

The Role of Production Networks in Sustaining and Rebalancing Asia's Growth

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Overview

- This talk considers real sector issues related to economic rebalancing in Asia.
 - It considers:
 - i) The role of FDI and production networks in facilitating technology transfer and industrial upgrading in developing and emerging Asia
 - ii) The nature of FDI and production networks in Asia
 - iii) Policy implications
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Technology transfer and industrial upgrading

- ❑ The best way to rebalance growth is to increase productivity (Jitsuchon and Sussangkarn, 2009).
 - ❑ Developing and emerging Asia should advance from assembling parts and components to higher value-added activities (e.g., the engineering and design aspects of production).
 - ❑ Crucial to obtain technology transfers and positive spillovers from MNCs operating in developing Asia.
 - ❑ Countries need to attract a critical mass of FDI. As industrial agglomeration grows, local firms can become part of production networks and obtain technology transfers (Lim and Kimura, 2009).
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Possibility of a virtuous cycle emerging

- ❑ Developing competitive SMEs and service sectors and investing in infrastructure would attract FDI
 - ❑ Industrial agglomeration would start to take place
 - ❑ SMEs and service sector would have lots of opportunities to develop and governments would have more revenue to invest in infrastructure
 - ❑ This would in turn attract more FDI.
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Understanding FDI in Asia

- What determines FDI in East Asia?
 - What are the distinguishing characteristics of FDI in the region?
 - How is FDI related to the intricate production networks?
 - How does FDI benefit the host country?
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- ❑ Dunning: Ownership, Location and Internalization advantages
 - ❑ Kojima: East Asian model: complementary relationship between FDI and trade
 - ❑ Both these models are important in understanding East Asian FDI
 - ❑ After the Plaza accord, Japanese FDI flow in South Korea and Taiwan during 1980s, NIEs during late 1980s, selected ASEAN member economies during 1990s.
 - ❑ After 1997/98 financial crisis and China's entry to WTO in 2001, Japanese FDI started to divert towards China
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- ❑ But parts and components production is still scattered throughout Asia.
 - ❑ The concept of production fragmentation has been widely used by Japanese MNCs
 - ❑ Service link cost is useful in explaining the development of production networks in East Asia
 - ❑ Service link costs fell because the large number of firms in close proximity made it easier for firms to produce parts and components and the handle frequent specification changes
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Theoretical Background: Dunning

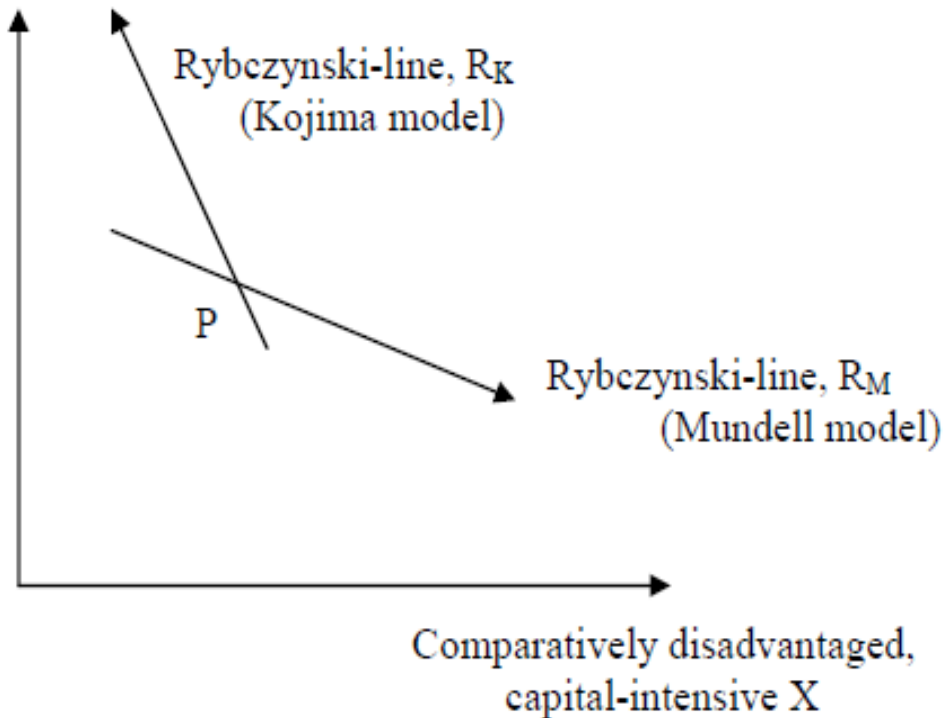
- ❑ Dunning: Ownership advantage is based upon technological and managerial superiority of home country firms relative to host country firms
 - ❑ Dunning: Locational considerations and advantages include wage levels, factor endowments, technology transferability, physical and human infrastructure, and market supportive institutions and political regimes
 - ❑ Dunning: Internalization refers to the net benefits obtained by FDI firms through more captive and more integrated business activities conducted by parent firms
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Theoretical Background: Kojima

- ❑ Kojima: General equilibrium model where trade and FDI are complementary.
 - ❑ Kojima: FDI originates from the home country's disadvantaged industry into the host country's advantaged industry and is therefore export-oriented in nature.
 - ❑ Kojima: This is in contrast to Mundell's model where FDI originates from the home country's advantaged industry into the host country's disadvantaged industry and is therefore export-substituting in nature.
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Theoretical Background

Comparatively advantaged,
labor-intensive Y



Source: Ozawa (2007)

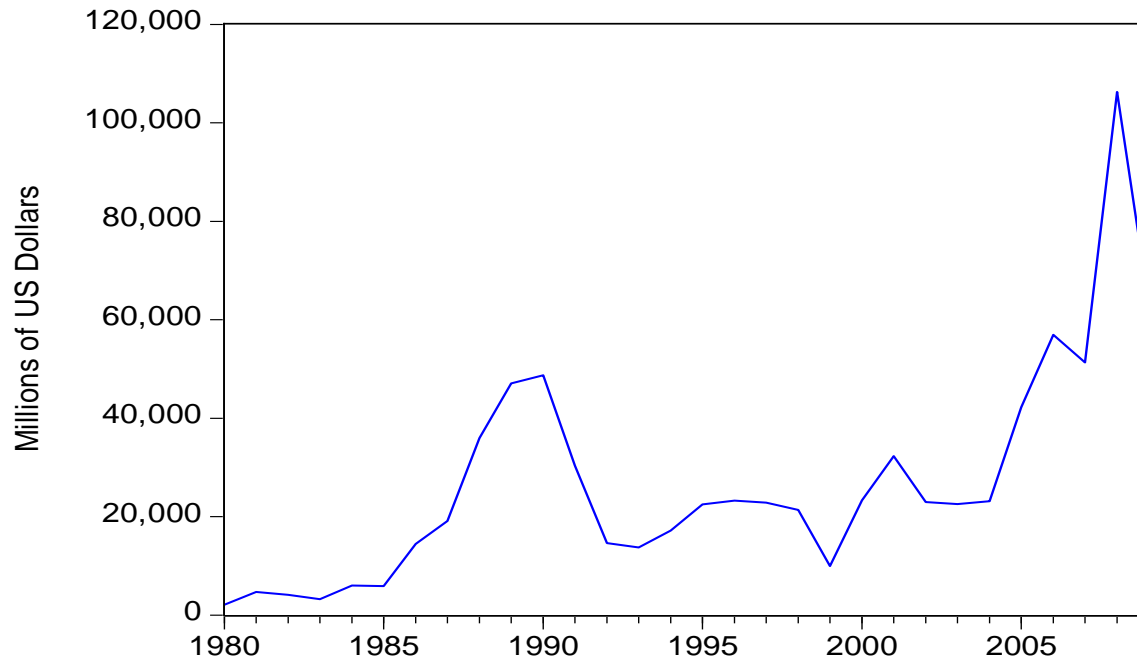
For Kojima, the inflow of capital causes the labor intensive industry to expand and capital industry to decline- a result opposite to that predicted by the original Rybczynski theorem

Theoretical Background: Kojima

- Kojima: Trade and FDI are complementary because
 - FDI involves the transmission of a 'package' of capital, managerial skill, and technical knowledge to the host country
 - FDI takes into consideration the present and potential pattern of comparative advantages between investing and host countries
 - Kojima: Technology transfer to developing countries is given in the form of know-how or of general industrial experience covering a wide spectrum of production activities.
 - Kojima: This type of technology transfer through FDI helps promote steady and balanced economic development and trade growth in developing economies
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FDI in East Asia

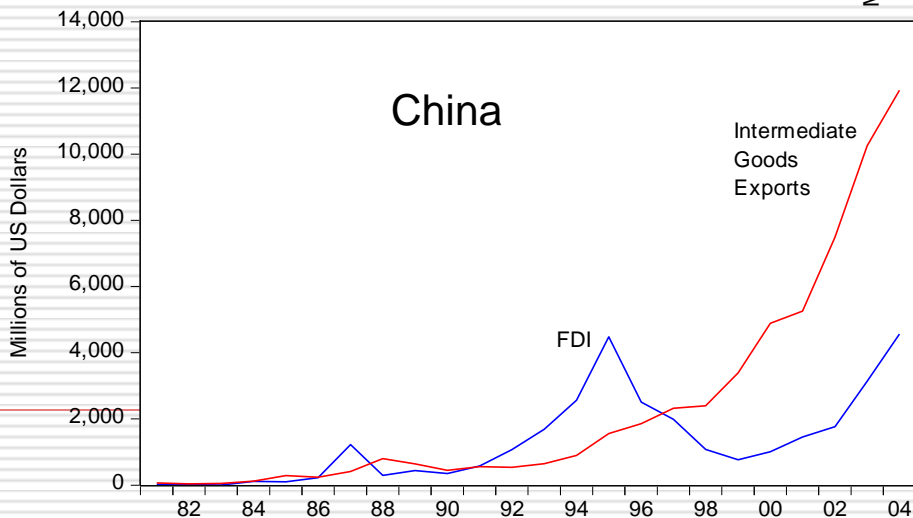
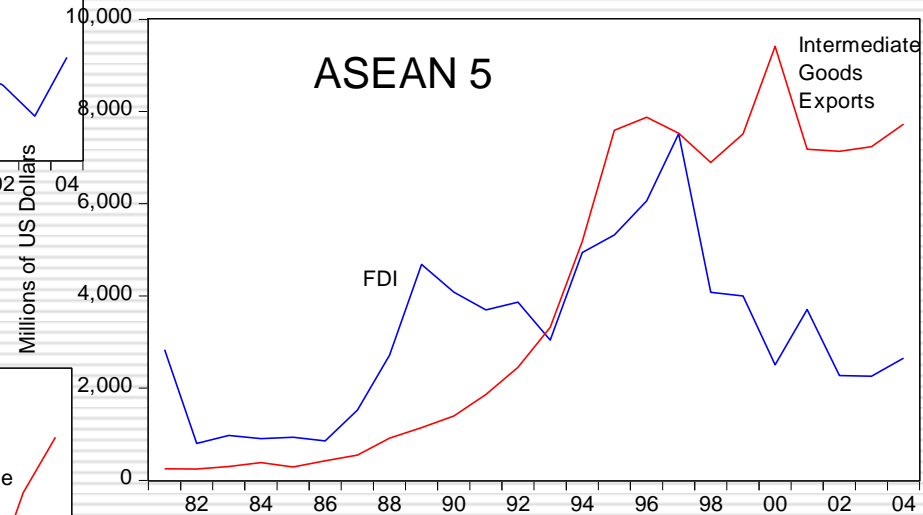
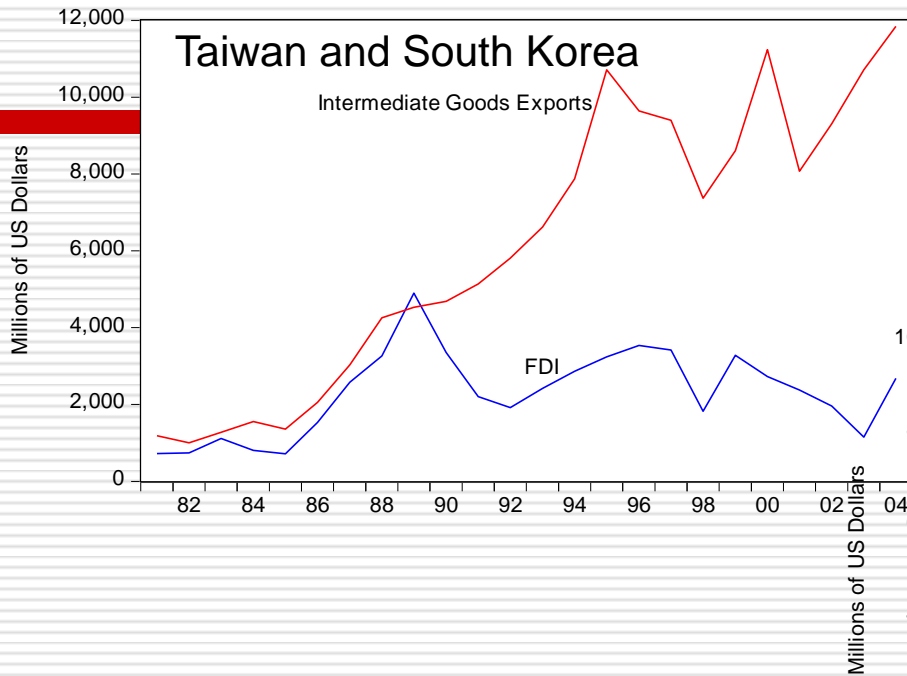
Japanese Outward FDI to the World



Source: CEPII-CHELEM Databases

- Before 1985, Japan's overseas investments were aimed at exploiting natural resources in resource rich economies or at manufacturing labor-intensive products such as textiles and clothing in labor abundant developing economies
- However after the Plaza accord agreement in Sep 1985, the focus changed to labor-intensive assembly operations to other Asian economies

Japanese FDI and intermediate goods exports



Sources: Japanese Ministry of Finance and CEPII-CHELEM Database.

FDI in East Asia

- ❑ Japanese FDI to Asian economies increased, its exports of intermediate goods to these economies increased in tandem
 - ❑ As Kojima posited, Japanese FDI and exports to Asia thus functioned as complements rather than substitutes
 - ❑ FDI to South Korea and Taiwan in the late 1980s fell down as US Treasury named these countries as the currency manipulators and thus resulting in exchange rate appreciation
 - ❑ The Japanese FDI then transferred to the ASEAN economies
 - ❑ FDI and intermediate goods export trended steadily upwards until 1997
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FDI in East Asia

- ❑ Exporting was an important learning vehicle for ASEAN firms and a mechanism for achieving technology transfer
 - ❑ These positive externalities then contributed to a virtuous cycle of growth
 - ❑ Japanese FDI then collapsed during and after Asian crisis
 - ❑ Interestingly though, the flows of parts and components from Japan to ASEAN continued unabated
 - ❑ Once a Japanese firm establishes a cross border production network in another country, it does not withdraw from that country
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FDI in East Asia

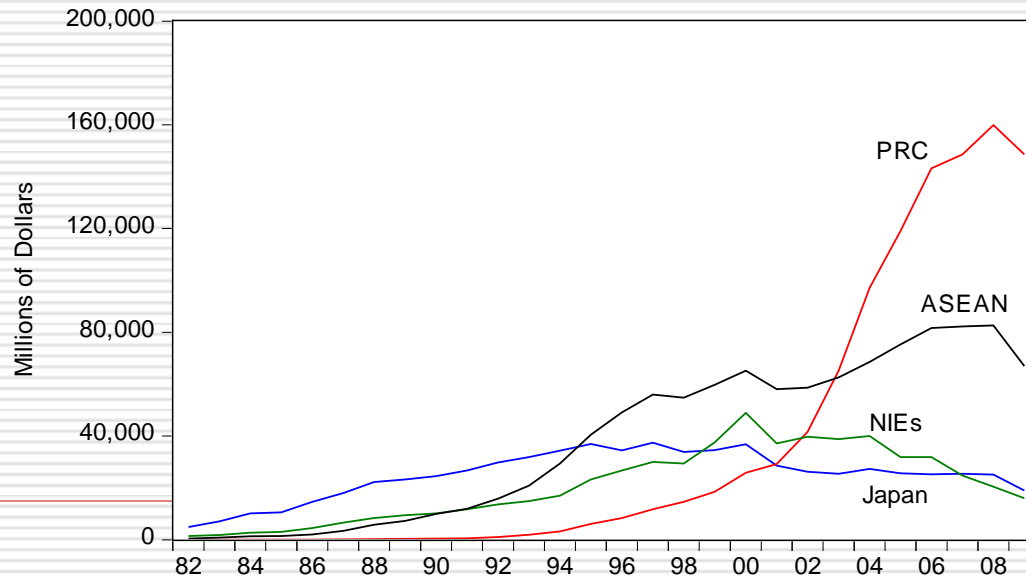
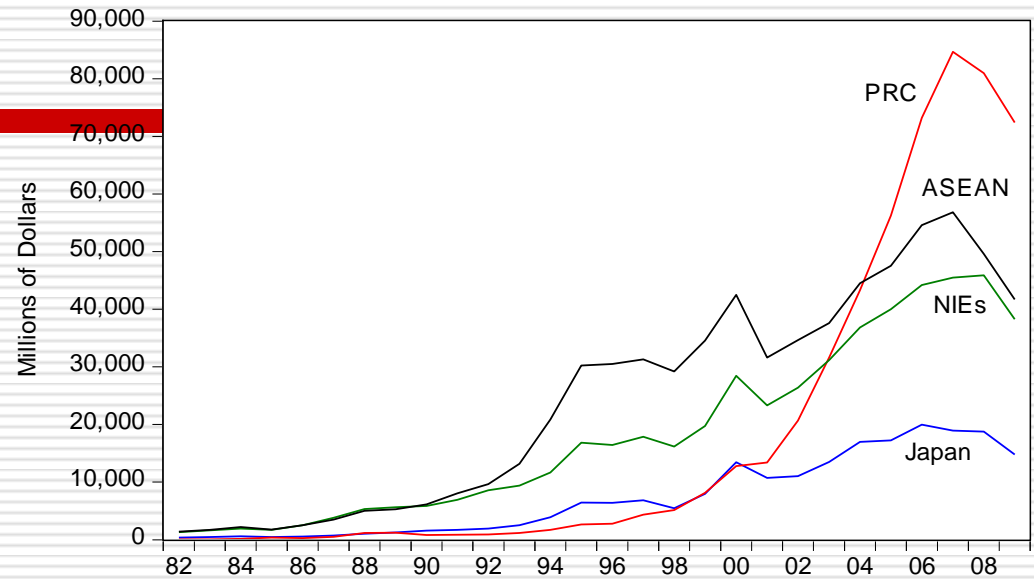
- ❑ Obashi (2010a,b): Trade in parts and components between East Asian economies tend to be more resilient than trade in finished goods or trade with extra- regional partners
 - ❑ Thus, while the Asian Crisis reduced the locational advantages of channeling FDI to ASEAN, it did not cause the MNEs to break off existing relationships with Southeast Asian firms
 - ❑ The FDI and parts/ components trade then began flowing to China, especially after China joined WTO in 2001
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FDI in East Asia

- While Japanese firms were the first to shift labor intensive operations to lower wage locations in Asia, other Asian firms especially from Taiwan and South Korea followed the pattern
 - The reasons were the higher wages and stronger exchange rates that emerged in the late 1980s and the 1990s
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FDI in East Asia

Value of Electronic Parts and Components Exports from East Asia



Value of Computer Exports from East Asia

Source: CEPII-CHELEM Database

FDI in East Asia

- ❑ For whole of East Asia, the flow of electronic parts and components within East Asia is the largest category traded
 - ❑ Computer and office equipment is the largest category exported from East Asia to the rest of the world
 - ❑ Electronic parts and components from East Asia flowed in equal quantities to the NIEs and ASEAN during 1980s
 - ❑ In the 1990s, flows to ASEAN far surpassed flows to NIEs
 - ❑ Starting in 2001, there was surge in electronic parts and components going to China
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FDI in East Asia

- ❑ For final assembled computers, Japan was the leading exporter in the 1980s, ASEAN became leading exporter in 1990s
 - ❑ Then starting in 2001 computer exports from China exploded
 - ❑ Intricate production and distribution networks developed in the region, involving complicated combinations of intra-firm trade, arms-length transactions, and outsourcing
 - ❑ ASEAN's imports from East Asia was 33% in 2009 in electronic goods, ASEAN exports to China was almost 60%
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FDI in East Asia

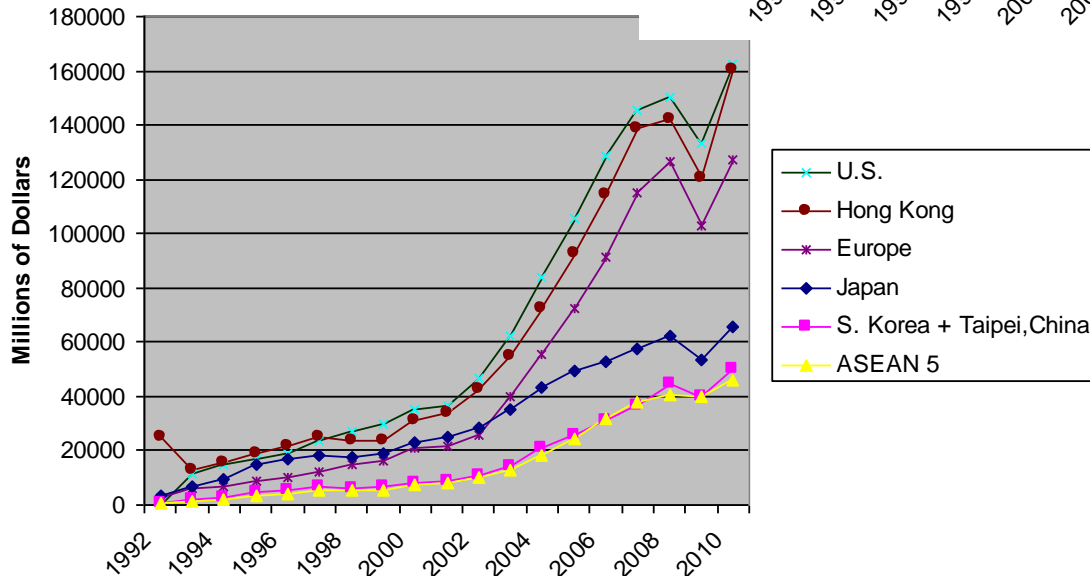
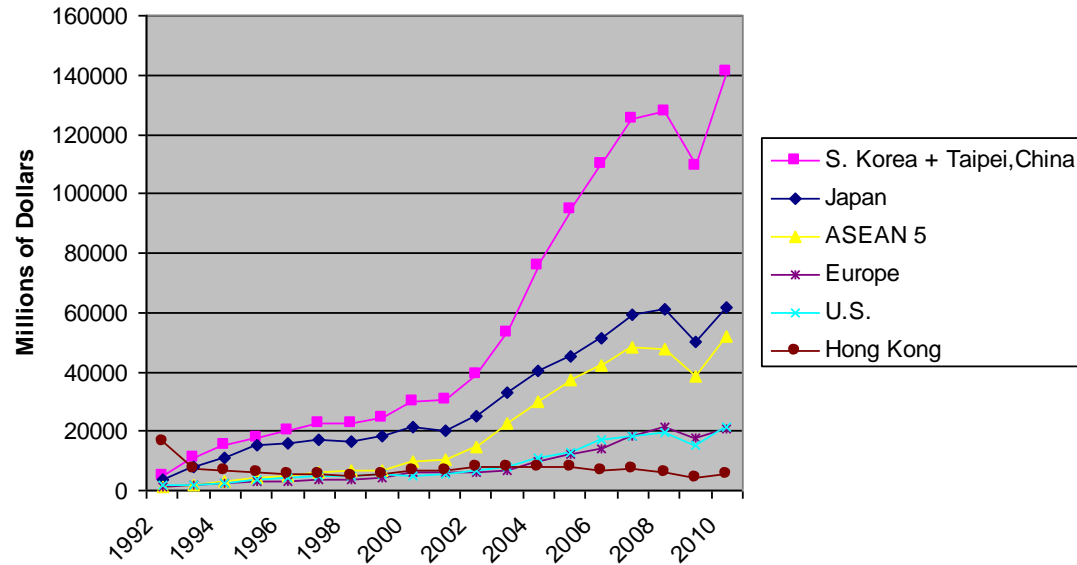
- ❑ Example of hard disk drive (HDD)
 - ❑ Hiratsuka (2010): affiliates of Japanese MNCs in the Philippines makes parts and components and ship them to Thailand to produce HDDs.
 - ❑ Then these HDDs are shipped to China to assemble computers, and the final computers are exported throughout the world.
 - ❑ Value chains such as these have mushroomed in East Asia
 - ❑ Up until recently, most of the East Asian production networks have been exported outside the region, however firms in Japan and NIEs have increasingly catering to local demand in China
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Production Networks in East Asia

- ❑ Characterized by intricate production and distribution relationships
 - ❑ Japan, South Korea, Taiwan and MNCs located in ASEAN produce sophisticated technology- intensive intermediate goods and ship them to China and ASEAN for assembly by relatively low skilled workers
 - ❑ The finished products are then exported throughout the world
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Production Networks in East Asia

China's Imports for Processing



China's Processed Exports

Production Networks in East Asia

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- ❑ Lion's share of China's imports for processing comes from East Asian economies
 - ❑ Major destinations for China's processed exports are US, Hong Kong, Europe.
 - ❑ Further, since most of the exports to Hong Kong are trans-shipped to the rest of the world, the western economies are the major consumers
 - ❑ 85% of processed exports are produced by foreign capital firms (Gaulier et al. 2011)
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Production Networks in East Asia

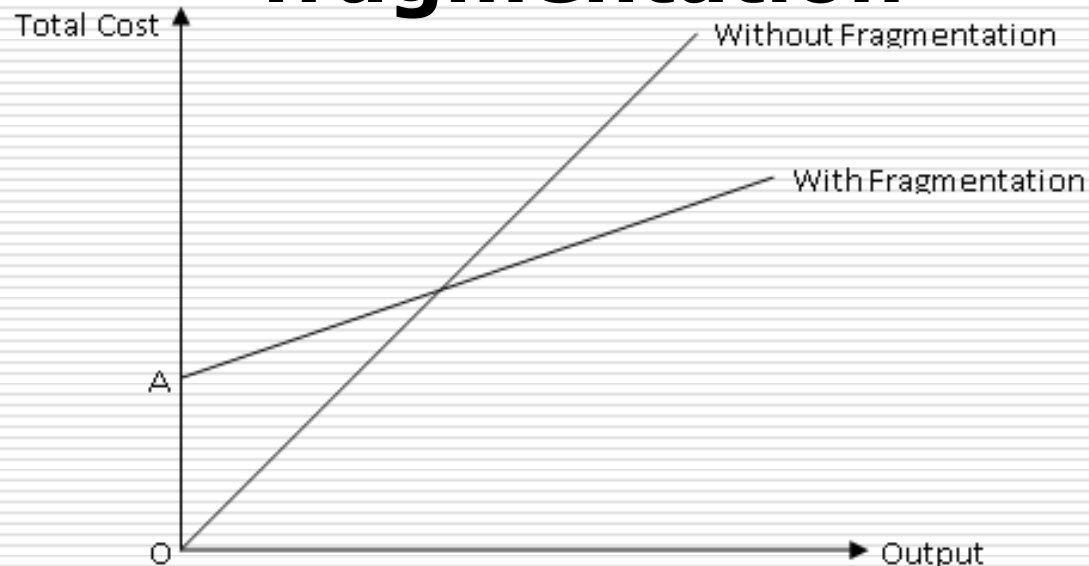
- ❑ Modeling this trade within East Asian production networks has proven challenging to economists
 - ❑ Traditional trade theories emphasize trade in final goods driven by differences in technology and factor endowments
 - ❑ Production fragmentation, however, involves trade in intermediate goods
 - ❑ Firms exploit comparative advantage by slicing up production processes and allocating the production modules to different locations based on differences in factor endowments across the fragmented production blocks
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Production Networks in East Asia

- ❑ 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 costs. (Kimura and Ando, 2005)
 - ❑ The service link cost varies across two dimensions
 - Geographical distance: transport costs, telecommunication costs, intra- firm coordination costs
 - Managerial controllability: costs of imperfect information, lack of credibility, loss of stable contracts
 - ❑ Lowering the service link cost facilitates the functioning of the sliced value chain
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Production Networks in East Asia

Total cost reduction with fragmentation



- Cost of the product which are not fragmented increases in the increasing trend as the number of output increases with compared to the product which are fragmented.
- One should notice however that there is a fixed cost involved initially with fragmentation indicated as OA intercept.
- Therefore, whether fragmentation saves the total production cost or not depends on the service link cost, OA, and the marginal production cost represented by the slope of total cost curve.

Source: Kimura and Ando (2005)

Policy Implications

- ❑ 1. How to Lower Service Link Costs
 - ❑ 2. How to Facilitate Technology Transfer Leveraged by Networks
 - ❑ 3. How to Enlarge the Scope of FTAs
 - ❑ 4. How to Enhance the Quality of Bilateral Investment Treaties
 - ❑ 5. How to Improve Regional Infrastructure
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Lowering service link costs

- ❑ Costs include transport costs, telecommunications costs, and intra-firm coordination costs.
 - ❑ Strengthen physical infrastructure (highways, ports, airports, ICT infrastructure, container yards).
 - ❑ Strengthen institutional infrastructure (legal system, contract enforcement, corporate governance, legal remedies for violations of intellectual property rights agreements).
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Facilitating technology transfer

- ❑ Need educated workers in host countries
 - ❑ High quality education in science and math helps supplier firms to become involved in engineering and design.
 - ❑ Domestic R&D supported by public research institutes can help indicate what technologies are appropriate.
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Developing Asia are not passive recipients of technology.

- ❑ Wignaraja (2008) analyzed the behavior of exporting firms in PRC, the Philippines and Thailand.
 - ❑ Results of probit analysis reveal that the technological capabilities of firms strongly determine firm-level exporting behavior in PRC, PHL, and THA .
 - ❑ Results indicate that firms' efforts to learn, assimilate and employ imported technologies affect their ability to export.
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FTAs

- Unilateral liberalization is beneficial, global liberalization is even better.
 - Important to facilitate movement of labor and firms from losing to gaining sectors.
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Asian “noodle bowl” problem – ADB survey

- ❑ Sample: 841 manufacturing firms from PRC, JPN, SGP, ROK, THA, PHL.
 - ❑ Larger, more established firms view FTAs positively.
 - ❑ Benefits of wider export market access and lower costs of imported intermediate inputs exceed the costs associated with FTA use.
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Optimizing use of the multitude of FTAs: short-run remedial measures

- ❑ (i) reduction of MFN tariffs to the extent possible;
 - ❑ (ii) rationalization of ROOs;
 - ❑ (iii) making available wider alternative options of ROOs to choose from;
 - ❑ (iv) intensifying awareness programs of FTAs among potential beneficiaries;
 - ❑ (v) getting business more involved in FTA negotiations; and
 - ❑ (vi) improving public and private sector institutional support, especially for SMEs.
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To the extent that the “noodle bowl” is a problem,

- Broader coverage and lower tariffs on both external and internal trade can mitigate “noodle bowl” effects.
 - A region-wide FTA:
 - would spur the growth of Asian trade and investment;
 - would make it possible to harmonize procedures for issuing certificates of origin, use of self certification, and achieve full cumulation of ROOs; and
 - would cause transactions costs to fall if electronic customs clearance was employed
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Agreement among ASEAN+3 countries should include:

- ❑ A high quality agreement in the region for market access for both goods and services;
 - ❑ A global standards investment agreement;
 - ❑ Satisfactory trade and investment facilitation measures;
 - ❑ Full cumulation of ROOs;
 - ❑ Special attention to the needs of less developed countries;
 - ❑ A dispute settlement mechanism.
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Possibilities and dangers of a region-wide FTA

- ❑ For poorer Asian nations, a region-wide FTA would offer greater market access and greater participation in regional production networks, and increased competition from more efficient firms in other countries.
 - ❑ Chia (2009) advocates providing safeguards for poorer countries and also capacity building assistance to improve supply side competitiveness in less developed ASEAN countries.
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Investment Treaties

- ❑ High quality investment treaties can attract and retain foreign investors.
 - ❑ Investment treaties should provide investment protection, investment facilitation, and investment liberalization. In addition, they should provide for dispute settlement.
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The role of national and regional infrastructure investment for

- (i) rebalancing Asia's growth;
 - (ii) creating new engines of growth;
 - (iii) promoting balanced, sustainable, green, and inclusive growth; and
 - (iv) improving national and regional competitiveness and productivity.
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Rebalancing for Sustainable Growth

- ❑ Accelerate regional cooperation and integration
 - ❑ Facilitate regional trade integration through physical connectivity as well as institutional linkages
 - ❑ Stimulate domestic demand and alleviate the further impact of crisis
 - ❑ Help narrow the development gap among Asian economies
 - ❑ Promote greater technologies and more efficient use of regional resources
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Large Infrastructure Projects as New Engines of Growth

Region/ Subregion	Transport Projects		Energy Projects		Total	
	Cost (\$ million)	No.	Cost (\$ million)	No.	Cost (\$ million)	No.
Asia	177,077	931	–	–	177,077	931
Asian Highway	43,276	121	–	–	43,276	121
Trans-Asian Railway	82,801	45	–	–	82,801	45
Asian Container Ports ^a	51,000	765	–	–	51,000	765
East/Southeast-Central-South Asia ^b	–	–	22,975	5	22,975	5
Southeast Asia	5,858	17	41,444	33	47,302	50
GMS	5,858	17	2,604	14	8,462	31
Trans- ASEAN Gas Pipeline	–	–	7,000	1	7,000	1
BIMP-EAGA	–	–	100	1	100	1
Others	–	–	31,740	17	31,740	17
Central Asia	21,414	38	11,131	44	32,545	82
CAREC	21,414	38	10,861	43	32,275	81
Others	–	–	270	1	270	1
South Asia	293	3	6,846	6	7,139	9
Total	204,642	989	82,369	88	287,038	1,077

Sources: Bhattacharyay (2008) and adapted from UNESCAP (2006a; 2007a,b; 2008a,b); ADB (2008a); CAREC (2008a,b,c); GMS (2009); ASEAN (2004); Bhattacharya and Kojima (2008); China Post (2007); Kathuria (2006); ADB staff estimates (2008); ASEAN Center for Energy (2005); and Von Hippel (2001).

Connectivity for Environmentally Sustainable Development and Poverty Reduction

1. Promotes environmental sustainability;
 2. Helps to increase standard of living and to reduce poverty by connecting isolated places and people with major economic centers and markets;
 3. Narrows development gap among Asian economies by connecting LDCs with major markets and business centers;
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Infrastructure, Competitiveness, and Productivity

Table 1: Global Competitiveness and Infrastructure Quality Index of Countries

Country	2001-2002			2008-2009				2009-2010			
	GCI		Infrastructure	GCI		Infrastructure		GCI		Infrastructure	
	Rank	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score
PRC	47	61	2.9	30	4.7	47	4.22	29	4.74	46	4.31
India	36	66	2.6	50	4.33	72	3.38	49	4.3	76	3.47
Indonesia	55	59	3	55	4.33	86	2.95	54	4.26	84	3.2
Japan	15	15	6	9	5.38	11	5.8	8	5.37	13	5.83
Korea	28	27	4.8	13	5.28	15	5.63	19	5	17	5.6
Malaysia	37	20	5.4	21	5.04	23	5.25	24	4.87	26	5.05
Philippines	54	68	2.4	71	4.09	92	2.86	87	3.9	98	2.91
Singapore	10	2	6.8	5	5.53	4	6.39	3	5.55	4	6.35
Thailand	38	30	4.6	34	4.6	29	4.67	36	4.56	40	4.57
Viet Nam	62	71	2.2	70	4.1	93	2.86	75	4.03	94	3

Note: GCI = Global Competitiveness Index; NA = Not Available

Score: 1= poorly developed and inefficient; 7= among the best in the world

Source: World Economic Forum (2001, 2009, and 2010)

Infrastructure, Competitiveness, and Productivity (cont'd)

- ❑ Increased infrastructure investment can promote competitiveness and productivity through reduced transport and logistics cost, thus reduced trade cost;
 - ❑ Quality and cost-effective infrastructure services can contribute to the improvement of productivity in any sector of an economy.
 - ❑ National and regional infrastructure is playing an evident role in facilitating the creation and expansion of economic corridors.
 - ❑ Enhanced transport and information technologies have caused cities in the region to specialize based on their comparative advantages, thereby creating a broad range of new activities.
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Meeting the Financing Needs

- ❑ On average, Asia needs to invest about \$750 billion per year in infrastructure (both national and regional) during 2010-2020
 - ❑ The region's vast domestic savings as the main source of financing for Asia's infrastructure
 - ❑ Strengthen national and regional local currency bond markets—notably the Chiang Mai Initiative (CMI), the ASEAN+3 Bond Market Initiative (ABMI), and the Asian Bond Funds (ABF)
 - ❑ Identify and prepare “bankable” projects to encourage private financing involving PPPs
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Conclusion

- ❑ FDI and production networks in Asia have distinctive characteristics.
 - ❑ To promote industrial upgrading, countries in developing Asia should seek to lower the service link cost between production blocks and to invest in human capital.
 - ❑ To connect producers and consumers in Asia, the region needs a high quality FTA covering trade in goods and services, a global standard investment agreement, and better infrastructure.
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Thank You
