

Chapter 2

Economic Integration and Development Strategies: A Theoretical Perspective

Koji Nishikimi

Institute of Developing Economies, JETRO

March 2008

This chapter should be cited as

Nishikimi, K. (2008), 'Economic Integration and Development Strategies: A Theoretical Perspective', in Sotharith, C. (ed.), *Development Strategy for CLMV in the Age of Economic Integration*, ERIA Research Project Report 2007-4, Chiba: IDE-JETRO, pp.47-81.

Chapter 2

ECONOMIC INTEGRATION AND DEVELOPMENT STRATEGIES: A THEORETICAL PERSPECTIVE

Koji Nishikimi

ABSTRACT

Economic integration creates two different forces on industrial location: *dispersion* and *agglomeration forces*. The dispersion force relocates industries across integrated countries according to each country's comparative advantage and achieves the static efficiency of resource allocation. In contrast, the agglomeration force serves as a dynamic source of industrialization but at the same time, it may produce the economic disparities among integrated countries and among domestic regions within each country. In order to work out effective development strategies under the influence of the two forces, it is important to manage dexterously the nonlinear effects, such as *home market effect*, *lock-in effect* and *hub effect*. With these effects, drastic progress in long-term economic development can be triggered by a single success of a short-term program for inviting firms, particularly in the initial stage of agglomeration. Individual policies therefore bear great importance in the industrialization process, but the government of each country is likely to face two kinds of difficulties in developing a successful strategy: (1) strategy-building requires extremely accurate information about the state of the country; and (2) difficulty in policy coordination to avoid excess public investment for development.

1. INTRODUCTION

In East Asia, a large number of multinational enterprises have vigorously expanded their production networks since the 1990s. Moreover, from the beginning of the twenty-first century, increasing numbers of free trade agreements (FTAs) and economic partnership

agreements (EPAs) have been concluded, and the economic integration has been rapidly progressing in this region on both *de facto* and *de jure* bases. The progress in integration promoted the intraregional division of labor in East Asia and thereby enhanced the production potentials of the region. As a result, the share of intraregional exports in total exports by East Asia has rapidly increased from 39.9 percent in 1990 to 51.1 percent in 2005, and their GDP share in the world has grown from 18.9 percent to 25.9 percent during the period 1990-2004. The progress in regional integration, however, has also generated serious concern over expanding economic disparities among integrated countries as well as among domestic regions in each country. For example, China encounters large and growing difference in production and income between coastal and inland regions: the GDP share of the 11 coastal provinces increased from 53.3 percent in 1990 to 61.3 percent in 2003, although these provinces occupy only 12.4 percent of China's land.

Economic integration is expected to create two different influences on industrial location. First, the international difference in comparative advantage leads different industries to different countries. As comparative advantage structures change over time, industries would disperse over many countries, and such a tendency becomes clearer as trade becomes more liberalized with economic integration (*the dispersion force of economic integration*). However, when there are significant economies of scale in production, firms tend to locate in countries/regions close to large markets so as to exploit the scale merits. This likely forms industrial agglomerations in a limited number of countries/regions, leaving other regions vacant (*the agglomeration force of economic integration*). Hence, with this second force, trade liberalization and capital mobilization tend to intensify the economic disparities noted above.

The relative size of the above two forces should largely determine the overall effects of economic integration on industrial growth of East Asian countries. It is regularly pointed out that the flying-geese pattern in Asia recently became more ambiguous than before, and this fact suggests that the agglomeration force has been getting dominant in East Asia. The current economic environment in this area might be rather tough for those countries/regions with small markets. In this chapter, we will study the desirable development strategies for the Cambodia, Laos, Myanmar and Vietnam (CLMV) economies, which joined the ASEAN in the late 1990s and now are vigorously try to catch up with other Asian countries. We attempt to find good ways to harness the two forces of integration for CMLV's growth and how to coordinate them with each country's strategy for development so as to make the Asian economic integration really fruitful.

In the following section, we look at how dispersion and agglomeration forces work in the process of economic integration. Then in Section 3, we examine the effects of these forces on resource allocation and economic disparity among countries and among domestic regions of each country. In Section 4, we investigate possible development strategies that appear to work effectively under the two forces.

2. TWO FORCES OF ECONOMIC INTEGRATION

As briefly discussed above, economic integration likely produces two different forces on industrial location, i.e., dispersion and agglomeration forces. It should be noted here that the industrial location pattern and the trade pattern are the two sides of a single coin. Both closely reflect the competitiveness of each country's products in the world market.

There are two major sources of competitiveness, *comparative advantage* and *home market effect*. The former source works in both cases with and without scale economies in production, while the latter works only in a situation with significant scale economies.

2.1 Dispersion force

First, let us examine the dispersion force on industrial location. This force arises from the comparative advantage structure among trading partner-countries.

2.1.1 Comparative advantage and industrial location

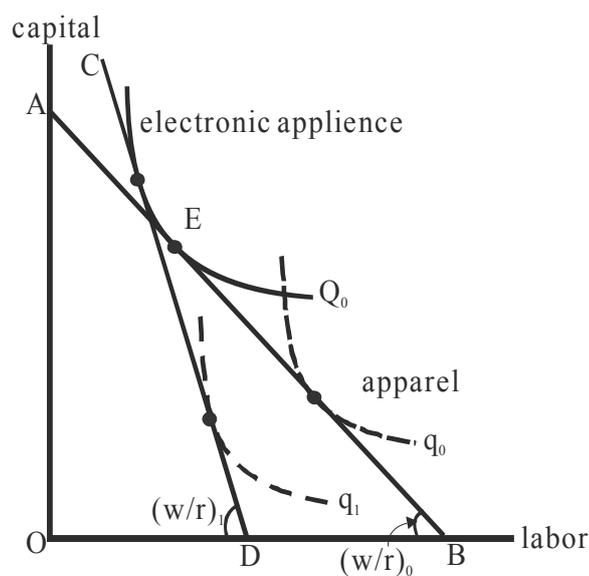
Asian countries exhibit wide differences in endowment of production factors such as land, capital, and labor with various skills and knowledge. For example, China is endowed with rich land resource and productive labor force, while Japan accumulates much engineering knowledge but has relatively small land and labor. The difference in factor endowment should be an essential determinant of the comparative advantage of each country. As factor endowment in a country changes with accumulation of physical and human capital, for example, the industrial structure of that country (and perhaps, of its trade partners) may evolve reflecting the comparative advantage.

Figure 1 shows a situation where labor becomes scarce relative to (physical and human) capital in a country that produces electronic appliance and apparel, which are characterized as capital-intensive and labor-intensive, respectively. Suppose that, initially, both industries have faced a wage-rental ratio given by $(w/r)_0$. Note that all points on line AB show the factor inputs that require identical total cost, for example, a dollar. Hence Q_0 units of electronic appliance entail the same cost as q_0 units of apparel

when the relative factor price is given by $(w/r)_0$. Now suppose that in this country, labor becomes scarce, so that the relative wage rises to $(w/r)_1$. Then, with this higher wage, the production cost of Q_0 units of electronic appliance is equivalent to that of q_1 units of apparel ($q_1 < q_0$). In other words, the production cost of labor-intensive goods will increase as labor gets scarce. This may cause a loss of that country's global competitiveness in the labor-intensive goods, and these industries may relocate to more labor-abundant countries.

The above story in Figure 1 may describe the current state in China, where labor scarcity has appeared and real wage has started to rise. It is expected that some of the most labor-intensive industries will be spilled out of China in the near future. These industries may relocate to labor-abundant countries in Asia, including CLMV countries.

Figure 1: Wage rise and relocation of industry.



Source: author.

2.1.2 *Flying geese pattern of industrial development*

Applying the above view to a general case that includes many industries and many countries with variable factor endowments, we can imagine a dynamic process where industries trickle down from one country to another, reflecting the over-time changes in each country's factor endowment. This idea is often called the flying geese model of industrial development.

In the context of East Asia, Japan has played the role of the “lead goose” ---i.e., the first to start operating the new industries in the area. As it gains advantages in production of more advanced goods, Japan successively releases industries in which it no longer holds a comparative advantage. Then, these industries relocate to nearby less-developed countries (the Asian NIEs), which, in turn, encourages relocation of some outdated industries in the “follower-geese” countries to the neighboring less-developed countries (ASEAN, China, and CLMV). This flying geese model fits the “catching-up” industrialization of Asian economies until the 1980s. More recently, however, the flying geese pattern in East Asia has become vague and more complicated with multiple lead geese, as asserted by Fujita and Hamaguchi (2007).¹

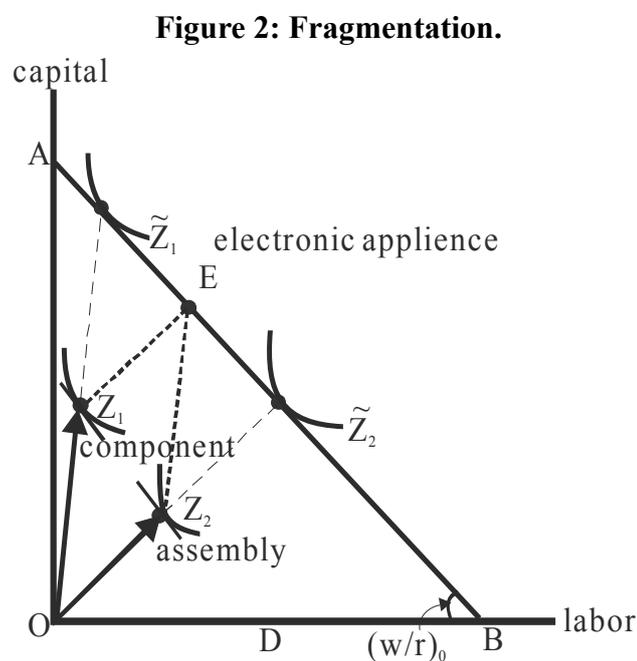
2.1.3 *Fragmentation*

The traditional arguments on comparative advantage and the flying-geese industrialization have focused on production of final goods. In Asia, however, the international division of labor has recently made substantial progress, particularly in the

¹ In the 1990s, the Asian NIEs caught up with Japan in certain technological areas such as semiconductors and information and telecommunication equipment (i.e., notebook computers and mobile telephones). On the other hand, China emerged not only as a location for cheap labor but also as a huge consumer market. These might be caused by the agglomeration forces of *de facto* economic integration, which would be discussed in the following sections of this chapter.

production of intermediate goods. Many enterprises in the automobile and electronics industries, for example, separate several processes of production and relocate them to different countries, according to the market conditions prevalent in each country. This phenomenon is often called fragmentation and has been intensively studied since the late 1990s.²

In the case of firms that apply fragmentation, the industrial location pattern can be basically described by the same theory of comparative advantage, as shown by Jones and Kierzkowski (2001) and Deardorff (2001).³ For example, suppose that the production of the electronic appliance given by point E in Figure 1 can be separated into two subprocesses, production of components (Z_1) and assembly (Z_2), as depicted in Figure 2. In the figure, we assume that the process of component production is more



Source: author.

² For detailed analysis of fragmentation, see Arndt and Kierzkowski (2001) and Jones (2000).

³ Here we assume that the production process in a fragmenting firm is characterized by constant returns to scale. When it is subject to increasing returns to scale, the location pattern is affected by home market effects as well as comparative advantage, as discussed in detail in the next section.

capital-intensive than the assembly process. Recall that line AB in Figure 2 (and Figure 1) represents a-dollar-worth inputs of capital and labor when the relative wage is given by $(w/r)_0$. Hence \tilde{Z}_1 units of the components cost as much as \tilde{Z}_2 units of the assembly service. If labor becomes scarce, the relative wage will rise. This makes assembly service more expensive and encourages the electronics firms to relocate their assembly process to countries where labor is more abundant and cheap. Clearly, this process of fragmentation is caused by the same mechanism of comparative advantage as the location process of the final-good industries, which is drawn in Figure 1.

In addition to changes in factor prices, a decrease in international transportation and communication costs among various location sites will encourage firms to apply fragmentation and build up their global intra-firm production networks, which enables more effective exploitation of the location advantages. In this sense, economic integration promotes global dispersion of industries.

2.2 Agglomeration force

2.2.1 Home market effect and industrial agglomeration

The origin of the agglomeration force can be found in the scale economies of production, which we temporarily set out of our view in the preceding section for the sake of analytical simplicity. Suppose that manufacturing process of sector M (the electronics sector, for example) is characterized by increasing returns to scale. We also assume that international transportation entails significant cost, while domestic transportation costs are negligible. Then, if M -firms produce the same homogeneous good, all domestic production of M should be supplied by a single firm as a result of competition. In this case, because of the scale economies, an M -firm operating in a country with large

markets can produce at lower cost, hence, tends to be more competitive in the world market. Then, export brings more production and higher efficiency to these firms. This, in turn, lowers the domestic price of M , which makes the consumers in that country better off. In short, the size of the home market affects the real income (utility) of the consumers in that market. This mechanism is often called *home market effect*.

The above story of natural monopoly with homogeneous M -products gives a simple and clear picture of the home market effect, but the result may seem to rely heavily on the assumption of pure monopoly in M -market, which is seldom observed in the real economy. Then one may wonder if home market effects can be obtained even when the market is not purely monopolistic. When manufactured goods are not homogeneous but slightly differentiated from each other, there should be multiple (or even many) producers at an equilibrium. Such situations are lucidly described by the monopolistic competition model of Dixit and Stiglitz (1977). In their model, each firm exhibits increasing returns to scale; hence, each variety of manufactured good, M_i , gets cheaper as its home market becomes large. When the price of M_i declines, however, consumers may spend their spare money to buy a new variety of M , rather than to increase their purchase of the existing varieties. In fact, at the equilibrium of monopolistic competition in Dixit and Stiglitz (1977), an increase in market size does not affect the production quantity of each firm but increases the number of varieties of manufactured goods. In this case, consumers enjoy higher utility with consuming a wide variety of M -good. Accordingly, the size of the market affects the real income, and the home market effects are therefore at work in the case with many M -firms, too.

Incorporating domestic transportation costs into the above model, we can obtain a domestic version of the home market effect: A large market attracts producers of a wide

variety of differentiated goods and gives consumers higher utility by providing those goods at cheaper prices. In addition, for the case of the domestic economy, it should be natural to allow labor (= consumer) migration across regions. With labor migration, the home market effect works more extensively by forming a circular effect between demand and supply growth: Labor (= consumer) migrates to the place where a wide variety of consumer goods are available, and this brings more income to spend at the market there, which in turn attracts more firms to that place. As a result, there emerges a large agglomeration of producers and consumers.⁴

2.2.2 Effects of transport hub

Other than the labor migration discussed above, there are several factors that form circular effects and stimulate the agglomeration mechanism. Formation of transport hubs is perhaps the most popular factor.

The basic mechanism of hub-formation originates from scale economies in transportation, which have been realized by the development of large-sized and high-speed carriers, such as large container ships, bullet trains, and jumbo jets. The scale economies provide an incentive for collective transportation and hence stimulate the development of transport network systems with trunk routes and the hub-spoke structure of transportation.

Trunk routes often arise from the following circular causations. Suppose there are regular services of transport on a given link. If this link is used, shippers can save substantial costs from seeking a transporter for individual shipment. This attracts many shippers to use this link, which in turn supports even more frequent transport services in

⁴ For detail of the agglomeration mechanism, see Fujita *et al.* (1999) and Baldwin *et al.* (2003).

the link. This positive feedback mechanism eventually leads to the endogenous formation of a trunk link and transport hubs at the two ends of the link. When scale economies in transportation rule the transport advantage of each location, a major transport node (hub) can spontaneously emerge at any place that has a large transport demand such as the sites of industrial agglomeration.

Once a hub-spoke structure arises in a transportation network, the hub attracts many producers and consumers by its significant transport advantages. This will switch on the reciprocal reinforcement process between transport hub and industrial agglomeration.⁵

2.2.3 Specific labor market

Another stimulation factor of agglomeration emerges when a pooled market for workers with special skills is formed. Such a market benefits both workers and firms as Marshall pointed out in his 1920 book:

[A] localized industry gains a great advantage from the fact that it offers a constant market for skill. Employers are apt to resort to any place where they are likely to find a good choice of workers with the special skill which they require; while men seeking employment naturally go to places where there are many employers who need such skill as theirs and where therefore it is likely to find a good market. The owner of an isolated factory, even if he has good access to plentiful supply of general labour, is often put to great shifts for want of some special skilled labour; and a skilled workman, when thrown out of employment in it, has no easy refuge.

(Marshall 1920: 271-272)

⁵ This reciprocal reinforcement is often called *hub effect*. For detail of the hub effect, see Krugman (1993), Fujita and Mori (1996), and Mori and Nishikimi (2002)

In the modern context, the most prominent example of this factor should be perhaps given by the case of IT clusters in Silicon Valley and Bangalore, where a large mass of IT firms and high-tech engineers have established a pooled market and attracted more firms and engineers.

2.2.4 Local Spillover Effects

Industrial agglomeration can be also caused by local spillover of information. Up-to-date knowledge of production technologies and market trends often plays a key role in many fields of business. Hence, individual producers always try to accumulate and update their knowledge bases. Such knowledge and information tend to spill over from one producer to another through face-to-face business contacts, close monitoring of rival firms and other daily communications, all of which should be easy if producers operate together in a same production site. As a result, firms in the same industry or closely related sectors are likely to be agglomerated. When a large number of firms are clustered in a small area, competition among them becomes severe, so that the firms naturally get specialized in slightly different products. This leads to monopolistic competition and creates a circular causation of further agglomeration via home market effect, as discussed in Section 2.2.1.

It should be noted here that in reality, the above forces of agglomeration often appear to operate together, so that we cannot simply identify the main factor of an existent agglomeration. For example, suppose a significant number of IT manufacturers operate side-by-side to exploit the information spillover effects. This may create a local market of high-tech engineers equipped with special knowledge and skills for their production and R&D activities. As production increases, transport network will be

developed to connect this site and major markets outside, and the site may become a transport hub if the transportation grows sufficiently. Once a hub emerges, it attracts large numbers of consumers as well as firms in various industries. All these factors interact with one another and create a large industrial cluster.

3. RESOURCE ALLOCATION AND DISPARITY EFFECTS OF INTEGRATION

3.1 Resource allocation effects

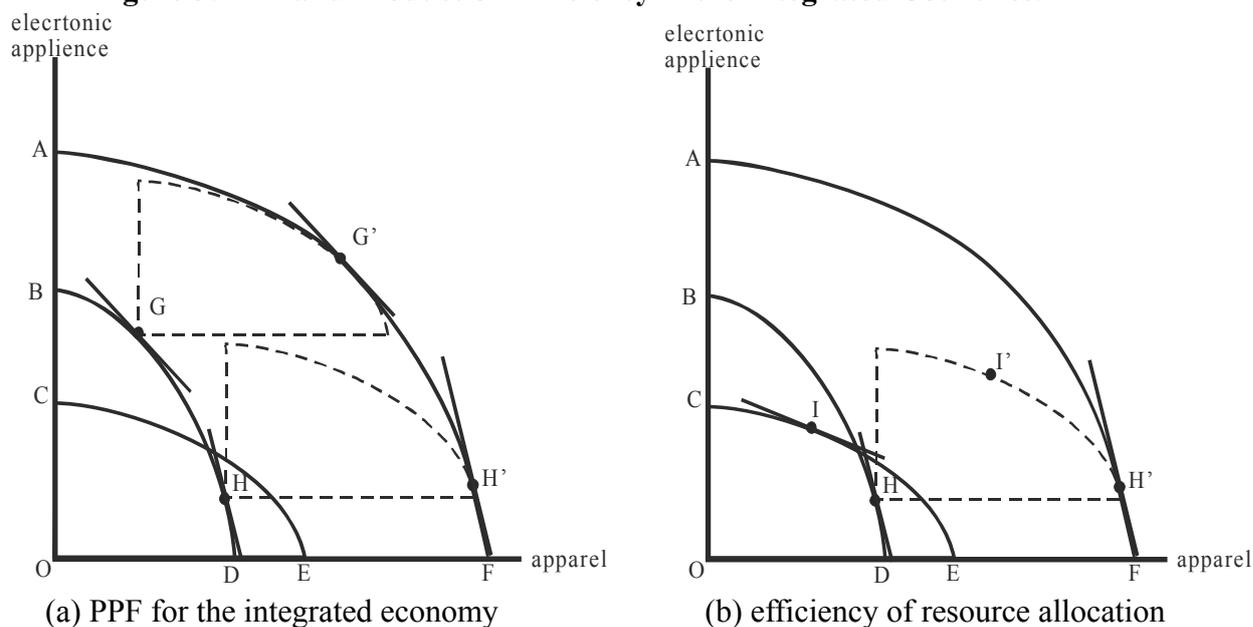
The dispersion and agglomeration forces bring different effects on resource allocation in the integrated economy. In the case of industries without scale economies, a competitive equilibrium with the dispersion force achieves a Parato optimal allocation. In contrast, if scale economies are at work, the agglomeration force may well bring about an inefficient allocation of resources. Below, we look at the allocation consequence of each case.

3.1.1 Efficiency gains from trade liberalization

First, let us examine the allocation effects of trade liberalization in a case without scale economies. Suppose two countries are being integrated. They produce two goods, electronic appliance and apparel, which are respectively capital-intensive and labor-intensive sectors, as in the case shown in Figure 1. Country 1 is assumed capital abundant, while Country 2 is labor abundant. In Figure 3, curves BD and CE depict the production possibility frontiers (PPF) of Countries 1 and 2, respectively. Sliding the PPF of Country 2 along Country 1's PPF, we can draw the envelope $AG'H'F$, which represents the PPF for the integrated economy of Countries 1 and 2. Note that total

production OG' can be decomposed into Country 1's production OG and Country 2's production GG' . Moreover, the slopes of the three PPFs (marginal rates of transformation) are all equal at the corresponding points, G and G' .⁶ It should be noted that market competition leads producers to achieve a production point where the slope of PPF is equalized to the relative price of the two products. Hence, free trade equilibrium realizes an efficient production in the integrated countries, such that the production point locates on the frontier PPT curve $AH'F$ in Figure 3.⁷

Figure 3: PPF and Production Efficiency in the Integrated Countries.



Source: author.

⁶ This can be verified by using the envelope theorem.

⁷ In addition to the production efficiency discussed in the text, efficiency in consumption is also realized at a competitive equilibrium under free trade. For details, see standard textbooks on microeconomics.

Now, suppose import taxes are levied, so that the relative price differs between Countries 1 and 2. Production in the two countries will occur at the points where the slopes of their PPFs are different, for example, at points H and I in the right panel of Figure 3. In this case, total production in the two countries is given at I' , which locates in the interior of the production possibility set, OAF . This resource allocation is not efficient because the production of both goods can be increased if resources are relocated so that Country 1 produces more electronics and Country 2 provides more apparel.

Such production can be achieved by eliminating the import taxes. In fact, if all tariffs are completely removed, then all producers in the two countries encounter the same product prices. This leads production in the integrated economy to a point on the envelope that achieves a Parato optimum allocation of resources. In other words, trade liberalization accompanying the process of economic integration will improve the efficiency of resource allocation in the integrated economy as a whole.

It should be noted that trade liberalization brings about an efficient resource allocation even for cases where firms apply fragmentation. As was discussed in an earlier section in this study, the location of producers of intermediate goods is affected by the comparative advantage structure basically in the same way as that of final-good producers. Hence, not surprisingly, trade liberalization brings about a gain in efficiency in resource allocation. Moreover, a decrease in international transportation and communication costs that accompany the process of economic integration will encourage firms to relocate their production processes to countries where their necessary inputs are available at cheaper prices. Accordingly, economic integration will improve the efficiency in resource allocation for cases with or without fragmentation.

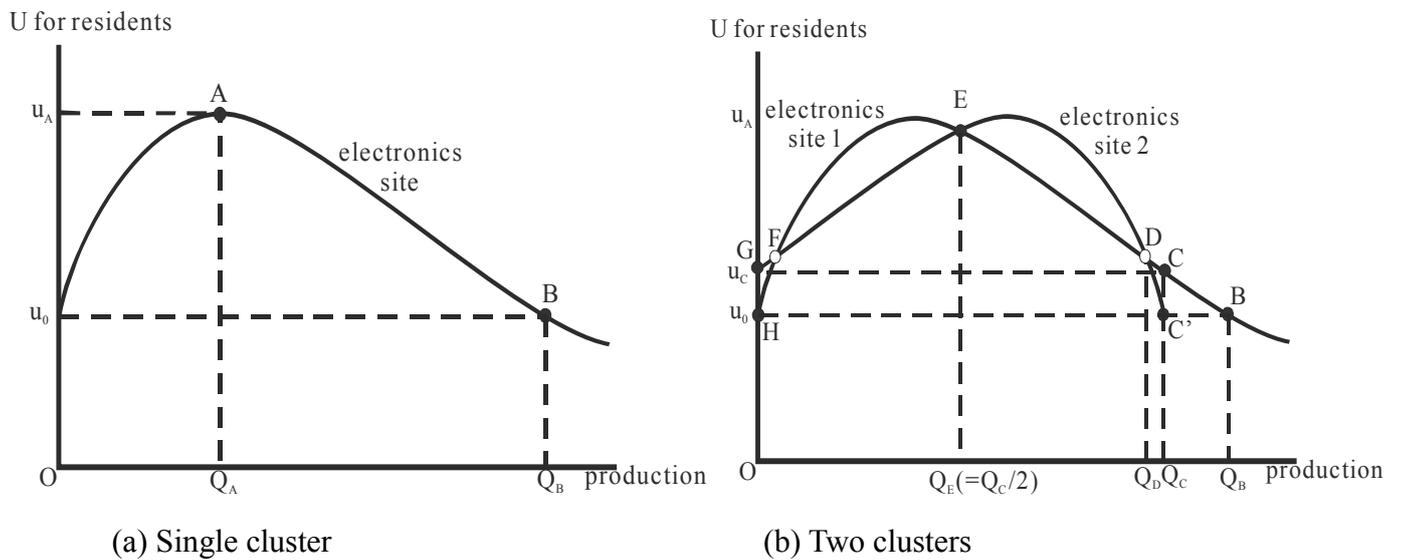
3.1.2 Allocation efficiency of agglomeration equilibrium

Next, we examine the allocation efficiency for cases where agglomeration forces are at work. The entire efficiency depends on how many industrial clusters exist in the equilibrium. Hence, the key question here is: Is there a reliable mechanism that generates the optimal number of clustering sites? In the real world, we often observe that new industrial clusters emerge in the process of economic growth. This suggests that market mechanism adjusts, to some extent, the number of clusters according to the size of the economy. However, it does not necessarily imply that the optimal number of industrial clusters are created by market forces. In fact, home market effect, which provides a main cause of the agglomeration force, tends to realize an excessively small number of large agglomerations.

Figure 4 shows how the home market effect hinders multiplication of clustering sites. Assume that, unlike in the previous examples, electronics manufacture is characterized by scale economies and, hence, by home market effects. Assume further that there is a single cluster of that industry at Site 1. If the production in Site 1 is sufficiently small as shown by the part of $O-Q_A$ in the left panel of Figure 4, the utility of residents near the site rises as production increases, due to the home market effects. We further assume that the home market effect diminishes as the production becomes larger than Q_A , so that the utility at Site 1 hits the maximum at A and then decreases as shown in the left panel of Figure 4.⁸

⁸ This occurs if there is a technological limit in product differentiation or if an expansion of employment and production in the electronics industry raises the prices of other products.

Figure 4: Allocation Efficiency with Home Market Effect.



Source: author.

When demand for the electronic appliance increases, the agglomeration at Site 1 will continuously grow over the utility-maximizing size, Q_A . Of course, any electronics firm can start producing alone at a site outside the cluster. However, such a firm will face some difficulty in finding good workers because workers at the new site achieve less utility, u_0 , than at the agglomerated site, due to home market effects. To keep workers in a small town, the relocating firm has to pay more wage than the agglomerated firms. As a result, home market effect tends to hinder the emergence of new clusters and make the existing agglomerations too large. Without policy intervention, the agglomeration at Site 1 will grow up to Q_B , where the utility level at that site equals to that at a potential new site.

Now suppose that the electronics production in Site 1 is given by Q_C in the right panel of Figure 4. In the figure, the production at the (potential) new site, Site 2, is measured to the left from Point Q_C , and the utility for Site 2's residents is represented by

Curve $C'EG$, which is drawn as a horizontal mirror of Curve HEB .⁹ Since Q_C is smaller than Q_B , individual producers do not have sufficient motivation to start production in a new site. However, even in this situation, the creation of Site 2 will make both sites' residents better off. If the critical mass of production, $Q_C - Q_B$, is transferred from Site 1 to Site 2 (perhaps by some policy measures), Site 2 starts growing spontaneously because it provides greater utility than Site 1. When the production in Site 2 exceeds $Q_C - Q_E$, some workers and firms in Site 2 will go back to Site 1, where larger utility is attainable than in Site 2. Therefore, Point E represents a stable equilibrium with two agglomerated production sites.¹⁰ Note that at Point E , residents in both sites achieve greater utility, as compared to the equilibrium with a single agglomeration. In other words, the equilibrium represented by Point C does not achieve the optimum allocation of resources while it is a stable equilibrium, too.

To sum, in cases where home market effect exhibits a reverse-U shape, market competition tends to hinder creation of new agglomeration. Economic liberalization accompanying the process of regional integration leads to excessive localization of producers with such effects.

3.2 Disparity effects

As we discussed in Sections 2.2 and 3.1.2, market forces lead the industries with scale economies to be localized in a small number of locations. Liberalization of international trade and investment encourages localization of such industries and intensifies economic disparities among integrated countries as well as among regions within each country.

⁹ For simplicity, we assume that the two sites provide identical conditions for production.

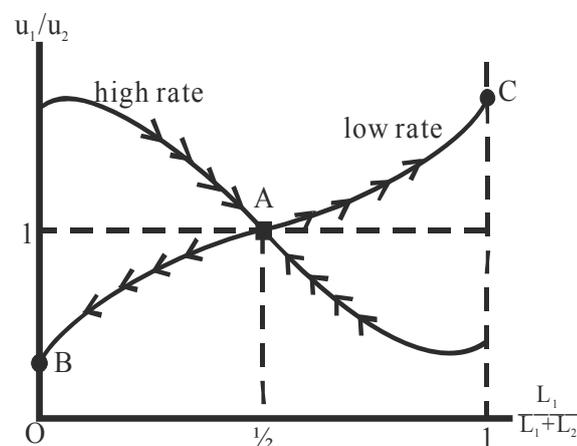
¹⁰ In the right figure of Figure 4, there are three stable equilibria, Points C , E and G , and two unstable equilibria, Points D and F .

3.2.1 Transport costs and core-periphery structure

How integration widens regional disparity is well explained by the core-periphery model whose essence has been discussed in Section 2.2. Using a two-region economy model, Fujita *et al.* (1999) closely examine the stability of geographical configuration of industries and show that transport costs between the two regions play a critical role in creating a core-periphery structure in a regional economy. Figure 5 depicts their main results. The two curves in the figure show the relations between Region 1's labor share and the ratio of utility for Region 1's residents to that for Region 2's residents, for cases with high and low rates of transport cost, respectively. If transport is prohibitively expensive, an increase of labor in Region 1 lowers the price of its products and wage because supply growth does not meet the corresponding growth in export demand.

Accordingly, for the case where high transport rate exists, the relative utility of Region 1 is given by the downward sloping curve in Figure 5. By contrast, if transport cost is sufficiently low, a growth in the regional supply potential leads to an increase of real wage (in utility term) in that region, due to home market effects. Hence, for this

Figure 5: Stability of Equilibrium in Two-region Model.



Source: author.

case, the relative utility curve has a positive slope.

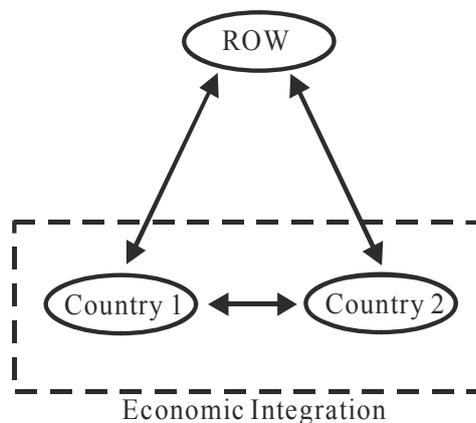
In both cases, the symmetric distribution of industries between two regions (represented by Point *A*) gives an equilibrium configuration. But the above-noted difference in slope of the curves produces a striking contrast in the stability of equilibrium between the two cases. When transport cost is sufficiently high, a small increase in Region 1's labor force lowers u_1/u_2 , which attracts labor back to Region 2, and vice versa. The equilibrium point *A* is therefore stable. When transport cost is low, in contrast, a small increase of labor in Region 1 raises u_1/u_2 and encourages more migration. In this case, the symmetric equilibrium is not stable, and the regional economy will be led to an extremely unequal state, Point *B* or *C*.

The above result of Fujita *et al.* (1999) is quite suggestive for the case of economic integration, too. The process of economic integration is often accompanied with a decrease in transport costs in a broad sense, including pecuniary/time costs for transportation as well as tariff/nontariff trade barriers. If it produces a change in stability of the dispersed equilibrium, as shown in Figure 5, then it will suddenly create a large disparity among integrated regions.

3.2.2 *Disparity among countries*

Within East Asia, international mobility of products, materials and capital has been increasingly enhanced, but labor mobility is still substantially limited across countries, so far. Hence, so as to examine how regional integration affects economic disparity among the integrated countries, the core-periphery model discussed above needs to be modified for cases where labor mobility is restricted only within countries. To do this, Nishikimi (2007) extends the core-periphery model with footloose capital developed by

Figure 6: Three-country Model of Economic Integration.



Source: Nishikimi (2007).

Baldwin *et al.* (2003). He assumes three countries, Countries 1, 2 and ROW, of which Countries 1 and 2 are forming an economic integration as illustrated by Figure 6.

Each country is endowed with two kinds of production factors, labor and capital. It is assumed that capital is internationally mobile without cost, while labor is immobile across countries. These production factors are to be used in two sectors: differentiated manufacture characterized by increasing returns to scale (IRS), and agriculture with constant returns to scale (CRS). Products of these two sectors are traded among the three countries, but they involve transport charges. Suppose that transport between the integrated countries costs less than that between ROW and each of Country 1 and 2.¹¹

Now, the question is: What geographical distribution of the IRS manufacture will emerge in equilibrium? Figure 7 shows the relationship between transport cost and each country's share in world production of manufactured goods. In both panels of Figure 7, the vertical axis represents each country's share in manufacturing, s_n ($n=1,2, \text{ROW}$), while the horizontal axis gives the "freeness of trade" within the integrated economy, f ,

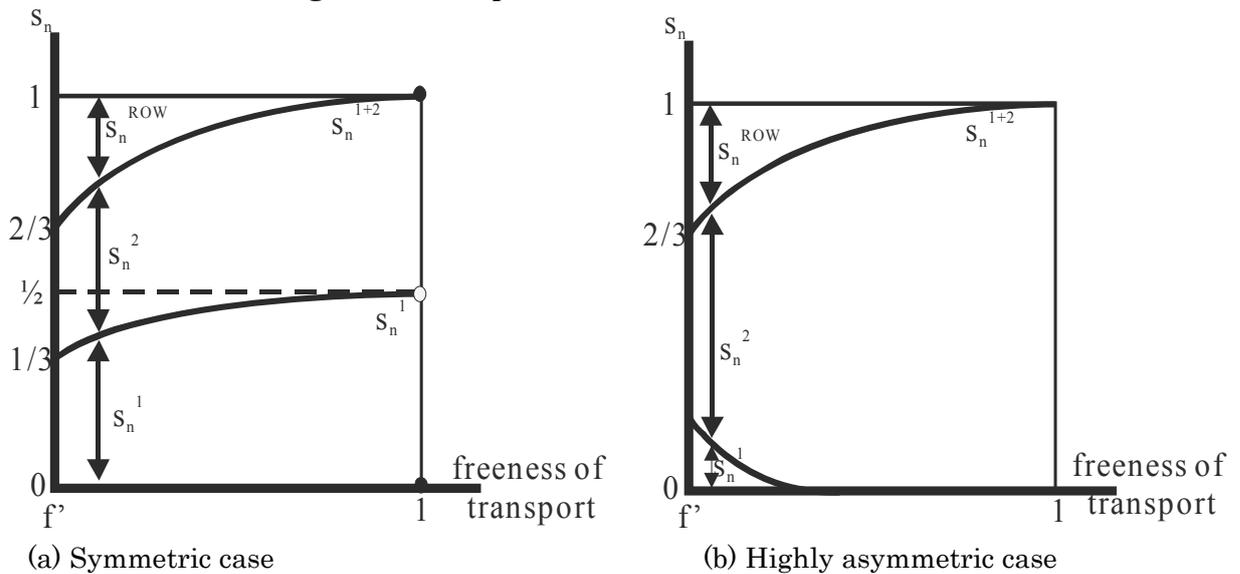
¹¹ Nishikimi (2007) simply assumes that transport cost between ROW and Country 1 equals to that between ROW and Country 2.

which is defined as the proportion of transport cost in the delivered price of the manufactured goods ($0 \leq f \leq 1$). The value of f equals unity when transport cost is zero, and it approaches zero as transport cost becomes infinitely large. These figures are drawn by assuming that the freeness of the transport between ROW and each of Countries 1 and 2, f' , is lower than that of trade within the integration ($f' < f \leq 1$).

The left panel (a) of Figure 7 depicts the case where the three countries are endowed with identical quantities of labor and capital. When transport cost within the integrated economy is as low as transport cost in the trade with ROW (i.e., $f=f'$), the three countries are situated in completely the same conditions, and thus in equilibrium. They have the same share of manufacturing industry, $s_n^1 = s_n^2 = s_n^{\text{ROW}} = 1/3$. As the freeness, f , increases in the process of economic integration, an increasing number of manufacturing firms relocate from ROW to Countries 1 and 2 because the transport facilitation within the integrated economy makes ROW relatively isolated and less attractive to the global capital. Yet, the shares for Countries 1 and 2 are always equal as they have identical conditions. In this case, therefore, integration does not intensify the disparity between the integrated countries.

In contrast, if there is a large difference in factor endowment, integration may intensify the disparity between the integrated countries. The right panel (b) of Figure 7 shows a case where Country 1 is much smaller in factor endowment than Countries 2, while keeping all other assumptions the same as the symmetric case of panel (a). As integration progresses (f increases), the smaller country in the integrated economy, Country 1, loses its share of manufacture. This is because the home market effect works between Countries 1 and 2. Eventually, when $f=1$, all firms are agglomerated in Country 2. In cases where diversified countries with different endowment are forming

Figure 7: Transport Cost and Production Shares.

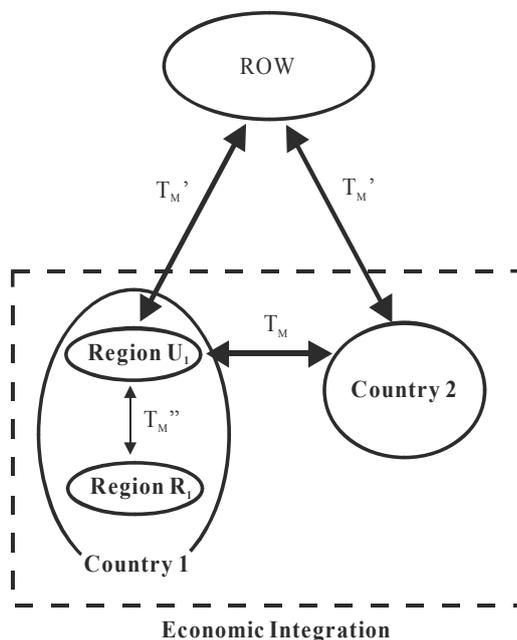


Source: Nishikimi (2007).

integration, the economic disparity may expand as trade liberalization progresses in the process of integration.

3.2.3 Disparity among domestic regions

Nishikimi (2007) also examines how integration of countries affects the disparity among domestic regions within each country. To do this, the preceding model is revised in as much as Country 1 is assumed to compose of two regions, U_I and R_I , as shown in Figure 8. It is assumed that all international ports in Country 1 locate in U_I , while R_I is situated in deep inland. Domestic transport of the manufactured goods also incurs costs, and, as in the previous model, capital is freely mobile across countries and regions, while labor is mobile only within each country.

Figure 8: Three-country, Two-region Model.

Source: Nishikimi (2007).

Nishikimi (2007) shows that a decrease in transport cost accompanying the process of integration accelerates localization of the IRS manufacturing industry in urban area, U_1 . This is because market integration provides larger opportunities to Region U_1 , which possesses the advantage of better accessibility to the integrated market than Region R_1 . As a result, economic integration tends to intensify the economic disparity among domestic regions, U_1 and R_1 .

4. DEVELOPMENT STRATEGIES UNDER ECONOMIC INTEGRATION: POLICY IMPLICATIONS

Based on the discussions in the preceding sections about several effects of economic integration, we now investigate possible development strategies for countries where economic integration is ongoing.

If the dispersion forces alone are at work in the process of integration, it would be rather easy to design a strategy. Every country can achieve an efficient resource allocation by fully utilizing market mechanism. In this case, all we need are liberalization and facilitation of trade for the market to work smoothly. However, the dispersion force does not seem to dominate in recent East Asia -- the flying geese pattern of industrialization is no longer clearly observed, and a growing number of industrial agglomerations have been emerging in various areas of the region. The agglomeration force appears to exert significant influences upon the industrial development in this area.

Under the influence of the agglomeration force, a small difference in the initial state may be amplified throughout the development path while a huge difference may be seen in the consequence. In this sense, individual development policies can trigger a long-term prosperity in economic development, but at the same time can entail a considerable risk of policy failure, which may cause long-term problems in development performance.

4.1 Transport costs and economic development

4.1.1 Transport development and lock-in effects

In Section 3.1.2, we have seen how the home market effect encourages growth of existing agglomeration and hinders birth of new clusters. This often brings a result where once a geographical structure of industrial agglomeration appears, it tends to be preserved even if that structure is not efficient. This tendency is regularly referred as *lock-in effect* of agglomeration.

More importantly, as transport cost and tariff/nontariff trade barriers are lowered,

competition among industrial agglomerations becomes severer, and this poses tough conditions to infant clusters. In other words, the lock-in effect becomes more prominent as economic integration progresses. Therefore, each country can hardly foster clusters by merely promoting economic integration. Each integrated country needs to build up its own strategy to attract industrial firms, in competition with all other surrounding neighbors.

While the agglomeration force causes the lock-in effect, it can fuel the development of a new cluster if the government successfully attracts a critical mass of producers to a production site by implementing an appropriate policy, as illustrated in Figure 4. In this sense, integrated countries should try to design their strategies so as to utilize the agglomeration forces rather than to suppress them.

4.1.2 Development of transport hub

As discussed above, a decrease in transport cost alone is likely to discourage creation of new agglomerations in less industrialized countries. However, this will not occur if the decrease in transport cost is accompanied by formation of a transport hub. As discussed earlier, a reciprocal reinforcement mechanism works between development of transport hub and formation of industrial agglomeration, once the transport volume at the hub exceeds a critical level. Hence, if the government of a country succeeds to develop a transport hub up to a proper size, then the development of the hub and the cluster will be accelerated spontaneously by that mechanism.

In Laos, for example, Vientiane has a good geographical advantage for its proximity to large cities in the surrounding countries such as Bangkok, Chiangmai, Hanoi, and Kunming. So as to exploit this advantage, the government needs to build a

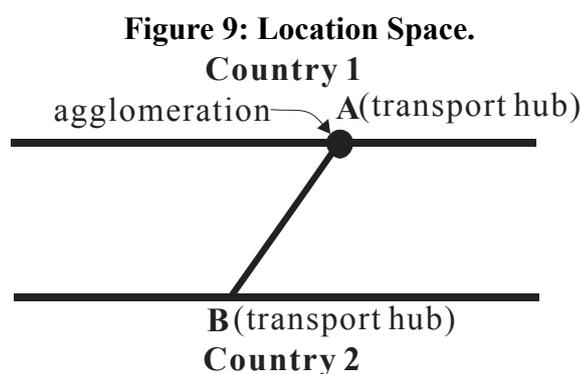
transport network connecting all the above cities and, at the same time, to stimulate industrial production in Vientiane. It should be noted that at this stage of development, the industrial production does not necessarily bring about the home market effect. It has only to create substantial demand for transport of the products and materials along the newly developed network. For emerging economies with small domestic markets, in particular, it seems feasible to start with fostering CRS industries such as foods, garments, and wooden products, rather than IRS industries such as chemicals, machinery, and electronics. They will be able to upgrade industries consecutively after establishing a transport hub, which connects and integrates several nearby markets.

The above strategy of industry-upgrade together with hub development appears to be applicable to other countries, too. For example, in Cambodia, a growing number of garment producers have recently operated in Phnom Penh, attracted mainly by cheap local labor. If the Cambodian government can successfully provide the appropriate transport infrastructure, its priority industry will bring about significant demand for transport to various cities, including Bangkok, Ho Chi Minh, and Sihanoukville for export by sea. Then, this will allow Phnom Penh to be a transport hub and enjoy the special location advantages in attracting IRS industries, which are generally accompanied by the agglomeration force and the lock-in effect in industrial localization. This development strategy with consecutive industry-upgrading seems steadier and more feasible than the strategy to form an agglomeration of IRS industries at one stroke by developing a special economic zone.

4.1.3 Control on transport costs

Another policy implication of the spatial economic arguments is the possibility of

industrialization by manipulating trade/transport costs. Fujita and Mori (1996) examine the evolution pattern of industrial agglomeration, assuming the location space depicted in Figure 9. The integrated economy consists of two countries, which are connected only by one link (highway or sea route) between two transport hubs, *A* and *B*. In the initial state, a single agglomeration exists at *A*, the hub in Country 1.



Source: Drawn by author based on Fujita and Mori (1996).

Figure 10 shows the typical evolution pattern of agglomeration formation in this two-country economy.¹² In the figure, the horizontal axis represents the cost required for transport of the IRS product between the hubs,¹³ while the vertical axis represents the total size of the integrated economy (total labor endowment). When the economy is sufficiently small, only the initial agglomeration can continuously exist in this integrated economy, no matter how much the transport costs. As the economy becomes large, a new agglomeration emerges in either country. If the international transport cost is sufficiently large, the new cluster appears in Country 1. In contrast, when the trade

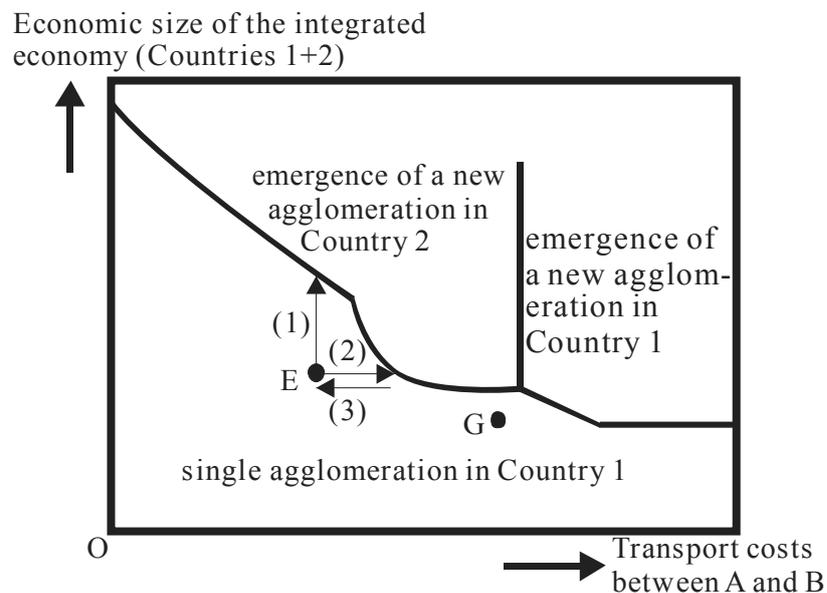
¹² Figure 10 is drawn for the case where labor is freely mobile across countries. In this case, the equilibrium level of consumers' utility (real wage) is equalized between the two countries. If we allow for international difference in the real wage, we can obtain a similar result to Figure 10 for the cases with restrictive labor mobility, too.

¹³ We assume that transport of CRS products does not entail any cost.

cost is small, the new cluster appears in Country 2 although it requires a relatively large market because of the strong lock-in effect created by the first cluster.

Now, suppose that the current state of the economy is given by Point *E* in Figure 10. What policy can the government of Country 2 exert so as to establish a new industrial cluster in Country 2? One possible choice is the *laissez-faire* policy: i.e., just wait for a sufficient growth of the integrated market without enforcing any active policy, as indicated by the arrow (1) in Figure 10. If regional integration expands the market enough to overcome the lock-in effect of the existent cluster, Country 2 will obtain a new cluster. If not, it may require a long time to foster the market.

Figure 10: Bifurcation Pattern and Alternative Transport Policies.



Source: Drawn by author based on Fujita and Mori (1996).

There is such an alternative policy measure as represented by the arrows (2) and (3). That is, the government can foster a new cluster by increasing the international trade cost by means of tariff and nontariff barriers [arrow (2)]. Then, once the new

cluster is established in Country 2, it creates the lock-in effect and can remain at the same place even if the government replaces the policy and lowers the trade cost to the previous level [arrow (3)]. In other words, the government of Country 2 can set up a new cluster by a temporary restriction of international trade, utilizing the lock-in effect. This policy measure sometimes works effectively, especially in cases where infant industries need to be nurtured.

The above arguments suggest that a temporary policy intervention may affect the entire path of economic growth. If the government can manipulate such policy measures accurately according to circumstances, it may be able to achieve the optimal development by carefully choosing the growth path. However, it should be noted here that those policies involve formidable risks of failure. For example, in Figure 10, suppose that the initial state of the integrated economy is represented by Point *G*, instead of Point *E*. In this case, the above policy of increasing the trade cost will lead to the emergence of a new cluster in Country 1 instead of Country 2. This leads economic disparity between the two countries to intensify, which is just the opposite of what is expected. As a matter of fact, it is quite difficult to identify correctly whether the economy is at Point *E* or *G*. Identical policies in similar situations can lead to completely different results. Halfhearted policymaking with superficial information may lead to negative results. Moreover, we have to remember that under the dominance of the agglomeration force, a temporary failure can affect the entire path to economic development.

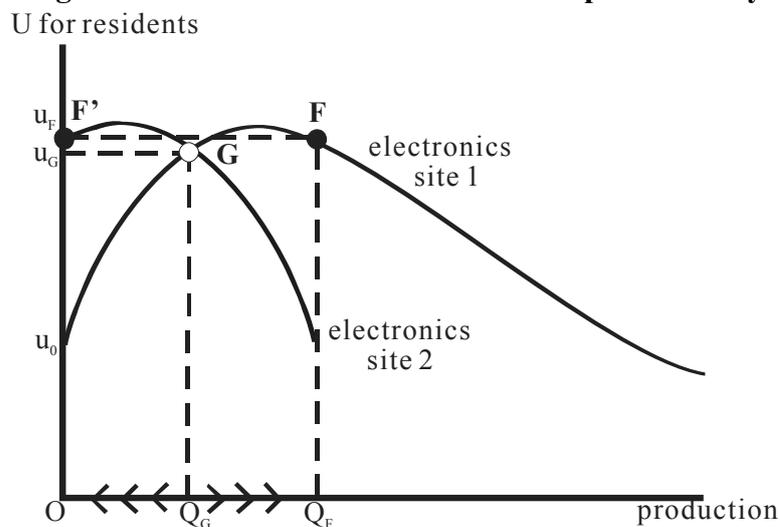
4.2 Competition in public investment

4.2.1 Excess investment for agglomeration-luring

As discussed in the preceding sections, long-run industrialization and economic development may be triggered by the success of a short-run program for firm attraction, particularly at the initial stage of agglomeration development. Therefore, the governments of many countries are eager to construct special economic zones (SEZ) and huge international ports/airports, spending large amount of public funds and economic assistances from abroad. This leads to an international competition in luring agglomeration, but unfortunately, not all of the investments can be rewarded because of the limited market size in developing countries.

Figure 10 above shows that when the market is relatively small, only a single cluster can be sustained in the entire area of the integrated countries. A similar situation can also be demonstrated by Figure 11. This figure depicts the home market effect of the clustering industry by revising Figure 4 for the case where market demand in the integrated economy is so small, as given by Q_F in Figure 11. In this case, there are three equilibria of which the dispersive equilibrium G is unstable, unlike the case of Figure 4. Thus, if two countries compete in investment to attract agglomeration, either of them has to abandon its development plan. As a result, a large amount of investment will be wasted.¹⁴ That is, without any coordination among governments, severe competition among neighboring countries will lead to excess investment for agglomeration-luring.

¹⁴ The government can avoid the passing of agglomeration by enforcing protectionist policies, but it will be accompanied by large costs of misallocated resources.

Figure 11: Prisoner's Dilemma in Development Policy.

Source: author.

4.2.2 Benefits and risks of policy coordination

The agglomeration-luring activities by adjacent countries have a game structure that is of the prisoners' dilemma type, and this is the main cause of the excess investments devoted to industrial agglomeration.

At the initial stage, many neighboring countries have an equal opportunity to obtain a new industrial cluster, and the cluster may be set up by a short-run policy, as discussed previously. In such a situation, it is rather natural for governments of those countries to eagerly invest in cluster-building. To avoid the redundant investment by neighboring countries, those countries need to coordinate their policies in this aspect. For example, the number and location of international airports should be determined in cooperation with neighboring countries, so that the countries can efficiently share the optimal number of airports. Otherwise, each country may try to construct an international airport for its own use, and this is clearly an over-investment. Similar problems can occur in the construction of SEZs for large-scale agglomerations, such as

that on automobiles, electronics, and heavy chemicals.¹⁵

Policy coordination, however, is not a panacea for the efficient resource allocation in agglomeration-luring. It may produce a serious side effect: Coordination can easily shift to collusion. If geographical distribution of clustering industries is determined by negotiation in the intergovernment assembly, then those industries are likely to be separated from market competition. This would make the industries spoiled and cause serious inefficiency in resource allocation. Of course, inefficient producers cannot survive the market competition, and the industrialization may fail in the long run. We are thus placed in a dilemma over what development strategy can be applied and need to look for a better way of allocating investment.

5. CONCLUDING REMARKS

In this chapter, we have examined two forces, dispersion and agglomeration forces, which are brought about by economic integration. These two forces bring different effects on resource allocation in integrated countries. In cases without scale economies, the dispersion force determines industrial location according to each country's comparative advantage, and a competitive equilibrium achieves a Parato optimal allocation. In contrast, if scale economies are at work, the agglomeration force serves as a dynamic source of industrialization and rapid economic development. However, this force tends to bring about inefficiency in static allocation of resources, and it may also produce serious economic disparities among integrated countries as well as among domestic regions within each country.

¹⁵ An effective coordination must be accompanied with some programs to compensate the devolving countries for forgoing benefits of the abandoned facilities, such as international airports and SEZs. It is not easy to design such a compensation program. In practice, this causes difficulty in coordination.

If the dispersion forces alone are at work in the process of integration, all we need are liberalization and facilitation of trade, so as to make the market work smoothly. However, the dispersion force does not seem to dominate in recent East Asia; the flying geese pattern of industrialization is no longer clearly observed, and a growing number of industrial agglomerations have been emerging in various areas of East Asia. The agglomeration force appears to exert significant influences upon the industrial development in this area.

In this situation, what kind of development strategy should be drafted for CLMV countries, so as to catch up? Is it the one that weakens the agglomeration force? –The answer here is No, such a strategy is neither effective nor realistic. Instead, we should try to utilize the agglomeration force aggressively to attract productive industries. To do this, it is important to manage dexterously various nonlinear effects, such as the home market effect, lock-in effect and hub effect, which are all likely to accompany economic integration.

Under the agglomeration force, a long-run industrialization and economic development can be triggered by the success of a short-run program to invite firms at the initial stage of the agglomeration development. However, there are two kinds of difficulties in implementing a successful strategy: (1) difficulty of the government to collect accurate information about the current state of the country, and (2) difficulty in policy coordination among the integrated countries. We should overcome these difficulties, taking into account the actual situation surrounding the country concerned.

REFERENCES

- Arndt, S.W. 2001. Offshore sourcing and production sharing. In Arndt and Kierzkowski (2001).
- Arndt, S.W. and H. Kierzkowski, eds. 2001. *Fragmentation: New Production Patterns in the World Economy*. Oxford: Oxford University Press.
- Baldwin, R., R. Forslid; P. Martin; G. Ottaviano; and F. Robert-Nicoud. 2003. *Economic Geography and Public Policy*. Princeton: Princeton University Press.
- Deardorff, A. 2001. Fragmentation across cones. In Arndt and Kierzkowski (2001).
- Dixit, A.K. and J.E. Stiglitz. 1977. Monopolistic competition and optimum product variety. *American Economic Review*. Vol.67, No.3. Pp. 297-308.
- Ethier, W.J.; E. Helpman; and P. Neary, eds. 1993. *Theory, Policy and Dynamics in International Trade*. Cambridge: Cambridge University Press.
- Fujita, M. and N. Hamaguchi. 2007. Regional integration in East Asia: From the perspective of the new economic geography. In Fujita *et al.* eds. (2007).
- Fujita M., P. Krugman and A. Venables. 1999. *The Spatial Economics: Cities, Regions, and International Trade*. Cambridge, MA: MIT Press.
- Fujita, M.; S. Kumagai; and K. Nishikimi, eds. 2007. *Economic Integration in East Asia: A Combined View from Spatial and Neoclassical Economics*. London: Edward Elgar, forthcoming.
- Fujita, M. and T. Mori. 1996. The role of ports in the making of major cities: self-agglomeration and hub-effect. *Journal of Development Economics*. Vol.49, No.1. Pp. 93-120.
- Jones, R.W. 2000. *Globalization and the Theory of Input Trade*. Cambridge, MA: MIT Press.
- Jones, R.W. and H. Kierzkowski. 2001. A Framework for fragmentation. In Arndt and Kierzkowski (2001).
- Krugman, P. 1991. *Geography and Trade*. Cambridge, MA: MIT Press.
- Krugman, P. 1993. The hub effect or threeness in interregional trade. In Ethier *et al.* eds (1993).
- Marshall, A. 1920. *Principles of Economics*. Eighth edition. London: MacMillan.
- Mori, T. and K. Nishikimi. 2002. Economies of transport density and industrial agglomeration. *Regional Science and Urban Economics*. Vol.32, No.2. Pp. 167-200.
- Nishikimi, K. 2007. Specialization and agglomeration forces of economic integration. Chapter 3 in Fujita, M. *et al.*, eds (2007).