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Role of production networks in sustaining and rebalancing Asia's growth

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

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

Abstract

In last few decades, Asian production networks have contributed significantly toward the rapid trade expansion and economic growth in East Asia. Developed Asia produces technology-intensive intermediate goods and capital goods and ships them to the People Republic of China (PRC) and ASEAN for assembly by lower-skilled workers. The finished products are then exported to the US, Japan, Europe, and other countries. In view of ongoing global financial crisis and European debt crisis, the ability of the rest of the world to absorb Asia's exports has decreased. Export production in some Asian countries has also been subsidized by artificially low prices for labor, land, and energy, and by lax enforcement of environmental regulations. Asian economies should thus rebalance away from relying too much on exporting subsidized goods to developed economies. On the supply side, the best way to rebalance growth is to increase productivity in order to raise wage rates and living standards. This can be done by leveraging production networks to graduate to higher value-added, knowledge-intensive activities. On the demand side, producers in the region should turn to Asian consumers as an engine of growth. This can be facilitated by improving connectivity through increased investment in connecting infrastructure such as transport and telecommunications; and by implementing a region-wide FTA. This paper addresses these issues by providing an analytic description of production networks in Asia. It then discusses how developing Asian countries could leverage production networks to facilitate technology transfer to domestic firms and how a regional FTA could bring Asian producers and consumers together. Finally, it considers how infrastructure investment in large and connecting projects could help to rebalance and sustain growth in the region through increased connectivity and reducing trade costs.

JEL-Code: F140, L230, O530.

Keywords: East Asian production networks, ASEAN, infrastructure, connectivity, rebalancing growth, sustainable growth.

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The views expressed in this paper are those of the author(s) and do not necessarily reflect the views or policies of the Asian Development Bank or Research Institute of Economy, Trade and Industry**.** Authors thank seminar participants at the ADBI Workshop on ASEAN, China, and India in New Delhi for helpful comments. Parts of this paper are adapted from Thorbecke and Yoshitomi (2006), Thorbecke (2010) and Thorbecke et al. (2011).

Role of Production Networks in Sustaining and Rebalancing Asia's Growth[2]

Willem Thorbecke and Biswa Nath Bhattacharyay

1 Introduction

In last few decades, the international production networks and supply chain of Asia (henceforth East Asian production network) have contributed significantly toward the rapid trade expansion (especially intra-regional trade) and economic growth in East Asia[3] as well as in narrowing development gap across countries. This production network has created a global value chain in production, investment and trade in many products such as automobiles and automotive parts, consumer electronics, telecommunications, garments and information and communications technology.

According to Borrus et al., (2000), "a lead firm's "cross-border production network" (CPN) is defined to be the inter- and intra-firm relationships through which the firm organizes the entire range of its business activities: from research and development, product definition and design, to supply of inputs, manufacturing (or production of a service), distribution, and support services. The CPN includes entire network of cross-border relationships between a lead firm and its own affiliates and subsidiaries, but also its subcontractors, suppliers, service providers, or other firms participating in cooperative relationships, such as standard setting or research and development (R&D) analysis".

In recent years, East Asia's exports have been produced within intricate production and distribution relationships. Japan, Korea, Taipei,China, and multinational corporations (MNCs) located in ASEAN produce sophisticated technology-intensive intermediate goods and capital goods and ship them to the People Republic of China (PRC) and ASEAN for assembly by lower-skilled workers. The finished products are then exported to the United States (US), Japan, Europe, and other countries. The volume of exports produced within these value-added chains has increased rapidly and this has led to growing trade imbalances between East Asia and the rest of the world. The region's global current account surplus equaled US$747 billion in 2007. US$710 billion in 2008, and US$620 billion in 2009.

There are a number of reasons why Asian economies should rebalance away from relying too much on exports to developed economies. As net exports from Asia have multiplied and growth abroad has stagnated, the ability of the rest of the world to absorb Asia's exports has decreased. In view of ongoing global financial crisis originated in US and European debt crisis, external demand expected to remain soft. Furthermore, export production in some countries has been subsidized by artificially low prices for labor,

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[3] Consists of People Republic of China Japan Mongolia, Hong Kong, China, Republic of Korea, Taipei,China, Brunei Darussalam Malaysia Singapore, Cambodia Myanmar ,Thailand, Indonesia Philippines Viet Nam and Lao PDR

land, and energy, and by the lack of rigorous enforcement of environmental regulations (Huang 2009). This state of affairs is not in the long-term interests of the producing countries. Finally, the trade composition in many countries is dominated by low value-added assembled goods produced through East Asian supply chains.

Rebalancing should take place on both the supply side and the demand side. On the supply side, the best way to rebalance growth is to increase productivity (Jitsuchon and Sussangkarn 2009) which would raise wage rates and living standards. On the demand side, producers in the region should look more to Asian consumers as an engine of growth. As the Ministry of Economy, Trade and Industry (METI) (2009) reports, Asia has 930 million people who are in the middle class and above. Thus, there exists huge potential for rising demand in Asia to offset shrinking demand in the West.

To increase productivity, firms in developing Asia should leverage production networks to graduate to higher value-added, knowledge-intensive activities. This can be accomplished by maintaining foreign direct investment (FDI)-friendly environments capable of nurturing industrial agglomeration and facilitating technology transfer. One key way to attract FDI is to lower the service link costs between geographically separated production blocks. These could be lowered by implementing a region-wide free trade agreement (FTA), improving intra-regional infrastructure connectivity, and developing competitive service sectors and small- and medium-sized enterprises (SMEs).

Many of these steps would also help Asian firms to connect with new sources of demand. For instance, improving infrastructure in transport, and telecommunications for increased connectivity within and between Asian economies; and implementing a region-wide FTA would give firms better access to consumers in Asia. In addition, raising worker productivity would increase labor income, raising the long-run purchasing power of consumers in the region. There is also the possibility of a virtuous cycle emerging. Developing competitive SMEs and service sectors and investing in infrastructure would attract FDI. Once countries receive a critical mass of FDI, industrial agglomeration would start to take place. Local SMEs and service sector firms would then have more opportunities to develop and increase their competitiveness and governments would have more revenue to invest in infrastructure. This would in turn attract more FDI.

The next section provides an analytic description of production networks in Asia. It focuses on East Asia (including Southeast Asian economies), since South Asia plays a very small role in these networks. Section 3 considers how developing Asian countries could leverage production networks to facilitate technology transfer to domestic firms. Section 4 considers a regional FTA and the role it could play in bringing Asian producers and consumers together. Section 5 considers how infrastructure investment could help to rebalance growth. Section 6 provides concluding remarks.

2. An Analytical Description of Asian Production Networks

Triangular trading patterns involve Japan, South Korea, Taipei,China and Multinational Corporations (MNCs) in ASEAN and the PRC exporting sophisticated intermediate goods to the PRC and Association of Southeast Asian Nations (ASEAN) for processing and export of the final products all over the world. Examining the flow of intermediate goods can shed light on the evolution of production networks in Asia.

Figure 1 and Table 1 shows that Japan is the largest exporter of intermediate goods to other East Asian countries. East Asia here includes Japan, Malaysia, the Philippines, the PRC, Singapore, South Korea, Taipei,China, and Thailand. After Japan, the leading exporters are Taipei,China, the PRC, and South Korea. Collectively ASEAN countries also export large quantities of intermediate goods. This partly reflects the presence of large multinationals in ASEAN countries.

To better understand the functioning of production networks in Asia it is helpful to look at specific sectors. Within East Asia the largest export category is electronic parts and components (ISIC classification number 321). Since 2000, almost 20 percent of intra-East Asian exports have been in the category electronic parts and components. Between East Asia and the rest of the world the largest export category is computers and office equipment (ISIC classification number 300). Since 2000, about 12 percent of East Asia's exports to the rest of the world have been in the category computers and office equipment. Examining these two categories is also useful because electronic parts and components are a key input into the production of computers and office equipment.

Figure 1. Intermediate Goods Exports from Individual East Asian Countries to the Region as a Whole

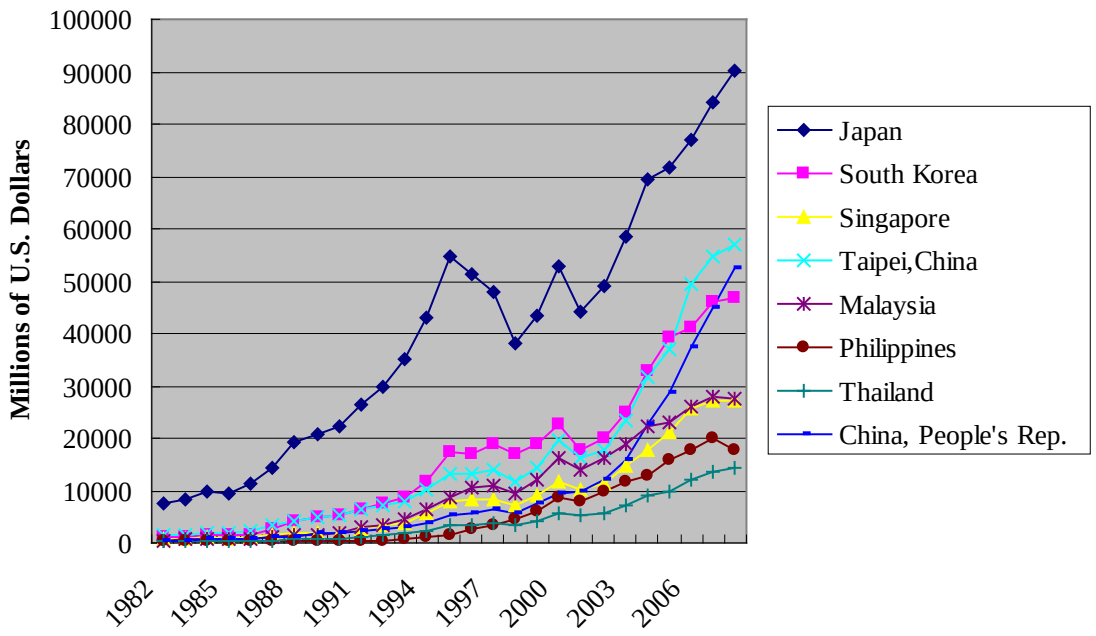

Table 1. Intermediate Goods Exports from Individual East Asian Countries to the Region as a Whole (millions of U.S. dollars)

Export zone	1985	1990	1995	2000	2005	2006	2007	2008
Japan	9468	22384.6	54650.2	52665.2	71799.6	76992.2	84243.3	90218
South Korea	1423.3	5159.1	17491.9	22826.3	39125.6	41098.1	46045.8	46788.1
Singapore	819.3	2048	8075.6	11800.3	21243.4	25530.1	27234.5	27217.5
Taipei,China	1959.9	5103.2	13199.8	19787.2	36950.3	49497.5	54868.2	56888.5
Malaysia	629.1	2027.9	8786.7	16265.6	23037.3	25877.8	27986.8	27518.9
Philippines	293.8	417.4	1426.2	8791.9	15877.1	17908.3	20144.1	17753.6
Thailand	251	873	3323.3	5648.4	9953.4	11943.3	13627	14472.2
China, People's Rep.	589.3	1732.9	5173.1	9392	28645.2	37306.1	44954.2	52329.7

Source: CEPII-CHELEM Database

Figure 2 and Table 2 show that before 2005 ASEAN countries were the largest importers of electronic parts and components from the rest of Asia. The Figure also shows that, after 2001, electronic parts and components exports from the rest of the region to the PRC mushroomed. 2001 was the year that the PRC joined the WTO, and evidently the PRC's WTO accession evidently increased the confidence of foreign firms to export parts and components to the PRC for assembly. The value of electronic parts and components going from East Asia into the PRC reached 87 billion dollars in 2007 and despite the beginning of the crisis still equaled 84 billion in 2008.

Figure 2. Electronic Parts and Components Exports from East Asia as a Whole to Individual East Asian Countries and Regions

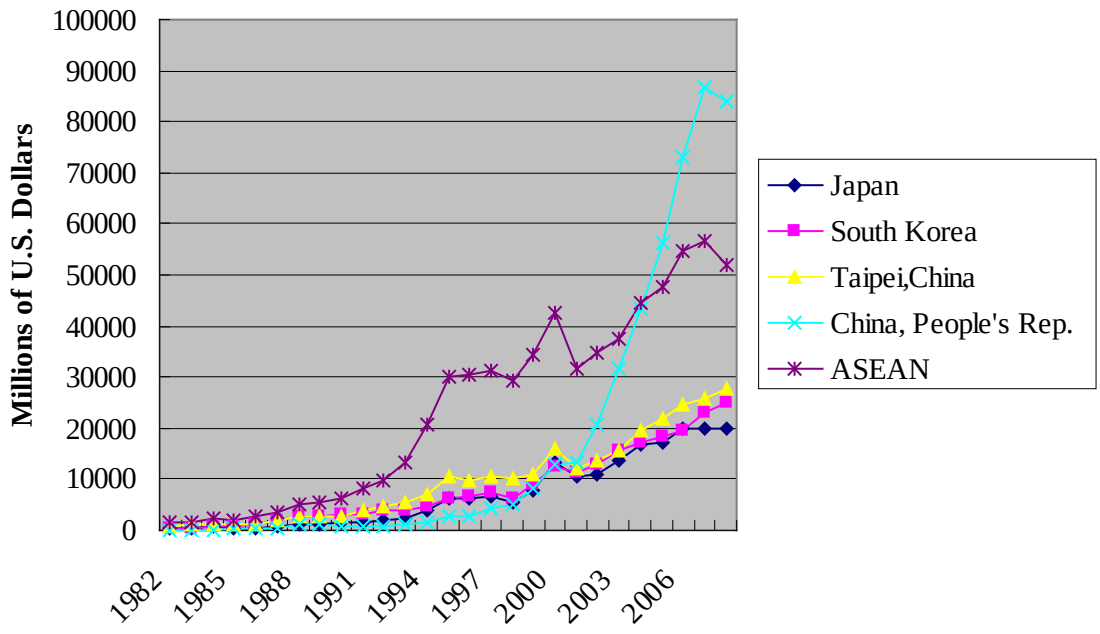

Table 2. Electronic Parts and Components Exports from East Asian as a Whole to Individual East Asian Countries and Regions (millions of U.S. dollars)

Import zone	1985	1990	1995	2000	2005	2006	2007	2008
Japan	472.9	1570.8	6443.7	13452.8	17248.2	19964.4	20074.5	20011.5
South Korea	638.3	3104.9	6366.8	12435.1	18176.5	19523.8	22931.9	24825.6
Taipei,China	1065.9	2764.8	10476.9	15989.8	21822.5	24690	25864.1	27770.5
China, People's Rep.	370.9	844.1	2651.9	12786	56258.2	73197.1	86835.6	83921.1
ASEAN	1775.5	6137.9	30225.3	42497.1	47558.4	54582.9	56743.8	52147.4

Source: CEPII-CHELEM Database

Figure 3 and Table 3 trace the evolution of computers and office equipment produced using the imported parts and components. Exports of final computer goods clearly reflect the imports of electronic parts and components. ASEAN was the leading exporter of the final assembled products before 2003. The PRC's exports began mushrooming after joining WTO in 2001, and reached 160 billion dollars by 2008.

Figure 3. Exports of Computers and Office Equipment from East Asian Countries and Regions to the World

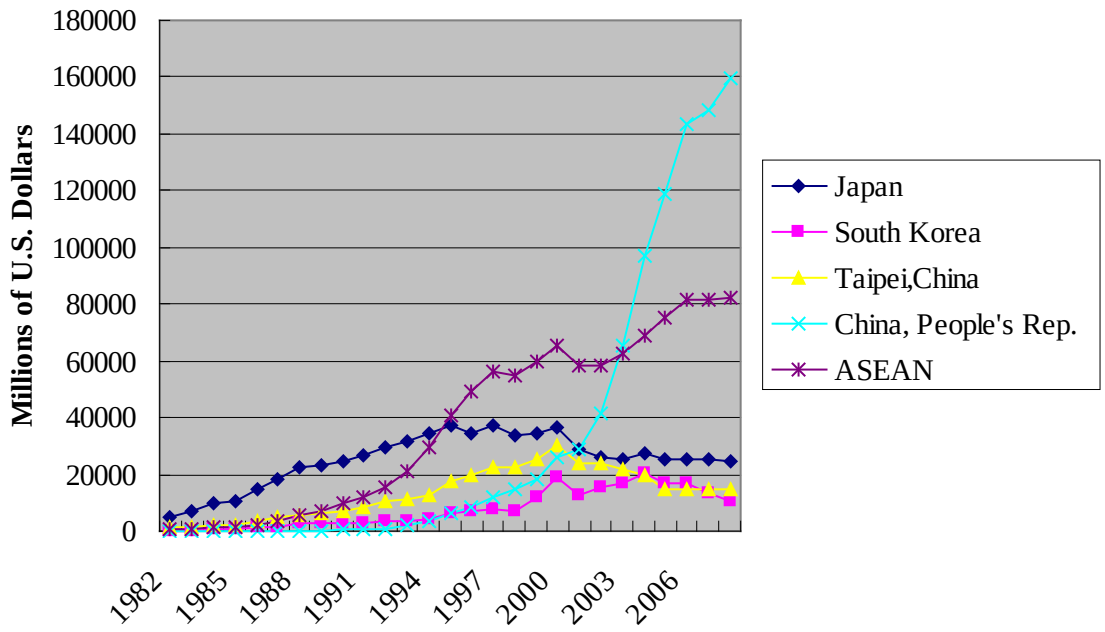

Table 3. Exports of Computers and Office Equipment from East Asian Countries and Regions to the World (millions of U.S. dollars)

Export zone	1985	1990	1995	2000	2005	2006	2007	2008
Japan	10589	24515.6	36934.7	36858.1	25612.5	25193.5	25205.7	24868.8
South Korea	581.2	2874.1	6004.9	18917.1	17123.8	16762.1	13021.7	10228.8
Taipei,China	2443.4	7294.1	17277.3	29988.5	14759.3	15106.2	14631	14417
China, People's Rep.	54.5	402.8	6141.4	25809.6	119064.3	143213.5	148343.9	159558.3
ASEAN	1429.7	9969.9	40512	65162.4	75320.5	81626.6	81481.9	82424.5

Source: CEPII-CHELEM Database

Figure 4 and Table 4 look at the flow of final assembled computer goods within and outside of the region. The lion's share of final goods flows out of the region. Even within the region, the largest purchasers are ASEAN and the PRC. Since these are the poorest

parts of the region, this suggests that many of these final goods are not primarily targeted to final consumers in Asia but are rather re-exported to consumers in the rest of the world.

Figure 4. Exports of Computers and Office Equipment from East Asia to East Asian Countries and Regions and to the Rest of the World

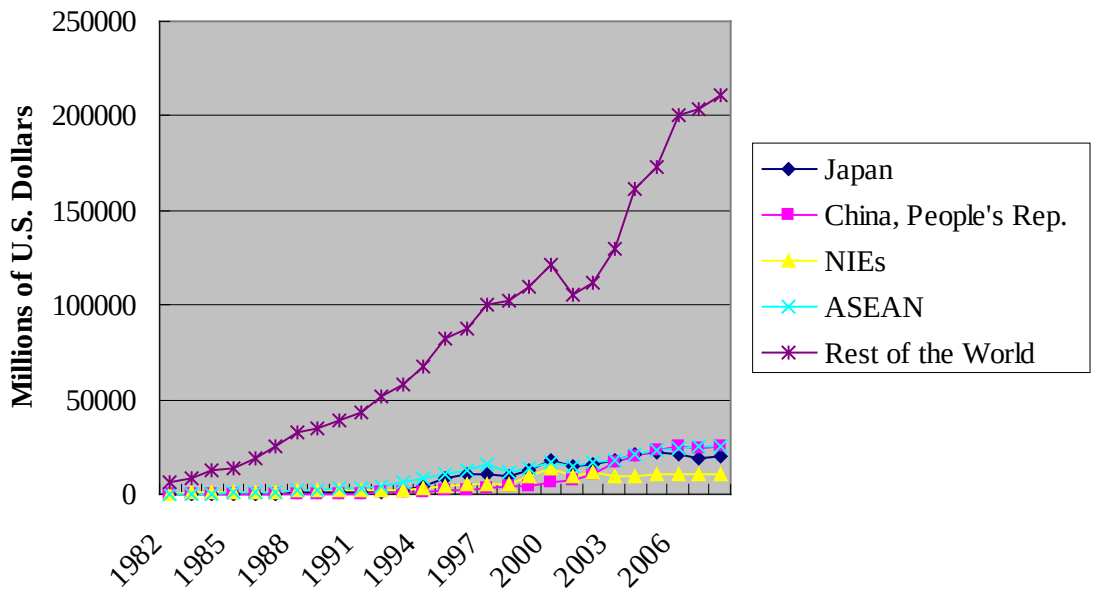

Table 4. Exports of Computers and Office Equipment from East Asia to East Asian Countries and Regions and the Rest of the World (millions of U.S. dollars)

Import zone	1985	1990	1995	2000	2005	2006	2007	2008
Japan	126.7	1039.8	8385.4	18393.9	22089.7	21390.6	18895.3	19843
China, People's Rep.	420.9	301.6	2063	6703.2	22689.5	25193.1	24335.4	25295.1
NIEs	613.9	2025.1	3921.4	14081.7	10503.3	10821.1	10809.6	10801
ASEAN	529.9	2924.6	10637	16477.7	23075	24156.6	25274.8	24888.6
Rest of the World	13406.5	38765.4	81863.5	121079.2	173522.8	200340.5	203369	210669.7

Source: CEPII-CHELEM Database

Thus, East Asian countries trade huge quantities of parts and components among themselves. These goods flow primarily to the PRC and ASEAN, where they are assembled and exported to the rest of the world.

3. Promoting Technology Transfer and Industrial Upgrading in Developing Asia

One benefit of processing trade for developing Asia is that MNCs play a large role in production and distribution processes. Furthermore, they bring expertise in finding new sources of demand and in tailoring production to the needs of the marketplace. Even if

American and European demand remain low, MNCs should be able to find new markets to exploit. Thus, processed exports should continue to play a role in developing Asia.

Processing trade also offers the potential to promote technology transfer and industrial upgrading. This can increase the productivity of local firms. Jitsuchon and Sussangkarn (2009) noted that the best way to rebalance growth is by increasing productivity. This raises wage rates and labor income over time, increasing the long run purchasing power of consumers. In addition, Jitsuchon and Sussangkarn (2009) argued that growth rebalancing should be accompanied by national efforts to increase the domestic content of the goods produced. Developing Asian countries would benefit if more of the value-added in the production chain could be produced domestically.

How can developing Asian countries increase the domestic content of exports? To do this they need to advance from simple to complex production activities—from assembling imported parts and components to participating in the engineering and design aspects of production. As Lim and Kimura (2009) discussed, it is crucial for local firms and entrepreneurs to obtain technology transfers and positive spillovers from the operation of MNCs in their countries. For this to happen, the absorptive capacity of the country must develop:

> Policymakers in [least developed countries] LDCs must be patient until they are hosting a critical mass of FDI, rather than hastily introducing performance requirements for technology transfers. Once the seed of industrial agglomeration has been planted, local firms and entrepreneurs will have ample opportunities for penetrating into production networks, which will eventually accelerate technology transfers and spillovers (Lim and Kimura 2009: 12).

The extensive benefits arising from FDI make it important for Asian countries to understand how they can attract FDI flows. As stated, one important step is to lower the service link costs between geographically separated production blocks. These costs can be lowered along two axes; distance and controllability (Kimura and Ando 2005). Costs along the distance axis include transport, telecommunications, and intra-firm coordination costs, while costs along the controllability axis include the costs of imperfect information, lack of credibility, and loss of stable contracts. To lower service link costs on the distance axis, Asian policymakers should focus on strengthening physical infrastructure such as i) networks of highways, ports, and airports; ii) information and communications technology (ICT) infrastructure; and iii) container yards. To lower costs on the controllability axis, policymakers should focus on strengthening market-supportive institutional infrastructure such as i) legal system enforcement mechanisms, ii) access to vendor information, iii) private contract enforcement mechanisms, iv) improved corporate governance, and v) legal remedies against violations of intellectual property rights agreements. The topic of strengthening regional infrastructure will be further discussed in Section 5.

Service link costs can fall when many firms locate in one area, and the resulting agglomeration can lead to economies of scale. Service link costs are reduced because the large number of firms in close proximity makes it easier for firms to procure parts and components and to handle frequent specification changes. In addition, the close proximity of many business partners with different skills and technologies helps to reduce the costs associated with uncontrollability.

For firms in developing countries to be able to reap the full benefits of these trade-FDI-technology networks, it is necessary for their economies to move up the value chain and not to remain engaged only in labor-intensive assembling activities. Technology transfer and upgrading is an essential element of this process. The intra-firm transfer of managerial technology from foreign affiliates to indigenous workers can be expedited if workers in the host country are better educated (Urata, Matsuura, and Wei 2006). Accordingly, the development of human capital is a prerequisite for effective technology transfer. However, it is not enough to simply provide more education. Rather the focus should be on the sciences and engineering, disciplines that equip students with the marketable skills that businesses need.

It is important to note that firms in developing Asia are not simply passive recipients of technology. Rather, their technological capabilities have a strong positive effect on their performance. Wignaraja's (2008) analysis of the behavior of exporting firms in the PRC, the Philippines, and Thailand revealed that the technological capabilities of firms—covering firms' competencies in (i) upgrading equipment, (ii) licensing technology, (iii) certifying International Organization for Standardization quality, (iv) improving processes, (v) adapting products, (vi) introducing new products, (vii) research and development (R&D) activity, (viii) sub-contracting, and (ix) linking technologies—strongly affected firms' abilities to export. The results indicated that firms' efforts to learn, adopt, and employ imported technologies had positive effects on their ability to export.

R&D policy can also play an important role. Because imported technology is expensive, selections must be made judiciously. Public research institutions can help in assessing and indicating the best technologies to import. For their part, governments can provide the necessary support to coordinate firms' R&D efforts with public research institutions and thereby promote relevant and efficient outcomes. The focus should not only be on the types of technologies to employ, but also on identifying the most appropriate partners. This linking up with other institutions or firms from abroad, whether done on a formal or informal basis, is critical to enhancing productive capacities in developing Asia.

Developing Asian countries receive technology spillovers when foreign affiliates increase local procurement in the host countries. As MNCs increase their tenure in developing Asia, they increase their procurement from local firms. This leads to the formation of industrial clusters, and local engineers and skilled workers begin to migrate between firms and sectors. In doing so, they bring their accumulated human capital with them and disperse it across the economy, promoting technological assimilation and productivity growth. For example, Kraemer and Dedrick (2006) have documented how the lion's share of the international production of notebook personal computers (PCs) is produced in the Yangtze River Delta by Original Design Manufacturers from Taipei,China. These manufacturers form part of a network that includes branded firms such as Hewlett Packard, Apple, and Toshiba, as well as suppliers of key parts and components, producers of basic industrial materials, and makers of operating systems and central processing units. Local Chinese firms supply connectors, batteries, switches, and displays and are also active in molding, casting, forging, plating, and module-assembling. These digital and human networks allow PC producers to react efficiently in real time to changes in consumer preferences and technology. Firms assembling the notebook PCs have also kept inventories lean by processing 98% of orders within three days of receipt. Productivity growth within this value chain has been phenomenal.

To summarize, in order to increase the tenure of foreign affiliates and reap the associated benefits as outlined above, it is necessary to create FDI-friendly environments characterized by the consistent and coherent enforcement of laws and regulations at all governmental levels, as well as stable macroeconomic fundamentals. Free trade agreements covering both trade and investment liberalization and facilitation, as well as high quality investment treaties, assume great importance here. It is to the topic of FTAs that the next section turns.

4. Implementing a Region-Wide FTA

A basic message of economics is that a country can reap the gains from trade by liberalizing unilaterally. Economies in the region can thus experience efficiency gains by reducing their MFN tariff rates, even if their trading partners do not. Partly because of the influence of special interests, this basic message is often forgotten in trade negotiations. Global liberalization would produce even greater gains by leading to a more efficient allocation of resources in the international economy along the lines of comparative advantage. FTAs between a limited number of countries, on the other hand, would be a second best solution because it would have trade diverting effects that would offset some of the trade creating effects. Amidst the stalled Doha Round trade talks, FTAs offer a means to liberalize trade and sustain economic recovery in Asia. Recent trend shows that FTA numbers have spread rapidly, particularly in East Asia. Regional FTAs have increased from 3 to 44 between 2000 and 2010 and that there are another 85 agreements at various stages of preparation. This FTA surge is due to dissatisfaction with the slow progress in global trade talks, the need to support sophisticated production networks through continued trade and investment liberalization, and a defensive response to the spread of FTAs elsewhere.

The benefits and costs of these FTAs deals are the subject of polarizing debates. Advocates point out that agreements strengthen the policies that underpin regional trade integration, laying the building blocks toward multilateral liberalization. Furthermore, market integration in Asia through FTAs can help promote greater intra-regional trade and investment, and create opportunities for greater production and spending in the region. There are, however, losers thanks to liberalization in particular sectors. It is therefore necessary to facilitate labor mobility and the movement of firms from losing sectors to gaining sectors by providing retraining and upgrading for workers displaced through trade liberalization and by reducing entry barriers to new firms and facilitating exit through structural reform. Sector-specific protectionist policies should be abandoned as much as possible, while competition policy should be strengthened.

FTAs between developing and developed economies affect sectors differently depending on the level of development. Hertel (2000) examined the impacts of liberalization of agriculture, manufacturing, and services on global trade volumes and welfare.[4] He found that full liberalization across these sectors would increase world trade by 20%. Three-fourths of these gains would come from liberalization in the manufacturing sector, a little less than a fourth from liberalization in the agricultural sector, and the remainder from the services liberalization. Welfare gains would be largest for agricultural liberalization, followed by manufacturing liberalization and then

[4] Hertel (2008) simulated the across-the-board abolition of estimated 2005 protection tariffs in agriculture; business, finance, and construction services; extractive industries; and manufacturing. He also considered liberalization of all sectors simultaneously. His model contained 22 sectors in 19 regions around the world.

services liberalization. The developing countries mainly benefit from manufacturing tariff cuts; while the developed countries gain more from agriculture and service liberalization. In addition, Hertel, Ivanic, and Winters (2008) simulated the impact of agricultural liberalization and found that it will hurt poor people working in agriculture due to reduced real after-tax factor earnings. However, the revenue replacement effects can be largely offset by poverty-reducing impacts of lower prices of agricultural products if all developing and developed countries reduce their agricultural tariffs together. Thus, to enhance the benefits and the quality of agreements, it is important to reduce the scope of these sensitive items in both types of economies and to enlarge the coverage of countries.

Critics also worry that this wave of agreements erodes the multilateral process and fosters an alarming "noodle bowl" of overlapping rules of origin (ROOs) requirements—which may be costly to businesses. The noodle bowl effect refers to the possibility that multiple trade agreements can cause the trading system to become chaotic. Baldwin and Kawai (2008) argued that the noodle bowl can cause problems when:

> Agreements are overlapping, complex, and different—with different liberalization standards, exclusion lists, rules of origin, standards, etc. This carries the risk of becoming unwieldy and makes doing business cumbersome (Baldwin and Kawai 2008:1).

In the past, the lack of empirical evidence on the business impact of FTAs has made it difficult to resolve this debate and explore policy implications. Recently, a survey on the region's 841 export-oriented manufacturing firms based in PRC, Japan, Singapore, Korea, Thailand, and Philippines offers new evidence (Kawai and Wignaraja forthcoming). The study finds that multiple ROOs impose limited burden on firms in East Asia. The survey finds that Asian businesses—particularly the larger, more established firms—view FTAs positively and that wider export market access and lower costs of imported intermediate inputs exceed the costs associated with FTA use. Around 28% of responding firms use FTA preferences and nearly double or 53% use or plan to use FTA preferences. This suggests that FTAs are indeed bolstering trade among firms—particularly as economic recovery takes hold—in the wake of declining trade volumes and the nascent protectionism triggered by the global economic crisis. Nevertheless, as more FTAs under negotiation take effect and the complexity of the Asian noodle bowl increases, the negative business impact is likely to intensify.

To optimize the use of the region's multitude of FTAs, firms need to plan trade businesses more efficiently and effectively under a regime anchored by the region's FTAs. Meanwhile, policymakers should seek to minimize transaction and administrative costs associated with an array of multiple, overlapping FTAs, while maximizing benefits offered by preferential tariffs and increased market access. Kawai and Wignaraja (forthcoming) offers several short-run remedial measures including: (i) reducing MFN tariffs as much as political constraints will allow, which could eventually support the conclusion of the Doha round; (ii) rationalization of ROOs (e.g., using international best practice guidelines of simplicity and transparency) and upgrading origin administration (e.g., electronic systems and self-certification for issuing origin certificates); (iii) making available wider alternative options of ROOs to choose from; (iv) intensifying awareness programs of FTAs among potential beneficiaries including availability of information on ROOs, phase-out tariff schedules and comparison with MFN rates; (v) getting business more involved in FTA negotiations; and (vi) improving public and private sector

institutional support, especially for SMEs.

To the extent that the noodle bowl is a problem, Chia (2009) noted that it can be overcome through an FTA between many countries in the region. Kawai and Wignaraja (2009) argued that a region-wide FTA would also spur the growth of Asian trade and investment through: (i) a larger regional market with increased market access to goods, services, skills, and technology; (ii) increased market size to permit specialization and realization of economies of scale; (iii) facilitation of the FDI activities and technology transfer of MNCs; and (iv) simplification of tariff schedules and adoption of compatible ROOs and product and technical standards. In particular, the region-wide FTA would make it possible to harmonize procedures for issuing certificates of origin, use of self certification, and achieve full cumulation of ROOs. Furthermore, it would cause transactions costs to fall if an electronic customs clearance method was employed.

The above-mentioned merits in forming a region-wide FTA as a means to consolidate the plethora of bilateral and plurilateral agreements is increasingly recognized in East Asia. ASEAN—as the region's oldest FTA—is emerging as an integration hub for FTAs in East Asia and with key ASEAN+1 agreements underway, the policy discussion in East Asia is focusing on competing region-wide FTA proposals—an East Asia Free Trade Area (EAFTA) among ASEAN+3 countries and a Comprehensive Economic Partnership for East Asia (CEPEA) among ASEAN+6 countries—that will guide future policy-led integration in the region.

The simulation approach embodied in computable general equilibrium model (CGE) models sheds light on the effects of alternative FTA policy scenarios. Such scenarios tend to focus on the removal of price distortions against imports that arise from existing trade barriers and other sources. The results of CGE studies provide insights into the numerical magnitude of gains and losses from trade liberalization and the distribution across regions, countries, and sectors. Accordingly, CGE studies can help in framing negotiation positions with FTA partners, indicate implementation schedules for trade liberalization and suggest the need for appropriate structural reforms to mitigate adverse impacts.

The CGE analysis in Kawai and Wignaraja (2009) suggests that a region-wide agreement in East Asia provides welfare gains over the present wave of bilateralism. More specifically, (i) a region-wide FTA, whether an EAFTA or CEPEA, offers larger gains to world income than the current wave of bilateral and plurilateral FTAs; (ii) the CEPEA scenario, which is broader in terms of country coverage, offers larger gains to the world as a whole in terms of income (US$260 billion, measured in constant 2001 prices) than the EAFTA scenario; and (iii) third parties outside either an EAFTA or CEPEA (e.g., the US or the European Union) lose little from being excluded from a region-wide agreement.

The formation of a comprehensive, World Trade Organization-consistent, region-wide FTA in East Asia may make it easier to achieve a deep Doha trade deal as many of the concessions on agricultural and industrial goods may already be incorporated into the region-wide agreement. Furthermore, it offers an insurance against rising protectionist sentiments that pose a risk to Asia's trade and economic recovery. Nonetheless, it is not obvious how such a region-wide FTA can be created given political economy considerations. A 2009 Joint Experts Group Study Report on an East Asia Free Trade Agreement advocated consolidating existing FTAs in the region rather than beginning

negotiations again from scratch. Political rivalry over FTA leadership in East Asia may, however, hinder any such joint venture. There are currently no bilateral or plurilateral FTAs between the PRC, Korea, and Japan; these countries would have to negotiate among themselves and would also have to exercise leadership to help the region achieve a comprehensive FTA. Also, the role of the US in Asia as a security anchor for many countries and the rising importance of European markets for many Asian economies suggests that involving the US and Europe may also make sense.

Governments should aim for high quality agreements. This will also give some insurance against rising protectionist sentiments that pose a risk to Asia's trade and economic recovery. The 2009 Joint Export Group Study Report on an East Asia Free Trade Agreement advocates an agreement between the ASEAN+3[5] countries that would include:[6]

1) a high quality agreement in the region for market access for both goods and services;
2) a global standards investment agreement;
3) satisfactory trade and investment facilitation measures;
4) full cumulation of ROOs;
5) special attention to the needs of less developed countries; and
6) a dispute settlement mechanism.

For poorer Asian nations, a region-wide FTA would offer both possibilities and dangers. The possibilities include greater market access and greater participation in regional production networks. The dangers include increased competition from more efficient firms in other countries. Providing safeguards for poorer countries and capacity building assistance are crucial to improving supply-side competitiveness in less developed ASEAN countries.

In the context of investments, investment treaties should ideally provide three substantive clauses and one procedural component.[7] The three substantive clauses are investment protection, investment facilitation, and investment liberalization and the procedural component is dispute settlement. Investment protection provides compensation in the case of expropriation and mandates fair and equitable treatment of foreign investment to avoid wrongful termination of government contracts. Investment facilitation requires transparency (i.e., that all relevant laws be publicly proclaimed). Investment liberalization emphasizes freer market access of investment (i.e., no restrictions on ownership). Along this line, national treatment, that is, that foreign firms should receive the same treatment as domestic firms, should be mandated. Dispute settlement involves state parties providing a “standing” offer to arbitrate with individuals or states in the case of a disagreement. High quality investment agreements would promote the flow of FDI in the region and thus contribute to technological upgrading in developing Asia.

In the case of ASEAN, the ASEAN Economic Community Blueprint set out initiatives to liberalize and facilitate investments in the ASEAN region. Investment cooperation in ASEAN was implemented through the 1998 Framework Agreement on the ASEAN Investment Area (AIA) and investment protection was implemented through the 1987

[5] ASEAN countries plus the People’s Republic of China, Japan, and the Republic of Korea
[6] An Asia-wide FTA could be formed initially by the ASEAN+3 or the ASEAN+6 countries.
[7] This paragraph draws on Kotera (2006).

ASEAN Agreement for the Promotion and Protection of Investment or the ASEAN Investment Guarantee Agreement (IGA). In February 2009, the AIA was replaced by the ASEAN Comprehensive Investment Agreement (ACIA), which takes into account international best practices based on four pillars—liberalization, protection, facilitation, and promotion—and includes new provisions to enhance AIA/IGA provisions. Under the ACIA, all industries under manufacturing, agriculture, fishery, forestry, and mining and quarrying sectors and services incidental to these five sectors will be liberalized.

5. The Need for and Benefits of Infrastructure Investment for Increased Connectivity

Current infrastructure in the region reflects the fact that most Asian countries have prioritized exports to the US and Europe. To adjust to the West's shrinking consumption as an aftermath of ongoing global financial crisis and European debt crisis, Asia now needs to increase intraregional infrastructure connectivity in order to promote expanded regional economic integration, enhanced intraregional trade (through reduction of trade cost), and sustainable and inclusive growth. Asian investment in infrastructure connectivity could enhance competitiveness and productivity, speed up economic recovery, and help in achieving balanced, sustainable, and inclusive growth in the medium- to long-term. In addition, connectivity could promote environmental sustainability through the development of cross-border green energy and transport networks. The coordinated financing by Asian countries of regional infrastructure networks and enhanced regional connectivity would maximize the efficient use and application of resources and lead to a sustainable and inclusive, high-growth path in the long run.[8] This effort would require concentrated efforts to develop both "hard" and "soft" infrastructure: physical infrastructure such as transport, energy, and telecommunications networks, and facilitating infrastructure such as appropriate policies, regulations, systems and procedures, trade facilitation measures, and the institutions necessary to make hard infrastructure work properly.

This section examines the role of national and regional (or cross-border) infrastructure investment in (i) rebalancing Asia's growth; (ii) acting as new engines of growth; (iii) promoting balanced, sustainable, green, and inclusive growth; and (iv) improving national and regional competitiveness and productivity.

5.1 ***Rebalancing for Sustainable Growth***

Trade and FDI have been crucial ingredients in the rapid growth and economic integration witnessed in Asia. Investments in infrastructure and logistics in the region have reduced trade costs, increased access to markets and suppliers, and improved international competitiveness. Asia, particularly East Asia, has fairly strong trade integration, primarily through tariff liberalization and increased trade in parts and components, and Asian economies have become key links in global production networks and supply chains with many countries in the region involved in different stages of assembly processes. As noted by Brooks and Hummels (2009), countries that are able to involve themselves more deeply in global production networks and that invest in trade-supporting infrastructure stand to benefit more from trade relationships and diversification of development opportunities. However, until now, the emphasis has been

[8] For a full definition of regional infrastructure, see Bhattacharyay (2008).

on integrating the production of intermediate goods within global production networks, rather than facilitating the meeting of final demand from within the region. To achieve more sustainable growth, infrastructure investment now need to focus more on the latter. The development of economic/transport corridors, to be discussed below, is an example of one strategy aimed toward this goal.

While Asian infrastructure has expanded relatively quickly to support the region's rapid trade growth and economic integration, there is still significant need for the superior infrastructure and logistics required to facilitate successful production and trade networks. Trade centers, such as PRC; Hong Kong, China; Malaysia; Korea; Singapore; Taipei,China; and Thailand, have all developed logistics systems to facilitate intraregional and international trade. However, these systems are still evolving and will come under increasing pressure as concentrations of economic activity expand inland. Several country-specific studies suggest that inland locations imply large logistics burdens. For example, almost 63% of the cost of transporting goods from Chongqing in the PRC to the West Coast of the US is incurred before the goods arrive at the PRC port for export (Carruthers and Bajpai 2003). The deficiencies of Central Asian transport systems—high costs coupled with low quality transport and logistics services—have meant that close to 20% of the value of traded goods is accounted for by transport costs. Carruthers and Bajpai's multi-country study (2003) demonstrated that a 20% reduction in logistics costs would increase the trade to gross domestic product (GDP) ratio by more than 10% in the PRC, Cambodia, and the Lao People's Democratic Republic; by more than 15% in Mongolia; and by more than 20% in Papua New Guinea.

Regional infrastructure can bring greater physical connectivity, helping to expand markets and accelerate growth and business through greater efficiency, agglomeration economies, and economic/transport corridors. The development of economic corridors is a good example of the dynamic aspect of regional infrastructure networks and demonstrates how good transport corridors can generate and attract more business and industries that in turn attract further infrastructure investment to support the increase in economic activity. The development of economic corridors across borders and within countries has been on the rise in Asia. Economic corridors require a robust transport infrastructure network and an effective logistics system to efficiently link economic activities within and across corridors. Effective telecommunications connectivity across the regions and digitalization/automation of movements of goods across borders are essential to reduce trade costs. As such, they are effective tools to accelerate regional and sub-regional economic integration within Asia. Physical connectivity has improved across most parts of the Asia and Pacific region through land, sea, and air-based transportation networks, largely in order to support economic development programs at both the national and regional levels. However, much still needs to be done and extensive investments in infrastructure are required to address and reduce poverty levels in the region.

5.2 Large Infrastructure Projects as New Engines of Growth

Large national and regional infrastructure projects involving many Asian economies have great potential to act as new engines for promoting growth. Such projects inherently include expanded employment opportunities and increased investment, not only in the project itself, but also in secondary and supporting industries and supply chains. Bringing forward and implementing high-priority national and regional pipeline projects could further boost Asia's growth and competitiveness in the global economy.

Asian Development Bank (ADB)/Asian Development Bank Institute (ADBI) (2009) include a list of major regional infrastructure projects for roads, rail, and energy networks totaling US$133 billion. Fiscal stimulus packages for large infrastructure project can contribute to economic growth and employment generation to offset the adverse impact of the ongoing global crisis.

Physical infrastructure and its quality can also influence location choices for efficiency-seeking or export-oriented FDI flows (Kumar and De 2008). Ang (2007), while examining determinants of FDI inflows to Malaysia, concluded that the provision of an adequate infrastructure base is an effective tool for stimulating FDI inflows. According to Indian Finance Minister Palaniappa Chidambaram, a lack of adequate infrastructure has impeded India's economic growth by 1.5% to 2% per year (World Economic Forum 2007). Esfahani and Ramírez (2003) estimated that if Africa had East Asia's growth rates in telephones per capita (10% vs. 5%) and in electricity generation (6% vs. 2%), its GDP per capita growth rate would have been at least 0.9% higher.[9] The efficiency and productivity of infrastructure services as an input to other sectors can improve the productivity of those sectors and enhance economic growth.

5.3 Connectivity for Environmentally Sustainable Development and Inclusive Growth

Enhanced energy and transport connectivity could also help Asia to address problems of environmental degradation, energy security, and input supply. Properly designed infrastructure projects, such as greener transport systems (urban metro systems and regional railways) and sustainable energy grids (renewable energy generative capacities and smart, cross-border electrical grids), across the region would help to efficiently facilitate the flow of goods and energy from areas where renewable sources are abundant to those where more are needed. This promotes the development of green economies, environmental sustainability, greater technological innovation and application, and the more efficient use of scarce regional resources.

Most developing countries in the region face barriers to reaching non-income Millennium Development Goals targets in health, agriculture, and education. These targets are closely associated with infrastructure needs. The lack of adequate infrastructure limits competition and this can lead to monopolistic pricing, particularly in rural areas. It can also affect both the market participation and educational opportunities available to the poor and can create obstacles to adequate health care, thus reinforcing the poverty cycle. Conversely, appropriate infrastructure investment can lead to poverty reduction, service provision, and growth, in a reinforcing cycle. It supports the process of growth on which poverty reduction depends and helps the poor access the basic services that improve lives and provide income opportunities. There is substantial evidence of the positive impact of national infrastructure on poverty reduction as attested to by the fact that quality road, transport, electricity, gas, water supply, and communications facilities have significant positive effects on economic growth (ADB/ADBI 2009). An examination of sub-regional transport and energy infrastructure projects in Central Asia, the Greater Mekong Region area, and South Asia has shown that these projects have had significant impacts on growth as well as on the welfare on poor households (ADB/ADBI 2009). Further, regional infrastructure investment for economic corridors can accelerate

[9] See Calderon and Serven (2004) and Rickards (2008) for other examples.

regional and sub-regional economic integration within Asia by redistributing goods and services and more effectively reducing poverty across the region.

Achieving inclusive growth through connectivity is also a primary challenge for landlocked, small, or less developed countries, whose rural or remote populations are often left behind. In total, there are 12 landlocked developing countries (LLDCs) in Asia[10] and they are among the most disadvantaged countries in the region. These countries face severe challenges to growth and development due to a wide range of factors, including poor physical infrastructure, small domestic markets, remoteness from world markets, and high vulnerability to external shocks. The necessity for imported goods to transit through the territory of at least one neighboring state, and the frequent change of transport modes, results in higher transaction costs. Inefficiencies in areas such as customs and transport can also be a stumbling block to the integration of LLDCs into the global economy and may impair export competitiveness and the inflow of FDI.

To respond to the transit problems in the borders that hinder LLDCs, a multidimensional approach is needed (United Nations Conference on Trade and Development [UNCTAD] 2008), most notably to develop adequate national transport networks and efficient transit systems, to promote regional and/or sub-regional economic integration, and to encourage FDI in economic activities that are not distance-sensitive. By way of example, the "Global Framework for Transit Transport Cooperation between Land-locked and Transit Developing Countries and the Donor Community" (United Nations 1995) was endorsed by the United Nations General Assembly with a view to enhancing transit systems and enabling LLDCs to reduce their marginalization from world markets. Additionally, many archipelagic Southeast Asian and Pacific countries face transport connectivity problems linked to low volume shipping and low value-added trade. Physical connectivity is crucial for landlocked, island, and small countries and the appropriate regional infrastructure is required to connect isolated groups to business activity centers and thereby contribute to the reduction of regional development gaps.

5.4 Infrastructure, Competitiveness, and Productivity

The global competitiveness of Asian economies depends on their infrastructure quality, as shown in Table 5. Increased infrastructure investment can promote competitiveness and productivity by reducing the trade costs associated with transport and logistics. Additionally, infrastructure services like transport, electricity, and telecommunications are essential inputs for any production activity. Therefore, high quality and cost-effective infrastructure services can contribute to the improvement of productivity in any sector of an economy. National and regional infrastructure, both physical and institutional, is playing an evident role in facilitating the creation and expansion of economic corridors. Enhanced transport and information technologies have allowed cities in the region to specialize based on their comparative advantages, thereby creating a broad range of new activities.

Table 5: Global Competitiveness and Infrastructure Quality Index

Country	2001–2002			2008–2009				2009–2010			
	GCI	Infrastructure		GCI		Infrastructure		GCI		Infrastructure	
	Rank	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score

[10] Afghanistan, Bhutan, Lao People's Democratic Republic, Nepal, Armenia, Azerbaijan, Kazakhstan, Kyrgyz Republic, Mongolia, Tajikistan, Turkmenistan, and Uzbekistan.

PRC	47	61	2.90	30	4.70	47	4.22	29	4.74	46	4.31
India	36	66	2.60	50	4.33	72	3.38	49	4.30	76	3.47
Indonesia	55	59	3.00	55	4.33	86	2.95	54	4.26	84	3.20
Japan	15	15	6.00	9	5.38	11	5.80	8	5.37	13	5.83
Korea	28	27	4.80	13	5.28	15	5.63	19	5.00	17	5.60
Malaysia	37	20	5.40	21	5.04	23	5.25	24	4.87	26	5.05
Philippines	54	68	2.40	71	4.09	92	2.86	87	3.90	98	2.91
Singapore	10	2	6.80	5	5.53	4	6.39	3	5.55	4	6.35
Thailand	38	30	4.60	34	4.60	29	4.67	36	4.56	40	4.57
Viet Nam	62	71	2.20	70	4.10	93	2.86	75	4.03	94	3.00

GCI = Global Competitiveness Index, PRC = People's Republic of China.
Note:
Total number of surveyed countries in the world: 75 (2001–2002), 134 (2008–2009) and 133 (2009–2010)
Score: 1= poorly developed and inefficient; 7= among the best in the world
GCI score of 2001–2002 was not available
Source: World Economic Forum (2001, 2009b, and 2010).

The ADB/ADBI 2009 flagship study on infrastructure and regional integration showed the cost of the total connective infrastructure needs (including electricity, transport, and telecommunications) of the Asia and Pacific region for the period 2010–2020 to be an estimated US$7.6 trillion. This figure includes both replacements for aging national infrastructure and the building of new infrastructure to support fast economic growth. In addition, throughout the same period Asia will require a further US$380 billion for water and sanitation projects and around US$300 billion for the more than 1000 regional pipeline infrastructure projects needed for pan-Asian connectivity.[11] On average, the total infrastructure investment needed for Asia over 2010–2020 is around US$750 billion per year.

Infrastructure played a key role in fiscal stimulus packages during the global financial crisis (see Table 6) The infrastructure portions of the region's fiscal stimulus measures were applied to key sectors, including transportation, energy, information technology and communications, and water, in both rural and urban projects. The PRC in particular sought to support both rural and urban development by investing nationally in railways, airports, electrical transmission technology, expressways, and telecommunications technology, as well as locally in rural roads, electricity, gas, water, and irrigation projects. Taipei,China and Korea focused their infrastructure spending on advanced technological upgrades and systems. Taipei,China continued its work on projects that advance the transportation network, industrial development, urban and rural development, and environmental protection. Korea invested heavily in transportation improvements (e.g., port upgrades, high-speed railways, and expressways) and in green technology, including projects for solar, wind, and hydrogen fuel cell energy, as well as carbon capture and storage (Foreign Affairs and International Trade Canada [FAITC] 2009; Kang 2010).

Table 6: Infrastructure Investment in the Stimulus Packages of Major Asian Economies

	Total Fiscal Stimulus	**As % of 2008 GDP**	**Infrastructure**	**Infrastructure as % of**

[11] See Bhattacharyay (2009) for further details.

	(US$ billion)		Component (US$ billion)	Total Stimulus
Australia	9.7	1.0%	2.3	23.7%
PRC	600.0	13.9%	275.0	45.8%
India	60.0	4.9%	33.5	55.8%
Indonesia	7.7	1.5%	1.3	16.9%
Japan	130.0	2.6%	1.5[3]	1.2%
Korea	11.0	1.2%	7.8	70.9%
Malaysia	2.0	1.0%	0.17	8.5%
Singapore	14.6	8.0%	3.1	21.2%
Taipei,China	20.4	5.3%	16.6	81.4%
Thailand	46.7	17.9%	30.6	65.5%
Viet Nam	8.0	8.8%	4.8	60.0%

[1] In current prices.
[2] Converted from New Taiwan Dollars to US$ at exchange rate for 28 January 2010 of 1TWD = 0.03117US$.
[3] Amount estimated from reports in FAITC (2009) and Sugimoto (2010).
Note: Exchange rates on 28 January 2010 used when needed (http://www.oanda.com/currency/converter/).
Source: Author's calculations from data in: Kang (2010); Sugimoto (2010); Kumar and Soumya (2010); Patunru and Zetha (2010); Nguyen, Nguyen, and Nguyen (2010); Jitsuchon (2010); World Bank (2009b); FAITC (2009); Alibaba.com (2008); International Federation of Consulting Engineers (2009); and ADB (2009b).

In Southeast Asia, both Thailand and Indonesia also announced significant investments in both rural and urban infrastructure. Indonesia planned to devote its US$1.3 billion infrastructure component to infrastructure acceleration and development programs across the board, by distributing funds to all of the rural and urban infrastructure-related ministries (Patunru and Zetha 2010). Thailand planned for water resource development and road construction in villages and rural areas, along with national improvements in transport and logistics, energy, and telecommunications through its two stimulus packages (Jitsuchon 2010).

More than 50% of India's US$60 billion fiscal stimulus package was designated with an infrastructure focus, though India is expected to use those funds primarily to support public private partnership projects in progress and in the pipeline. The government of India has also authorized its India Infrastructure Financing Company Limited and non-bank infrastructure finance companies to raise increased funds through bond issuances and from multilateral and regional institutions (FAITC 2009; Kumar and Soumya 2010). As many Asian countries have accelerated domestic infrastructure investment for enhancing national connectivity, the coordination of this spending in the direction of regional infrastructure development, such as airports, seaports, and roads, is essential for realizing regional connectivity.

6. Conclusion

This paper has considered real sector issues related to economic rebalancing in Asia. It has argued that Asian economies should move away from growth strategies driven by excessive exports to developed economies. Rebalancing should take place on both the demand side and on the supply side. On the demand side, producers in the region should exploit the capacity of the 930 million middle class consumers in Asia to function

as an engine of growth (METI 2009). On the supply side, the best way to rebalance growth is to increase productivity. This would increase the long-term income of Asian consumers and, consequently, their ability to sustain production directed toward regional markets.

To increase productivity, developing Asian countries should leverage production networks to graduate to higher value-added, knowledge-intensive activities. This can be accomplished by investing in human capital to provide workers with marketable skills, implementing appropriate R&D policies to enhance the technological capabilities of firms, and maintaining FDI-friendly environments to nurture industrial agglomeration and facilitate technology transfer. An FDI-friendly environment would include both the consistent and coherent enforcement of laws and regulations at all governmental levels and the maintenance of stable macroeconomic fundamentals. In addition, a key way to attract FDI is to lower the service link costs between geographically separated production blocks. These could be lowered by implementing a region-wide FTA, improving intraregional infrastructure, and developing competitive service sectors and SMEs.

A region-wide FTA should include full cumulation of ROOs in order to overcome noodle bowl effects. Infrastructure investment can be facilitated if governments, multilateral development banks, and bilateral financial institutions work together. More open and competitive service sectors would be promoted if policymakers removed distortions that favor manufacturing over services. SMEs could be strengthened if Asian governments were to establish high-level coordinating agencies like SPRING Singapore and develop long-term holistic plans to nurture SMEs.

Many of these steps would also help Asian firms to connect to new sources of demand. For instance, improving infrastructure for enhanced connectivity and implementing a region-wide FTA would give firms better access to consumers in Asia. In addition, raising worker productivity would increase labor income, thereby raising the long-run purchasing power of consumers in the region. Investment in infrastructure can help Asian economies (i) to rebalance for sustainable and inclusive growth, (ii) to improve competitiveness and productivity. Furthermore, investment in large national and regional infrastructure projects can act as a new engine of growth. At this juncture, East Asian economies should provide new stimulus packages with significant investment in transportation, energy, information technology and communications, and water.

There is also the possibility of a virtuous cycle developing. Nurturing competitive SMEs and service sectors and investing in infrastructure would attract FDI. Once countries receive a critical mass of FDI, industrial agglomeration could start taking place. This would give local SMEs and service sector firms more opportunities to develop and increase their competitiveness, while at the same time providing governments with more revenue to invest in infrastructure. This would in turn lead to greater FDI inflows and increased technology transfer to local firms.

This paper has considered how Asian countries can rebalance their economies by increasing productivity on the supply side and by targeting regional consumers on the demand side. Although these changes would be difficult initially, in the long run they would allow workers and consumers in the region to increase their incomes and to enjoy more of the fruits of their labor.

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