

French, German, and Japanese FDI on Intra-East Asian Trade

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Abstract

In this paper we first document the growing importance of intra-East Asian trade in parts and components and capital goods facilitated by foreign direct investment (FDI). Japanese direct investment has a stronger influence on intra-East Asian trade relative to FDI from France and Germany. It is related to the roles of small and medium enterprises in the Japanese FDI in East and Southeast Asia.

JEL Classifications: F14, F15, F23

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I. Introduction

East Asia¹ has witnessed a remarkable increase in the volume of intraregional trade during the past two decades. In particular, many countries in the region have experienced the explosive growth in intra-regional trade in parts and components. An important development that has contributed to the phenomena has been identified as the international fragmentation of production where the production process of a final product is split into two or more steps and each production stage is undertaken in different locations across national boundaries. Many alternative names have been coined for such a phenomenon, including “slicing the value chain” (Krugman, 1995), “vertical specialization” (Hummels, Ishii, and Yi, 2001), “international production sharing” (Ng and Yeats, 2001) and “outsourcing” (Hanson *et al.*, 2001).

Growing evidence documents the phenomenal increase in the international fragmentation of production in a variety of industries such as textiles and apparel, machinery and transport equipment, consumer electronics, toys and furniture. The extent of international production fragmentation and the depth of the regional production networks, however, vary according to industries. As Hiratsuka (2008) points out, the international production fragmentation in industries such as textiles involves relatively simple disintegration of procurement and production. In contrast, more elaborate and well-developed production network is found in the electronics industry.

It is often hypothesized that Multinational Enterprises (MNEs) are the driving force behind the development of fragmentation process. The international fragmentation of production will be adopted if it is a cost-saving strategy for MNEs. By doing so, they combine many resources available at different locations across national borders leading to establishing their production networks. The standard comparative advantage in trade theory predicts that the firms locate relatively labor-intensive segment of the production in the country where labor is abundant whereas locate relatively capital-intensive segment of the production in the country where capital is abundant, that is driven by factor-endowment dissimilarities. In East and Southeast Asia, the rapid growth of intra-regional trade has also been associated with a rising volume of Foreign Direct Investment (FDI). As a result, East Asia (excluding Japan) has gained in importance as recipients of FDI over time. Recent improvements in service links in terms of lower transportation and communications costs as well as the progressive liberalization and deregulation of international trade and foreign direct investment in the region, also contributed to this trend. Furthermore, the dispersed production networks created by such fragmentation appear to be more extensive in East Asia than in any other parts of the world (Fung, Garcia-Herrero and Siu 2009; Athukorala, 2006; Ng and Yeats, 2001; 2003). The expansion of trade and intra-

¹ In this study, East Asia covers the following countries/regions: China, Hong Kong, Japan, Republic of Korea, Indonesia, the Philippines, Malaysia, Singapore, and Thailand.

regional trade have also raised the growth rates of various Asian economies (Zhang 2001).

International production fragmentation and the formation of regional production networks can have various important implications for international trade. When MNEs engage in production fragmentation, initially, production may be geographically fragmented across national boundaries but organizationally confined within the boundaries of a transnational firm. Affiliates of MNEs may rely heavily on imported intermediate products from their home countries if they are faced with limited choices of local suppliers of those products. This will be the case if intermediate inputs require specialized production techniques that are not yet available in the host countries. It is widely recognized that a significant amount of trade in the global economy is indeed carried out in the form of intra-firm trade, which may be reflection of FDI-based production fragmentation. Moreover, as production is fragmented across locations, exports of capital goods required to produce parts and components from an FDI source country may also expand. It may also increase imports by an FDI source country as a host country increases exports of finished products back to the source country.

These networks, over time, disseminate knowledge to local suppliers in the host countries, which can then enhance local capability formation (Ernst, 2000). Advanced knowledge possessed by the MNEs may be spilled over through contractual relationship with local firms. Production linkages as well as procurement relationships between the foreign affiliates and the domestic firms are likely to be created and local technological capability for producing intermediate goods improves. Furthermore, against the backdrop of intensified competition in the world market in many industries, MNEs have been under pressure to reduce their costs of sourcing intermediate products instead of focusing on the origin of the suppliers. Regional production networks then cover both intra-firm and inter-firm transactions linking together affiliates, joint ventures with its subcontractors, suppliers as well as service providers. When foreign affiliates start sourcing intermediate goods locally, it will partially offset the trade-creating effect of FDI.

At the same time, industry agglomeration or clusters may form networks involving affiliates and non-affiliates for intermediate products when economies of scale create more profits to offset transportation costs. Countries then tend to specialize more narrowly within industries to define their own niche markets and achieve scale economies. Take the hard disk drive industry in Thailand for instance. Parts and components are procured locally as well as from other countries in Asia. Furthermore, several suppliers located in different countries supply the same parts and components to several assemblers on behalf of Seagate, Western Digital, Hitachi, Fujitsu (Hiratsuka 2008). Evidence of industrial clusters can be found in various parts of East Asia; examples include the Shanghai-Jiangsu corridor and Guangzhou in China, the Eastern Seaboard in Thailand, Penang in Malaysia and parts of Hsingchu and Taoyuang in Taiwan. The industrial clusters subsequently led to the expansion of the international exchange of parts and components and capital goods within East Asia.

Antras (2005) proposes a theory of incomplete contracts that suggests that production

fragmentation will go through several stages. First, parts and components will be produced within a single country where the firm is located. Second, attracted by lower wages in the developing countries and facilitated by the standardization of the production the multinational firms will seek to outsource some of the lower end production activities. The constraining factor is the institutional weakness, particularly intellectual property rights protection in emerging economies. Thus the first stage of transnational production sharing is intra-firm—using foreign direct investment and foreign affiliates to protect the technology and skill content contained in these components. The next stage of offshoring is to localize the fragmentation process by subcontracting with the local firms. The last stage consists of the entire process being produced overseas, with only marketing, research and development, and other managerial functions being retained in the home country. Then, where is East Asia situated in the product cycle of offshoring today? Does foreign direct investment play an important role? Is it really true that foreign direct investment systematically facilitate trade in parts and components, particularly in East Asia?

Furthermore, does the nationality or the source of investment make a difference in this regard? Production networks may be coordinated in a variety of ways involving a mix of intra-firm and inter-firm structures. It has been documented that there exists significant differences in the nature of the production networks created by MNEs from different countries. One defining characteristics of the structures of Japanese production network is that they are hierarchical networks (Sturgeon 2003). In other words, dominant leading firms effectively coordinate tiers of suppliers. Japanese networks had been structured based on long-term business and traditional keiretsu relationships, and thus relatively closed to outsiders (Borras *et al.*, 2000, Fung 2002). The suppliers are ‘captive’ in a sense that they can’t switch buyers of their products easily due to relation-specific investment and asset specificity. Leading firms at the same time make exit an unattractive option for their suppliers by providing enough resources and market access (Gereffi *et al.*, 2005). This type of production networks exhibit a lower propensity to engage in external sourcing.

As Japanese manufacturers have expanded into Asia, they have tried to replicate their homegrown vertical keiretsu system. For example, electrical industries as well as automobile ones consist of layers of subcontractors in Japan. Small and Medium Enterprises (SMEs), as subcontractors to larger multinationals, function as suppliers of intermediate goods. After large-scaled Japanese manufacturers shifted their production site from Japan to various Asian countries seeking low-cost assembly sites for labor-intensive production processes in 1970s and 1980s, SMEs also established their overseas production to extend the long-term close business ties. A large part of FDI by Japanese MNEs is actually undertaken by SMEs, which is a distinctive characteristic of Japanese FDI. Those SMEs which produce parts and machinery for the large manufacturers also established production networks in the East Asian countries.

Although identifying any systematic differences in trade and FDI behaviors between of Japanese and European firms is beyond the scope of this paper, we will simply examine whether FDI from those countries could have different implications on intra-regional trade in East Asia.

II. Patterns of Trade in East Asia

A. Intra-regional trade

Table 1a and 1b examine the changes in the share of geographic direction of individual East Asian² imports and exports, respectively for 1985, 1995, 2003, 2006 and 2009. These Tables also include the figures for North America and EU15 for comparisons.

East Asia in general appears to have gone through significant changes in the direction of their imports. Intra-East Asian trade already commanded a large share of their total trade in 1985 at 48.7%, and then continued to grow to 60.8% and 59.6% in 2003 and 2006, respectively. The increase is largely attributed to China. China's share almost tripled from 5.9% to 16.3% between 1985 and 2006. However, the share of intra-Asian trade declined from 59.6% in 2006 to 55.8% in 2009, alongside with the deepening global downturn. A large part of intra-East Asian trade is linked to the international production networks which produce finished goods that are then shipped to major importing countries. As the global financial crisis deepened since 2008, the share of intra-East Asian trade which considerably depends on demand, from developed economies, may also have declined.

Table 1a. The Geographic Pattern of East Asian Imports

importing country		from						
		East Asia	Japan	China	NIEs	ASEAN4	North America	EU15
<i>East Asia</i>	1985	48.7%	25.7%	5.9%	10.7%	6.4%	17.1%	13.6%
	1995	56.4%	22.8%	10.0%	16.0%	7.5%	15.8%	13.9%
	2003	60.8%	17.5%	14.3%	18.4%	10.7%	11.3%	11.0%
	2006	59.6%	14.4%	16.3%	18.4%	10.4%	9.6%	9.8%
	2009	55.8%	12.9%	16.1%	16.7%	10.1%	9.1%	10.5%
<i>Japan</i>	1985	25.9%		5.1%	7.7%	13.1%	24.0%	7.6%
	1995	34.7%		10.8%	12.3%	11.5%	25.9%	14.5%
	2003	42.4%		19.7%	10.2%	12.5%	17.6%	12.8%
	2006	41.4%		20.5%	9.8%	11.1%	13.7%	10.0%
	2009	41.9%		22.3%	8.6%	11.0%	12.6%	10.3%
<i>Korea</i>	1985	34.8%	24.2%	0.0%	3.5%	7.1%	22.8%	11.0%
	1995	40.0%	24.6%	5.6%	4.2%	5.6%	24.7%	13.4%
	2003	47.1%	20.3%	12.3%	7.1%	7.5%	15.0%	10.8%
	2006	45.0%	16.8%	15.7%	5.6%	7.0%	11.9%	9.4%
	2009	45.1%	15.3%	16.8%	5.9%	7.0%	10.1%	9.5%

² As defined in Table 1, in this chapter East Asia includes China, Hong Kong, China, Indonesia, Japan, Republic of Korea, Malaysia, Philippines, Singapore, Taiwan Province of China and Thailand.

<i>Taiwan</i>	1985	37.1%	27.6%	0.0%	3.8%	5.7%	25.5%	11.1%
	1995	48.0%	29.2%	3.0%	8.8%	7.0%	21.6%	14.4%
	2003	56.1%	25.7%	8.7%	11.4%	10.3%	14.2%	10.4%
	2006	54.8%	23.0%	12.3%	10.9%	8.6%	11.9%	8.6%
	2009	52.3%	20.8%	14.0%	9.4%	8.0%	11.1%	8.7%
<i>Hong Kong</i>	1985	68.8%	23.1%	25.5%	17.5%	2.8%	9.8%	12.3%
	1995	74.5%	14.8%	36.2%	18.8%	4.6%	8.4%	10.8%
	2003	78.9%	11.8%	43.3%	17.1%	6.6%	5.9%	8.3%
	2006	81.1%	10.3%	45.8%	18.4%	6.6%	5.2%	7.1%
	2009	78.5%	9.2%	45.7%	15.7%	7.8%	5.2%	7.6%
<i>Singapore</i>	1985	49.6%	17.0%	8.6%	6.8%	17.2%	15.5%	12.2%
	1995	57.6%	21.1%	3.3%	11.8%	21.5%	15.5%	13.4%
	2003	58.1%	11.3%	8.1%	10.7%	28.0%	13.6%	11.7%
	2006	57.5%	8.3%	11.4%	12.5%	25.3%	13.1%	10.9%
	2009	53.2%	7.6%	10.5%	12.2%	22.8%	12.3%	13.1%
<i>China</i>	1985	49.8%	35.8%		11.9%	2.1%	14.6%	16.5%
	1995	54.6%	22.0%		28.1%	4.5%	14.2%	16.1%
	2003	54.1%	18.0%		27.6%	8.4%	9.3%	12.8%
	2006	49.3%	14.6%		25.9%	8.7%	8.5%	11.0%
	2009	42.5%	13.0%		21.3%	8.2%	8.9%	12.0%
<i>Thailand</i>	1985	49.9%	26.5%	2.4%	13.7%	7.2%	12.6%	16.1%
	1995	55.4%	30.7%	3.0%	15.3%	6.4%	12.7%	15.9%
	2003	57.5%	24.1%	8.0%	13.8%	11.6%	10.0%	10.0%
	2006	56.4%	20.1%	10.6%	13.6%	12.1%	7.1%	8.4%
	2009	56.7%	18.7%	12.7%	13.2%	12.1%	6.8%	8.8%
<i>Malaysia</i>	1985	54.2%	23.2%	2.1%	22.4%	6.6%	16.4%	16.1%
	1995	59.1%	28.1%	2.3%	23.7%	5.0%	17.1%	15.6%
	2003	63.1%	17.2%	8.8%	25.1%	12.0%	16.0%	11.8%
	2006	63.0%	13.2%	12.1%	25.2%	12.5%	13.0%	11.1%
	2009	60.9%	12.4%	13.9%	22.3%	12.2%	11.7%	11.4%
<i>Indonesia</i>	1985	45.0%	14.4%	5.4%	13.7%	11.5%	25.9%	9.3%
	1995	51.4%	22.1%	2.3%	21.0%	5.9%	19.9%	10.7%
	2003	53.1%	13.0%	9.1%	20.8%	10.2%	9.3%	10.9%
	2006	55.0%	9.0%	10.9%	23.9%	11.3%	7.8%	9.7%
	2009	61.0%	10.2%	14.5%	25.2%	11.2%	8.4%	8.6%
<i>Philippines</i>	1985	42.9%	25.8%	2.4%	13.5%	1.2%	18.7%	19.0%
	1995	47.3%	22.7%	3.7%	17.0%	3.9%	13.7%	20.1%
	2003	55.0%	19.5%	4.6%	21.5%	9.4%	22.4%	8.1%
	2006	57.6%	14.2%	7.2%	26.2%	10.0%	16.6%	8.3%
	2009	60.9%	12.6%	8.9%	25.8%	13.7%	12.5%	7.2%
<i>North America</i>	1985	31.6%	17.7%	1.0%	10.2%	2.7%	27.9%	19.9%
	1995	35.0%	14.6%	5.6%	9.8%	5.1%	27.5%	16.4%
	2003	31.0%	8.5%	11.4%	6.8%	4.4%	24.3%	18.1%
	2006	31.7%	7.3%	14.8%	5.5%	4.1%	22.2%	16.3%
	2009	32.4%	5.7%	18.0%	5.1%	3.6%	20.6%	16.4%
<i>EU 15</i>	1985	6.5%	3.5%	0.4%	1.7%	0.9%	8.4%	56.2%
	1995	10.4%	4.1%	1.7%	3.0%	1.6%	8.1%	61.5%
	2003	11.4%	3.1%	4.1%	2.5%	1.8%	7.2%	58.5%
	2006	12.2%	2.4%	5.7%	2.5%	1.5%	6.4%	53.9%
	2009	13.0%	2.1%	7.1%	2.3%	1.5%	6.6%	53.1%

(Source) Compiled from UN Comtrade data base, Author's calculation

Table 1b. The Geographic Pattern of East Asian Exports

exporting country		to						
		<i>East Asia</i>	<i>Japan</i>	<i>China</i>	<i>NIEs</i>	<i>ASEAN4</i>	<i>North America</i>	<i>EU15</i>
East Asia	1985	42.4%	16.9%	4.7%	15.1%	5.7%	29.4%	11.4%
	1995	51.0%	12.9%	8.7%	20.9%	8.4%	21.1%	13.9%
	2003	51.6%	10.6%	12.6%	20.1%	8.3%	19.4%	14.2%
	2006	49.6%	8.9%	13.1%	19.7%	7.9%	17.9%	14.2%
	2009	47.4%	7.6%	13.5%	18.6%	7.8%	14.8%	13.4%
Japan	1985	24.1%		7.1%	12.8%	4.2%	40.2%	13.2%
	1995	42.0%		5.0%	25.0%	12.1%	28.9%	15.9%
	2003	44.9%		12.2%	23.5%	9.2%	26.5%	15.3%
	2006	45.7%		14.3%	23.2%	8.1%	24.3%	13.6%
	2009	51.5%		18.9%	23.5%	9.1%	17.7%	11.4%
Korea	1985	25.8%	15.0%	0.0%	7.4%	3.4%	39.7%	11.7%
	1995	44.8%	13.7%	7.5%	15.9%	7.7%	21.3%	13.3%
	2003	47.2%	8.9%	18.1%	13.6%	6.6%	19.2%	12.9%
	2006	47.8%	8.2%	21.3%	12.7%	5.6%	14.8%	12.5%
	2009	46.9%	6.0%	23.8%	11.8%	5.3%	11.3%	9.1%
Taiwan	1985	26.4%	11.3%	0.0%	12.0%	3.1%	51.4%	9.4%
	1995	50.2%	11.8%	0.3%	29.6%	8.5%	25.0%	13.1%
	2003	59.7%	8.6%	15.9%	28.3%	6.8%	19.4%	13.1%
	2006	64.9%	7.6%	24.3%	25.2%	7.7%	16.0%	10.4%
	2009	63.7%	7.1%	26.6%	22.3%	7.6%	12.3%	9.5%
Hong Kong	1985	40.8%	4.2%	26.0%	7.0%	3.6%	33.2%	13.6%
	1995	50.1%	6.1%	33.3%	7.1%	3.6%	23.3%	15.0%
	2003	57.4%	5.3%	41.7%	7.0%	3.4%	19.5%	13.7%
	2006	60.6%	4.8%	46.3%	6.2%	3.2%	15.9%	13.7%
	2009	63.2%	4.3%	49.8%	5.9%	3.2%	12.1%	12.8%
Singapore	1985	40.7%	9.4%	1.5%	9.3%	20.6%	21.9%	11.0%
	1995	52.0%	7.8%	2.3%	15.4%	26.5%	18.8%	13.4%
	2003	59.5%	6.1%	6.3%	17.1%	30.0%	13.1%	12.1%
	2006	60.2%	5.5%	9.7%	16.7%	28.2%	10.5%	10.6%
	2009	60.5%	4.5%	9.7%	19.5%	26.7%	7.5%	8.7%
China	1985	58.6%	22.2%		33.7%	2.7%	9.4%	9.2%
	1995	55.9%	19.1%		33.1%	3.7%	17.7%	12.9%
	2003	43.6%	13.6%		26.1%	4.0%	22.4%	16.5%
	2006	38.6%	9.5%		25.2%	4.0%	22.7%	17.5%
	2009	35.4%	8.2%		22.5%	4.7%	19.9%	17.5%
Thailand	1985	39.0%	13.4%	3.8%	15.4%	6.3%	20.9%	19.8%
	1995	47.7%	16.8%	2.9%	23.0%	4.9%	18.9%	15.1%
	2003	48.9%	14.2%	7.1%	17.9%	9.7%	18.2%	14.7%
	2006	47.9%	12.7%	9.0%	16.6%	9.6%	16.0%	13.0%
	2009	45.6%	10.3%	10.6%	14.6%	10.1%	11.8%	10.6%
Malaysia	1985	60.2%	23.8%	1.1%	29.1%	6.3%	13.7%	14.9%
	1995	53.1%	12.7%	2.7%	31.6%	6.2%	21.5%	14.2%
	2003	53.7%	10.7%	6.5%	28.7%	7.8%	20.2%	12.1%
	2006	52.0%	8.9%	7.2%	26.7%	9.2%	19.4%	12.1%
	2009	57.4%	9.8%	12.2%	25.6%	9.8%	11.5%	10.3%

Philippines	1985	39.6%	18.9%	1.6%	12.9%	6.1%	37.5%	16.2%
	1995	40.5%	15.9%	1.2%	16.2%	7.2%	37.4%	16.9%
	2003	57.7%	22.3%	6.2%	21.5%	7.7%	12.7%	13.1%
	2006	58.9%	21.6%	8.3%	20.9%	8.2%	11.7%	11.5%
	2009	56.8%	15.9%	9.8%	20.4%	10.6%	9.7%	11.0%
Indonesia	1985	64.7%	46.2%	0.5%	16.1%	1.9%	22.0%	6.4%
	1995	58.1%	27.1%	3.8%	22.2%	5.0%	14.7%	14.9%
	2003	58.4%	15.9%	5.9%	25.5%	11.0%	21.0%	16.3%
	2006	58.0%	16.7%	9.8%	22.4%	9.1%	18.9%	18.0%
	2009	54.5%	16.2%	7.6%	23.0%	7.7%	18.3%	20.3%
North America	1985	17.9%	8.8%	1.6%	5.9%	1.6%	37.9%	18.9%
	1995	24.8%	9.5%	1.9%	10.2%	3.3%	35.9%	17.5%
	2003	19.4%	5.8%	3.2%	7.6%	2.9%	40.5%	16.6%
	2006	18.8%	4.8%	4.3%	7.3%	2.3%	38.4%	16.3%
	2009	19.5%	4.3%	5.8%	7.2%	2.2%	32.1%	17.4%
EU 15	1985	4.2%	1.2%	0.8%	1.5%	0.7%	10.8%	57.8%
	1995	7.8%	2.1%	1.0%	3.2%	1.6%	7.3%	61.8%
	2003	6.2%	1.6%	1.6%	2.2%	0.9%	9.7%	60.9%
	2006	6.2%	1.3%	1.9%	2.1%	0.8%	9.0%	59.1%
	2009	7.2%	1.2%	2.7%	2.4%	0.9%	7.7%	57.0%

(Source) Compiled from UN Comtrade data base, Author's calculation

The NIEs also increased its importance in intra-East Asian imports between 1985 and 2006. The share increased from 10.7% in 1985 to 18.4% in 2006. On the other hand, the table reports relatively small gain in the share of the ASEAN by 3.6% between 1985 and 2006. In contrast, a sizeable decline is observed in the share of Japan by almost 11.3% during the same period and the share further declined by 1.5% from 2006 and 2009. The shares of North America in the East Asian imports also declined, however, by lower amount relative to the Japanese experience. In contrast, the share of imports from EU15 rebounded from 2006 to 2009 on the back of a general declining trend.

Increased dependency on regional trade can be seen for all East Asian countries, although sizeable differences regarding the extent of the dependence exist among those countries. At the same time, the dependence on North America and EU 15 as an import source declined for all East Asian countries except for Japan and Singapore where the share of EU 15 increased slightly.

The increased importance of China as an import source country can be seen in all East Asian countries, particularly for more advanced nations such as Japan, Korea, Taiwan and Hong Kong. China has also become an increasingly important factor for non-regional markets. The increase in the share of China in the imports of North America between 1985 and 2009 was 17.0%. In spite of the fact that intra-regional imports dominate in EU15 accounting for 53.1% in 2009, China managed to gain its share by 6.7% since 1985. For both regions, China accounts for approximately 55% of their imports from the East Asia in 2009.

The table shows that there have been significant changes in the pattern of China's imports. In 1985, more than one third of its imports originated from Japan. Two decades later, its

reliance on Japan has declined to 13.0%. On the other hand, a large increase in the share of NIEs is witnessed.

A similar pattern of deepening trade ties among East Asian economies can be observed on the export side. The share of intra-regional exports increased from 42.4% in 1985 to 51.6% in 2003 followed by slight decline. In all countries examined, significantly higher increase in the share of intra-regional exports is reported for Taiwan by almost 38% and Japan by 27.4% followed by Hong Kong and Korea by 22.3% and 21.1%, respectively. The increase in the share of intra-regional exports in all countries is largely attributed to China and to a lesser extent to NIEs. If we exclude Japan from East Asia, increased dependency on regional trade is evidenced for all other Asian countries except China.

The share of NIEs bound and ASEAN4 bound exports from China shrank from 36.4% to 27.2% between 1985 and 2009. In contrast, much higher portion of Chinese goods is absorbed by both North America and to a lesser extent by EU15 in 2009. As we have shown in the import side, the reliance on North America declined for all other East Asian countries except China. The decline in that reliance appears to be even larger on the export side. Taiwan in particular, the share of North America declined from 51.4% in 1985 to 12.3% in 2009.

B. Trade by production stage in East Asia

The above section leads to the conclusion that East Asian countries have generally become increasingly interdependent in trade. This section considers composition of trade by stage of production in East Asia.

Table 2. Average growth rate of imports and exports by production stage

(1998–2009)

Countries	Imports			Exports		
	Total	Intermediate Goods	Final Goods	Total	Intermediate Goods	Final Goods
<i>Eight Asian Nations</i>	9.9%	10.8%	8.4%	9.9%	10.4%	9.5%
<i>Japan</i>	6.0%	7.3%	4.7%	4.4%	5.5%	2.6%
<i>China</i>	18.3%	17.8%	19.5%	19.9%	21.7%	18.9%
<i>Hong Kong</i>	6.2%	8.1%	4.0%	6.3%	9.4%	3.3%
<i>Indonesia</i>	15.1%	15.3%	15.3%	7.6%	10.5%	8.4%
<i>Malaysia</i>	7.2%	7.1%	7.8%	7.3%	7.9%	6.0%
<i>Philippines</i>	2.7%	2.4%	4.7%	2.8%	2.0%	5.0%
<i>Rep. of Korea</i>	12.6%	11.5%	16.1%	10.0%	9.5%	10.9%
<i>Singapore</i>	7.4%	8.0%	5.4%	8.6%	10.6%	2.8%
<i>Thailand</i>	10.7%	11.2%	10.7%	9.9%	11.0%	9.5%
<i>EU15</i>	7.0%	6.4%	6.9%	6.9%	6.6%	6.6%
<i>North America</i>	4.3%	3.5%	5.0%	3.6%	3.2%	3.1%
<i>World</i>	7.4%	7.4%	7.0%	7.5%	7.4%	7.2%

(Source) Compiled from UN Comtrade data base, Author's calculation

Table 2 examines the annual growth rate of trade in total manufactured goods and compares them with the rate of trade in finished and intermediate goods. The table provides strong evidence that trade in intermediate goods resulting from the international fragmentation of production has been the driving force of Asian trade during recent years. Between 1998 and 2009, exports of intermediate goods grew at a rate of 10.4% among Asian nations on average, which is faster than the growth rate of 9.5% for exports of final goods. On the import side, trade in intermediate goods grew over 2.4% point faster than trade in final goods. Compared with other parts of the world, the growth rate in intermediate goods is much faster among Asian nations, both for exports and imports. The growth rate of exports of intermediate goods for the world, the EU 15 and North America was 7.4%, 6.6% and 3.2%, respectively while that of imports was 7.4%, 6.4% and 3.5%, respectively. This reflects the fact that international fragmentation of production has prevailed more among the countries of East Asia relative to other regions of the world.

Table 3. Trade partner by production stage

Imports	stage	China	China, Hong Kong SAR	Indonesia	Japan	Malaysia	Philippines	Rep. of Korea	Singapore	Thailand	Asia	North America	European Union 15	World
1998	FC	4.4%	32.9%	6.1%	28.3%	6.2%	8.6%	5.0%	12.7%	8.3%	18.3%	29.5%	27.4%	24.8%
	FCA	19.4%	15.6%	21.5%	12.7%	18.2%	10.4%	12.0%	21.0%	17.3%	15.8%	18.1%	16.1%	17.0%
	IMPC	21.8%	19.2%	16.3%	13.2%	46.1%	46.7%	24.3%	39.7%	26.7%	23.3%	21.1%	17.6%	18.9%
	IMSF	44.5%	28.6%	37.5%	23.6%	21.7%	24.7%	33.0%	16.4%	34.6%	28.6%	20.1%	27.7%	27.1%
	P	8.2%	2.1%	12.6%	19.1%	3.7%	9.5%	22.7%	6.0%	11.2%	11.4%	6.4%	7.7%	8.3%
2002	FC	4.5%	29.6%	6.6%	27.7%	7.6%	6.9%	9.8%	11.9%	7.6%	16.1%	32.1%	28.8%	25.3%
	FCA	21.0%	16.0%	14.0%	12.3%	15.0%	7.0%	14.5%	17.2%	17.5%	15.8%	17.4%	14.9%	16.1%
	IMPC	27.4%	26.9%	13.8%	14.4%	47.0%	55.5%	22.7%	41.4%	27.1%	26.4%	17.4%	16.5%	18.5%
	IMSF	34.7%	24.2%	35.6%	22.5%	20.8%	19.4%	29.5%	14.7%	31.6%	26.2%	19.0%	25.7%	25.3%
	P	10.6%	2.0%	19.5%	19.3%	4.7%	9.5%	20.2%	7.0%	14.3%	12.3%	8.7%	9.1%	10.0%
2006	FC	4.2%	21.6%	6.5%	20.8%	7.5%	7.7%	8.3%	9.0%	7.7%	11.4%	27.9%	25.8%	21.5%
	FCA	19.2%	16.1%	14.6%	11.0%	14.4%	6.6%	14.6%	14.6%	14.3%	15.2%	16.4%	14.2%	15.5%
	IMPC	30.5%	36.2%	10.5%	13.7%	41.4%	48.4%	17.6%	40.7%	22.9%	27.0%	15.1%	14.5%	17.3%
	IMSF	26.0%	21.5%	31.3%	23.5%	22.9%	19.6%	30.3%	14.3%	32.0%	24.4%	20.3%	26.1%	25.2%
	P	17.9%	2.1%	19.2%	26.8%	7.6%	13.2%	26.1%	9.3%	20.3%	17.6%	14.0%	12.1%	13.5%
2009	FC	5.3%	22.6%	7.8%	24.2%	9.7%	14.0%	8.7%	11.1%	9.2%	12.5%	30.0%	29.7%	23.5%
	FCA	17.1%	17.0%	23.1%	10.4%	15.9%	7.7%	13.8%	16.2%	14.4%	15.2%	18.0%	13.1%	15.4%
	IMPC	27.7%	39.0%	17.5%	12.4%	37.7%	40.4%	18.7%	41.1%	23.5%	26.2%	14.7%	14.0%	17.1%
	IMSF	26.2%	19.0%	36.1%	24.4%	26.6%	23.0%	32.3%	17.0%	32.9%	25.5%	19.3%	25.9%	25.6%
	P	23.5%	2.3%	15.2%	26.7%	9.4%	14.9%	26.4%	11.0%	19.8%	19.7%	14.5%	12.2%	14.3%

(Note) FC: Consumption goods FCA: Capital goods IMPC: parts and components
 IM SF: semi-finished goods, P: primary goods

(Source) Compiled from UN Comtrade data base, Author's calculation

Exports	stage	China	China, Hong Kong SAR	Indonesia	Japan	Malaysia	Philippines	Rep. of Korea	Singapore	Thailand	Asia	North America	European Union 15	World
1998	FC	47.9%	42.6%	20.5%	20.0%	14.0%	17.7%	19.2%	10.9%	37.4%	27.0%	16.6%	27.2%	24.9%
	FCA	15.0%	12.3%	4.1%	27.4%	18.5%	12.2%	20.2%	28.4%	13.0%	20.1%	21.3%	19.2%	17.9%
	IMPC	9.8%	17.6%	4.7%	29.6%	36.5%	59.6%	22.0%	37.4%	24.8%	24.6%	26.3%	17.9%	19.4%
	IMSF	22.9%	24.9%	36.3%	19.4%	23.9%	9.0%	34.5%	13.9%	18.8%	22.6%	24.1%	28.3%	26.5%
	P	3.8%	1.5%	17.5%	0.4%	5.3%	1.5%	0.8%	0.8%	4.0%	2.3%	6.8%	3.1%	7.0%
2002	FC	40.2%	35.9%	20.8%	22.4%	12.7%	14.8%	19.4%	8.5%	33.1%	26.3%	17.6%	29.2%	25.1%
	FCA	20.0%	14.7%	8.2%	23.0%	18.8%	17.0%	26.2%	22.0%	14.9%	20.1%	18.9%	18.3%	16.7%
	IMPC	15.6%	25.5%	8.7%	29.6%	38.2%	59.3%	24.3%	42.8%	23.3%	26.7%	25.7%	17.1%	19.0%
	IMSF	20.3%	22.2%	40.4%	20.2%	22.2%	6.5%	25.9%	15.1%	19.9%	21.3%	24.4%	27.0%	24.8%
	P	2.9%	1.4%	19.5%	0.4%	5.1%	1.4%	0.3%	0.7%	4.5%	2.4%	7.5%	3.4%	8.9%
2006	FC	31.1%	26.5%	17.1%	20.6%	10.6%	13.2%	14.8%	7.7%	27.2%	22.4%	16.6%	26.8%	22.1%
	FCA	26.8%	14.9%	5.8%	22.1%	20.4%	15.6%	27.6%	14.4%	17.9%	21.8%	18.9%	18.2%	16.6%
	IMPC	17.4%	36.4%	7.1%	28.5%	30.9%	53.7%	25.9%	44.4%	21.3%	26.4%	22.1%	16.3%	17.6%
	IMSF	22.2%	20.3%	41.8%	22.5%	25.3%	12.6%	25.1%	16.1%	22.6%	22.5%	26.1%	28.1%	25.7%
	P	1.4%	1.6%	25.5%	0.9%	8.4%	2.5%	0.5%	0.7%	6.6%	2.6%	10.2%	4.2%	11.3%
2009	FC	30.4%	23.4%	17.3%	16.7%	12.8%	13.4%	11.5%	10.3%	30.2%	22.0%	17.9%	29.7%	23.7%
	FCA	30.2%	17.1%	6.3%	20.9%	15.4%	23.6%	34.5%	13.8%	17.6%	24.1%	15.7%	16.4%	16.4%
	IMPC	17.8%	38.8%	6.3%	29.2%	31.5%	46.6%	26.0%	48.8%	19.6%	26.0%	17.4%	15.8%	16.8%
	IMSF	20.3%	19.1%	40.0%	26.0%	32.6%	12.8%	27.4%	18.6%	27.7%	23.5%	27.0%	28.1%	26.0%
	P	1.0%	1.5%	30.1%	1.2%	7.3%	3.5%	0.5%	0.6%	4.9%	2.6%	12.5%	3.7%	12.1%

(Note) FC: Consumption goods FCA: Capital goods IMPC: parts and components

IM SF: semi-finished goods, P: primary goods

(Source) Compiled from UN Comtrade data base, Author's calculation

Table 3 further distinguishes different types of intermediate goods, i.e., parts and components (IMPC) and semi-finished goods (IMSF). Finished goods are also further classified into consumption goods (FC) and capital goods (FCA). Primary goods (P) form the last category. This classification by different stages of production is useful in showing how each nation of East Asia is involved in production fragmentation and to what extent they differ from other regions of the world. The classification is explained in Appendix 1.

The most notable difference between the rest of the world and the East Asian nations can be found in the trade pattern of parts and components. At the global level, approximately one fifth of both imports and exports comprise the exchange of parts and components. That share remained relatively stable between 1998 and 2009 although both import and export are on a slight declining trend in recent years. Table 3 shows very different trends for different regions. For example, North America experienced declines of 6.5% and 8.9%, respectively, in its import and export share of parts and components from 1998 to 2009. The EU 15 also experienced a declining trend in its parts and components trade, although more moderately relative to North America. The trend in East Asia contrasts markedly with the other regions, with the share of the parts and components trade consistently accounts for approximately a quarter or more of total imports and exports during the same period.

For finished products, the most distinguishing difference between the rest of the world and the Asian nations can be found in the trade pattern of consumption goods, particularly on the import side. Approximately 24% of world imports take the form of consumption goods. In the case of North America and the EU15, the share is almost 30%. Among the East Asian nations, the corresponding share only amounts to 12.5% in 2009, which was a decline of almost 6%

from 1998.

Another interesting point to note is the gradual decline in import share of capital goods which can be seen in all Asian countries examined except Hong Kong and Korea. However, one must use caution about BEC (Broad Economic Categories issued by the United Nations) classification for capital goods. Capital goods (41) include producers' goods that are defined in the System of National Accounts (SNA) as part of fixed capital formation. However, there are goods in capital goods (41 and 51) that can be used as intermediate products in the related industry. Examples include motors, diesel and semi-diesel engines, generators, transformers, radiators, rectifiers, and so on.

Furthermore, there is considerable variation in the trade patterns across East Asian countries. A general picture of the division of production processes in East Asia can be drawn from Table 4 as follows: China's trade structure can be characterized by a larger import share of parts and components and semi-finished products, and by a large export share of consumption goods as well as capital goods. This reflects China's role in production fragmentation as a processing and assembly base for finished products destined for the world market.

The general feature of three ASEAN countries, Malaysia, the Philippines, and Indonesia is a large share of intermediate goods among both imports and exports. The decomposition of intermediate goods shows that while parts and components account for a large share of imports and exports in Malaysia and the Philippines, semi-finished goods account for a large share in Indonesia. The import structure of Thailand is similar to the above-mentioned three ASEAN countries; however, the distinctive difference can be found in its export structure, i.e., a much larger share of exports of consumption goods. In this comparison, Singapore is treated separately from the four other ASEAN countries due to its relatively high wages, and it will be discussed subsequently.

Japan's trade structure is quite different from those of the developing Asian countries. Japan is a large supplier of parts and components, reflecting Japanese industries turning to other countries of the region for the assembly of Japanese products (Jones *et al.*, 2004). The trend is also marked by a small export share of consumption goods. Table 3 also indicates that capital goods hold a large share of Japan's exports, which reflects in part large Foreign Direct Investment (FDI) outflows from Japan. Production fragmentation has been facilitated greatly by multinational corporations and consequent FDI, which has had a significant impact on exports from investing countries to host countries. This may be due to the fact that new production facilities need to be equipped using capital goods from the investing country or because new capital goods are required for expanding existing production capacities.

A large share of parts and components trade can also be found in countries such as Singapore and Hong Kong where wage costs are much higher relative to other developing countries of East Asia. In Singapore, parts and components make up a substantial share of its imports and exports. Over 41% of imports and 48% of exports are induced by the need for parts and components. This represents Singapore's pivotal role as an outsourcing centre in East

Asia, particularly high-tech manufacturing, and as a hub for many leading international firms. Singapore's superior logistics sector as well as finance industry helps to form the world-class supply chains in the region.

Hong Kong as a trading hub for electronic parts and components in Asia hosts a number of multinational manufacturers which source parts of key components and take advantage of its free port status. At the same time, the electronics industry is characterized by the heavy dependence on imported parts of key components. Local firms source both worldwide and the mainland China. Hong Kong's import share of parts and components increased dramatically from 19.2% in 1998 to 39.0% in 2009. On the export side, electronics industry is the largest export industry, accounting for nearly 50% of its total exports in 2006. Furthermore, two-thirds of electronics exports comprise parts and components. What contributes to the large amount of parts and components exports is its involvement in outward processing production in China. This led to an increase in the export share from 17.6% in 1998 to 38.8% in 2009.

III. General Trend in FDI in East Asia

Table 4 shows that although global FDI inflow continued to be dominated by the EU15 since 1980, East Asia (without Japan) has gained in importance as recipients of FDI over time until mid-1990s in terms of both the volume of inward flows and their world share. Total value of inflows of FDI into eight East Asian economies that amounted to US\$ 4.5 billion in 1985 increased to US\$ 71.8 billion in 1995. Their share in total world inflows rose from 7.7% in 1985 to 21.1% in 1995. The surge of FDI came to a halt however in 1997 with the Asian financial crisis. The swift recovery from the crisis in terms of FDI volume in 1998 was only followed by another sharp downturn in 2001. Since 2003, FDI inflow to the region has been on a rise again. It reached US\$ 132.51 billion in 2004, a 56% increase over 2003 with a backdrop of improved economic performance, a more favorable FDI policy environment and a rise in merger and acquisition activities in the region. Considering 30% increase in global FDI inflow in 2004, a gain in the region's FDI inflow is spectacular. It continued to grow until 2008 reaching US\$ 219 billion which was up to forty nine-fold from 1985. The global financial crisis had a major dampening effect on global FDI inflow in 2008 among developed countries and spread to developing countries in late 2008 and early 2009. In the midst of the turmoil, however, total inflow of FDI in East Asia managed to increase slightly in 2008 because of the increased FDI inflow to Korea, Hong Kong, Indonesia, and China during the year countervailed the decreased FDI inflow to the rest of East Asian economies. The region finally faced a downturn in FDI inflows in 2009, although the share of East Asia in global FDI flows surged from 10.2% to 16.4% in 2009 as FDI flows to developed countries further contracted during the year.

Table 4. Inward FDI and its share in the World Inward FDI

(Unit: US\$ million)

	1985	1990	1995	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
<i>Japan</i>	642.0	1,753.0	41.5	8,322.7	6,241.3	9,239.3	6,324.3	7,815.7	2,775.0	-6,506	22,550	24,426	11,939
<i>Republic of Korea</i>	218.0	759.0	1,250.0	8,591.0	3,692.0	2,975.0	3,785.0	7,687.0	7,198.0	4,950	2,628	8,409	5,844
<i>Taiwan Province of China</i>	342.0	1,330.0	1,559.0	4,928.0	4,109.0	1,445.0	453.0	1,898.0	1,625.0	7,424	7,769	5,432	2,803
<i>Hong Kong, China</i>	-267.2	3,275.1	6,213.4	61,924.1	23,776.5	9,681.9	13,623.6	34,034.7	35,897.0	42,892	54,341	59,621	48,449
<i>China</i>	1,956.0	3,487.1	37,520.5	40,714.8	46,877.6	52,742.9	53,505.0	60,630.0	72,406.0	69,468	83,521	108,312	95,000
<i>Singapore</i>	1,046.8	5,574.7	11,591.3	16,484.5	14,121.6	5,821.5	9,330.8	16,059.8	20,083.0	24,207	35,778	10,912	16,809
<i>Thailand</i>	160.0	2,575.0	2,070.0	3,350.0	3,886.0	947.0	1,952.0	5,862.0	8,957.0	9,751	11,355	8,544	5,949
<i>Malaysia</i>	694.7	2,611.0	5,815.0	3,787.6	553.9	3,203.4	2,473.2	4,624.0	3,965.0	6,060	8,538	7,318	1,381
<i>Philippines</i>	12.0	550.0	1,459.0	1,345.0	899.0	1,792.0	347.0	688.0	1,854.0	2,345	2,916	1,544	1,948
<i>Indonesia</i>	310.0	1,092.0	4,346.0	-4,550.0	-2,978.4	145.0	-596.9	1,023.0	5,260.0	5,556	6,928	9,318	4,877
<i>E. Asia</i>	4,472.2	21,253.9	71,824.2	136,575.0	94,937.2	78,753.7	84,872.6	132,506.5	157,245.0	172,653.0	213,774.0	219,410.0	183,060.0
<i>ASEAN 5</i>	2,223.5	12,402.7	25,281.3	20,417.1	16,482.1	11,908.9	13,506.0	28,256.8	40,119.0	47,919.0	65,515.0	37,636.0	30,964.0
<i>N. America</i>	21,862.0	21,862.0	21,862.0	21,862.0	21,862.0	21,862.0	21,862.0	21,862.0	21,862.0	135,462	374,371	379,830	148,540
<i>EU15</i>	15,965.0	89,459.0	116,324.0	674,278.0	362,418.0	283,863.0	240,572.0	185,227.0	387,858.0	492,090	778,602	414,979	333,932
<i>World</i>	57,959.0	201,614.0	340,336.0	1,409,568.0	832,248.0	617,732.0	557,869.0	710,755.0	916,277.0	1,305,852	2,099,973	1,770,873	1,113,189

(Unit: %)

	1985	1990	1995	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
<i>Japan</i>	1.1%	0.9%	0.0%	0.6%	0.7%	1.5%	1.1%	1.1%	0.3%	-0.5%	1.1%	1.4%	1.1%
<i>Republic of Korea</i>	0.4%	0.4%	0.4%	0.6%	0.4%	0.5%	0.7%	1.1%	0.8%	0.4%	0.1%	0.5%	0.5%
<i>Taiwan Province of China</i>	0.6%	0.7%	0.5%	0.3%	0.5%	0.2%	0.1%	0.3%	0.2%	0.6%	0.4%	0.3%	0.3%
<i>Hong Kong, China</i>	-0.5%	1.6%	1.8%	4.4%	2.9%	1.6%	2.4%	4.8%	3.9%	3.3%	2.6%	3.4%	4.4%
<i>China</i>	3.4%	1.7%	11.0%	2.9%	5.6%	8.5%	9.6%	8.5%	7.9%	5.3%	4.0%	6.1%	8.5%
<i>Singapore</i>	1.8%	2.8%	3.4%	1.2%	1.7%	0.9%	1.7%	2.3%	2.2%	1.9%	1.7%	0.6%	1.5%
<i>Thailand</i>	0.3%	1.3%	0.6%	0.2%	0.5%	0.2%	0.3%	0.8%	1.0%	0.7%	0.5%	0.5%	0.5%
<i>Malaysia</i>	1.2%	1.3%	1.7%	0.3%	0.1%	0.5%	0.4%	0.7%	0.4%	0.5%	0.4%	0.4%	0.1%
<i>Philippines</i>	0.0%	0.3%	0.4%	0.1%	0.1%	0.3%	0.1%	0.1%	0.2%	0.2%	0.1%	0.1%	0.2%
<i>Indonesia</i>	0.5%	0.5%	1.3%	-0.3%	-0.4%	0.0%	-0.1%	0.1%	0.6%	0.4%	0.3%	0.5%	0.4%
<i>E. Asia</i>	7.7%	10.5%	21.1%	9.7%	11.4%	12.7%	15.2%	18.6%	17.2%	13.2%	10.2%	12.4%	16.4%
<i>ASEAN 5</i>	3.8%	6.2%	7.4%	1.4%	2.0%	1.9%	2.4%	4.0%	4.4%	3.7%	3.1%	2.1%	2.8%
<i>N. America</i>	37.7%	10.8%	6.4%	1.6%	2.6%	3.5%	3.9%	3.1%	2.4%	10.4%	17.8%	21.4%	13.3%
<i>EU15</i>	27.5%	44.4%	34.2%	47.8%	43.5%	46.0%	43.1%	26.1%	42.3%	37.7%	37.1%	23.4%	30.0%

(Note) East Asia excludes Japan

(Source) World Investment Report, various years

The largest contributor to the region’s rising share in global FDI inflow has been China. FDI inflow to China has grown dramatically over the past two decades since China initiated its “open-door” policy in 1978. It was in the mid-1980s when FDI inflows surged and marked the beginning of China’s ride on the wave of globalization. After it achieved unprecedented growth during the early 1990s, however, FDI inflow started to decline. This downturn continued until the next wave of FDI inflow hit China in 2000. Despite the widespread decline in global FDI inflow between 2000 and 2002, China was able to increase FDI inflow with expectations of further deregulation and China’s accession to the WTO. In 2008, the value of inward FDI to China continued to increase despite financial crisis. The total value of in 2008 was 55 times larger than in 1985, accounting for 6.1 percent of global FDI inflow and almost 52 percent of aggregate FDI inflow to East Asia. However, even China was not spared a negative impact of

the global financial crisis in 2009.

ASEAN 5 experienced a significant increase in FDI inflow during the early 1990s, accounting for 7.4 per cent of global FDI inflow in 1995. The Asian financial crisis in 1997 triggered a sharp decline in the region's FDI inflow, although individual national performances varied greatly. In order to attract further FDI inflows, the ASEAN Investment Area was established in 1998 and required the member countries to reduce or eliminate investment regulations and conditions that might impede investment flows. This provided a new impetus for economic integration among ASEAN member countries. The ASEAN Free Trade Area (AFTA) became fully operational on 1 January 2003 and this added momentum to economic integration in the region. FDI inflows to the ASEAN 5 continued to increase until 2007 reaching US\$ 65 billion.

Among the ASEAN 5, Singapore has been a leader in attracting FDI, which has played a pivotal role in that country's economy. A liberal open-door policy and extensive FDI promotion policies towards foreign investors attracted a massive amount of FDI. In 2007, Singapore retained its position as third-largest recipient in East Asia, attracting US\$ 35 billion, which accounted for approximately 55% of total FDI inflows to the ASEAN 5. FDI inflows into the ASEAN 5 in 2008 varied significantly; they surged in Indonesia; dropped slightly in Thailand and Malaysia; and fell sharply in the Philippines and Singapore. Although inward FDI bounced in Singapore and the Philippines in 2009, it continued to decline in Thailand, Malaysia and Indonesia.

FDI inflows to the East Asian "Tigers" (Hong Kong, China, China, the Republic of Korea and Taiwan Province of China) began to increase rapidly in the early 1990s against the backdrop of strong economic growth and the liberalization of investment regimes. The slowdown of the domestic economy and the regional economic situation as a result of the Asian financial crisis prompted the sharp decline of FDI inflows to Taiwan in 1998. As a result, the share of the East Asian "Tigers" in global FDI declined to 2.8% during the year. Since then, the share of these economies has quickly picked up and has reached at 5.4% in 2000. Their share in global FDI inflow peaked at 6.1% in 2004.

Hong Kong experienced an unprecedented FDI boom in 1999 after it recovered from the turmoil of the Asian financial crisis. The surge reflected Hong Kong as a financial hub for business in the region, particularly in China. Hong Kong is by far the largest investor in China, and its investments have increased dramatically since early 1980s. A significant portion of the investment originates from China itself. Much of China's capital outflow that takes place either through legal or illegal channels to Chinese firms located in Hong Kong finds its way back to China as FDI. This type of "round tripping" of funds is mostly used to escape regulations such as barriers to trade or to gain eligibility for incentives available only to foreign investors e.g., tax concessions. Hong Kong is also used as a stepping stone for investment to China. A large number of foreign firms use affiliates in Hong Kong to invest in China on their behalf. In addition, many overseas companies have regional offices as well as regional headquarters in Hong Kong. It has been experiencing another surge in FDI inflows during recent years. This

partly reflects the Closer Economic Partnership Arrangement (CEPA) signed between Hong Kong, China and China, which opened up new opportunities not only for firms in Hong Kong, China but also for foreign investors. In 2004, Hong Kong attracted almost 26% of the FDI inflow into the region, accounting for 4.8 % of global FDI inflow. Hong Kong remained as Asia's second largest destination for FDI in recent years.

Since the 1997 Asian financial crisis, the Republic of Korea has adopted extensive policy reforms in favor of FDI such as simplifying the approval procedure, the removal of various restrictions on foreign ownership, strengthening tax incentive systems and financial support for foreign investors, among others. As a result, FDI inflows began to surge in 1997 and maintained strong growth until 2000. In 2004, the inflows picked up once again and the Republic of Korea absorbed more than 1 % of global FDI inflow. Inflows to Republic of Korea declined considerably in 2006 mainly due to a significant fall in the value of cross-border M&As and divestment by foreign investors (UNCTAD 2007). Following a continuous decline in FDI inflows over the period of 2005~2007, FDI in Republic of Korea surged again despite the impact of the global financial crisis.

The inflow of FDI to Taiwan grew rapidly, particularly towards the end of the 1990s, due to a large-scale reform of various laws and regulations as well as further opening up of financial sector. However, after 2001, the absolute magnitude of FDI in Taiwan has been small, which was a clear contrast to the surge in FDI inflow to the Republic of Korea. However, in 2006, Taiwan saw the highest growth rate of FDI in this region, with inflows jumping to over US\$7 billion. This was only followed by the sharp decline in inward FDI as the global financial crisis spread to East Asia in 2008 and 2009.

IV. Gravity Equation

A. Model specification

The gravity model has been widely applied in various studies of international trade and FDI (Feenstra *et al.*, 2001). The gravity equation in international trade using cross-country data is commonly written as:

$$X_{ij} = f(GDP_i, GDP_j, F_{ij}) \quad (1)$$

where X_{ij} is the value of the trade flow of goods from country i to country j , GDP_i and GDP_j are the GDP in country i and j , respectively, and F_{ij} is a vector of factors that influence trade flow. The factors commonly used include the physical distance between the two countries i and j , which is used as a proxy for transportation costs, a dummy variable that assumes the value 1

if i and j share a common language and 0 otherwise, a binary variable assuming the value 1 if i and j share a common land border and 0 otherwise, and a dummy variable assuming the value 1 if i and j have a free trade agreement and 0 otherwise.

The model specification is augmented in order to examine the economic impact of FDI inflow on the host country's trade. China, Hong Kong, China, Singapore, the Republic of Korea, Thailand, Malaysia, the Philippines, Indonesia and Japan are included in the estimation for 1998~2006. Originally, the analysis was conducted using the data set between 1998 and 2009. However, the results were drastically different from what we present below. We conjecture that this paradox is due to the transient abnormality in the FDI as well as international trade data stemming from the global financial crisis of late 2000's. Therefore, we excluded the period 2007, 2008 and 2009 from our analysis.

Of particular interest is the impact of FDI on the various forms of trade in East Asia. One possible specification issue for including FDI in the gravity analysis is the endogeneity problem. More specifically, the causal relationship between FDI and trade may be driven by unobserved common factors such as variations in government policy, technology, tastes, etc. The strategy adopted here to deal with this issue is to estimate FDI at the first stage using various instrumental variables while in the second stage, bilateral trade is regressed on the predicted value of FDI as the additional independent variable. The error term in the FDI equation is, thus, uncorrelated with the error term in the trade equation.

The model predicts that FDI flow and bilateral trade flows between any two countries as:

$$FDI_i = \alpha_0 + \beta_1 DIFPGDP_{ij} + \beta_2 DIFWAGE_{ij} + \beta_3 DUTY_i + \beta_4 CTAX_i + \beta_5 CORRUPT_i + \beta_6 GSTAB_i + \beta_7 LAW_i + \beta_8 TEL_i + \varepsilon_{ij} \quad (2)$$

$$T_{ij} = \gamma_0 + \rho_1 GDP_i + \rho_2 GDP_j + \rho_3 DIST_{ij} + \rho_4 DMB_i + \rho_5 FDI_i + \delta_{ij} \quad (3)$$

where subscripts i and j refer to reporting country and partner country. The definition of the variables in the above equation is listed below. Annual data for eight countries from 1998 to 2004 are used in the estimation. Equation (3) is run on parts and components and capital goods separately. In addition, the impact of an each explanatory variable on bilateral import flows and export flows are examined separately.

- FDI_i – the level of FDI stock in reporting country.
- $DIFPGDP_{ij}$ – the absolute value of the difference in per capita GDP between i and j .
- $DIFWAGE_{ij}$ – the absolute value of the difference in wages between i and j .
- $DUTY_i$ – import tariff of the host country.
- $CTAX_i$ – corporate tax rate of the host country.
- $CORRUPT_i$ – an index of corruption in the host country.
- $GSTAB_i$ – an index of government stability in the host country.
- LAW_i – an index of rule of law in the host country.

- TEL_i – the number of telephone main lines per 1,000 people in the host country.
- $DIST_{ij}$ – the geographical distance between the two most important cities in i and j .
- T_{ij} – the volume of exports or imports by country i to or from j in total trade, intermediate or final products.
- GDP – gross domestic product.
- DMB_{ij} – a dummy variable that is 1 if i and j share a common border and 0 otherwise.

The independent variables included in equation (2) are believed to exert an influence on inward foreign direct investment in each country of East Asia by changing the investment environment through institutional and policy changes, and economic fundamentals.

Two variables have been incorporated in this analysis that may influence the level of foreign production – the absolute difference of per capita GDP ($DIFPGDP$) and wages ($DIFWAGE$). The gap in per capita GDP and wages between a reporting country and a partner country should have a positive influence on FDI with the vertical type.³ Trade in intermediate goods can be very sensitive to cost differences between two countries. For production fragmentation to take place, additional coordination costs must be offset by a reduction in the total production costs. Factor price differentials between countries allow at least one fragment to be produced more cheaply in another country (Deardorff, 2001).

Policy-related variables, such as import duty and corporate tax rates have also been incorporated. MNEs, which set up vertical production networks, may be encouraged to invest in a country with relatively low tariff barriers due to lower costs of their imported intermediate products.

Another policy-related variable that can influence a host country's location advantage is the host country's corporate or other tax rates. As global profit maximizers, MNEs can be sensitive to tax factors, since such factors have a direct effect on their profits. Evidence of significant negative influence from corporate tax rates on FDI have been reported in previous studies by Wei (1997), Gastanaga and others (1998), and Hsiao (2001).

Also included in equation (2) are institutional factors, such as the level of corruption, the stability of each government, and the rule of law. Hines (1995) showed that FDI from the United States grew more rapidly in less corrupt countries than in more corrupt countries after 1977. Wei (1997) presented an alternative explanation of the negative and significant effect of corruption on FDI. Unlike taxes, corruption is not transparent and involves many factors that are more arbitrary in nature. An agreement between a briber and a corrupt official is difficult to enforce and it creates more uncertainty over the total questionable payments or the final outcome. Wei (1997) demonstrated the fact that this type of uncertainty induced by corruption leads to a reduction in FDI. Political stability of a government and the sound rule of law can also be important factors in the inflow of FDI. Their related risks can impede FDI inflows despite favorable economic conditions.

³ For a very interesting study on how vertical intra-industry trade helps integrate East Asia, see Wakasugi (2007).

The last variable, TEL, included in equation (2) is a proxy for quality of infrastructure.

We now turn to equation (3). The volume of trade in both intermediate and final products is expected to be positively related the market size of the two countries concerned. The variable GDP captures the idea that larger countries trade more than small countries as they need to offer more differentiated products to satisfy a wide variety of consumers. According to the theory of fragmentation outlined by Jones and others (2004), scale of production would determine the division of labor since specialization increases as the scale of production rises. As Grossman and Helpman (2005) proposed, the variable can also be treated as a proxy for the “thickness” of the markets; this has a positive impact on the location of outsourcing, as the likelihood of the firms finding an appropriate partner in their search increases as the size of a country increases.

The distance variable is considered to be a crucial factor in explaining international trade since distance increases transportation costs, which is a trade-resistance factor that negatively influences the bilateral trade volume. In particular, transportation costs are considered to have a larger impact on decisions concerning production fragmentation, as each intermediate product that belongs to the same value-added chain may cross national boarder multiple times.

The final variable is a dummy variable with regard to whether the importing country and exporting country are adjacent. The dummy variables may capture various factors that lead to reduced business transaction costs. For example, firms in adjacent countries are likely to have a better understanding of business practices than firms from a different business environment. This familiarity certainly helps to reduce the cost involving uncertainty. The familiarity with the business environment also helps to reduce the difficulty of finding an appropriate outsourcing partner in production networks. Except for the dummies, all variables are log-linearized. Sources for the variables are listed in Appendix 2.

B. Empirical results

Table 5 presents the estimation results using random effect model. It reveals a positive and statistically significant influence of all countries’ direct investment on trade in parts and components as well as in capital goods. The results indicate that FDI by all source countries is positively related to both intra-regional bilateral exports and imports of parts and components as well as capital goods. Thus inward FDI and trade in both parts and components and capital goods are complementary. On the import side, the result may be attributed to various trade liberalization policies and institutional changes that many East Asian economies pursued during the 1990s to help generate greater openness for trade. For example, many East Asian economies unilaterally eliminated their tariffs on capital and intermediate goods. In addition, duties on trade in information technology products were completely eliminated due to the completion of the Information Technology Agreement (ITA) in 1996. This is important because among the commodities actively traded in the East Asian region (excluding Japan) the leading category is

information technology products. Regarding institutional changes, the establishment of Export Processing Zones (EPZs), where manufacturers can enjoy import duty exemption as well as extensive usage of a duty drawback system on the imported parts and components used for the production of exports, effectively reduces the impact of tariff barriers.

Table 5. Regression results

Explanatory Variables	Dependent Variable : Export					
	FDI from Japan		FDI from Germany		FDI from France	
	PC	CA	PC	CA	PC	CA
<i>GDP, reporter</i>	0.671*** (0.062)	0.728*** (0.063)	0.487*** (0.074)	0.686*** (0.077)	0.470*** (0.065)	0.647*** (0.070)
<i>GDP, partner</i>	0.726*** (0.057)	0.691*** (0.058)	0.770*** (0.055)	0.781*** (0.057)	0.654*** (0.055)	0.683*** (0.058)
<i>DIST</i>	-1.174*** (0.210)	-0.935*** (0.187)	-1.137*** (0.204)	-0.988*** (0.187)	-1.055*** (0.195)	-0.903*** (0.185)
<i>DB</i>	-0.141 (0.382)	0.291 (0.339)	-0.100 (0.371)	0.240 (0.338)	-0.007 (0.355)	0.347 (0.344)
<i>FDI -predicted</i>	0.666*** (0.106)	1.129*** (0.119)	0.422*** (0.058)	0.405*** (0.067)	0.471*** (0.049)	0.481*** (0.057)
LM observations	1% 643	1% 643	1% 643	1% 643	1% 643	1% 643
Explanatory Variables	Dependent Variable : Import					
	FDI from Japan		FDI from Germany		FDI from France	
	PC	CA	PC	CA	PC	CA
<i>GDP, reporter</i>	0.593*** (0.066)	0.671*** (0.064)	0.328*** (0.075)	0.450*** (0.076)	0.428*** (0.069)	0.597*** (0.071)
<i>GDP, partner</i>	0.858*** (0.060)	0.805*** (0.059)	0.896*** (0.055)	0.854*** (0.056)	0.810*** (0.581)	0.802*** (0.059)
<i>DIST</i>	-1.059*** (0.239)	-0.797 (0.194)	-0.987*** (0.214)	-0.754*** (0.186)	-0.967*** (0.223)	-0.769*** (0.192)
<i>DB</i>	-0.195 (0.435)	0.201 (0.352)	-0.125 (0.389)	0.245 (0.336)	-0.091 (0.405)	0.248 (0.346)
<i>FDI -predicted</i>	0.668*** (0.107)	0.880*** (0.121)	0.449*** (0.058)	0.539*** (0.066)	0.416*** (0.049)	0.381*** (0.057)
LM observations	1% 643	1% 643	1% 643	1% 643	1% 643	1% 643

(Note) PC: parts and components CA: capital goods, standard error in parenthesis

As discussed in Section I, Antras (2005) provides a theoretical framework of the various stages of offshoring or international production fragmentation. Stage I consists of firms producing parts within the home countries. Stage II refers to the situation when the firms invest abroad and the affiliates source their more standardized parts from developing countries. This is the stage when FDI plays an important role. At Stage III, the multinational firms procure from the localized firms and leave much of the production chain to the developing countries. The set of variables that affect the progression of the stages include the quality of the institutions in the developing countries, the relative wages as well as the degree of standardization of the parts. Using Antras' basic taxonomy, East Asia remains at Stage II of the product cycle in offshoring.

Furthermore, a closer look reveals that the magnitude of the coefficient of parts and components is far from homogenous among the source countries. Japanese direct investment appears to have a very large effect on both intra-East Asian bilateral exports and imports relative to FDI from France and Germany.

Japanese manufacturing industries concentrated their business networks in East Asia in order to achieve the economies of scale. During the process, a cross-border division of labor by Japanese MNEs started to expand from between Japan and East Asia to between the East Asian countries not including Japan (METI 2008). The large impact of Japanese direct investment on the intra-regional trade of parts and components may be attributed to this distinctive characteristic of Japanese direct investment.

Regarding intra-regional bilateral exports and imports of capital goods, the difference in the magnitude of the impact of Japanese direct investment relative to other FDI source countries is magnified in both exports and imports. The stark difference can partly be due to an extensiveness of Japanese machinery production in Asia and the fact that a wide range of goods that can be used as intermediate inputs in related industries being classified as "Capital Goods" in the BEC as we discussed in previous section.

In 2003, 18 % of general machinery industry affiliates were located in China, 16 % in North America, 15 % in ASEAN and 8 % in the NIEs economies (JBIC, 2004). Furthermore, with the assistance of the Keiretsu system and the assistance of local Japanese government in deploying overseas operation for SMEs, very strong intra- and inter- industry relationships exists. Over time, these working and sometimes personal relationships of "fellow Japanese" developed into a valuable trust that allows further intra and inter industrial co-operations that otherwise would not have existed.

Another key aspect of Japanese machinery industries is that they possess leading technology and organization in the post WWII period. Japan was the early adaptors and developers of Numeric Control technology (NC), which they aggressively applied to their products with continual improvements. This effort resulted in high valuation and world wide acceptance of their machineries in the latter half of 1970s. In 1982, Japan has become the world's largest machine tool producer of the world. At their peak production in 1990, Japan recorded a value

of US\$13 billion. Since then, Japan has continued to lead the industry.

Japanese manufacturing industry as a whole, has also produced more and more varieties of output. Ranging from relatively low-tech components, to high-tech machineries like to aerospace components. In contrast, it seems that the French and German industries produce narrower selections.

A large impact of Japanese direct investment on the bilateral intra-regional trade in Asia can be best understood by the wide range of offerings from Japan and from their affiliates in Asia, many of which fall into the “Capital Goods” classification. The overall results are consistent with the hypothesis. The relatively large impact of the distance variable found in this study implies that high potential benefits for East Asian countries that could be materialized by reducing the of trade costs. The adjacency dummy is not found to have significant influence on regional bilateral trade.

V. Conclusion

Our paper highlights the importance of FDI in general and Japanese FDI in particular in facilitating trade in parts and components. This corresponds to stage II of Antra's theory. In stage III, domestic suppliers from East and Southeast Asia will step in and take control of such form of trade and production integration. We document the growing importance of intra-East Asian trade of parts and components. Our statistical analysis based on the gravity model shows that FDI from Japan, Germany and France all play an important role in facilitating the trade of parts and components in East Asia. Using Antras' basic taxonomy, East Asia remains at Stage II of the product cycle in offshoring. Furthermore, if we adopt Antras' framework, this implies that institutional quality, particularly intellectual property rights protection, remains a concern for the decision to localize the production chain in the host economies.

Does the source of FDI matter for the linkages between FDI and the various modes of trade? Our empirical studies show that FDI from Japan has a particularly strong influence on both trade in parts and components as well as trade in capital goods compared to the case of FDI from France and Germany. With respect to capital goods, it is fairly well-known that the Japanese engineering and machinery sector has a distinguished history and continues to be a leading sector of the economy. It seems likely that Japanese affiliates are set up abroad to import machinery from Japan or to manufacture and export some of the capital goods to other Asian economies. Such capital goods are used to produce and then export parts and components. Thus, trade in capital goods and trade in parts are both facilitated by Japanese direct investment and the two modes of trade are positively correlated. In addition, FDI rather than local supply is needed both because of the quality of the machinery as well as the importance of safeguarding the intellectual content of such capital goods. Other complementary

explanations of the significant influence of Japanese FDI on modes of intra-East Asian trade include the activities of the small and medium enterprises as well as other *keiretsu* suppliers that follow the Japanese multinationals when they go abroad. In contrast, direct investments from France and Germany also facilitate trade in parts and components as well as capital goods. Without the *keiretsu* linkages, the European firms may use more local suppliers as well as supplies from other foreign affiliates in the region.

The fact that German and French FDI seem to contribute less to trade in parts and components in East and Southeast Asia may reflect that such trade that is associated with these European companies involve other entities such as local suppliers and/or affiliates of other multinationals.

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Appendix 1. Commodity Code

Code	Explanation
1	Food and beverages
11	Food and beverages, primary
111	Food and beverages, primary, mainly for industry (P)
112	Food and beverages, primary, mainly for household consumption (F-C)
12	Food and beverages, processed
121	Food and beverages, processed, mainly for industry (IM-SF)
122	Food and beverages, processed, mainly for household consumption (F-C)
2	Industrial supplies nes
21	Industrial supplies nes, primary (P)
22	Industrial supplies new, processed (IM-SF)
3	Fuels and lubricants
31	Fuels and lubricants, primary (P)
32	Fuels and lubricants, processed
321	Fuels and lubricants, processed, motor spirit
322	Fuels and lubricants, processed (other than motor spirit) (IM-SF)
4	Capital goods (except transport equipment), and parts and accessories thereof
41	Capital goods (except transport equipment) (F-CA)
42	Parts and accessories of capital goods (except transport equipment) (IM-PC)
5	Transport equipment, and parts and accessories thereof
51	Transport equipment, passenger motor cars (F-C)
52	Transport equipment, other
521	Transport equipment, other, industrial (F-CA)
522	Transport equipment, other, non-industrial (F-C)
53	Parts and accessories of transport equipment (IM-PC)
6	Consumption goods nes
61	Consumption goods nes, durable (F-C)
62	Consumption goods nes, semi-durable (F-C)
63	Consumption goods nes, non-durable (F-C)
7	Goods nes

(Note) P: Primary goods

IM-SF: Semi-finished goods under Intermediate goods

IM-PC: Parts & components under Intermediate goods

F-CA: Capital goods under Final goods

F-C: Consumption goods under Final goods

321 and 7 are treated as “others”

Appendix 2. Source of variables

Variable	Explanation
FDI	Aggregate FDI inflows of each country, aggregate FDI inflows to East Asia, and aggregate FDI to the world are from UNCTAD.
CORRUPT	An index of corruption from the International Country Risk Guide by the PRS Group. It ranges from 0 to 6, with a higher number indicating a lower level of corruption.
GSTAB	An index of government stability from the International Country Risk Guide by the PRS Group. The range is from 0 to 12. A higher score means higher stability of a government.
Law	An index of Law and Order from the International Country Risk Guide by the PRS Group. It ranges from 0 to 6, where a higher number indicates a better system of law and order.
DUTY	Import duties are from the International Monetary Fund's Government Finance Statistic Yearbook.
WAGE	Average wages in manufacturing from the United Nations Common Database, LABORSTA and official country websites.
CPTAX	Corporate income tax rate, measured in percentage points, from <i>Worldwide Summary</i> by PricewaterhouseCoopers website.
TEL	Telephone mainlines (per 1,000 people) from World Development Indicators.
GDP	GDP in United States dollars are from EconStats.
PGDP	Per capita GDP are from EconStats.