International Production Networks: Contributions of Economics to Policymaking*

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Abstract

ASEAN and developing East Asia have applied development strategies that have effectively utilized global value chains and have achieved both sustained economic growth and rapid poverty alleviation. This paper claims that the international trade theory or economics in general has greatly contributed to the formulation of such development strategies. Economists should also work for new issues and challenges that these countries start facing in a new step of economic development.

Key words: Fragmentation, agglomeration, connectivity, economic integration, innovation

1. Novel development strategies in ASEAN and East Asia

The strength of economics resides in constructive back-and-forth feedbacks between deductive theories and inductive empirics, which makes a cutting edge vis-à-vis other disciplines in social sciences. However, such strength has not been fully utilized. Rather, the history tells us that economics has gradually given up fields and topics immediately useful for people and society to other social sciences such as business and management, political science, international relations, and sociology. If economists are a bit more conscious of the interface with the real world, economics can contribute to the world to a much greater extent. In the following, I would like to present one example in which economics has already provided essential inputs to the real world and still a number of issues in economics are under-utilized.

Newly developed economies in the Association of South-East Asian Nations (ASEAN) and surrounding developing East Asia are now completely re-writing their development strategies. From the mid-1980s they aggressively invited foreign direct investment (FDI) and in the Asian Currency Crisis, started idealistic economic integration at the policy level. Then after 2010, these efforts began to converge to development strategies with effectively utilizing global value chains (GVCs). In this process, the international trade theory that we are familiar

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with is broadly applied.

Everybody in the world talks about GVCs for development these days. However, there does not exist shared understanding yet on what sort of GVCs we are talking about and how a country can hook up with them. ASEAN and developing East Asia are by far the most advanced in the effective utilization of GVCs, particularly in the manufacturing sector. In this sense, this region is at the frontier of developing a novel development model with GVCs.

The utilization of GVCs in ASEAN and developing East Asia can be stratified in a tier structure as Figure 1. Tier 3 is a step of hooking up with a relatively slow GVCs. Operations in this tier are observed, for example, in agriculture and food processing, international linkages in garment and footwear, and international tourism. Tier 2 is a stage to participate in much more time-sensitive production networks. Machinery industries are major players in this tier and extend international production networks with massive parts and components trade. Other examples include cut-flower operations with air transportation, call centers, and business process outsourcing (BPO). Tier 1a is a phase in which industrial agglomeration is formed with thick international connectivity. A typical example is the formation of agglomeration in automobile industry, being supported by supplies of parts and components from abroad. The last tier, Tier 1b, is a stage in which research and development (R&D) stock should be accumulated, human capital must be nurtured and attracted, and innovation hubs are created.

Tiers can be different across industries or regions even within a country. One country has multiple tiers in one time. However, in the overall economic development of each country, we can identify the most critical tier to overcome. In the current ASEAN, Myanmar, Cambodia, and Laos are at the timing of going up to Tier 2; Vietnam, the Philippines, and Indonesia struggle with Tier 1a; and Thailand and Malaysia start challenging for Tier 1b. By imposing a conceptual framework as such, we can think of necessary economic and policy environment for each tier.

Since the initiation of ASEAN Free Trade Area (AFTA) in 1992, ASEAN has marched toward economic integration. In particular, after launching ASEAN Economic Community

Figure 1: Effective Usage of Global Value Chains in ASEAN and Developing East Asia

Source: ERIA (2015). Slightly modified.

(AEC) Blueprint in 2007, it has headed for deeper economic integration. This strategy was reinforced and better organized by the Master Plan of ASEAN Connectivity (MPAC) (ASEAN (2010)). By 2015, ASEAN has overcome a number of issues and challenges for Tier 3, Tier 2, and a part of Tier 1a. And then, AEC2025 and MPAC2.0 started in 2016 placed more weights on Tier 1a and Tier 1b. In the following, we will discuss how far the international trade theory or economics in general has contributed to and will work from now for the formation of novel development strategies.

2. Tier 2: participating in production networks

(1) Fragmentation and the 2nd unbundling

The fragmentation theory proposed by Jones and Kierzkowski (1990) is theoretically a minor extension of the Sanyal and Jones (1982). However, it provides good intuition in understanding a new pattern of the international division of labor and international trade and thus has been a key conceptual framework in the policy formation since the 1990s.

The fragmentation theory describes the pattern of the international division of labor and international trade that is qualitatively different from what traditional comparative advantage theories depict. There are two salient differences. First, there exists a certain degree of freedom in cutting out production blocks. Particularly when location advantages widely differ between the origin and the destination, such as in a case of fragmentation between developed and developing countries, the degree of freedom can play a significant role. From the viewpoint of a firm that fragments production, the firm can cut out a production block so as to take advantage of differences in location advantages between the home country and the investment destination, considering its firm-specific experience, technology, and managerial know-how. From the viewpoint of a host country, it does not have to host the whole industry but can invite fragmented production blocks to start industrialization as far as it provides a certain level of investment climate to fit them.

Second, the fragmentation theory emphasizes the importance of the cost of service links that connect remotely placed production blocks. The concept of transport cost accompanied with international trade is not new, and the standard model can describe the emergence of non-traded goods when a high transport cost exists. However, it does not pay much attention to the possibility that transport costs may bring in decisive differences in the pattern of international division of labor and international trade. The fragmentation theory enlarges the concept of transport costs to so-called service link costs and allows them to include not only monetary costs but also time costs as well as various costs of coordination between production blocks. Unless service link costs are low enough, fragmentation of production does not occur at all.

The concept of service link costs was expanded by the idea of the 2nd unbundling proposed by Baldwin (2011), which established a tighter interaction with policies. Baldwin calls the international division of labor in terms of production processes or tasks as the 2nd unbundling and contrast it with the 1st unbundling where the industry-wise international division of labor occurs. In the 2nd unbundling, various things including goods, ideas, technology, capital, engineers, and others must be mobile between production blocks, which is made possible thanks to the information, communication, and technology (ICT) revolution. In addition, to

participate in the 2nd unbundling, a host country should provide enabling policy environment.

The concept of production fragmentation and the 2nd unbundling emphasizes differences between Tier 3 and Tier 2. When GVCs are discussed in the context of developing economies other than East Asia, the differences are not necessarily emphasized. Tier 3 is a slow international division of labor in terms of industries corresponding to the 1st unbundling, and thus the supporting policies are also relatively easy. On the other hand, Tier 2 requires a substantial reduction in service link costs.

Various efforts by ASEAN in the line of AEC Blueprint and MPAC tried to solve bottlenecks for Tier 2. In its development strategies, ASEAN emphasized the participation in production networks through the betterment of location advantages and the reduction in service link costs. AEC Blueprint included not only tariff removals but also trade facilitation such as the introduction of single window system in customs clearance. MPAC proposed the concept of physical, institutional, and people-to-people connectivity, which explicitly emphasized hard and soft infrastructure of quality higher than Tier 3. The fragmentation theory and the conceptual framework of the 2nd unbundling have influenced policy making in ASEAN and developing East Asia to a great extent.

(2) Implication of new economic geography

The basic framework of new economic geography has also been widely accepted by policymakers in ASEAN.¹⁾

The most important message of new economic geography is that a reduction in trade costs between the core and the periphery generates both agglomeration forces and dispersion forces. As trade costs between the core and the periphery come down due to trade liberalization and the improvement of logistics infrastructure, people and resources that seek consumption markets or business partners are attracted to the core. This is regarded as agglomeration forces. On the other hand, when the core gets congestion in the form of wage hikes, land price surge, traffic jam, pollution, and others or when wage gaps between the core and the periphery become large, some people and resources may want to move from the core to the periphery. This is called dispersion forces. A reduction in transport costs enhances efficiency in the economy as a whole. And then, if a policymaker would like to achieve a balanced economic development between the core and the periphery, some supplementary policies to properly control the two forces are required.

The conceptual framework has been essential to ASEAN's policymaking on trade liberalization and the development of logistics infrastructure. MPAC intended to provide reliable connectivity in remote mountainous areas and islands in order to generate demand for Tier 3 type businesses and to promote Tier 2 by developing hard and soft logistics infrastructure. Not just to reduce trade costs, MPAC takes care of the construction of industrial estates and the betterment of location advantages in the periphery in order to set a proper balance between agglomeration forces and dispersion forces.

The conceptual backbone of MPAC was *The Comprehensive Asia Development Plan (CADP)* (ERIA (2010)) submitted by ERIA to the East Asia Summit in 2010. This report

1) As for new economic geography, see Fujita, Krugman, and Venables (1999) and Baldwin, Forslid, Martin, Ottaviano, and Robert-Nicoud (2003).

includes an extensive simulation analysis based on the Geographical Simulation Model (GSM) developed by Institute of Development Economies (IDE)-Japan External Trade Organization (JETRO) and ERIA and quantifies economic effects of trade liberalization, trade facilitation, infrastructure development, and others. The updated version of CADP (ERIA (2015)) also applied a similar approach.²⁾ Such visualization of spatial economic effects is proved to be highly persuasive for policymakers.

When a less developed country (LDC) applies the fragmentation theory and would like to invite production blocks by reducing service link costs, we usually assume that economic activities can cross the national border but labor cannot. However, in the current Mekong region, for example, more complicated issues emerge in the globalization. In such a situation, new economic geography becomes even more important.

Suppose that the Cambodian Government intends to host production blocks to Phnom Penh and start participating in production networks (see Figure 2). In fact, before inviting production blocks, Cambodian labor started moving from rural areas in Cambodia to Thailand to seek relatively high wages. Not all are going to the Bangkok Metropolitan Area, but about 1 million Cambodians are working in Thailand in a formal or informal manner. This is a pretty big number for Cambodia with the total population of 15 million. The population of Phnom Penh is 1.5 million, and thus labor inflows from rural to Phnom Penh are needed for serious industrialization. Here, unless wages in Phnom Penh are high enough, labor does not come to Phnom Penh. On the other hand, if wages are too high, production blocks do not come to Phnom Penh. How can Phnom Penh attract both labor from rural areas and satellite factories from Thailand? The answer is to enhance location advantages of Phnom Penh in order to raise incentives for production blocks, to improve living conditions for labor coming to Phnom

Figure 2: Industrialization of Phnom Penh and Movements of Production Blocks and Labor

Source: The author.

2) As for the details of GSM, see Kumagai and Isono (2016).

Penh, and/or to reduce moving costs of labor from rural to Phnom Penh.

Simply to reduce trade costs may not achieve balanced economic development between countries or between urban and rural. We need supplementary policies to improve location advantages or to adjust the mobility of economic activities and people, in order to establish a proper spatial design of economic development. New economic geography has been an important input for policymakers.

3. Tier 1a: the formation of industrial agglomeration

(1) Production networks and industrial agglomeration

Countries that have stepped up from Tier 3 to Tier 2 are forerunners of ASEAN, China, several countries in Eastern Europe, Mexico, and Costa Rica.³⁾ Going beyond Tier 2, countries that reach Tier 1a, i.e., forming industrial agglomeration with linking international production networks, particularly in machinery industries, are almost limited to some of the ASEAN member countries and other developing East Asia.⁴⁾ Manufacturing bases in Eastern Europe do not reach the stage of forming agglomeration yet. In Latin America, only the Central Basin of Mexico starts forming industrial agglomeration in tight connection with international production networks. While the argument over GVCs is proliferated everywhere in the world, researchers in North America and Europe do not yet seem to be keen on the formation of industrial agglomeration and its implication for industrialization in newly developed economies and LDCs. There is a lot of room for policy studies on industrial agglomeration with GVCs.

Europe has been at the center of agglomeration studies. However, in Europe, the most immobile element is human, and agglomeration is primarily formed in the mechanism of moving sectors with high transport costs close to high population density areas. On the other hand, cases of East Asia include industrial agglomeration at a location where no significant population originally existed and the development of industrial estates, highway networks, and a large-scale port triggers the formation of agglomeration. The examples are the Eastern Seaboard in Thailand and the Pearl River Delta in China. As production networks get dense and sophisticated, the inter-firm (arm's length) transactions, in addition to intra-firm transactions, become important. And inter-firm transactions tend to be in short distance in order to reduce transaction costs. In particular, when transactions include small and medium enterprises (SMEs) or local firms in LDCs, they are almost certainly in geographical proximity. As Kimura and Ando (2005) conceptualize two-dimensional fragmentation, inter-firm transactions in the sophistication of production networks are crucial factors for the formation of industrial agglomeration in East Asia.

An important element in Tier 1a is that industrial agglomeration is formed not under the closed import substitution type industrialization strategies but in tight connection with international production networks. Through thick international production networks, parts and components in shortage are procured while some intermediate or final products are exported. By

3) See Ando and Kimura (2005) and Obashi and Kimura (2016, 2017 (forthcoming)).

4) Although it is not easy to quantify the development of industrial agglomeration, ERIA (2015) assesses stages of development in key cities of ASEAN.

doing so, industrial agglomeration is gradually formed.

Here we actually need to discuss more on whether industrial agglomeration can be formed without any trade protection or it is sometimes effective to give a temporary protection in order to invite parts producers and assemblers. The Thai case seems to be a successful one in which the manipulation of tariffs on built-up cars and parts effectively motivated assemblers first and then parts producers to invest in Thailand. On the other hand, Indonesia started forming industrial agglomeration after almost removing tariffs at the ASEAN level. This issue would be crucial to policy discussion on whether the Philippines or Viet Nam can promote a full set of automobile industry or not.⁵⁾

The relative importance between international production networks and industrial agglomeration clearly differs across industries. In particular, a contrast between electronics industry and automobile industry is distinctive. Kimura (2009) discusses the combination of multiple transactions in the machinery industry operation where different types of transactions in terms of distance, time duration, and transport mode are combined. Electronics places a large weight on long-distance transactions while automobiles prefer short-distance transactions. This fact may influence the significance of industrial agglomeration in development strategies.

Tier 1a requires the level of trade and investment liberalization higher than Tier 2. In Tier 2, it basically suffices if a specific industry in an individual industrial estate is hooked up with international linkage. On the other hand, in Tier 1a, industrial linkages should be extended across a number of industries and firms within and beyond the national border, multiple industrial estates must be tightly linked, and production sites are developed even outside industrial estates. Therefore, Tier 1a requires trade and investment liberalization that covers a wider range of production sectors than Tier 2. Furthermore, let alone linkages within the manufacturing sector, the provision of high-quality manufacturing-supporting services including finance, telecommunication, transport, distribution, and professional services are required, no matter whether such services are provided by foreign or local players.

As for trade in goods, we economists have greatly contributed to clean tariff removals with almost no exception that AEC has achieved. International economics has also played an important role in providing a conceptual framework and empirical measurement for trade facilitation, removals of non-tariff barriers, and standard and conformance.⁶⁾ On the other hand, we have not been persuasive enough to convince policymakers for the importance of services liberalization.

A number of empirical studies have recently flourished using international input-output tables and trade in value added (TiVA) data.⁷⁾ These data are expected to provide information on the utilization of GVCs including the participation in production networks and the formation of industrial agglomeration. However, to do so, we must deepen our research further. For example, the TiVA data allow us to calculate ratios of domestic and foreign value added embodied in a country's final products or exports. When a country just participates in production networks, a thin slice of value added will come as a production block, and thus the ratio of

5) Kimura and Urata (2016) discuss the formation of automobile industry agglomeration in ASEAN.

6) See Cadot, Munadi, and Ing (2013) for example.

7) As for TiVA data, see

<http://www.oecd.org/sti/ind/measuringtradeinvalue-addedanoecd-wtojointinitiative.htm>.

domestic value added may be low. On the other hand, once a country forms industrial agglomeration and contributes to a wide range of production activities, the ratio may become large. It would be great if we could read the data as such, but other elements including the economic size of a country, the existence of upstream exporting industries such as agriculture and mining, trade openness in general also affect the ratio of domestic value added. It would be rather dangerous to set a higher ratio of domestic value added as a policy target, which might end up with the revival of trade protectionism. We must further develop constructive and reliable policy studies along the line of TiVA data.

(2) Local firms to participate in production networks

What happens in industrial agglomeration? This is a very important question in policy discussion in newly developed countries. In particular, it is linked with how to foster local firms and local entrepreneurs.

Effective usage of GVCs at the center of development strategies means a heavy dependence on foreign firms up to a certain point of industrialization. Major players in Tier 2 and at the beginning of Tier 1a are likely to be foreign firms. Of course, some local firms may extend international production networks in food processing, textiles and garment, and other resource-based industries. However, machinery industries are after all most important in terms of the size of industries and the degree of sophistication of production networks, and thus foreign firms naturally dominate. The aggressive introduction of foreign firms may accelerate industrialization, but, on the other hand, it becomes difficult to foster national champions, which Japan and Korea used to do.

Then is it OK to depend on foreign firms all the way? It would be acceptable for countries in small size, but a country with tens of million population may naturally want to prepare a condition in which local firms can get into production networks. If so, industrial agglomeration is going to be a key for fostering local firms.

In searching possible parts suppliers in the upstream, foreign assemblers look at both price and non-price competitiveness. Price competitiveness means the ability of making things cheap. In newly developed economies, local firms are often advantageous in price competitiveness vis-à-vis imports or foreign affiliates in the country because of the dualistic labor market and others. Thus, some good local firms may have chances to participate in production networks run by foreign firms. A typical problem is on non-price competitiveness such as the stability of product quality, the precision in delivery timing, and others. In such a situation, foreign assemblers may have incentives to raise non-price competitiveness of local firms by transferring technology and providing training. Up to Tier 2, the scope of technology transfer and spillover from foreign to local firms is limited. In Tier 1a, foreign firms are more likely to be motivated for technology transfer, and local firms have chances to get access to technology through transactions with foreign firms. Such a function of industrial agglomeration is crucial to the effective utilization of GVCs.

To justify a story saying “In industrial agglomeration, transactions between foreign and local firms emerge, which triggers technology transfer or spillover, ending up with productivity enhancement or process innovation by local firms,” we need extensive micro/panel data analyses. We have already accumulated studies on technology spillovers, vertical and horizontal, from foreign affiliates to local firms. Although the results are of variety, vertical technol-

ogy spillover is typically detected in LDCs.⁸⁾ However, most of the studies do not directly capture horizontal or vertical inter-firm relationship but indirectly quantify the strength of linkages by using input-output tables. Therefore, we do not really know what happens between foreign and local firms. It is also important to distinguish between intentional technology transfer and unintended technology spillover. In what sort of channels do local firms receive technological information? How far does such an access to technology improve local firms' performance such as productivity? There are many things that we have to explore.⁹⁾

As for the relationship between exporting and corporate performance such as productivity, there exist a large number of empirical papers on whether good firms export (self-selection) and whether exporting improves corporate performance (learning by exporting).¹⁰⁾ In cases of LDCs, both causal relationships tend to be statistically significant. This is certainly an important finding. However, in the context of East Asian countries, local firms can have certain exposure to production networks even if they do not directly export but have transactions with foreign affiliates in industrial agglomeration. Selection and learning at this level should also be explored in empirical studies. Furthermore, the story of "learning by importing" or complementarity between imports of intermediates and exports of final products¹¹⁾ may be more naturally understood in the context of production networks.

We have accumulated tons of empirical studies with micro/panel data. We could develop more persuasive policy discussion if these empirical results would be reinterpreted as the phenomena in Tier 1a, i.e., interaction between production networks and industrial agglomeration.

(3) Spatial design of industrial agglomeration

Bangkok, Jakarta, and Manila are large cities with 10 million plus population in their metropolitan areas. A comparison among them tells us the importance of physical metropolitan planning.

Bangkok is famous in terrible traffic jams. However, once getting out of the city area, we find extensive highway networks in the area of 100 km diameter, 40 industrial estates scattered around, and large airports and ports supporting industrial agglomeration. For example, there are three assembly factories of Toyota here. About 80% of parts are procured from this industrial agglomeration itself, and the amount of intermediate inventory for most of the parts is merely two-hour production equivalent. From everywhere within this industrial agglomeration, parts can be carried in within two and half hours. Such infrastructure supports just-in-time operations. Customs clearance in Laem Chabang Port and Suvarnabhumi Airport is also quick. Once these conditions are placed, workers originated from Northeast and other parts of rural Thailand live in wide areas, and thus living costs can be kept low, ending up with relatively low wages to provide competitiveness in the manufacturing sector. On the other hand, highly educated people like managers and engineers who love city life can live in Bangkok and commute everyday. These conditions allow local firms to have a lot of opportunities to set up transactions with foreign firms. In contrast, in Jakarta and Manila, excessive concentration

8) See a series of empirical studies initiated by Javorcik (2004).

9) ERIA and IDE-JETRO have continuously worked on inter-firm technology transfer in industrial agglomeration with detailed questionnaire survey. See for example Kimura, Machikita, and Ueki (2016).

10) See a series of empirical studies following Bernard and Jensen (1999) and Melitz (2003).

11) See for example Kasahara and Rodrigue (2008) and Kasahara and Lapham (2013).

of people and economic activities occurs, and land price hikes and traffic jams become bottlenecks for further industrialization. Spatial design of industrial agglomeration is crucial.

The contribution of economics to this issue is so far limited. First, we have to define agglomeration or industrial agglomeration and quantify it. The boundary of industrial agglomeration does not coincide with the border of administrative districts, and thus usual aggregated statistical data do not work well. There are various attempts including the strength of night lights in satellite pictures, but these studies are still preliminary.¹²⁾ Then, what sort of economic activities is going on in industrial agglomeration? What is the fundamental difference between transactions within agglomeration and beyond? How can we assess the efficiency of industrial agglomeration? These are economic questions that we economists should take care of.

(4) Implication for income disparity and poverty issues

In the first half of industrialization, particularly from Tier 2 to Tier 1a, the manufacturing sector plays an important role in both rapid economic growth and poverty alleviation. This fact should be appreciated more explicitly.

Most of the LDCs have massive population in rural, traditional, or informal sectors. These people are in poverty, and we have to pull these people up by economic policies rather than social policies. A key is the movement of people from rural to urban, from traditional to modern, and from informal to formal sectors. Labor-intensive manufacturing industries or production blocks and supporting services sector generate employment for these relatively unskilled workers.

The smoothness of internal labor movements affects the speed of poverty alleviation as well as the competitiveness of manufacturing sector. Figure 3 is a VMPL (value of marginal product of labor) diagram and describes labor movements from rural/traditional/informal (sector x) to urban/modern/formal sector (sector z). The length of horizontal axis corresponds to the total number of labor in this country. The section of BA in $VMPL_x^0$ curve is drawn as almost flat, which denotes the existence of redundant labor in sector x. Point A is the initial equilibrium where wages in two sectors were equalized at w_0 . Now, investment or productivity growth occurs in sector z, and $VMPL_z$ curve shifts upward from $VMPL_z^0$ to $VMPL_z^1$. If labor can move between two sectors without friction (case 1), it moves from sector x to sector z by L_1L_0 , a new equilibrium is point B, and the wage is kept at w_0 . As far as the redundant labor moves between sectors, wages barely rise, which strengthens the international competitiveness of sector z. If $VMPL_z$ curve moves up further, the wage in sector x starts rising. Suppose instead that movements of labor between sectors are difficult (case 2). Then, even if $VMPL_z$ curve shifts upward, employment in sector z stays at O_zL_0 , and the wage in the sector goes up to w_1 , which degrades international competitiveness of sector z. The wage hike is good for labor in sector z. However, the wage in sector x is still w_0 so that wage disparity between sectors expands.

As Kimura and Chang (2017 (forthcoming)) show, wages in the formal sector are rela-

12) ERIA (2015), in cooperation with IDE-JETRO, tried to capture the growth of industrial agglomeration by utilizing the strength of night lights. As for the usage of night lights, see Keola, Andersson, and Hall (2015).

Figure 3: Labor Movements from the Rural/Traditional/Informal to Urban/Modern/Formal Sector

Source: ERIA (2015).

tively low in ASEAN and China, after controlling GDP per capita, which contrasts with South Asian countries. This means that like case 1, labor movements between sectors are relatively smooth in ASEAN and China, which accelerates poverty alleviation and enhances international competitiveness of the manufacturing sector. On the other hand, South Asian countries have high average wages, which lowers the international competitiveness of the manufacturing sector.

The smoothness of internal labor movements from rural/traditional/informal sector (sector x) to urban/modern/informal sector (sector z) depends on multiple factors. First, sector z should generate demand for labor. Second, incoming labor must fill the created demand. In order to meet these, sector z has to be sufficiently labor-intensive. In addition, gaps in educational background and human capital between two sectors should not be too large. In addition, third, additional costs accompanied with labor movements such as moving costs per se and living costs in cities must not be too high.

Economic research on labor movements, internal or cross-border, in ASEAN and East Asia is still at the infant stage. We have to activate research activities on this topic because they will surely have profound policy implication.

(5) Policy studies for Tier 1a

Although newly developed and developing economies in ASEAN and East Asia now face a number of issues and challenges in Tier 1a, the contribution of economics to policy making is still limited. These countries are different from Japan, Korea, or Taiwan in their aggressive usage of GVCs in economic development. There is a lot of homework for economists.

4. Tier 1b: creating innovation hubs

Once Tier 1a is fully achieved like Thailand and Malaysia, GDP per capita reaches US\$6,000–10,000 even if heavy dependency on foreign firms remains in industrialization. However, the next step may not be easy. To become a fully developed economy, a country must be capable of conducting not only process innovation but also product innovation.

Let's check the ratio of research and development (R&D) expenditure to GDP: Korea 4%, Japan 3%, China and Singapore 2%. On the other hand, figures in other ASEAN member states are extremely low except Malaysia with a bit less than 1%. This of course is not just a matter of money; a country must build up meaningful R&D stocks together with fostering human capital. How can usual developing countries such as ASEAN deal with this issue?

Ultimately, a national innovation system that connects industries, governments, and academics must be constructed, but how can a country that totally lacks R&D investment by now step up? Japanese, Korean, or Chinese models seem difficult for ASEAN to follow; these countries basically depended on domestic resources while aggressively introducing foreign technologies. One salient difference of ASEAN from Japan or Korea is the degree of committing itself to globalization. Is there any way to create an innovation hub while aggressively utilizing globalization and attracting foreign firms and foreigners? Singapore is of course an important model to learn though such decisive policy implementation must be difficult in other countries.

Development strategies for Tier 1b have not been documented yet, but some of the necessary conditions can be identified. One of them is the betterment of urban amenities in order to attract highly educated people, domestic and foreign, for innovation.

In the globalization era, competitive intellectuals who generate innovation will move everywhere in the world to seek a working place where their talents are most appreciated and look for a comfortable and intellectually stimulating living for their families. Although strong home bias certainly exists with differences in language and culture, many intellectuals try to survive in developed countries particularly when their home countries are LDCs. If a newly developed country would like to invite good intellectuals and keep them for long, certain conditions should be met. Urban amenities are one of such necessary conditions.

You economists are certainly highly educated intellectuals. Then think of where in the world you are willing to live. Of course, heterogeneity across individual taste is large. However, for example, Manhattan and London would be great if I could survive as a professional. Paris would be good, but not for long. Bangkok is good though not for 10 years. How about Jakarta? What are the set of criteria in choosing a place for myself and my family?

Glaeser, Kolko, and Saiz (2001) list four elements of urban amenities. The first is possible consumption of a variety of services and goods. A large portion of goods consumption may eventually be switched from shopping malls to B-to-C or C-to-C e-commerce in the long run. However, various services such as restaurants and music concerts will still remain at the site. The second is aesthetic and physical setting. This includes a thoughtful city plan and beautiful architecture, good climate, appropriate air conditioning, and an environment-friendly smart city. The third is good public policies. Examples are children's education, medical services, and safety in cities. The fourth is speed. Urban transport should take anybody to anywhere, anytime within a city, quickly and safe. An easy trip to a resort is possible over

weekend. Inbound outbound overseas tourism should be easy.

Policy studies must be deepened on how innovation in newly developed countries should be designed and how we attract intellectual people by urban amenities.

5. Economics for policy discussion

ASEAN and developing East Asia have led the world in the construction and implementation of development strategies that get involved with globalization. Economics has contributed to policy formation for effectively utilizing GVCs for Tiers 3, 2, and a part of Tier 1a. From now on, Tiers 1a and 1b must have more weights for new policies.

In ASEAN, distance between researchers or economists and policy makers is much shorter than in typical developed countries, and we economists have ample room for getting involved with policy making. In the process of establishing democracy, some erroneous “common belief” on economic policies tends to be flourished. We must promote right policies and positively engage ourselves in the interface with policy discussion. By always seeking chances to utilize our theories and empirics for policy discussion, we can contribute to the real world to a greater extent.

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