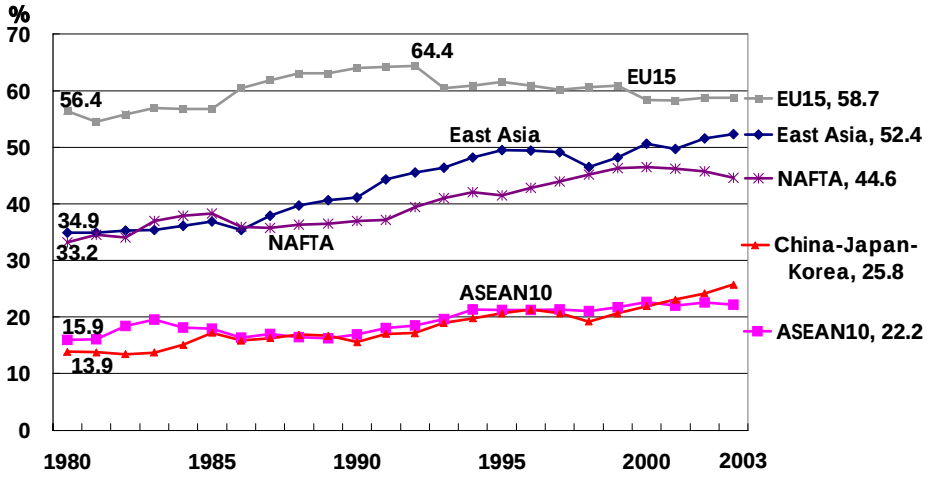
East Asia (ASEAN 10, China, Japan, Hong Kong, Korea, and Taiwan) has increased trade, in particular, intra-regional trade remarkably, in the last decade. The intra-East Asia trade share rose up to 52 % in 2003 (see Figure 3), which is larger than that of NAFTA (45%) although smaller than that of the EU (59%). Meanwhile intra regional trade shares of ASEAN and China-Japan-Korea still remain 22% and 26% in the same year respectively? Then three questions arise.

Q1: Why intra-regional trade share of East Asia amounted to more than 50%, meanwhile those of ASEAN and China-Japan-Korea remain still low?

Q2: Why the intra-regional trade shares of East Asia, ASEAN10, China-Japan-Korea are rising?

Q3: What kinds of goods are traded in East Asia?

Figure 3. Intra-regional Trade Share (%)



Source: IMF Direction of Trade, 2004, CD-ROM. The data on Taiwan was prepared by the author based on the Council for Economic Planning and Development, Republic of China, Taiwan Statistical Data Book, 2004.

The gravity framework gives us hints to these questions. I will explain by using the gravity framework.

Why the intra-regional trade share of East Asia amounted to more than 52%? Maybe, there is an optimum space size for economic activity. Transportation costs seek small space. On the contrary, economy of scale needs larger space. Interaction of transportation costs and economies of scale determine optical space for economy. The optimum space is enough large space to attain economies of scale and cover various location advantages, but not so large. The space of East Asia may be just optimum space size under present transportation and communication technologies, which is almost equivalent to that of the Southern part of Canada, the United States, and Mexico. Optimum space size, of course, would be large if transportation technologies advance and transportation costs fall. In this context, ASEAN 10 or China-Japan-Korea are just sub-region, and small space for economic activity. Combined ASEAN 10, C-J-K, Hong Kong and Taiwan, East Asia become enough large space to provide much of business opportunity.

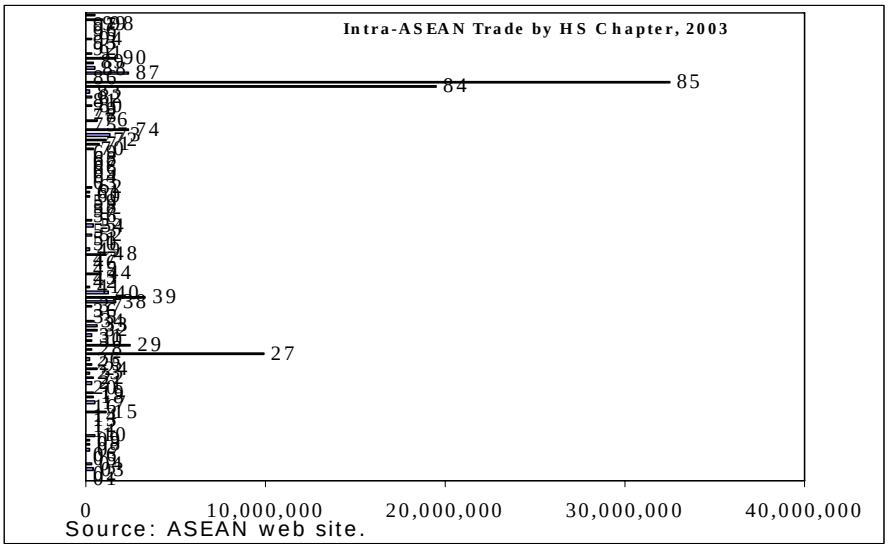
Well then, why the intra-regional trade share of East Asia is increasing? And why those of ASEAN, and China-Japan-Korea are rising also? According to the gravity framework, growing the intra- regional economy against the extra-regional economy leads to increase the intra-regional trade share assuming that other conditions are constant. In this regard, China has played very important role for an expansion of intra-regional trade of East Asia. The ASEAN economies, in particular, Vietnam is growing rapidly. The dynamism of East Asian economy, and ASEAN economy have increased intra-regional trade share of East Asia and ASEAN.

Transportation costs in the region have decreased. We should note is that transportation systems have developed much in East Asia. Forwarders, logistic companies, have taken much of investment in electronic procurement system which link on line with assemblers, suppliers, air and sea cargoes, air flights and marine transportation, and inland road transportation. Trucks managed by forwarders come to pick up parts and components to suppliers, and transport them to assembler either within country and /or across countries on time. Just in time production management has prevailed in East Asia like NAFTA. Consequently, transportation costs have been reduced greatly in the region. Unit of nation is no more important as ever before. Instead, unit of sub-region, namely, ASEAN, and or unit of East Asia has increased its importance for business sector.

Lastly, what kinds of goods are traded in East Asia? This question means that, in what sense, East Asia has achieved its regionalization. East Asia's intra-regional trade has been dominated by intermediate goods. The East Asian governments have provided exemption of import duties on intermediate goods and capital goods on unilaterally concession base. For example, the Board of Investment of Thailand has provided special

privileges to the promoted companies to exempt import duties on the approved intermediate goods and capital goods. The goods with the certificate and invoice can pass through the custom office shortly without paying import duties. Furthermore, factories located in the export processing zone (EPZ) are regarded as ones in the foreign country. The factories can import any goods without paying import duties, and export finished goods after manufacturing. Due to these special trade facilitation measures, intra-regional trade has developed in the Asia-Pacific, in particular, in ASEAN and China where wage rates are cheap and human resources are rich.

Figure 4. Intra-industry Trade in ASEAN



Source: ASEAN web site.

Indeed, intra-regional trade has been dominated by intermediate goods and capital goods. Figure 4 shows intra-industry trade of ASEAN by products (HS code, 2 digits). As shown in the figure, intra-regional trade of ASEAN has been dominated by machinery (HS84) and electrical machinery (HS85).

3. INTERNATIONAL PRODUCTION NETWORKS

Transportation cost is a key element of international production networks. Supposing that transportation costs are zero, firms can locate production facilities anywhere they wish. On the contrary, if transportation costs are high, industry will locate to near large market[2]. That is the presence of transport costs gives rise to the "home market effect" for suppliers located near a large market (Fujita 2006).

Multinational corporations (MNCs) can explore location-specific advantages, for products with low transportation costs, according to country/city, which are different in market size, agglomeration of supporting industry, infrastructure, human resources such as wage rates, investment facilitation measures including corporate tax holiday, and so on. Manufacturing production process has split into many stages (Deardorff 2001), locating in country/city where there are location-specific advantages. International production networks, or production fragmentation across countries has most developed in East Asia (Ando and Kimura, 2003). Assemblers have outsourced production processes to intra-firms or inter firms located in East Asia in order to maximize profit. Consequently, parts and component are produced in different countries/cities, and purchased from various countries for assembling, forming international production networks (production fragmentation across countries) due to low transportation costs.

A hard disc drive industry gives a good example (Hiratsuka 2006). Figure 5 shows a map of the sources of the various parts of a hard disk-drive that is assembled in Thailand by Hitachi Global Storage, Thailand, the affiliate of a Japanese company. The

[2] Automobile industry is one of high transportation cost industry. Firms prefer to procure within country to reduce transportation costs.

plant in Thailand was managed by IBM, and acquiesced by Hitachi in 2003. The disk is sourced from the US, Japan and Malaysia. Of course, the disk itself consists of several parts, some of which are imported from the US and Japan and the same can be said of most of the parts listed. If we traced out the ultimate source of every bit of a disk drive, the map would be impossibly complex. Is should be noted that each country substitutes and complements each other. Parts and components are produced and shipped from eleven countries in the Asian-Pacific region, from Singapore to Mexico, for assembly purpose in Thailand. Interestingly, same parts and components are produced in multiple countries, and shipped to Thailand. The hard disk-drive itself is an intermediate good that will be shipped somewhere and assembled into some electronic devices such as personal computer, music instrument devices (Ipod), and external hard disc drive.

Why has international production networks of the hard disc drive developed so much? There are several reasons. First, transportation costs are very low for the hard disc drive. A hard disc drive itself is very small and light products. Parts and component of hard disc drive are tiny products, and can be packed into a small box, which make it possible to transport by air. In fact, transportation costs are not small, if compared to production costs and labor costs (Hiratsuka, 2006a). For example, Transportation cost of Soode Nagano, a HDD part supplier, claims transportation costs about 2% of total sales, which is equivalent to labor cost.

Second, MNCs have explored low wage rates of East Asia. International production networks have developed in machinery (HS84) and electrical machinery (HS85) where intra-industry trade have expanded as discussed in the previous section. This industry has most developed in East Asia mainly due to low wage rates. Many big factories, related to machinery and electrical machinery, require more than ten thousands

engineers and operating workers for 24 hours operation. Thanks to low wage rate, more than 50% of electrical parts are exported from East Asia (Hiratsuka, 2006b).

Furthermore, forwarders or logistic companies have taken huge investment in order to links on line assemblers, suppliers, and air, sea, and truck cargoes, which has made it possible for them to transports parts and components on “just in time” to assemblers and wholesalers. In addition, development of infrastructures by governments and private sectors such as air and sea ports, road transportation networks, industrial estates and parks, and so on.

4. ENHANCING INTERNATIONAL PRODUCTION NETWORKS

How can we enhance international production networks? To reduce production costs and transportation costs are ways to enhance international production networks. Of course, strictly speaking, transportation costs of intermediate goods are accounted to be production costs.

Production costs are can be reduced by enhancing capacity building in infrastructure (road, sea and air ports, communication, and so on), institutions (streamlining procedure of trade, investment and registration, deregulation of capital participation, tax privilege and other investment facilitation measures), and human resources (skill labor training centre, laboratory, and university).

Then how about transportation costs?. Well then, what does determine transportation costs? Tariff rates, investment by logistic firms, facilitation measures of trade such as tax clearance, and infrastructure deeply determines transportation costs.

In East Asia, transportation costs are decreasing due to development of infrastructure both by public and private sectors, investment by forwarders for electric procuring system and warehouses, and tax reduction at the AFTA and on unilaterally bases.

How can we reduce transportation costs? In this regard, it should be noted that road transportation across countries within ASEAN has not prevailed yet like the EU, which has bottlenecked for further reduction of transportation costs in ASEAN. METI of Japan and JETRO investigated the transportation costs between Bangkok and Hanoi, and between Hanoi and Guangzhou with comparison by truck, ship, and air. Table 1 summarizes transportation costs between Bangkok and Hanoi. It was just trial that truck transported goods between Bangkok and Hanoi with special cooperation from custom offices at the border in Laos, Thailand, and Vietnam. METI and JETRO found that transportation by truck would be practical if custom procedures at the borders pass smoothly. In reality, custom procedures at the borders by truck container take much of time. First, container cargo has to be transferred from a truck to another truck at the border in Laos. Second, custom office procedures are very complicated and lack of transparency at the border, which consumes much of time, and thereby road transportation across borders make it uncertain.

Table 1. Transportation from Bangkok to Hanoi

	Volume	Transit Time	Costs $US
By Ship	1 TEU	10-15 days	1,000
By Air	3334kg	2-3 days	4,000
By Truck	1 TEU	4 days	2,500

Source: METI and JETRO, 2005, "Senkuteki Kamotsu Toushi Kankyou Seibi Jitushi Jigyou.

5. ENSUREING INTERNATIONAL PRODUCTION NETWORKS

International production networks have well developed, in particular, in electrical machinery in which transportation costs are low compared to other products. The well developed international production networks, however, has a weak point. The international production networks have based on the fragile international trade system. NAFTA has established based on very rigid trade system because the Unites States has a big power which dominates more than 80% of international trade within NAFTA, and in addition, has a dispute settlement mechanism stipulated agreements of the NAFTA. East Asia, however, has not established any rigid trade arrangement yet. ASEAN free trade area (AFTA), and ASEAN and China FTA have not stipulated any dispute settlement mechanism yet. If a serious commercial dispute occurs among countries, no body can settle the dispute with power. Instead, there is logically possible that trade sanction are taken by some countries without violating the WTO rule (Baldwin 2006).

Table 2 shows that extent to which GATT Article 2 disciplines the trade of East

Asian countries. Japan has bound almost all its tariffs at quite low rates for non-agricultural products; the simple average bound tariff (final bound), 2.3%, and actual tariff ("applied"), 2.5%. It would be impossible for Japan to raise its tariffs much without violating the GATT's Article 2 – tariff bindings. Article 2 commits members to 'bind' their MFN tariffs which members commit not to raise a tariff beyond the 'bound' tariff rates. This fact alone makes it almost unthinkable for domestic political forces in Japan to ask the Government of Japan for such a thing. Taiwan is broadly similar with Japan.

Table 2. Bound and applied tariffs in APEC Members

Member Economy	Tariff binding coverage	Simple average final bound on non-agricultural goods	Simple average applied on non-agricultural goods	Import duties collected to total merchandise imports
Australia	97.0	11.0	4.6	3.9
Brunei	95.3	24.5	3.0	n.a.
Canada	99.7	5.3	4.0	0.9
Chile	100.0	25.0	5.9	4.1
China	100.0	9.1	9.5	2.7
Hong Kong	45.7	0.0	0.0	0.0
Indonesia	96.6	35.6	6.7	2.8
Japan	99.6	2.3	2.5	2.0
Korea	94.5	10.1	6.7	3.2
Malaysia	83.7	14.9	9.1	1.2
Mexico	100.0	34.9	17.1	1.9
New Zealand	99.9	11.0	3.4	2.0
Papua New Guinea	100.0	30.1	4.7	133.5
Peru	100.0	30.0	9.7	8.6
Philippines	66.8	23.4	5.8	5.0
Russia	n.a.	n.a.	10.1	7.0
Singapore	69.2	6.3	0.0	0.1
Chinese Taipei	100.0	4.8	5.5	n.a.
Thailand	74.7	24.2	13.3	3.1
United States	100.0	3.2	3.3	1.6
Viet Nam	na.a	n.a.	15.7	7.9

Source: WTO country profile, statistical database, http://stat.wto.org/CountryProfile/ WSDBcountry PFExport.aspx?Language=E&Country=AL).

Other East Asian countries are different. Korea's final bound tariff rates is 10.7% against applied tariff, 6.7%. This means that Korea could raise its MFN tariffs by 3

percentage points on average without violating Article 2. Korea unilaterally extends to its imports, the 'real' average Korean tariff is just 3.2% ("Import duties as a share of total imports").

China extends, its tariff revenue is just only 2.7% of the value of imports, but its final bound is 9.1%. What these facts mans that China can withdraw the unilateral tariff concession through export processing zone treatments. Indonesia, Malaysia, the Philippines, and Thailand have higher risks. Their final bound tariffs are 14.9% to 35.6% against the applied tariff, between 5.8% and 13.3%. The four ASEAN countries unilaterally grant duty-free MFN treatment to their trade partners. Furthermore, the actual import duties over total import are extremely low, between 1.2% and 5.4% What this means is that the four ASEAN countries can raise their tariffs without violating their WTO commitments, and or can withdraw the unilateral tariff concession provided to companies operating in the countries.

If a tariff-raising fire breaks out anywhere in East Asia, the Asia-Pacific countries will be affected through international production networks in which not only the East Asian countries but also the Central and South America countries have participated. What measures should we take to cope with the weak international trading system?

The first step would be to bind the APEC countries with their current applied tariff rates. The step will enforce the ASEAN countries to lower final bound rates, which will decrease risk of the tariff raising war, and benefit to Taiwan where has been excluded from FTAs in East Aaia. The second step would be the ASEAN plus three (China, Japan and Korea) to form high level of FTAs without any exclusion lists for non-agricultural products and with a rigid dispute settlement mechanism. Such East Asia FTA will contribute to enhance international trade system in the whole Asian-Pacific region.

References

Ando, Mitsuyo. and Fukunari Kimura. 2003. The Formation of International Production and Distribution Networks in East Asia. NBER Working Paper 10167. http://www.nber.org/papers/w10167

ASEAN-Japan Research Institute Meeting. 2003. ASEAN-Japan Comprehensive Economic Partnership: vision and Tasks Ahead, Joint Study Report, Chiba: Institute of Developing Economies.

Baldwin, Richard. 2006. "The East Asian Noodle Bowl Syndrome", prepared at international workshop on Co-development of Each Nation in East Asia's Integration, organized by Institute of Developing Economies, JETRO, on January 17-18, 2006.

Deardorff, AlanV. 2001. "Fragmentation in Simple Trade Models." *North American Journal of Economics and Finances*, 12: 121-137.

Hiratsuka, Daisuke. 2006a. "Vertical Intra-Regional Production Networks in East Asia: A Case Study of the Hard Disc Drive Industry" in Hiratsuka (Eds.), East Asia's De Facto Economic Integration: London: Palgrave Macmillan.

_____. 2006b. "Catching Up of Manufacturing Cum De facto Economic Integration in East Asia" in Hiratsuka (Eds.), East Asia's De Facto Economic Integration: London: Palgrave Macmillan.

Krugman, Paul. 1991a. "Increasing Returns and Economic Geography" The Journal of Political Economy, Vol. 99, No3 (Jun.): 483-499.

_____.1991b. *Geography and Trade*, Cambridge: the MIT Press.

_____.2004. "The New Economic Geography: Where Are We?" International Symposium on Globalization and Regional Integration-from the Viewpoint of Spatial Economics, December 2, organized by Institute of Developing Economies, IDE JETO (http://www.ide.go.jp/Japanese/Inter/Sympo/pdf/krug_summary.pdf., January 12, 2005).

Krugman, Paul, and Anthony Venables. 1995. "Globalization and the Inequity of Nations." The Quarterly Journal of Economics Vol.110, no. 4 (November): 857-880.

The Ministry of Foreign Affairs of Japan. 2002. Japan's FTA Strategy (Summary) (http://www.mofa.go.jp/policy/economy/fta/strategy0210.html, April 6, 2005).

_____. 2003. Framework for Comprehensive Economic Partnership between Japan and the Association of South East Asian Nations, (http://www.mofa.go.jp/region/asia-paci/asean/pmv0310/framework.html, April 25, 2005).