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Abstract

This paper surveys research on foreign direct investment (FDI) in East Asia. The pattern of FDI in the region has changed over time. Outward FDI from Asia began in earnest when Japanese multinational corporations (MNCs) shifted production to other Asian economies following the 60% appreciation of the yen that started in 1985. The major destinations for Japanese FDI initially were South Korea and Taiwan. However, as labor cost in these economies rose, Japanese FDI shifted to Association of Southeast Asian Nations (ASEAN) economies. MNCs from South Korea and Taiwan responded to the increase in labor costs by also investing in other Asian economies. Following the 1997-98 Asian financial crisis, China became a favored destination for FDI. As Kojima (1973) noted, one of the striking features of East Asian FDI is its complementary relationship with trade. The complementary nature of trade and FDI in Asia is partly due to the rise of regional production networks. Parts and components rather than final products are traded between fragmented production blocks. To understand the slicing up of the value chain, it is helpful to compare the production cost saving arising from fragmentation with the service cost of linking geographically separated production modules (Kimura and Ando, 2005). This has been called "networked FDI" by Baldwin and Okubo (2012). It is a complex form of FDI in which horizontal, vertical, and export platform FDI take place to differing degrees at the same time. The fragmentation strategy adopted especially by Japanese MNCs is to allocate production blocks across countries based on differences in factor endowments and other locational advantages. The paradigm example of this type of production fragmentation is the electronics sector, where parts and components are small and light and can easily be shipped from country to country for processing and assembly. In this sector, the quality of a country's infrastructure plays an important role in its ability to attract FDI.

JEL classification: F21, F23, O53
Keywords: East Asia, Foreign direct investment, Production networks, Fragmentation, Parts and components trade, Networked FDI, Horizontal FDI, Vertical FDI

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1. Introduction

What is foreign direct investment (FDI), and what determines the flow of FDI in Asia? How has Asian FDI changed over time? How can we understand the flow of FDI within regional production networks? This paper seeks to answer these questions.

It begins with a background section. After reviewing some definitions, it considers various theories of FDI. Dunning (1988) has modeled FDI by focusing on firms' ownership, location and internalization advantages. Kojima (1973) posited that FDI flows from the labor-intensive industry in the capital abundant country into the labor-intensive industry in the capital scarce country. As wages in the capital abundant country increase, he argued that firms would transfer production to lower wage countries, and export capital-intensive intermediate goods and equipment goods to the host country. In Kojima's model FDI and trade are thus complementary.

On the other hand Mundell (1957) presented a model where capital flows from a capital-abundant country to a capital-scarce country when the capital-scarce country has trade barriers that hinder the import of capital-intensive goods. The capital flow into the capital scarce country causes the production of capital-intensive goods to increase and the production of less capital-intensive goods to contract. These changes in the patterns of comparative advantage then eliminate the basis for trade. Thus Mundell argues that FDI and trade are substitutes .

Following the Plaza Accord in 1985, the Japanese yen appreciated significantly. To cut production costs, Japanese companies shifted production to other Asian economies. As Section 3 documents, exports of sophisticated capital and intermediate goods from Japan to these Asian economies tended to increase together with the FDI flows. Thus the evidence indicates that there has been a complimentary relationship between FDI and trade in Asia. South Korea and Taiwan also followed a similar pattern.

The traditional perspective on FDI by Japan and the Newly Industrializing Economies (NIEs) focuses on multinational corporations (MNCs) from Japan, South Korea, and Taiwan shifting production to developing and emerging Asia and then exporting the finished goods primarily to the West and to other developed markets. Recently, though, MNCs have taken a more nuanced approach. Baldwin and Okubo (2012) have described this approach using the term "networked FDI". This means that MNCs source some intermediate goods from the host country and sell some final goods to the host country. Section 4 discusses networked FDI and summarizes some of the main findings of Baldwin and Okubo.

Section 5 then focuses on understanding the slicing up of the value added chain in Asia. It first documents that parts and components within regional production networks have largely gone to China and ASEAN and have by-passed India and certain other countries. To understand why, it presents a model where firms decide to fragment production when the production cost saving arising from fragmentation exceeds the cost of linking geographically separated production blocks (the service link cost). It then argues that the service link cost is closely linked to the quality of physical and market-supportive institutional infrastructure in the host country. The quality of infrastructure can then help to explain why some countries and regions have done so much better at attracting FDI and becoming part of regional supply chains. For instance, it has been noted that even if labor costs were zero in India, it would still be cheaper for MNCs to produce in China because the quality of the infrastructure is so much better.

Sections 1 through 5 provide an overview of FDI in Asia. Section 6 concludes.

2. FDI: Background

2.1 Definitions

International capital flows can be divided into three major categories: Foreign Direct Investment (FDI), portfolio equity investment, and debt flows. FDI gives a controlling stake in the local firm. It includes equity capital, reinvested earnings and financial transactions between parent and host enterprises. Portfolio equity investment involves purchases of a local firm's securities without a controlling stake. It includes shares, stock participations, and similar vehicles that usually denote ownership of equity. Debt flows include bonds, debentures, notes, and money market or negotiable debt instruments.

Capital and particularly financial flows tend to be highly volatile and reversible. The degree of volatility depends upon the type of capital flow. In particular, short-term financing is considered the most volatile. Bank credits, portfolio flows, and financial derivatives are highly volatile. FDI is less volatile, making it more valuable for developing economies. This stability especially applies to equity capital flows, the largest of the three components of FDI.

According to the Organization for Economic Cooperation and Development (OECD), direct investment is a category of international investment made by a resident entity in one economy (the direct investor) with the objective of establishing a lasting interest in an enterprise located in an economy other than that of the investor (the direct investment enterprise). [i] "*Lasting interest*" implies the existence of a long-term relationship between the direct investor and the enterprise and a significant degree of influence by the direct investor on the management of the direct investment enterprise. Direct investment involves both the initial transaction between the two entities and all subsequent capital transactions between them and affiliated enterprises. The *direct investor* may be an individual, an incorporated or unincorporated public or private enterprise, a government, a group of related individuals, or a group of related

incorporated and/or unincorporated enterprises that has a direct investment enterprise (that is, a subsidiary, associate or branch) operating in an economy other than the economy or economies of residence of the foreign direct investor or investors. A *direct investment enterprise* is an incorporated enterprise in which a foreign investor owns 10 per cent or more of the ordinary shares or voting power for an incorporated enterprise or an unincorporated enterprise in which a foreign investor has equivalent ownership. Ownership of 10 per cent of the ordinary shares or voting stock is the guideline for determining the existence of a direct investment relationship. An "effective voice in the management", as evidenced by an ownership of at least 10 per cent, implies that the direct investor is able to influence, or participate in, the management of an enterprise; absolute control by the foreign investor is not required. Direct investment enterprises are entities that are either directly or indirectly owned by the direct investor and comprise:

• subsidiaries (an enterprise in which a non-resident investor owns more than 50 per cent);

• associates (an enterprise in which a non-resident investor owns between 10 and 50 per cent) and;

• branches (unincorporated enterprises wholly or jointly owned by a non-resident investor);

When the 10 per cent ownership requirement for establishing a direct investment link with an enterprise is met, certain other enterprises that are related to the first enterprise are also regarded as direct investment enterprises. Hence the definition of direct investment enterprise extends to the branches and subsidiaries of the enterprise (so called "indirectly owned direct investment enterprises").

2.2 Theory

Dunning (1988) argued that firms' willingness to engage in foreign production depends on a firm's ownership, location and internalization advantages. A firm will shift production abroad if it can leverage these advantages in its target market. The advantage of ownership springs from the technological superiority of the direct investor relative to firms in the host country. This superiority must more than offset the extra costs arising from differences in business customs, laws, languages, and other factors. The larger the share of the direct investment enterprise owned by the direct investor, the greater the control. Firms in arms' length relationships retain some control when they are involved in long-term relations. Locational advantages include wage levels, factor endowments, technology transferability, exchange rates, physical and human infrastructure, and market-supportive institutions and political regimes. Internalization advantages concern the benefits accruing to the direct investor from being able to conduct intra-firm transactions. The FDI firm needs to compare costs arising from asymmetric information, incomplete contracts, and similar factors with the efficiency gains available through subcontracting and outsourcing.

In traditional models, FDI and exports are substitutes. Mundell (1957) demonstrated that capital will flow from a capital-abundant country to a capital-scarce country when the capital-scarce country has trade barriers that hinder imports of capital-intensive goods. The capital outflow from capital-abundant country into the capital scarce country causes the production of capital-intensive goods to increase and the production of less capital-intensive goods to contract. These changes in the patterns of comparative advantage then eliminate the basis for trade. Thus Mundell argues that FDI substitutes for trade.

Kojima (1973), on the other hand, presented a model where FDI and trade are complements. In his framework FDI flows from the labor-intensive industry in the capital abundant country

into the labor-intensive industry in the capital scarce country. To understand Kojima's model consider a case where wages in the capital abundant country increase and where products become more capital and knowledge intensive. Firms in the investing country then transfer production to lower wage countries, and export capital-intensive intermediate goods and equipment goods to the host country where in labor intensive process is completed. Thus Kojima argues that FDI and trade are complements.

Kojima modeled FDI as a means of transferring a package of capital, managerial skill, and technical knowledge to the host country. The resulting technology transfer comes in the form of know-how or of general industrial experience. According to Kojima, this could include assembly techniques; material selection, combination, and treatment techniques; machine operation and maintenance techniques; provision of blueprints and technical data; training of engineers and operators; plant lay-out; selection and installation of machinery and equipment; quality and cost controls; and inventory management.

3. FDI: The East Asian Experience

3.1 Japanese FDI

The appreciation of the Japanese yen after the Plaza Accord in September 1985 was the most important macroeconomic factor leading to the surge of Japanese FDI in the latter half of 1980s. There are two reasons for this. First, the 60 percent appreciation of the yen made it less economical to perform labor-intensive activities in Japan, thereby reducing exports of these goods. This led Japanese multinational corporations (MNCs) to transfer many of these operations to other Asian economies where production costs are lower. Second, Japanese outward direct investment during the period was stimulated by the "wealth effect" arising from the appreciation of the yen. Japanese firms became wealthier in terms of increased collateral and liquidity and

were able to finance their investment more cheaply relative to the foreign competitors (Urata and Kawai, 2000).

Figure 1 examines Japanese FDI, intermediate goods, and capital goods flows to Asian economies over the 1980-2004 period. The figure shows that as Japanese FDI increased, Japan's exports of intermediate goods and capital goods to these economies increased in tandem. This supports Kojima's (1973) hypothesis that Japanese FDI and exports are complements rather than substitutes.

Following the Plaza Accord, Panel A of Figure 1 shows that there was a surge of Japanese direct investment going to South Korea and Taiwan. However, as Thorbecke and Salike (2011) discussed, in the late 1980s their currencies appreciated and their wage rates skyrocketed. The locational advantages of producing in South Korea and Taiwan fell, and Japanese FDI shifted to the ASEAN countries. Wages remained competitive and, at least until the 1997-98 Asian Crisis, exchange rates were stable.

Because of the disruptions and instability associated with the Asian Crisis, the locational advantages of producing in ASEAN declined and Japanese FDI flows plummeted. However, the flow of parts and components from Japan to ASEAN continued (see Figure 1, Panel B). This shows that Japanese MNCs continued to run their operations in ASEAN although few new investments were directed towards the region. Once a Japanese firm establishes a cross border production network in another country, it is reluctant to withdraw from that country. This is because firms pay high costs in identifying locational advantages and reliable business partners (Kimura and Obashi, 2010). They thus seek to maintain stable transactions in the face of disruptions.

The momentum of Japanese FDI then shifted to China, especially after China joined the WTO in 2001. There was a surge in Japanese FDI and particularly Japanese parts and components and capital goods flowing to China. This is clear in Figure1 Panel C. China's WTO accession increased investors' confidence that China would provide fair enforcement of the relevant laws and regulations and thus increased their willingness to invest in China.

Several benefits accrued to Asian economies from the inflow of Japanese FDI. The IMF (2012), for instance, found that the rest of Asia gained from Japanese FDI. They reported regression evidence indicating that every 1 percent increase in Japanese FDI to an emerging Asian economy over the 1985-2011 period increased growth in that economy by between 0.58 and 0.69 percent. According to the IMF, this is much more than the increase in growth caused by FDI from other countries.

The higher growth from Japanese FDI partly reflects its characteristics. As Kojima (1973) noted, it is associated with technology transfer and learning in emerging Asia. Lim and Kimura (2009) discussed how, once economies in Asia host a critical mass of FDI, industrial agglomeration occurs and local firms penetrate production networks. This in turn leads to technology spillovers. In this context, the authors point out the importance of Small and Medium Enterprises (SMEs) in the age of globalization, production networking and regional economic integration. [ii]

Lee and Shin (2012) presented regression evidence indicating that FDI led to substantial technology spillovers. They then used these measures to calculate welfare gains from FDI flows. They concluded that FDI flows lead to large welfare gains in countries like China, Indonesia, Malaysia, the Philippines, and Thailand.

The Japanese FDI described above was designed largely to take advantage of lower production costs. The final goods were then largely shipped to developed economies, especially in Europe and North America. Huang (2012) has described this kind of FDI as the traditional Japanese type.

More recently, however, Japanese companies have expressed concern that Western markets are drying up. A survey of Japanese firms by the Japanese Bank for International Cooperation (JBIC) (2010) reported that one of the primary motives now for Japanese firms to ship production to places like China, India, and ASEAN is to try to reach middle class consumers in these countries. This issue is discussed further below.

3.2 Outward FDI from Other Asian Economies

While Japanese firms were at the vanguard of the shift in labor-intensive activities to lower-wage locations in Asia, other Asian firms soon followed. Figure 2 shows outward FDI from China, South Korea and Taiwan. FDI is measured as a percentage of each country's gross domestic product.

The figure shows that Taiwanese FDI soared in the late 1980s. The locational advantage of producing in Taiwan fell at that time. The US Treasury named Taiwan as a currency manipulator and the Taiwanese central bank let its exchange rate appreciate. Taiwan also ran out of redundant rural laborers, leading to a large increase in wages. Taiwanese producers then transferred production to more cost effective locations (see Yoshitomi, 2003).

Taiwanese FDI was also stimulated when the government deregulated FDI for notebook PC companies. These companies transferred production to the Yangtze River Delta close to

Shanghai. A value chain developed in this area that produces many of the world's laptop computers.

Figure 2 also shows that Korean FDI has increased steadily over the years. Lee, Kim, and Kwak (2012) discussed how Korean FDI up until 1994 largely involved small-sized Korean firms in labor-intensive industries looking for cheaper labor abroad. Between 1994 and 1998 FDI involved large Korean firms (*Chaebols*) investing in capital intensive industries and targeting markets abroad. Then between 1999 and 2010 Korean FDI largely revolved around SMEs concentrated in higher value-added, technology-intensive industries. Some were involved in regional production networks and others targeted consumer markets abroad.

Figure 2 also shows that Chinese outward FDI began increasing, especially after 2000. Huang (2012) sheds light on Chinese outward direct investment (ODI). Chinese FDI focuses on three areas: 1) investing in companies that can provide advanced technology or brand names, 2) obtaining commodities that can be used for Chinese production, and 3) linking with service companies that can facilitate Chinese exports. Some of it is controversial because it is done by state-owned enterprises whose motives may be state-directed rather than commercially-oriented.

Huang (2012) also noted that one of China's locational advantages is productivity-adjusted costs. Thus, China has tended not to transfer factories overseas. Recently, though, as costs in China have increased, some companies have shifted the production of garments, toys and footwear to ASEAN. Li (2012) similarly discussed how producers of low value-added products such as textiles are shifting production to Vietnam and other Southeast Asian countries because labor costs are rising in China.

China has become the fifth leading foreign investor in ASEAN. Between 2008 and 2010 FDI flows from China to ASEAN equaled USD 9 billion. Within Asia, this was surpassed only

by Japan with USD 16 billion and ASEAN itself with USD 27 billion.[iii] Intra-ASEAN flows often involve more advanced countries investing in less advanced countries. For instance, Singapore invests a lot in its ASEAN neighbors and Vietnam is a leading investor in Laos.

India is not shown in Figure 2. Its outward FDI was minuscule until 2000, but it then climbed to 1.6 percent of GDP in 2007. As Kumar (2007) discussed, much of this is efficiency-seeking FDI driven by regional trade agreements. For instance, when India and South Korea began negotiating an Economic Partnership Agreement, Tata Motors acquired Daewoo Motors of Korea. Tata then used this connection to establish a more efficient way of producing cars and trucks (see Nag *et al*. 2012).

4. East Asian Networked FDI

Japanese FDI after the Plaza Accord was initially designed to take advantage of lower production costs and to produce final goods for developed economies. However, as discussed above, this pattern has been changing. Baldwin and Okubo (2012), in a detailed analysis of Japanese data, have tried to characterize these changes. They coined the term "networked FDI" to describe East Asian FDI at present. They regarded networked FDI as a concept that transcends conventional classifications such as horizontal FDI or vertical FDI. It is instead a complex form of FDI in which horizontal, vertical and export platform types of FDI take place in differing degrees at the same time.

They argued that unlike the case of U.S. MNCs, most Japanese affiliates buy some of their intermediates from abroad and sell some of their output abroad. Their concept of networked FDI implies that affiliates are operating as nodes in regional production networks.

They found that this particular pattern became much stronger between 1996 and 2005. They suggested that the nature of FDI is influenced by regional comparative advantage (i.e., the proximity of markets and suppliers).

Theoretically, the authors argued that it is useful to organize thinking about the classic substitutes-or- compliments view of trade and FDI by considering the share of an affiliate's output that is sold locally and the share of its intermediates that are sourced locally. Using these variables, they classify:

- Pure horizontal FDI as the case where affiliates sell all output locally and source all intermediates locally.
- Pure vertical FDI as the case where all intermediates are sourced locally but some of the final good output is exported back to the home nation.
- Pure export platform FDI as the case where all intermediates are imported and all output is exported.
- Tariff-jumping assembly FDI as the case where all intermediates are imported and all output is sold locally.
- Pure resource extraction (cash-crop agriculture, mining, fishing, etc.) as the case where intermediate inputs are sourced locally and all output is exported. Sometimes, though, some intermediates may be imported (e.g. oil drilling).

FDI that is marked by low levels of both local sales and local sourcing may be labeled 'networked FDI' since these facilities are most naturally viewed as part of international supply chains, or links in global value chains. One interesting aspect of this FDI is its intimate

connection with trade. Indeed, trade and investment are simple two observable facets of a single economic activity.

The substitutability of FDI and trade increases as both the share of imtermediates sourced locally and the share of output sold locally increases. At one extreme, pure horizontal FDI extinguishes all trade. At the other extreme, outward processing FDI maximizes trade in both intermediates and final goods. The extent to which FDI is market-seeking (as opposed to efficiency-seeking) increases as the share of output sold locally increases.

The traditional import-substitution strategy, for example, involves starting with local assembly and pushing multinationals to produce more intermediates locally; the eventual goal is to export. This would show up as a decrease in the share of output sold locally and an increase in the share of intermediates sourced locally.

The 21st century version of this – pursued by China and other East Asian nations – starts with export platform FDI and then seeks to induce multinationals to source more intermediates locally. Sometimes, these countries also seek to develop local markets for the final good.

Based on this analytical framework, Baldwin and Okubo (2012) analyzed the behavior of Japanese affiliates. The data for their study came from the yearly survey called the "Survey on Overseas Business Activities" conducted by the Japanese Ministry of Economy, Trade and Industry (METI). This survey covers all Japanese affiliates in all sectors and in all nations. The survey provides firm-level data on the sales and sourcing patterns of Japanese affiliates. The data cover the number of employees, assets, purchases, intellectual property indicators, and many other items.

Looking at Japanese data from 1996 and 2005, the authors noted that progress in information and communication technology made it increasingly economical to spatially unbundle production and disperse the production stages to locations with attractive production costs. A few sectors remain as classic horizontal sectors but very few correspond to classic vertical sectors. Many sectors can be classified as 'networked FDI', where affiliates import substantial shares of their intermediates and export substantial shares of their output.

Focusing on individual sectors, primary sectors tend to have extreme patterns. Forestry and metal mining, for instance, have low local sales but high local sourcing of intermediates. In the machinery sector, sales and sourcing tend to rise and fall together. For motor vehicles, both local sourcing and local sales are high. On the other hand, other transportation equipment have both low sales and low sourcing.

Baldwin and Okubo (2012) also found that production fragmentation seems to have occurred mostly in the machinery sector, reflecting the internationalization of supply chains. This is especially true for the mechanical machine and electronics sectors. For the electronics sector, and in particular for phones and computers, Baldwin and Okubo concluded that the production networking patterns are regional rather than global. They also found that Japanese MNCs tend to view Asia and the European Union in similar fashion. Their FDI to these regions are networked rather than being purely horizontal or purely vertical. On the other hand, they reported that Japanese MNC's behavior in North America is different, especially for manufacturing. Most of the sales in this case were made in the local market. Japanese affiliates thus do not seem to be engaged in production chains in the U.S.

5. Understanding Fragmentation in East Asia

5.1 East Asian Electronics Exports

Baldwin and Okubo (2012) noted that for the electronics sector and especially for phones and computers, production networks are regional rather than global. In 2010, 16.4 percent of all intra-East Asian exports were in the category 'electronic components'.[iv] For every year after 1993, the category electronic components was the largest category of intra-East Asian exports out of the 70 categories tracked by the CEPII-CHELEM database.[v] In 2010, 10 percent of exports from East Asia to the rest of the world were computer equipment and 8.5 percent were telephone equipment. For every year after 1993, computer equipment was the largest category of exports from East Asia to the world. The electronics industry, with parts and components flowing between countries in the region and final assembled electronics goods such as computers flowing outside of the region, is thus far and away the most important industry within East Asian production networks.

The flow of parts and components in this industry is closely related to the flow of FDI. It is thus instructive to examine the flow of electronic parts and components. Figure 3 shows the flow of parts and components from East Asia to individual East Asian economies and regions. In 2010 USD100 billion went to China and almost USD 60 billion went to ASEAN. The large value of parts and components flowing to China and ASEAN is what one would expect since they are downstream in the value chain. About USD 20 billion each in electronic parts and components went to Japan, South Korea, and Taiwan. The amount flowing to India was miniscule. Within ASEAN, almost all of the parts and components went to Singapore, Malaysia, Thailand, and the Philippines. Indonesia and Vietnam received less than 5 percent of the value of parts and components going to ASEAN in every year since 1993.

5.2Modeling Fragmentation in East Asia

Modeling the fragmentation decisions behind these trade flows has required new analytical tools. Trade theories have traditionally focused on exchanges of final goods driven by differences in technology and factor endowment. However, production fragmentation involves trade in parts and components. Firms allocate production blocks across economies based on differences in factor endowments and other locational advantages.

Kimura and Ando (2005) have proposed a theoretical framework for understanding these decisions. In their model firms decide to slice up the value chain when the cost saving from segmenting production exceeds the service cost of linking fragmented production blocks (the service link cost). There are two primary types of costs associated with linking geographically-separated production blocks, distance and managerial controllability. Costs along the distance dimension can be lowered by strengthening physical and ICT infrastructure, increasing the knowledge base, enforcing high standards of corporate governance, and providing legal remedies when firms within a network relationship violate intellectual property rights agreements (Yusuf *et al.*, 2003*).* Costs along the controllability dimension include the costs of ineffective dispute settlement mechanisms, incomplete contracts, and asymmetric information.

Kimura and Ando (2005) have represented this framework geometrically with the graph shown in Figure 4. For production at a single location, the total cost of production increases with output. For fragmented production, the total cost also increases with production but the slope of the line is smaller. However, there is a fixed cost (the service link cost) associated with fragmentation that is represented by the distance OA on the y axis. Therefore, whether fragmentation reduces the total cost of production depends on the service link cost, OA, and the marginal cost of production as represented by the slope of total cost curve.

Thorbecke and Salike (2011) have argued that some ways to lower service link costs and thus to increase fragmentation include strengthening physical infrastructure such as 1) the network of highways, ports, and airports, 2) the ICT infrastructure, 3) container yards, and also market-supportive institutional infrastructure such as 1) enforcement of the legal system, 2) information on vendors, 3) enforcement of the stability of private contracts, 4) corporate governance, and 5) legal remedies when firms violate intellectual property rights agreements.

This framework can help explain the patterns observed in Figure 3. The largest share of parts and components flows to China and the smallest share flows to India. China has superb networks of highways, ports, and airports in the Pearl and Yangtze River Deltas. This high quality infrastructure has attracted many firms. The resulting agglomeration makes it easier for firms to interact with upstream and downstream partners. There are also a plethora of skills and technologies within the industrial cluster. This has lowered service link costs and made businesses much more willing to establish production blocks in these areas. By contrast, the infrastructure in India is much poorer. In a JBIC (2010) survey of Japanese firms, the quality of infrastructure was the number one concern of firms considering investment in India. Someone observed that even if labor costs were zero in India, it would be more economical to produce in China because the infrastructure is so much better there. Also, as Nag et al. (2012) noted, unlike in the case of China, agglomeration has not acted as a magnet for Japanese FDI into India.

The quality of infrastructure is also correlated with the extent to which ASEAN countries have become part of regional production networks. As discussed above, only minuscule amounts of electronic parts and components go to Indonesia and Vietnam. By contrast, large quantities go to Singapore, Thailand, and Malaysia. In the JBIC (2010) survey, 17 percent of foreign investors singled out poor infrastructure as a concern for Indonesia and 30 percent

mentioned this as a concern for Vietnam. By contrast, only 7 percent of firms mentions poor infrastructure in the context of Thailand and only 4 percent mentioned this concerning Malaysia. Similarly, infrastructure is not a concern for Singapore.

So, for economies to take part in regional production networks and receive the attendant technology spillovers, it is essential that they improve the quality of their infrastructure. Kimura and Ando (2005) have noted that it is hard to implement the necessary changes in infrastructure for a whole country. It might thus be easier for countries to begin with a city or a province.

These improvements in infrastructure can then lead to a virtuous cycle. As they lower the service link cost, they will attract production blocks. Local small and medium sized enterprises will then have opportunities to get involved in the production networks. This will lead to productivity spillovers and changes for host country firms to develop. This in turn will increase government tax revenue, giving them more money to spend on infrastructure.

6. Conclusion

FDI in East Asia has unique features. While it is influenced by factors such as the ownership, location and internalization advantages highlighted by Dunning (1988), it also follows Kojima's (1973) complementarity model. In Kojima's model, FDI flows from the capital exporting country's disadvantaged industry into the host country's advantaged industry. MNCs in the investing country then export sophisticated parts and components and technology to the assembly country, so that there is a complementary relationship between exports and FDI. The outward FDI from Asia began in earnest when Japanese MNCs shifted production bases to other Asian economies after the yen began appreciating in 1985. Initially, the major destinations for Japanese FDI were NIEs, especially South Korea and Taiwan.

However, as wages and exchange rates in the NIEs increased, Japanese MNCs transferred their production bases to ASEAN countries. After the 1997/98 Asian financial crisis, Japanese MNCs channeled new investments to China. However, they did not withdraw their existing investments from ASEAN countries but instead continued to export large quantities of intermediate goods to affiliates in ASEAN. The investments in China primarily focused on final assembly operations and China became the key export platform for regional production and distribution networks. It imported parts and components from East Asia and exported the final assembled products throughout the world. Japanese trade and FDI have thus been complementary.

Japanese FDI has also had a positive impact on the economies of East Asia. Empirical evidence indicates that Japanese FDI, more than FDI from other countries, has contributed to growth in the host countries. Further, emerging economies in the region have also benefitted from industrial agglomeration and the resulting technology spillovers.

MNCs from South Korea and Taiwan began investing in other Asian economies especially beginning in the late 1980s. The locational advantage of producing in Taiwan fell as the US Treasury named Taiwan as a currency manipulator and as its currency appreciated. As labor cost went up, Taiwanese MNCs also benefitted from governments deregulation on computer related business which prompted for investments in China. Korean FDI also followed this pattern of using cheaper labor abroad when wage rates in Korea increased. Korea's FDI largely involved SMEs that were focused on in higher value-added, technology intensive industries, some of which were linked to regional production networks. China recently has increased its outward FDI. These investments were often in lower end products like garments, toys and footwear and in lesser developed members of ASEAN.

FDI in East Asia has recently been characterized as “networked FDI” by Baldwin and Okubo (2012). It is a complex form of FDI in which horizontal, vertical and export platform FDI take place in differing degrees at the same time. FDI that is marked by low levels of both local sales and local sourcing may be labeled as networked FDI since these facilities are most naturally viewed as part of international production chains or links in global value chains. The fragmentation strategy adopted especially by Japanese MNCs involves allocating production blocks across countries based on differences in factor endowments and other locational advantages. This fragmentation is accompanied by more trade in parts and components than in final goods.

Kimura and Ando (2005) provided a theoretical foundation for understanding this fragmentation of the value chain. Firms slice up the value chain when the cost saving arising from fragmentation exceeds the service link costs. Therefore the total cost of production depends on the service link cost and the marginal cost of production. Key steps to lower the service link costs include improving the quality of both the physical and the market-supportive institutional infrastructure.

Much of the fragmentation of production is seen in the electronics sector. Intermediate products in these industries are relatively easy to ship between production blocks and to assemble into final products.

Regional production network have followed a stable pattern, with Japan, Taiwan, South Korea, and MNCs in ASEAN shipping parts and components to the coastal regions of China and to ASEAN for final assembly and re-export to developed economies. There is pressure though for this pattern to change. Rising labor costs in Eastern China have given impetus to MNCs to relocate their bases to inland regions of China and to other Asian destinations, especially the new

member countries of ASEAN. India may also become a promising place to invest, although this depends on India increasing its locational advantage by improving the quality of its infrastructure. Finally, if the U.S. and Europe continue to stagnate, more of the final output of production networks could flow to Asia. This would allow Asian workers to enjoy more of the fruits of their labor.

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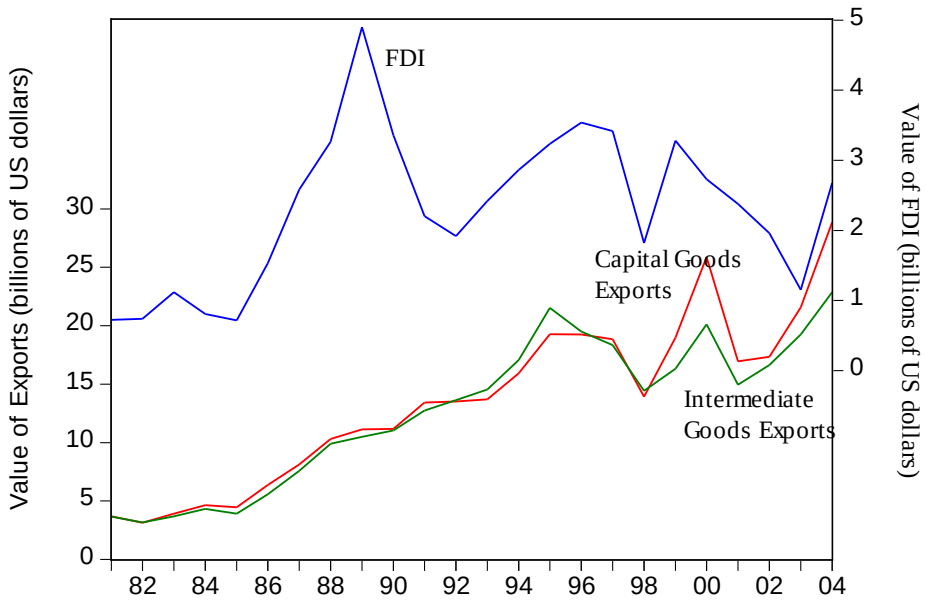

Figure 1a: Japanese Capital and Intermediate Goods Exports and FDI to South Korea and Taiwan.
Source: Japanese Ministry of Finance and CEPII-CHELEM Database.

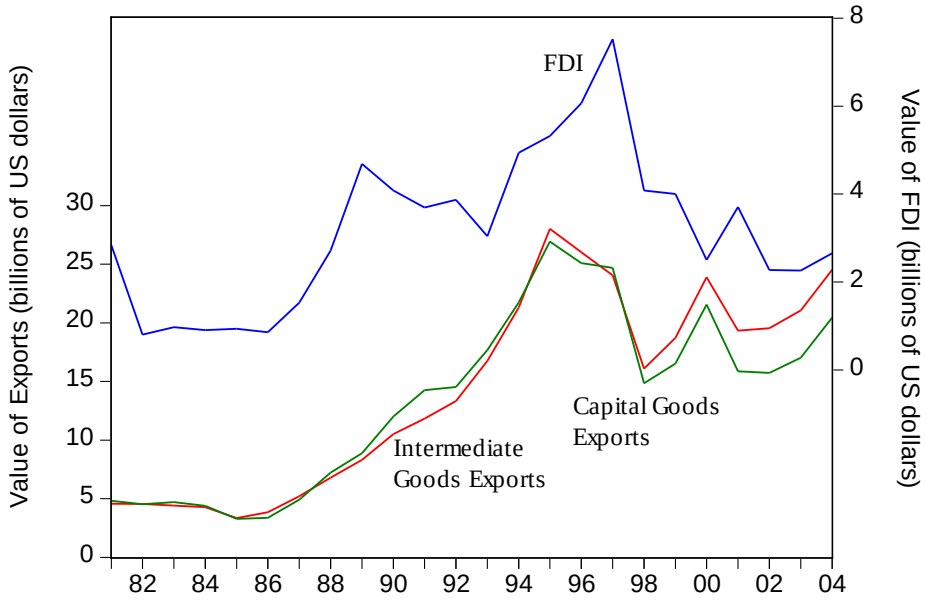

Figure 1b: Japanese Capital and Intermediate Goods Exports and FDI to Indonesia, Malaysia, the Philippines, Singapore, and Thailand.
Source: Japanese Ministry of Finance and CEPII-CHELEM Database.

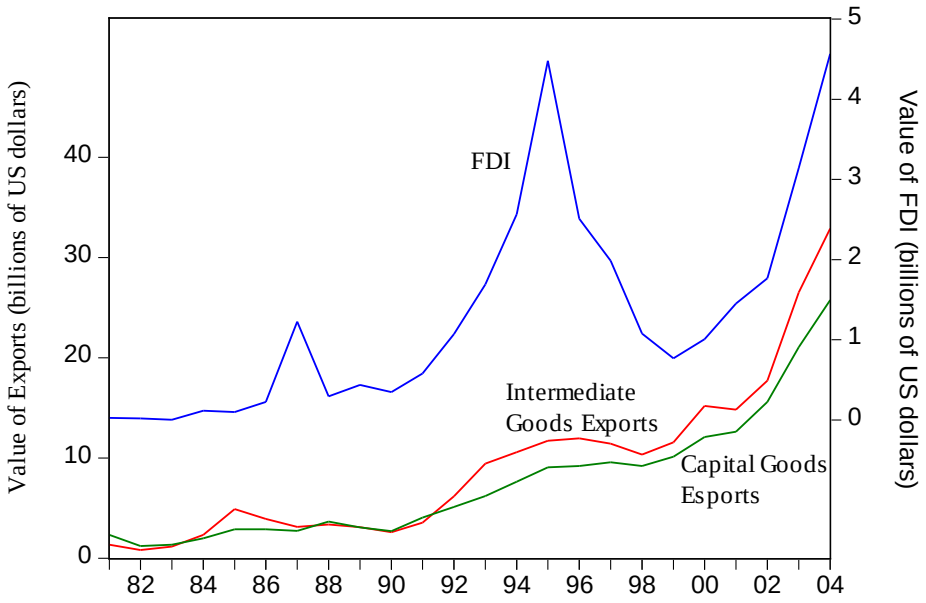

Figure 1c: Japanese Capital and Intermediate Goods Exports and FDI to China.
Source: Japanese Ministry of Finance and CEPII-CHELEM Database.

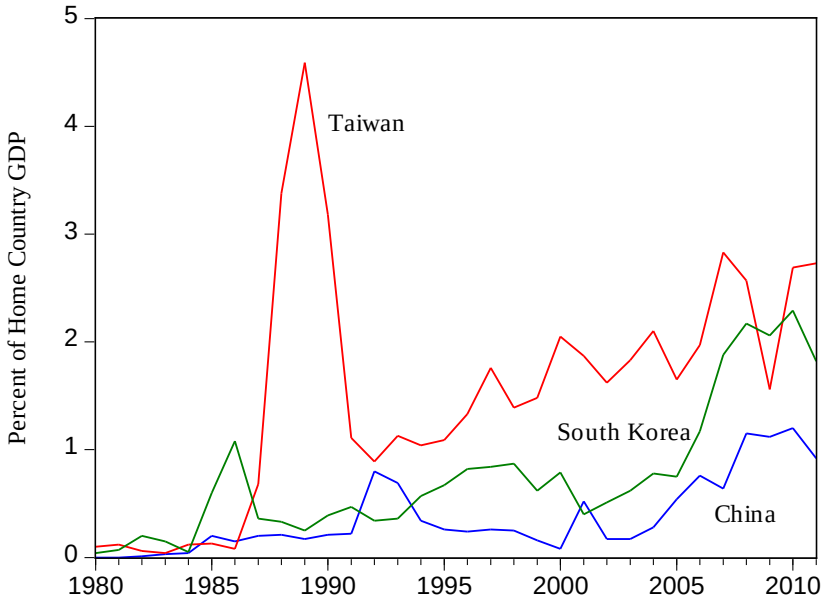

Figure 2. Outward FDI of China, South Korea, and Taiwan.
Source: www.unctad.org.

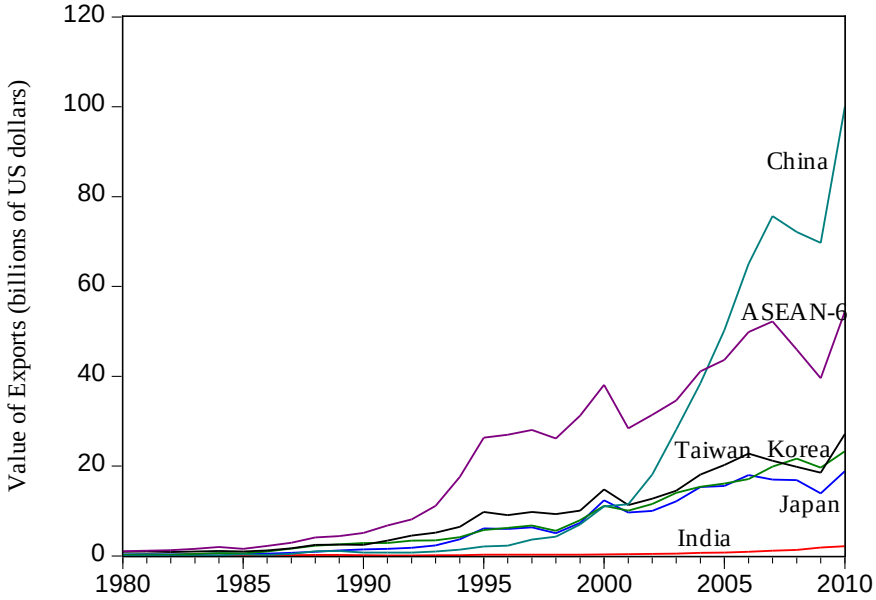

Figure 3. Exports of Electronic Parts and Components from East Asia to Asian economies and regions.
Notes: East Asia includes China, Japan, Malaysia, the Philippines, Singapore, South Korea, Taiwan, and Thailand. ASEAN-6 includes Indonesia, Malaysia, the Philippines, Singapore, Thailand, and Vietnam. Electronic components come from the Harmonized System Codes 8540-8542.
Source: CEPII-CHELEM Database.

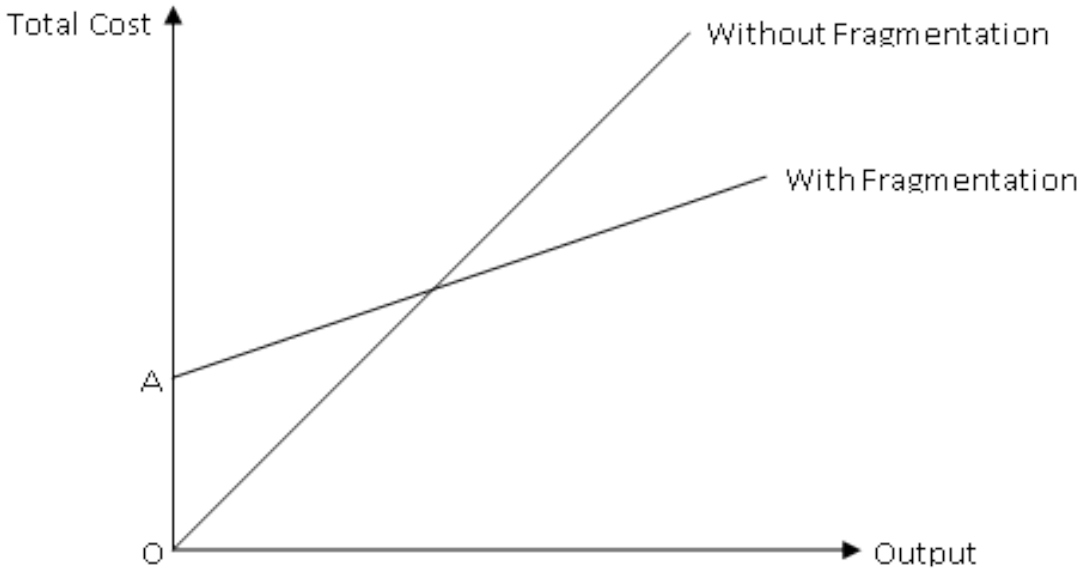

Figure 4. Total Cost with and without Fragmentation.
Source: Kimura and Ando (2005).

Notes

[i] The website for the OECD is www.oecd.org.

[ii] Krugman (1994) argued that growth in East Asia was driven by capital accumulation and that total factor productivity (TFP) growth played only a small role. However, traditional measures of TFP are biased for several reasons. For instance, technological progress was often embodied in imported capital goods. Yoshitomi (2003) discussed this and other issues and documents the important role that learning and technological transfer played in East Asian development.

[iii] These data are from www.asean.org.

[iv] Electronic components come from the Harmonized System Codes 8540-8542.

[v] East Asia here includes China, Japan, Malaysia, the Philippines, Singapore, South Korea, Taiwan, and Thailand.