



# The “flying geese” model of Asian economic development: origin, theoretical extensions, and regional policy implications

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## Abstract

This paper presents a comprehensive review of the “flying geese” (FG) model, which recently has become well known as a way of explaining rapid economic growth in East Asia. Kaname Akamatsu’s 1930s work introduced the concept. Through statistical analysis of industrial development in pre-war Japan, this author followed Akamatsu in developing a theoretical model called Kojima Model I. Subsequent works produced Kojima Models II and III.

The regional transmission of FG industrialization has been noted as an engine of Asian economic growth, due in part to Saburo Okita’s forceful presentation of the theme of the FG model in a 1985 lecture. It is hoped that this paper will help to advance a better understanding of the FG model, its historical origin, its theoretical extensions, and its relevancy, as well as its incompleteness as a model of economic development. © 2001 Elsevier Science Inc. All rights reserved.

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## 1. Introduction

The “flying geese” (FG) pattern of economic development has recently become quite well known throughout the world as a way of describing rapid economic growth in East Asia. Such a description is widely used, as if it is a self-explanatory phenomenon; however, the

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exact meaning of the term is not specified, and its origin not clearly understood. The purpose of this paper is to clarify the relatively unknown and often neglected background of the FG model.

The phrase “flying geese pattern of development” was coined originally by Kaname Akamatsu in the 1930s (Akamatsu, 1935; Akamatsu, 1937) articles, both in Japanese, and presented to world academia after the war in 1961 and 1962 articles in English. (These Akamatsu originals are reviewed in Section 2.)

The FG model intends to explain the catching-up process of industrialization in latecomer economies, which consists of: (i) a basic pattern, i.e., a single industry grows tracing out the three successive curves of import, production, and export; and (ii) a variant pattern in which industries are diversified and upgraded from consumer goods to capital goods and/or from simple to more sophisticated products. Akamatsu discovered these two patterns, which looked like a flying geese formation, through statistical analysis of industrial development in the prewar Japanese economy. Kojima introduced a theoretical model in which the accumulation of physical and human capitals causes the economy to diversify first to more capital-intensive key industries and then to rationalize them so as to adopt more efficient production methods. Such diversification/rationalization paths are repeated in moving the economy towards the higher stages of production and export. This is Kojima Model I, which is one of the theoretical pillars for the FG paradigm.

The FG pattern of industrial development is transmitted from a lead goose (Japan) to follower geese (Newly Industrializing Economies (NIEs), ASEAN 4, China, etc.). This regional spread of the FG development is discussed in Section 3.

The development of the Akamatsu original was stimulated by the appearance of Vernon’s “Product Cycle” theory (Vernon, 1966). Furthermore, Okita’s address (Okita, 1985) made the FG model very popular, but it created such a misunderstanding that the model came to be applied to regional transmission itself while forgetting the importance of the catching-up process.

The regional transmission of FG industrialization has been facilitated by the “pro-trade-oriented FDI” mechanism, through which an investing country’s comparatively disadvantageous production is transplanted onto a host country in such a way as to strengthen the latter’s comparative advantage. This type of comparative advantage augmentation via FDI brings about an expansion of production and trade and results in “FDI-led growth” in the regional economies involved.

Such pro-trade-oriented FDI constitutes a second theoretical pillar for the FG model. FDI is upgraded along the ladder of industry and extended to many developing economies, and such FDI spread is stylized as an “investment frontier” map.

The theory of “agreed specialization” (a third theoretical pillar for the FG model) is presented as an effective measure to increase intra-industry trade in an integrated region.

In Section 4, a number of important comments on the regional transmission of FG industrialization are discussed. Most of them support our proposition but some are critical from the viewpoint of dependency theory and in the wake of the 1997 to 1998 Asian financial crisis. By reviewing these comments, we broaden the issues that the FG model has to investigate.

Section V shows the fact that building the Asia Pacific Economic Community (APEC) has

been based upon the FG pattern of development since Kojima is its founding father. The East Asian group that consists of ASEAN plus 3 (Japan, China, and Korea) should foster regional development *à la* the FG model by keeping an open regionalism, which will not set up an institutional integration but will remain consistent with a multilateral, nondiscriminative, free-trade regime of the General Agreement on Tariffs and Trade (GATT)/World Trade Organization.

## 2. Akamatsu's original FG model

The late Akamatsu Kaname (1896~1974), professor emeritus of Hitotsubashi University, coined the phrase “*Ganko-Keitai*” in his 1935 and 1937 articles (see References). It was later translated as “flying geese pattern” in his 1961 and 1962 papers.<sup>1</sup> It is a theory to explain a sequential development of manufacturing industries in developing economies. The essence of the FG model may be summarized by directly citing key observations from Akamatsu's English articles, as follows:

“The wild-geese-flying pattern of industrial development denotes the development after the less-advanced country's economy enters into an international economic relationship with the advanced countries” (Akamatsu, 1962, p. 11.).

This means that the FG model aims at addressing the catching-up process of industrialization in developing open economies.

### 2.1. Basic pattern of development of industry

“Wild geese fly in orderly ranks forming an inverse V, just as airplanes fly in formation. This flying pattern of wild geese is metaphorically applied to the below-figured three time-series curves each denoting import, domestic production, and export of the manufactured goods in less advanced countries” (Akamatsu, 1962, p.11).

This is the *basic* (or fundamental) pattern which is the sequence of import (*M*), domestic production (*P*), export (*E*) occurred in a certain industry. From empirical studies (see also Akamatsu, 1950, 1965), Akamatsu drew the basic sequential curves for a consumer good, X (say, cotton textile) in Meiji Japan as shown in Fig. 1a, and for a capital good, Y (say, textile machinery) in Fig. 1b.

Stage I. “When an underdeveloped nation first enters the international economy, the primary products, which are her specialties, are exported and industrial products for consumption are imported from advanced nations. [Because the latter's more advanced factory products are superior in quality and cheaper in price.] (Akamatsu, 1961, p. 206.)

Stage II. “At the second stage of the growth of an underdeveloped nation, domestic production of imported goods is initiated, with the domestic market as an outlet. This is due to the fact that concentration of purchasing power on such articles makes their domestic production profitable, and domestic capital is drawn to this activity. The development of consumption by imports is nothing less than an establishment of the foundation for self-production. Further, national economic policy stimulates this trend toward domestic production when it appears.

Fig. 1 Flying Geese Pattern of Industrial Development

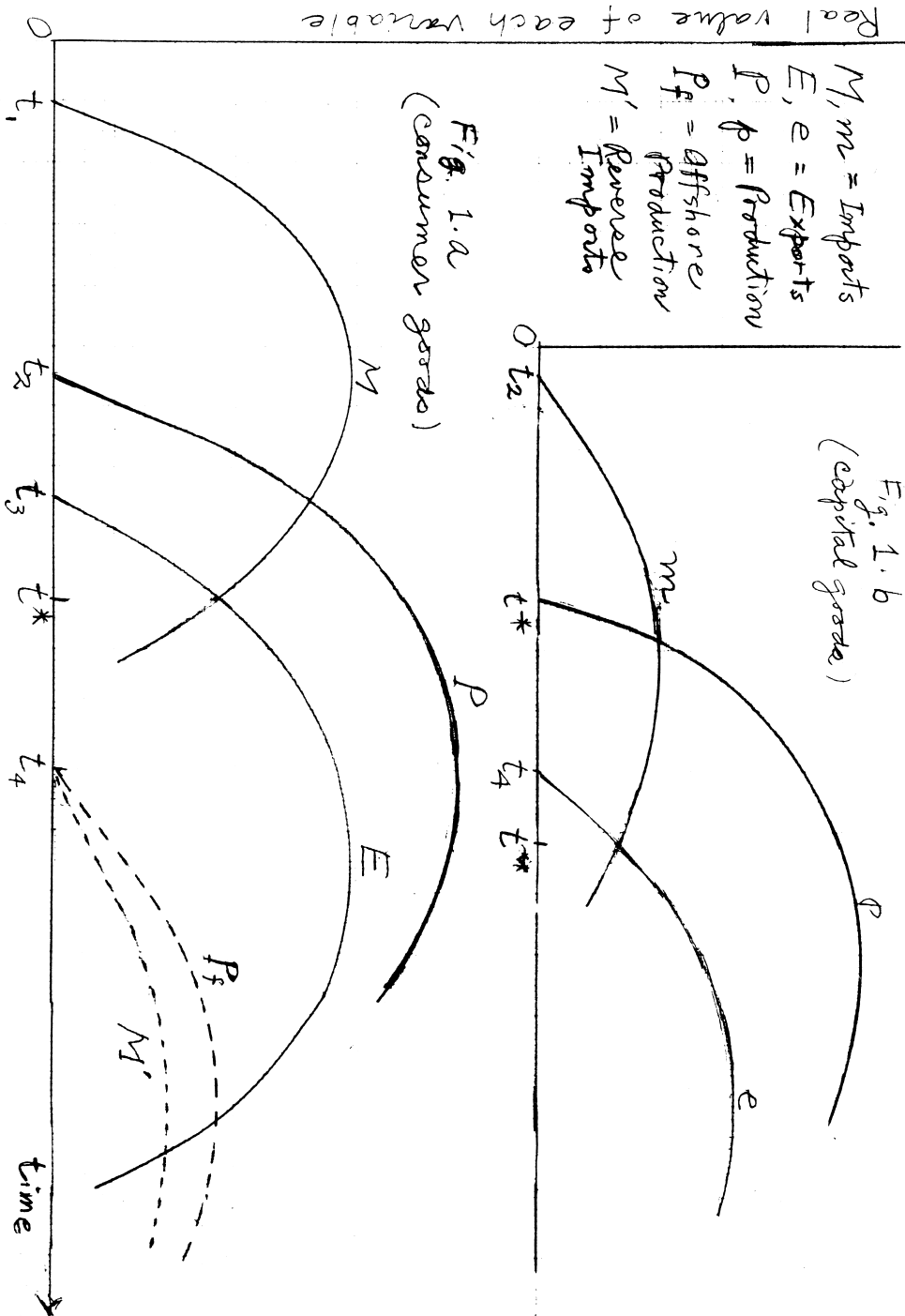


Fig. 1. Flying geese pattern of industrial development

The import of manufactured consumer goods from advanced nations stagnates and then decreases. On the other hand, however, machinery must be imported, from advanced nations because of the sudden rise of consumer goods industries“ (Akamatsu, 1961, p. 206–207).

In Fig. 1a, the import of consumer good ( $X$ ) increases from  $t_1$  to  $t_2$ . At  $t_2$ , domestic demand becomes large to be enough to set up optimal scale plants, making it possible for profitable domestic production to begin. Thus, at  $t_2$ , the  $P$ -curve starts to increase in Fig. 1a, and the imports ( $m$ ) of capital goods ( $Y$ ) also rise as shown in Fig. 1b.

Stage III. “This is the stage when the domestic consumer goods industry develops into the export industry. By this time most of the domestic markets have turned into markets for domestic industrial goods. As production is put on a larger scale for mass production, the products are exported in increasing numbers to overseas markets. Simultaneously, the domestic production of hitherto imported machinery comes to the fore, while the import of capital goods, which are substitutes for domestic machinery, begins to decline in turn” (Akamatsu, 1962, p. 14).

In Fig. 1a, around  $t^*$ , as far as consumer goods are concerned,  $E$  increases, whereas import ( $M$ ) declines, making trade in balance. At the same time,  $P$  becomes equal to domestic demand ( $D$ ), since  $D = P - E + M$ . This situation reflects a successful implementation (or graduation) of the catching-up process of the industry concerned along the sequential path of  $M$ - $P$ - $E$ , which is the *basic* pattern of the FG model. Now the industry is able to turn from import substitution (Stage II) toward export-led growth.

## 2.2. Variant pattern of diversification of industries

Besides the basic pattern above identified, the FG model allows a *variant* (or subsidiary) pattern:

“Although reference is made here simply to consumer goods and capital goods, there are many kinds and qualities of consumer goods and capital goods. Accordingly, the sequential phenomenon of  $M$ - $P$ - $E$  occurs not only in connection with capital goods following consumer goods, but also in the progression from crude and simple goods to complex and refined goods” (Akamatsu, 1961, p. 208).

The diversification (or pluralization) of products (or industries) is thus classifiable into two patterns. One is an intra-industry cycle created by the emergence of new products within an existing industry, e.g., from cotton to woolen to synthetic textiles, or from crude and simple goods to complex and refined goods. The other is an inter-industry cycle exhibiting the development of a new industry, e.g., from textiles to steel to shipbuilding to autos to computers, or from consumer goods to capital goods.

Each cycle, either intra- or inter-industry, repeats the basic FG pattern enhancing efficiency and competitiveness of an industry, which may be called a *rationalization of production*. The intra-industry cycle also raises value-added and brings about growth of an industry. On the other hand, a *diversification of production* through inter-industry cycles upgrades the structure of industries and exports. Thus, interactions between, and parallel progress in, the rationalization and diversification of production (i.e., the basic and variant FG patterns occurring at the same time) stimulate national development.

### 2.3. Empirical studies

By 1975, only 1 year after Akamatsu's death, many empirical studies had been published by Akamatsu (posthumously) and his pupils. All verified the existence of the basic FG pattern in the development of various products and intra-industry, along with the inter-industry cycles for a number of industries in the Japanese economy, both prewar and postwar, as well as in some foreign countries (e.g., Korea and Thailand). But these studies written in English were limited to Shinohara (1961), Rapp (1967), and Yamazawa (1972, 1975, 1990). During the war, Akamatsu's 1935 and 1937 originals were unknown abroad, but after his postwar English papers were published in 1961 and 1962, a number of favorable evaluations on the Akamatsu FG model began to appear in foreign literature, e.g., Zimmerman (1965), Higgins (1969), Sautter (1973), and Rapp (1967, 1975).

### 2.4. Kojima Model I: diversification and rationalization of industries

A theoretical model building of FG development with respect to the basic and variant patterns of FG development was started by Akamatsu's principal pupil, first in Japanese (Kojima, 1958) and later in English (Kojima, 1960).

A two-factors and two-goods case is illustrated in Fig. 2 *à la* factor proportions (or Heckscher–Ohlin) theorem. The production functions of the two goods are represented by single isoquant,  $X$  and  $Y$ , showing the combinations of labor and capital required to produce a unit of output. The factor intensity, shown by the slope of a product expansion path, say,  $Oa_1$  and  $Ob_1$  is assumed that X-industry is relatively more labor intensive, whereas Y-industry is more capital intensive for any factor price ratio. If the factor price ratio,  $\omega = \text{wage/rental}$ , is represented by the slope of the common tangent  $MN$  to the isoquant  $X$  and  $Y$ , both goods are produced at the optimal factor combination  $a_1$  and  $b_1$ , and their costs (= prices) are the same or 1:1 ( $OM$  measured in terms of labor,  $ON$  measured in terms of capital). If the factor price ratio represented by the slope of  $M'N'$  and  $M''N''$ , both being parallel to each other, or in other words, if wage becomes relatively dearer, the optimal factor combination will be  $a_2$  and  $b_2$ , meaning a more labor saving/capital using method of production, the cost (= price) of Y-goods (i.e., more capital intensive products) will be cheaper than X-goods (i.e., more labor-intensive products).

The factor endowment ratio, i.e., total capital ( $K$ )/total labor ( $L$ ) of the economy is represented by the slope of a  $\lambda$  line. The closer is the  $\lambda$  line to one of the optimal factor combinations, say  $a_1$ , the larger is the factor allocation and consequently the output share for that industry, and vice versa.<sup>2</sup> When, as shown in Fig. 2, the  $\lambda$  line goes through  $a_1$ , the economy will completely specialize in the production of X-goods, which achieves comparative advantage because its relative cost is lower than in the other case with dearer wage.

Now the economy specializes in the production of X-goods, which is a labor-intensive industry relative to Y-goods and, accordingly, as the economy grows the demand for labor input will increase and relative wage will rise. Then it becomes more rational for the economy to increase its factor allocation to Y-production, the more labor-saving industry, by moving the optimal factor combinations from  $a_1$  to  $a_2$  in X-industry and from  $b_1$  to  $b_2$  in Y-industry. This is a structural change of industries towards upgrading diversification and is

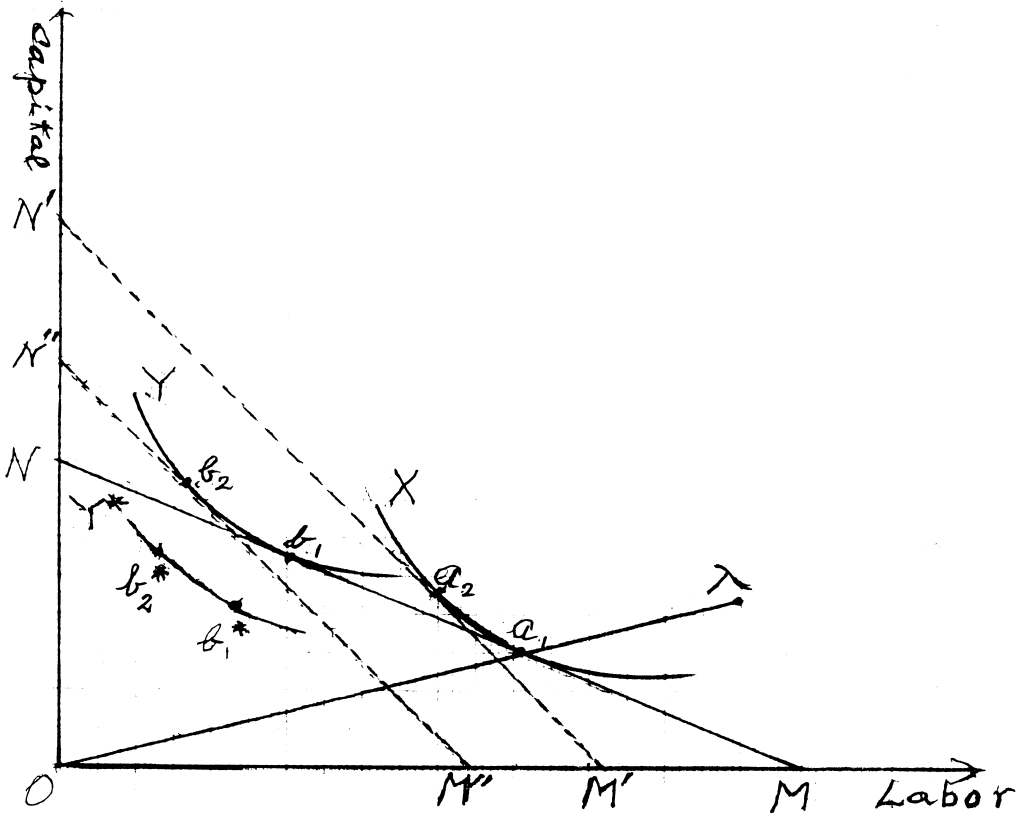


Fig. 2.

made possible due to the progress of capital accumulation with which the  $\lambda$  line becomes steeper, approaching closer to  $b_2$ .

There is another possible path for economic growth, i.e., through a rationalization of industries. This path is illustrated by using the same Fig. 2. Let us suppose the  $Y$ -isoquant shows a unit cost to produce  $Y$ -goods by using an inferior  $\alpha$ -mode of production, whereas the  $Y^*$ -isoquant represents a superior  $\beta$ -mode. This is a Hicks-neutral technological progress. To compare optimal production point  $b_1^*$  with  $b_1$ , the new superior mode results in a reduction of unit cost under the same factor price ratio and factor intensity.

The rationalization of industry is made possible by technological progress, economies of scale, “learning-by-doing,” and accelerated intra-industry product cycle. Instead of the movement along an isoquant, the rationalization of an industry brings about the shift of isoquant from the inferior  $\alpha$  production mode to the superior  $\beta$  one.

Both the diversification move towards a more capital-intensive industry and the rationalization move towards a superior mode of production enhance the efficiency of the economy as a whole and raise its wage rate or per capita income level, which is after all the essence of economic development. But because both paths require the accumulation of capital, physical as well as human, it is necessary to undertake them alternately. In Japan, the

structural change of creating new key industries was undertaken first, and then a steady rationalization of that industry followed. These two processes comprise one development stage, taking 20 to 25 years. The alternate promotion of diversification and rationalization led to a reinforcing effect in rapid production growth and trade expansion.<sup>3</sup>

The sequencing of development stages occurred naturally as it was guided by the growth of demand, in both home and foreign markets, supported by the rapid accumulation of capital due to a high saving ratio, and stimulated by effective technological progress. Presently, the inflow of foreign capital facilitates this catch-up process in developing economies.

### 3. Regional transmission of FG development

#### 3.1. Third pattern of FG development

In his postwar articles, Akamatsu added a third pattern of intercountry alignment in order to explain the international (or regional) transmission of FG development from a lead goose to follower geese.

Stage IV. “In the third stage the consumer goods industry was already homogenized (or uniform) with that of the advanced countries, attaining the same standard as that of the advanced countries; therefore, those countries are no longer less-advanced countries as far as this industry is concerned but have joined the ranks of advanced countries as an exporter of these goods. In the fourth stage this advanced status is further elevated. A characteristic phenomenon of this stage is that the export of consumer goods begins to decline. This is attributable to the fact that consumer goods are put into production in other less advanced countries and development in a wild-geese-flying pattern is under way. Another feature is that in this stage, capital goods domestically produced in the third stage begin to be exported. In other words, in place of the decreasing export of consumer goods, capital goods are exported and reach the stage of high-degree heterogeneity (or differentiation) in regard to other less advanced countries.

Furthermore, with regard to this sequence, that is, a wild-geese-flying pattern sequence, the underdeveloped nations are aligned successively behind the advanced industrial nations in the order of their different stages of growth in a wild-geese-flying pattern“ (Akamatsu, 1961, p. 208).

“The less-advanced ‘wild geese’ are chasing those ahead of them, some gradually and others rapidly, following the course of industrial development in a wild-geese-flying pattern.

The advanced “wild geese,” which are in the lead flying onward, incessantly achieving technological innovations and trying to maintain a certain distance of heterogeneous (or dissimilar) difference from the less-advanced ‘wild geese’“ (Akamatsu, 1962, p. 17–18).

#### 3.2. Kojima Model II: pro-trade-oriented (PROT) foreign direct investment (FDI)

For a lead goose country (say, A), the phase of post-catch-up situation ( $t^*$ ) in Fig. 1 prevails. Exports of consumer goods,  $E$ -curve, continue to rise up to a peak at  $t_4$  and then decline because such labor-intensive consumer goods (say, textiles) are losing comparative



advantage due to a rapid rise in wages, which, however, is a benefit of economic growth. A follower goose, say country B, whose wage level is much lower, now begins to produce textiles. This production is facilitated if lead goose A's firms make FDI by transferring capital, superior technology, and managerial skills as a package to the follower goose B. This enhances the productivity of A's foreign production,  $P_f$  in Fig. 1a, which represents a comparative advantageous industry in country B. Its products are sold in both local and foreign markets, and some portion is imported back to country A, i.e., reverse imports,  $M'$ , curve. Meanwhile, country A's exports of capital goods ( $e$ -curve, to country B in Fig. 1b) increase with an enlarged scale of production and reduced costs. This is what Kojima called "Pro-trade oriented FDI."<sup>4</sup> This constitutes the second theoretical pillar for the FG model.

The most important characteristic of PROT-FDI is that a FDI is undertaken from an investing country's comparatively disadvantaged industry (i.e., country A's X-industry), making its foreign production in country B to achieve a stronger comparative advantage through providing appropriate capital goods and technology (i.e., a borrowed technology from the viewpoint of host country). In lead country A itself, output and export of capital goods, Y, is expanded, enhancing comparative advantage, as the resources released from X are reallocated to Y.

FDI thus augments comparative advantages in both countries, resulting in an expanded basis for trade and a reinforced productivity growth.<sup>5</sup> As long as this type of FDI is promoted, an FG stimulus of industrialization is transmitted sequentially from a lead goose to follower geese, bringing about enlarged trade and co-prosperous economic growth. This is nothing else but the "FDI-led growth" of regional economies, which is a prime motive for building regional integration.<sup>6</sup> Moreover, FDI creates substantial spillover effects. Foreign affiliates generate, through backward and forward linkages, supporting industries and employment. They contribute to developing local entrepreneurship and managerial and technical skills. They improve the quality and morale of labor through training and education. Ultimately, FDI induces "reforms" in production methods, employment systems, business management, and even laws and political organizations. Such reforms are most needed to climb up the ladder of development stages.

### 3.3. Vernon's "Product Cycle" theory

The posthumously published essay by Akamatsu (1975), which had been written a few days before his death on December 20, 1974, addresses  $P_f$ - and  $M'$ -curves shown in Fig. 1a. This essay was influenced by Vernon's "Product Cycle" theory and Kojima's PROT-FDI mentioned in the above.

The basic pattern of FG growth of a single industry, that is the sequential  $M$ - $P$ - $E$  curve, may be properly called a "catching-up product cycle" in a developing economy which, depending upon borrowed technology and capital, increases economies of scale through "learning-by-doing," and thus international competitiveness, and enables catching-up with the advanced world. Once domestic production is rationalized, firms are confronted with a task to extend PROT-FDI abroad and/or to diversify their production structure, at home.

In contrast, Vernon is concerned with a "genuine product cycle" of a new product that is innovated in the most advanced country, the US, although the process of innovation itself is

left unexplained. Along the growth of the new product, firms undertake FDI in their efforts to enter the import-restricting countries. Once they succeed in jumping tariffs and other trade barriers, they monopolize (or oligopolize) local markets by preventing other multinationals' entries. This is what I call an "antitrade oriented (or, in brief, ANT-) FDI." Because the FDI of this type is undertaken against the pattern of comparative advantages, the original exports, as well as the domestic output, of the new product will decrease, and a "hollowing out" of the home industry may occur. Besides, the benefits for the host country are dubious. It may be better for the host country to liberalize trade than to allow an oligopolistic intrusion of multinationals.

Vernon's model actually suggests another type of FDI. When a new product reaches its mature stage, it becomes standardized with technologically stable production. Instead of the decisive role played by research and development activities or managerial skills, as at the earlier stage, unskilled and semiskilled labor becomes important, especially in the mature stage production characterized by high labor intensity. Accordingly, the production location move through FDI to low-wage developing countries, which now have a comparative advantage in such a matured product. This is Kojima's PROT-FDI.

### 3.5. Bruce Cumings' comment

Interestingly, Cumings (1984), perhaps a dependency theorist, refers to the Akamatsu FG model after reading *Japan and a New World Economic Order* by Kojima (1977):

"For Japan the product cycle has not been mere theory; it has melded with conscious practice to make Japan the preeminent example of upward mobility in the world system through successive waves of industrial competition. In the 1930s, Kaname Akamatsu elaborated his famous FG model of industrial development in follower countries, predating Vernon's work by several decades. Time-series curves for imports, import-substitution for the domestic market, and subsequent exports of given products tend to form a pattern like wild geese flying in ranks. The cycle in given industries—textiles, steel, automobiles, light electronics—of origin, rise, apogee, and decline has not simply been marked, but often mastered, in Japan; in each industrial life cycle there is also an appropriate jumping off place, that is, a point at which it pays to let others make the product or at least provide the labor. Taiwan and Korea have historically been receptacles for declining Japanese industries" (Cumings, 1984, p. 150–151).

He continues to observe:

"The product cycle is a middle-range explanation for the waxing and waning of industrial sectors, and that it is imbedded in some larger structure—an international division of labor or a world economy" (Cumings, 1984, p.153.).

However, the product cycle Cumings describes here is not really Vernon's but his own interpretation.

Other dependency theorists, Bernard & Ravenhill (1995) use "Flying Geese" and Vernon's "Product Cycle" theories interchangeably. It is right to do so as long as FDI is PROT, but wrong if it is antitrade oriented.

Originally, the FG pattern of development applied solely to the catching-up phase of industrialization in latecomers, but we would also like to include the post-catch-up phase as well. Multinationals now play a very important role in regional integration.

### 3.6. Okita's address in 1985

The late Okita Saburo (1914–1993), a famous Japanese economist and a foreign minister in 1980, introduced the FG pattern of development to the wider audiences from Asia, USA, Canada, Australia, New Zealand, and Latin America, when he presented a speech at the fourth Pacific Economic Cooperation Council conference held in Seoul in 1985:

“The division of labor in the Pacific region has aptly been called the FG pattern of development . . . Traditionally, there have been two patterns or types of international division of labor: the vertical division of labor such as prevailed in the 19<sup>th</sup> century to define relations between the industrialized country and the resource-supplying country or between the suzerain and the colony; and the horizontal division of labor typified by the EEC with its trade in manufactures among industrialized countries, often among countries at the same stage of development and sharing a common culture. By contrast with both of these types, the FG pattern represents a special kind of dynamism. In the Pacific region, for example the United States developed first as the lead country. Beginning in the late 19<sup>th</sup> century, Japan began to play catch-up development in the nondurable consumer goods, durable consumer goods, and capital goods sectors in that order. Now the Asian NICs and the ASEAN countries are following in Japan's footsteps. . .

Because there is such great variety in the Asian nations' stages of development, natural resource endowments, and cultural, religious, and historical heritages, economic integration on the EEC model is clearly out of the question. Yet it is precisely this diversity that works to facilitate the FG pattern of shared development as each is able to take advantage of its distinctiveness to develop with a supportive division of labor (Okita, 1985, p. 21).

This is nothing but the third pattern of FG development. Due to Okita's status, the FG pattern has become very famous and popular not merely in the academic circle, but also in the political, business, and even journalistic world. The pattern was thought to symbolize the Asian way of development that was creating the “miracle of East Asia.”

### 3.7. Investment frontier

Through intensive statistical works Kojima (1995) found that Japan's FDI has been of the PROT type, which exhibits a pattern of an “investment frontier” akin to a warm front in a weather map.

Fig. 3 is drawn with two assumptions. (a) An economy's industrial structure is diversified and upgraded in a sequence from X (textiles and other labor-intensive goods) to Y (steel, chemicals, and other capital-intensive goods), and further to Z (machinery and other capital/knowledge-intensive goods). This industrial shift occurs *horizontally* over time. (b) The FG pattern of industrialization is transmitted through PROT-FDI from economy A, the lead goose or Japan, to follower geese B (or, NIEs), C (or, ASEAN 4), and D (or, China) according to the order of industrialization stage or per capita income level. This geographical spread takes place *vertically* over time. The passage of time is indicated by dotted lines I, II, III, and so forth.

At period I, Japan graduates from the catching-up process in X-industry, and there is no outward FDI yet. At period II, Japan now achieves a comparative advantage in Y-industry

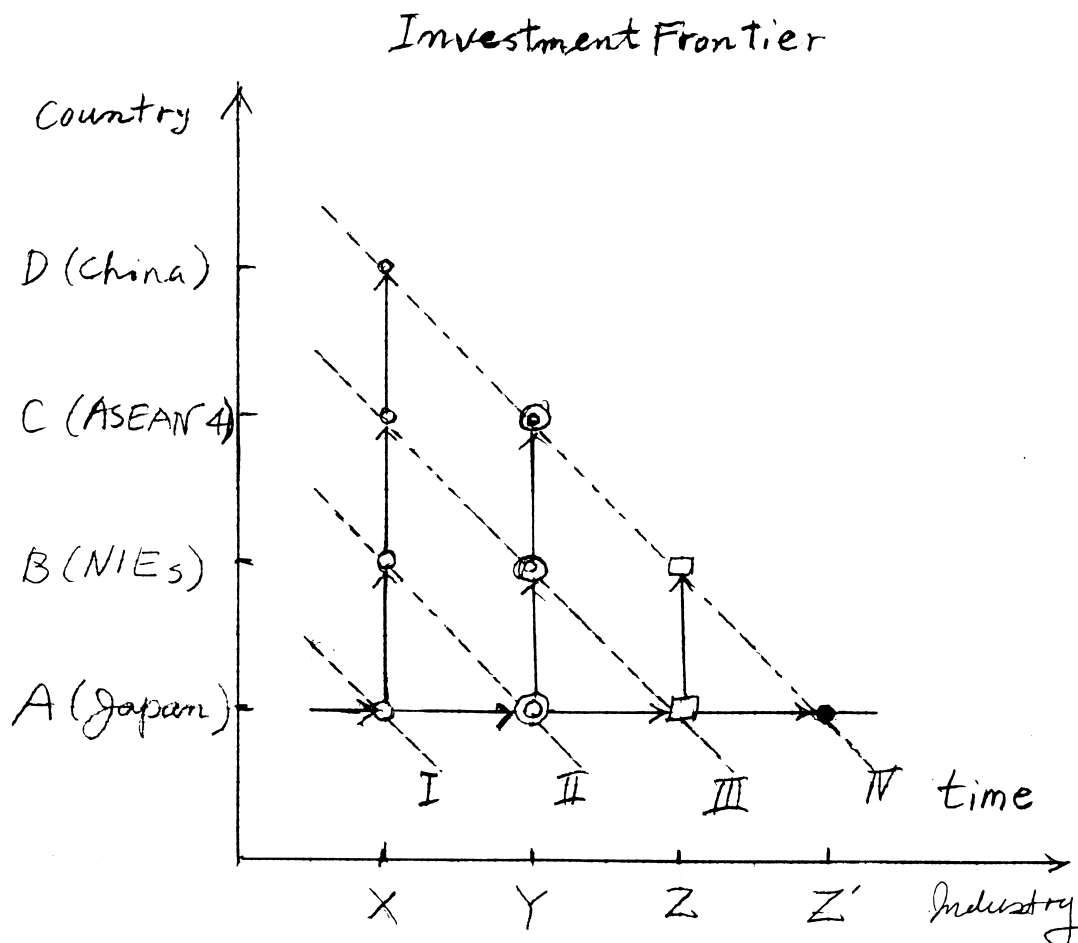


Fig. 3. Investment Frontier

and invests in country B's X-industry (i.e., PROT-FDI). By period III, Japan upgrades its comparative advantage to Z-industry, and invests in country B's Y-industry and country C's X-industry. At period IV (say, the year 2000), the future progress of Japan's industrialization is yet unclear, but her investment has spread widely toward country B's Z-industry, country C's Y-industry, and country D's X-industry.

### 3.8. Kojima Model III: agreed specialization

In accordance with the regional spread of FG industrialization, the structures of industry and exports in each country converge into a more or less similar pattern. Hence, intra-industry trade promotion becomes important in order to avoid trade conflicts and, moreover, to foster regional integration.

Kojima (1970) presented a "theory of agreed specialization," by elaborating by his 1970 and 1992 papers, which are concerned with the third pillar of the FG model.

Let us suppose the following average cost (AC) function:

$$AC = c(x)/x = a/x + b \quad \text{if } x < x^* \quad (a, b, x^* = \text{constant}) \quad (1)$$

$$AC = c(x)/x = a/x^* + b \quad \text{if } x > x^*$$

where  $x^*$  is a minimum optimal scale (MOS) of output under a given mode of production. Up to  $x^*$ , technical economies of scale are effective and fixed cost per unit of output,  $a/x$ , decreases continuously. Beyond  $x^*$ , economies of scale exhaust and unit fixed cost,  $a/x^*$ , becomes constant.

Now, let us compare two modes of production,  $i = \alpha, \beta$ . Then, minimum ACs (which equals marginal cost) are as follows:

$$b_\alpha^* = a_\alpha/x_\alpha^* + b_\alpha \quad (2)$$

$$b_\beta^* = a_\beta/x_\beta^* + b_\beta \quad (3)$$

As shown by curve  $A_\alpha S_\alpha$  in Fig. 4, AC decreases up to the MOS output,  $x_\alpha^*$ . It then becomes constant, as line  $S_\alpha A'_\alpha$  shows. Similarly, the curve  $A_\beta S_\beta A'_\beta$  shows AC curve when superior production mode  $\beta$  is adopted.

Now,  $DD'$  curve represents demand for the product under consideration, which is common both to country I and II, whereas  $D_t D'_t$  curve shows the total demand of the two countries taken together. If each country produces independently, supply equals demand at point 1 with  $P_\alpha$ -price. Whereas if, under some agreement, one country entrusts another country to produce the total demand, an equilibrium attains at point 2 with  $P_\beta$ -price. In other words, if the two countries (or firms) agree in such a way that country I specializes in a differentiated good, say X, while country II does the same in another good, say Y, both sides can obtain an increased volume of both goods at lowered price.

In fact, agreed specialization is a very normal affair within the firm. Specialization within the plant or within the department is a de facto agreed specialization, which is planned by the headquarters and agreed upon by each sector.

Import under agreed specialization has a character of offshore-sourcing FDI. It is, therefore, facilitated if FDI is undertaken mutually in a PROT-direction instead of an ANT-direction. However, it is not always necessary to form a wholly owned FDI. Joint ventures, small capital participation, or even an original equipment manufacturing is adequate. An original equipment manufacturing arrangement, for example, means that country I's firm (say, A) entrusts country II's firm (say, B) the production of variety X and uses offshore procurement. And if the firm B reciprocates the offshore procurement of variety Y, then an agreed specialization is realized. It should be remembered that the direction of original equipment manufacturing is pro-trade and diametrically opposite to that of the ordinary FDI of the antitrade type.

There are a number of ways in which such agreed specialization can emerge, either explicitly or de facto within a regionally integrated group, because the integration assures mutual liberalization of trade and investment.

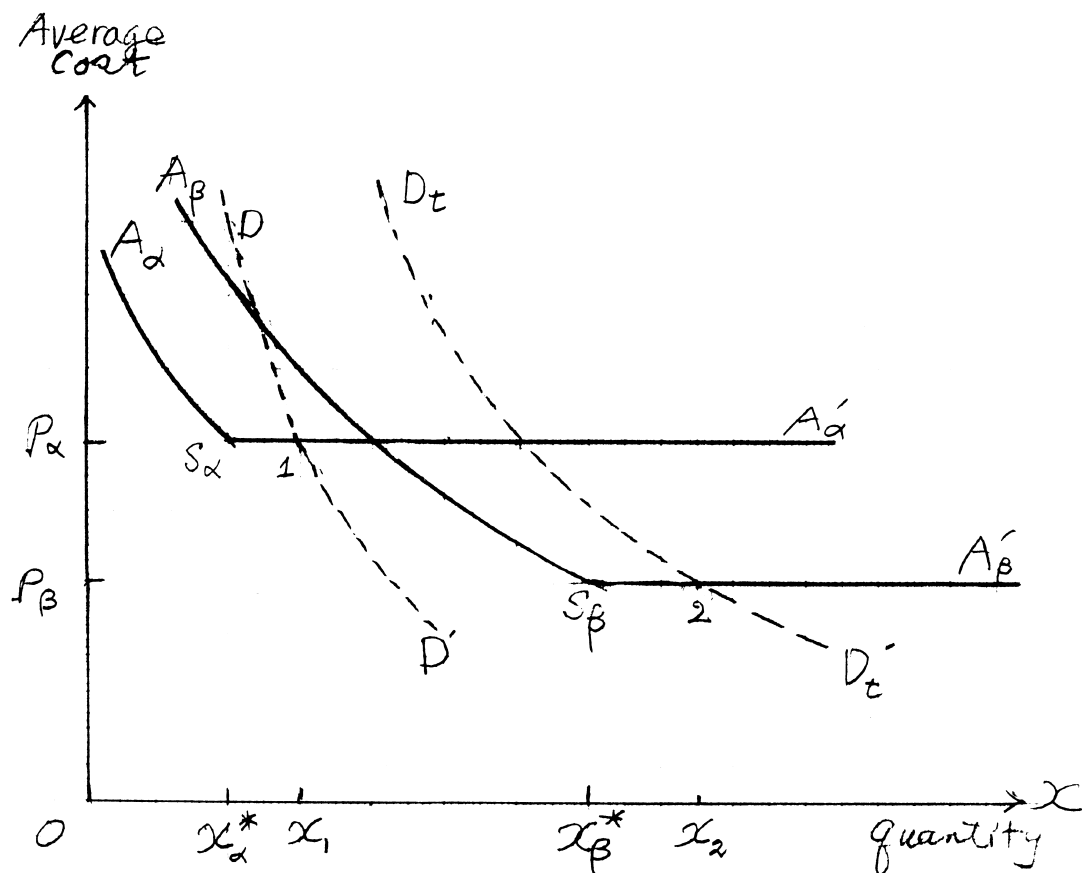


Fig. 4.

#### 4. Publicity of the FG pattern of Asian economic development

Thanks to Okita's influential speech, the FG pattern has been widely accepted, even in official reports, and highly evaluated as "an engine of development in the East Asian flock of economies." Unfortunately, Okita emphasized only the regional transmission pattern of FG development (i.e., the third pattern). Consequently, the FG model came to be identified only with this pattern to the neglect of the other patterns (i.e., the first and second ones). As a result, a number of critical comments appear. Moreover, due to the 1997 to 1998 Asian financial crisis, the Asian miracle theme was seriously discredited. Some of important discussions are briefly reviewed in the following.

##### 4.1. World Investment Report (1995) and other official views

Terutomo Ozawa of Colorado State University is one of the closest collaborators of Kojima's studies, as best seen in a coauthored paper (Kojima & Ozawa, 1984) and (Ozawa, 1996). In his several papers (e.g., 1991, 1992, 1993, 1996), Ozawa summarizes the Akamatsu original neatly in terms of the "natural-order-of-development-sequencing" proposition. Then,

he draws a diagram depicting the three-stage transmission process of Japanese (lead goose) FG pattern of industrial development to Asian developing economies (follower geese), a diagram akin to Fig. 3. He also has recently begun to construct a financial-side model of FG development (Ozawa, 1999).

Following Ozawa's advice, the *World Investment Report* (an annual report prepared by United Nations Conference on Trade and Development, 1995, Division on Transnational Corporations and Investment) devoted Chapter V to examine the "interactive restructuring (of Asian economies) assisted by transnational corporations." The Report discusses extensively the FG paradigm (in Box 5.4, pp. 258–260) consisting of Akamatsu's basic pattern and Kojima's of theory of PROT FDI.

The Report presents an elaborated statistical table (p. 242) on postwar structural changes in the Japanese economy and its outward FDI. The relations between structural changes and FDI outflows can be elaborated as shown in Fig. 5, involving the sequence of production ( $P$ ), exports ( $E$ ), and FDI ( $F$ ) in three categories of manufacturing, X (labor intensive light industries), Y (heavy and chemical industries) and Z (machinery).<sup>7</sup>

In Fig. 5a,  $P_X$ , the share of X-goods in total manufacturing production and  $EX$ , its share in total manufacturing export run downward in parallel fashion from the peak in 1955. At the same time,  $P_Y$  and  $E_Y$  for Y-goods increased, also in parallel fashion, slightly to their peak in 1970, 15 years later than in X-goods, and then began to decline toward 1990. In contrast,  $P_Z$  and  $E_Z$  for Z-goods rose rapidly from 1970 all the way to 1990. In other words, the parallel growth of both production and export indicates the FG pattern in the sequence of X- to Y- to Z-goods with a certain time lag of 15 and 20 years, respectively. In Fig. 5b, a similar FG pattern of growth for FDI outflows appeared in  $F_X$  first and  $F_Y$  followed, 15 years later than their production/export growth. This time lag reflects the fact that FDI was undertaken from a comparative advantage-losing industry *à la* the PROT type. But  $F_Z$  increased rapidly, almost parallel to  $P_Z$  and  $E_Z$  (in Fig. 5a). This means that FDI in Z-industry was undertaken mainly to enhance intra-industry specialization.

Returning to the *World Investment Report* (1995), it concludes:

"According to this paradigm, a group of economies advances together because of mutual interactions between countries through demonstration effects, learning and emulation, with the transmission mechanism being flows of people, trade in goods and services, flows of FDI, technology and other TNC-related assets. A characteristic feature of the 'flying-geese' pattern in Asia has been the increasing role of TNCs. Initially through nonequity arrangements and joint ventures and, more recently through FDI.

The relative importance of the various factors that made the 'Asian miracle' possible are debatable (World Bank, 1993). There is no doubt, however, that, apart from government and local private business, TNCs have been a factor among the forces that spurred restructuring and economic development" (UNCTAD, 1995, p. 258).

The rapid *sequential* growth of East Asian economies is stressed in both the report of the World Bank (1993) and of the Asian Development Bank (1997), even though they do not explicitly refer to the FG pattern.

On the other hand, in Japan, *Tsushou Hakusho* by the Ministry of International Trade and Industry (1992; p. 138) and *Sekai-keizai Hakusho* by the Economic Planning Agency (1994;

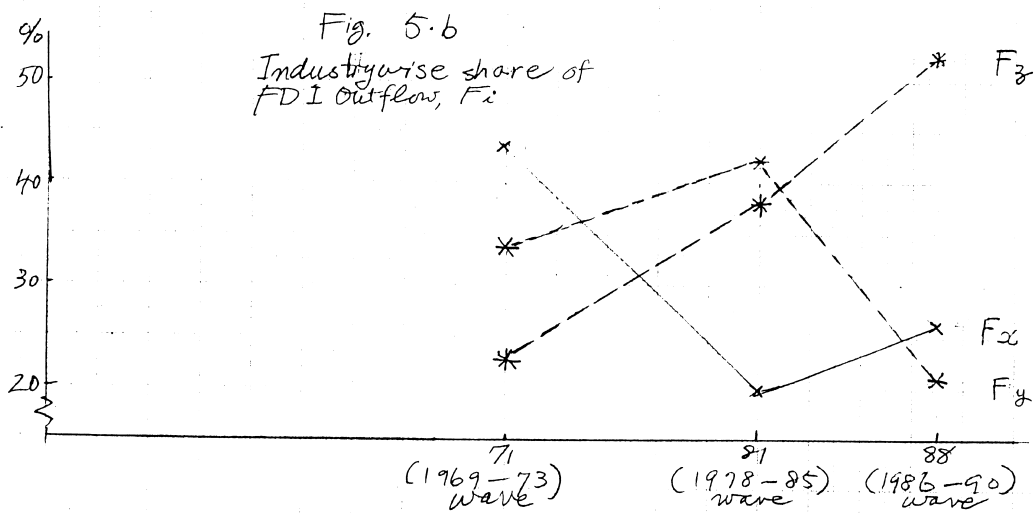
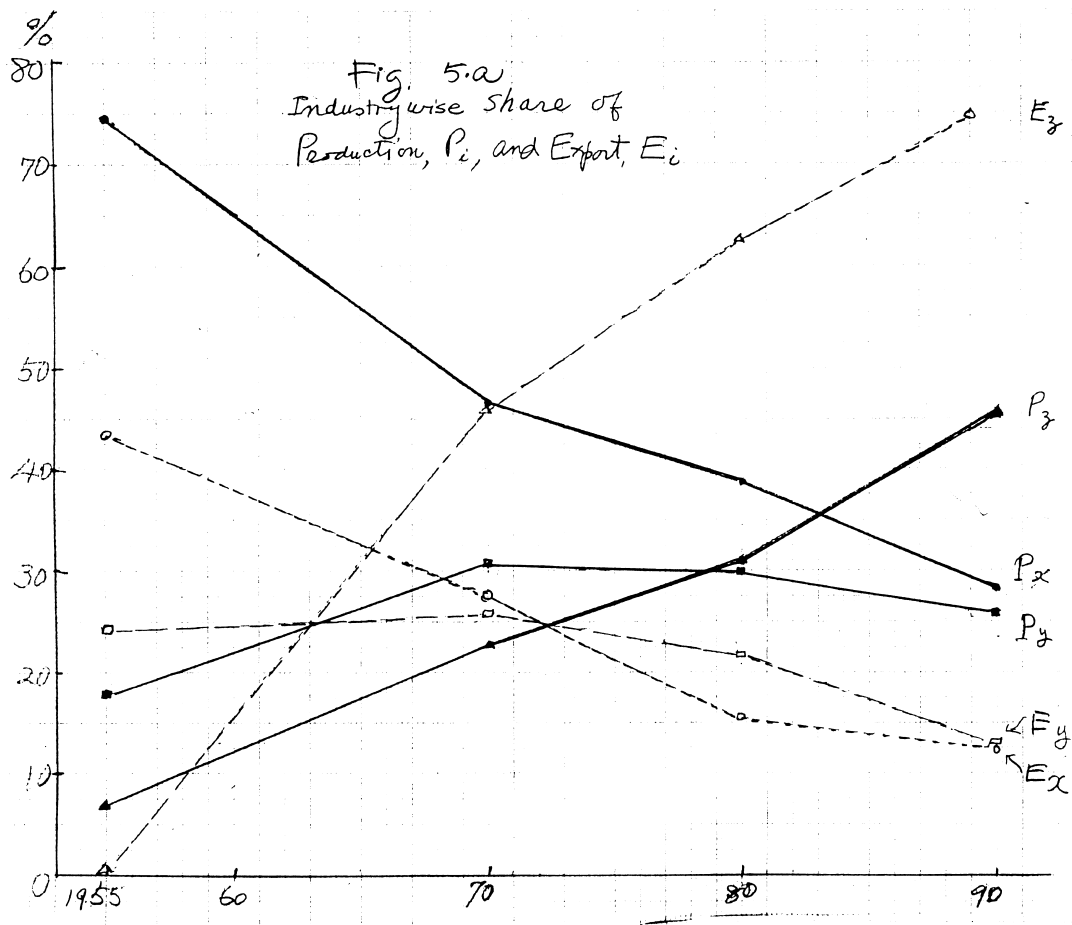


Fig. 5. (a) Industrywise share of production,  $P_i$ , and export,  $E_i$ . (b) Industrywise share of FDI outflow,  $F_i$ .



p. 120) mention specifically and officially the “FG pattern” in order to explain the sequential catching-up process in Asian economies.

Recently, a study group headed by Ito Takatoshi at the Economic Research Institute of Japan’s Economic Planning Agency (2000), emphasized the importance of upgrading of industrial structures in Asian developing economies *à la* FG model, rather than the GDP analysis along the lines of classical, neo-classical, or endogenous growth theory, which are used by both the World Bank and the ADB reports

#### 4.2. Supporting researches to FG regional growth

A large number of researches has come to, besides the official views mentioned above, support the FG pattern of regional spread of industrial development.<sup>8</sup> Here, several significant studies are briefly reviewed:

(1) Tran (1992) analyses the transmission of Japan’s synthetic fiber industry sequentially to NIEs, ASEAN 4, China, and Vietnam, beginning from downstream to upper stream products. Recently, Kosai & Tran (1994) make it clear that industrialization as measured in terms of both a manufacturing/GDP ratio and a manufacturing share in total exports has spread through FDI in the sequence of Korea—Thailand—Malaysia—Indonesia during the 1960 to 1990 period (i.e., geographical extension of a FG pattern), while production has upgraded in the order of textiles—synthetic fibers—steel—office equipment in each country (i.e., industry structural upgrading of a FG pattern). These findings are supportive of Kojima’s “Investment Frontier” map in Fig. 3 above.

(2) APEC Economic Committee (1995) did an intensive statistical study on correlations between the trade and investment patterns of individual APEC member economies in 1980, 1990, and 1992, and found that direct investment and trade are complements, not substitutes, meaning that FDI in this region is PROT, not antitrade oriented. The correlation between trade and FDI shares of all APEC member countries for 1992 is found to be positive, large, and significant. The total elasticities of changes in trade flows to changes in the total direct investment (inward and outward FDI) stock average about 0.6 for the APEC region as a whole.

These are significant findings that support the FG pattern of FDI-led growth. Similar research is done by Urata (1996).

(3) Shinohara Miyohei, Professor Emeritus of Hitotsubashi University, presented for the first time Akamatsu’s original FG pattern to Western academia (Shinohara, 1961). He also added another phase, called the “boomerang effect,” which shows a reverse flow of imports from the newly industrializing countries to the advanced capital-exporting countries (Shinohara, 1976, 1982). The boomerang effect also explains Japan’s declining share in US export markets in the wake of rising exports of Asian countries. It thus manifests itself as an industrial hollowing (*sangyo-kudoka*) phenomenon in advanced countries. Shinohara concluded that “the boomerang effect seems to be empirically an effective and empirically logical explanation of the rise and fall of economic powers” (Shinohara, 1996, p. 418).

In his 1996 paper, Shinohara investigates the rapid increases in machinery trade (i.e., intra-industry horizontal trade) during the 1975 to 1992 period between (i) Japan and Asian

countries (NIEs, ASEAN 4, and China), (ii) the USA and Asian countries, and (iii) NIEs and ASEAN 4. These increases reflect both the expansion of intra-industry trade and the interaction of mutual industrial development in the Asia Pacific region.

(4) Watanabe (1997, p. 3) pointed out that mutual FDI, mainly from NIEs to ASEAN and China, rose more than FDI inflows from Japan, USA, and EU within the East Asian group (NIEs + ASEAN 4 + China) during the first half of 1990s. This new structure of FDI flows enhances intragroup (intra-Asian) financing. It was also accompanied with a big expansion of intragroup trade from US\$ 32.7 billion in 1980 to US\$ 136.6 billion in 1990 (i.e., 4.2 times growth), and further to US\$ 336.1 billion in 1995 (i.e., 2.5 times growth). Thus, the East Asian group is creating what Watanabe calls a “self-propelling virtuous circle growth” both in capital acquisition and product marketing.

Watanabe’s studies addressed several issues such as:

i) How can we promote the investment-cum-trade virtuous circle growth within developing countries? Here, the “agreed specialization” principle—the last stage of FG development—is crucial.

ii) Is there any optimal degree of openness (or globalization) for each economy and for the region as a whole? For East Asia, the roles of Japan, the USA, and the EU are important and cannot be neglected as the providers of markets, capital, and technology.

iii) What kind of relationship may be established between East Asia and advanced countries in the Pacific as well as in Europe?

These issues are closely related to some critical comments on the FG model and its form of regional integration to be discussed in the next section.

#### 4.3. Comments on the FG model

A number of criticisms have been raised about the FG model. Some are political and ideological in nature; they come from dependency theorists in political science. Some others are more constructive, suggesting modifications of the model to reflect the changing global environment.

(1) A first critical comment suggests that Japan’s investment cum trade expansion might be a revised version of imperialism or a Greater Asian Coprosperity Sphere (see Cumings, 1984, Ihaza, 1999) under which Japan intends to establish a hegemonic, hierarchical network of overseas production throughout East Asia.<sup>9</sup> Bernard & Ravenhill (1995, p. 172) admit that those fears are exaggerated. Kojima’s PROT FDI demonstrates mutual gains from an enlargement of production and trade, which results in a virtuous circle of regional growth.

Interestingly, Korhonen (1998) observes that:

“Akamatsu’s theory is a general theory of development, which describes how an undeveloped country can rapidly become a developed country” (p. 23). “Japan would not try to be a policeman, but rather an economic peacemaker” (p. 43). “Economism extols the virtues of concentrating on economic activity, development of industries, and trade” (p. 196). (Japan maximized savings by minimizing military expenditure.) “By the early 1990s the flying geese theory had become a fairly standard term for referring to the East Asian model of development . . . The *dependencia* theory had become an anachronism, and confrontational

rhetoric had been replaced by economic development rhetoric, spiced by references to the Pacific age (p. 144).”

(2) Bernard & Ravenhill (1995) criticize the FDI-led growth strategy in the following way: Such strategy creates dependence on borrowed technology, capital, management, and marketing and does not encourage any indigenous innovation. Foreign affiliates import capital goods and intermediate inputs from home, spreading little linkage effect to the host economy and leaving only small value-added by cheap local labor. Therefore, it is not a real indigenous development but merely a “disguised” one (Ihaza, 1999, p. 14). Periphery economies are exploited by the center. Moreover, such export-led growth is vulnerable against changes in global economic and political circumstances, because the location and variety of production are controlled by the hierarchical network of foreign multinational corporations.

This type of condemnations used to be typical of the dependency theory that prevailed before the oil crisis in October 1973. But these seemingly “adverse” conditions often prove to be the advantages of latecomer economies *à la* Gerschenkron (1962). They can be made useful to hasten catching-up industrialization.

Since the mid-1970s, some developing countries particularly in East Asia, including China, turned to an open economy policy, partially liberalizing imports and welcoming foreign investment. The more open an economy, the faster its growth.

Excessive dependence on foreign capital and enterprise is dangerous and should be refrained. But indigenous development may be promoted by capturing the spillovers of FDI, particularly when FDI is PROT.

(3) The FDI-led growth of Asian geese, which the Japanese economy led, resulted in “triangle trade” in which capital goods, components, and other inputs are purchased from Japan (and increasingly from Taiwan and Korea), processed in the NIEs but now to an increasing extent in ASEAN and China, and exported to third country markets, mainly the US rather than Japan (Bernard & Ravenhill, 1995, p. 200). This triangle trade caused a large trade deficit for Asian countries vis-à-vis Japan, on the one hand, and a growing deficit to the US vis-à-vis the Asian group and Japan. This development necessarily creates trade conflicts with the US.

Bernard & Ravenhill argue that these trade imbalances are caused by the failure of reverse imports in the FG product cycle (see Fig. 1). This is not a correct interpretation. Japan’s reverse imports have been increasing, while its general imports did not expand as much. The real cause of Japan’s huge export surplus represents a macroeconomic imbalance that needs to be adjusted through macroeconomic measures. Intra-Asian integration will lead to an openness in Asia towards the US and EU, which are the important providers of markets, investment, and technology.

(4) I would like to reply to the comments of Sugawara (1997) on Kojima’s “investment frontier,” which is earlier illustrated in Fig. 3:

i) The structure of industry and its change over time vary with the category of products. Singapore and Hong Kong, the small-city economies, e.g., are not suited to establish steel plant or automobile assembly in which only a large-scale production is profitable. They step up from X-industry, skipping Y, to Z-industry. Each Asian country specializes in differentiated or niche products within an industry of a broad category. Although there appear

varieties of products of smaller category, almost all countries promote upgrading industry of broad category sequentially from labor-intensive to more capital- or knowledge-intensive goods, along with accumulation of capital and technological knowledge stocks.

ii) Some economies may grow faster and others slower and, thus, the ranking of advanced stages may change over time. Moreover, some follower geese may become sub-leaders when they graduate from the catch-up process and start to undertake FDI, particularly in specialized niche products. In general, in East Asian region, the country order depends on historical timing of opening economy in respective country.

iii) In East Asia, Japan is not the sole lead goose, but the US and EU also play the leader's role. They have to cooperate closely in order to foster the economic development of the region as a whole, particularly in making their FDI complementary to each other.

iv) The world economy as a whole has been growing along the line of FG transmission of industrialization. Here the lead goose changed in terms of roughly 50 years, for example, from Pax Britannica to Pax Americana. What will be the 21st century global system? This kind of long-term change in the world economic structure was what Akamatsu tried to explain by his dialectics in the sequence of heterogeneity (or differentiation) by an industrial revolution—homogenization (or uniformity) by followers' catch-up—higher-degree heterogeneity by a new leader's innovation. Accordingly, the lead goose in the East Asian flock may also change over a long-term period.

(5) The diversification of products within an industry and the intra-industry division of labor via trade have become important issues. Petri (1988) presents a “theory of following” (a transmission of industrialization), which is seen from a follower goose's point of view.

By following, we mean conscious acts by agents to replicate the behavior of other *model* agents. (“Consciousness” is necessary to exclude behavior that might be similar to another agent's due to nothing more than common stimuli.) As any economic activity, following is presumably costly, and has to be justified against opportunity cost (Petri, 1988, p. 54).

He surveys in detail that Korea followed, imitated and replicated the Japanese FG pattern of industrial development very closely with some 15 to 25 years time lag. As a result, “Korean export structure mirrors Japanese patterns more than might be explained by factor endowments alone (p. 50).” “Not surprisingly, the growing industrial similarities between Korea and Japan are becoming an important source of economic friction” in their bilateral trade and in their trade with the rest of the world, particularly the US (p. 59).

The most promising approach to trade peace is through intra-industry trade, i.e., a tight network of interrelations between Korean and foreign firms (p. 61). This is nothing less than Kojima's agreed specialization.

In accordance to the progress of FG pattern industrialization, the structure of industries and exports becomes more or less similar between the lead goose and the follower geese and among the follower geese themselves. This creates many problems such as overproduction, fierce competition, dumping, and protectionism in the importing countries.

The most promising approach to mitigate these problems, as Petri suggests, is to promote “agreed specialization” so that each economy specializes in different niche products and exchange them at reduced costs.

#### 4.4. *The 1997 to 1998 financial crises*

The contagious financial crises in East Asia originating from Thailand in July 1997 have raised serious questions about the sustainability of the FG pattern of development and the desirability of “Asian values.” After all, the Asian geese were no longer flying but lying sick on the ground. Yet, practically to the big surprise of pundits, those crisis-stricken countries have quickly regained strength and are back on fast track to economic growth.

In this respect, Radelet & Sachs (1997) were quite foresighted in expecting the recent economic rebound in East Asia and advocating a quick return to its FDI-led growth formula as a way of moving forward.

“The Southeast Asian currency crises of 1997 are not a sign of the end of Asian growth but rather recurring—if difficult to predict—pattern of financial instability that often accompanies rapid economic growth” (Radelet & Sachs, 1997, p. 45).

The financial instability was caused mainly by the huge speculative movement of hot money.

“Just as Indonesia, Malaysia, and Korea rapidly recovered from financial crises in the 1970s and 1980s, so the Asian economies are likely to resume rapid growth within two to three years. In the long term, growth will continue because most of Asia has adopted capitalism as the organizing basis of economic life and become deeply integrated into the global economy.

The third doctrine, which best exemplifies the Asian paradigm, was aptly named by the Japanese economist Kaname Akamatsu in the 1930s: the ‘flying geese’ model, according to which countries gradually move up in technological development by following in the pattern of countries just ahead of them in the development process. . .

The trick is to bring multinational production enterprises and their technologies into the poorer economies to link them to the engines of growth of the advanced economies” (Radelet & Sachs, 1997, p. 54).

Indeed, “the trick” is now working. East Asia has overcome the crisis and is resuming the FG pattern of regional development. I believe that it still retains unlimited possibility for the future.

- i. The East Asian economies, including Japan, have to equip strong and efficient financial systems which have been neglected because of latecomers. At the same time, East Asia as a whole has to establish a regional buffer institution, like an Asian Monetary Fund, to prevent any huge speculative attacks on the stock and currency markets.
- ii. The development of Indonesia and China, e.g., lags behind other East Asian economies perhaps due to their large size and only recent entry into the capitalist world. Further FDI-led growth and its spillover into indigenous development should be promoted. Deeper reform is required not only in the production system but also in the social, political and legal regime.
- iii. The FG development will spread farther to North Korea, the new ASEAN members (Vietnam, Cambodia, Laos, and Myanmar), India, Pakistan, and so forth. At the same time, there is a lot of potential for service sector FDI, particularly, in finance and information technology.

- iv. As a lead goose in East Asia, Japan has to innovate new products and technology so as to enlarge the scope of the regional division of labor. Japan also has to increase imports from other Asian countries faster than exports. Because Japan is merely one of the leaders, she should cooperate closely with other leaders, namely the US and EU.
- v. What kind of division of labor in the entire East Asian region will be formed and expanded in the future, say by 2020? The prediction<sup>10</sup> is not easy, because the regional division of labor is determined primarily by market forces. But the regional integration movements influence and facilitate Asian growth. This is the topic that will be discussed in the following section.

## 5. APEC

Building an APEC has experienced a long history since Kojima's original proposal for the community was introduced in 1965. Interests have risen in three stages (see Kojima, 1994). First, with the aim of implementing the Kojima proposal, the Pacific Trade and Development Conference (PAFTAD) was created in 1968. Second, the Canberra Seminar for the Pacific Community, led by Sir John Crawford of Australia and Dr. Saburo Okita of Japan, was convened in September 1980, resulting in the establishment of the Pacific Economic Cooperation Council. Third, the APEC ministerial conference was started in November 1989, again in Canberra, just before the collapse of the Berlin Wall.

Kojima's original proposal (Kojima, 1966) envisioned that, if five advanced nations (AD group) in the Pacific rim—Japan, the United States, Canada, Australia and New Zealand—established a Pacific Free Trade Area (PAFTA), a large gain would be obtainable from trade expansion and dynamic economic growth in the wake of trade liberalization. Then, the AD group, using the gains as a fund, would be able to assist and promote the economic advance of the developing countries (DC group) in the region, which were expected to become associated members of PAFTA. In other words, the Kojima proposal for PAFTA primarily aimed at facilitating economic development in the Asian DC group, whereas PAFTA of the AD group merely provides a means to help that object. And what Kojima had in mind was that the Asian development would be promoted through the FG model.

A series (26 times by 2000) of PAFTAD conference have been prepared by its international steering committee (chaired by Kojima, Okita, and now Hugh Patrick) (Patrick, 1996), which served as its brain trust, greatly influencing the visions of Pacific Economic Cooperation Council and APEC.

The present APEC has three distinctive characteristics. First, this regional integration primarily aims at building an economic development oriented community; and, therefore, regional liberalization of trade (and investment) should be pursued, if gradually, so as to facilitate economic development by taking into consideration each country's different circumstances. This is pursuant to Kojima's original proposal.

Second, as the ASEAN group strongly insists, each member country promotes a "concerted unilateral MFN (most favored nation) liberalization of trade" (Drysdale & Vines, 1998, p. 6) rather than harried negotiations based on the reciprocity principle that has been

pursued by the US and GATT. Because of this Asian way of liberalization, APEC is unable to meet GATT Article 24 and, thus, it will not be recognized as an institutional (formal) integration, like EU and NAFTA; but it remains as a functional (informal) integration. The concerted unilateral liberalization is needed because APEC consists of divergent economies.

Third, APEC adopts the principle of open regionalism. This means that individual APEC members can unilaterally extend APEC liberalization to nonmembers on an unconditional MFN basis. Such open regionalism makes APEC consistent with the multilateral, nondiscriminative freer trade system of GATT/World Trade Organization. Here again, the US insists to keep a conditional basis (i.e., APEC extends the benefits of its regional liberalization to nonmembers that are willing to accept a similar obligation toward the APEC members) in order to avoid the “free ride” of, e.g., the EU.

Up to the present, there appears a serious cleavage of views between ASEAN, which aims primarily at economic development, and the US, which forces fast liberalization of trade and investment in Asia, mainly for the benefit of the US. While GATT/World Trade Organization endeavors to promote global liberalization of trade, regionalism should build and enlarge the regional production bases first through deeper integration.

I would like to recommend the following:<sup>11</sup> ASEAN (10) + 3 (Japan, China, and Korea) should be a core group, called an “Asian Economic Community” (AEC) and take more positive initiatives for promoting regional economic development *à la* the FG model, which has been explored above. So far, the American initiatives have tended to be too “strong” and often too “one-sided,” demanding fast liberalization, to be realistically suitable for Asian development. The initiatives now must be launched by the AEC group of countries themselves. The Pacific AC group has to come up with concrete measures of assistance to facilitate the economic development of AEC. Japan is inside the AEC as a representative of the AC group and plays an important role of bridging the two groups. EU also can help the AEC through the Asia-Europe Meetings process (Dutta, 1999, 2000).

By propelling regional economic development, the AEC economies should be able to raise their per capita incomes closer to the advanced economies’ level with more equal income levels among themselves, say within 20 or 30 years. Then, a new horizon for further integration and development will be open.

## 6. Conclusions

This paper introduced first Akamatsu’s original presentation of the FG pattern of development. Then his thoughts have been expanded, mainly by Kojima, into three models: the catching-up process through diversification/rationalization of industries; the PROT FDI; and agreed specialization. Much refinement and formalization of these models remain unfinished.

The regional transmission of FG industrialization has become famous as an engine of Asian economic growth, due in part to Okita’s speech. A number of comments, some of which are supportive and others are critical, are reviewed and discussed in order to broaden the range of issues that the FG model should explore. Asian developing countries within APEC should concentrate to propel regional economic development along the lines of the FG model.

It is hoped that this article is helpful to better understand the historical origin of the FG model, its theoretical extensions, its relevancy, as well as its incompleteness as a model of economic development.

## Notes

1. Akamatsu prepared his 1962 article to demonstrate mainly the FG pattern of industrial development and, later in his 1961 paper, he applied it to the wider theme of change, “heterogeneity” vs. “homogenization” in the world production/trade structure, a distinction which was later modified as “differentiation” vs. “uniformity.”
2. Factor allocation is determined in such a way that drawing parallel vectors  $Oa_1$  and  $Ob_1$  from factor endowment point,  $\lambda$ , and find their crossing points. Then the length of  $Oa_1$  (or  $Ob_1$ ) to its respective crossing point shows factor inputs for X-goods (or Y-goods).
3. Two goods and two modes of production actually involve four commodities that exceed the number of factors of production, i.e., labor and capital. Consequently, the optimal allocation of factors and outputs is indeterminate with different outcomes. Kojima (1960) illustrates by numerical examples the diversification-cum-rationalization course of Japan’s economic development in the prewar years.
4. The model of PROT FDI was presented by Kojima (1973, 1978) and expounded by Kojima & Ozawa (1984) and Kojima (1992). Such Japanese-type FDI (I often used this nomenclature) are supported by many researches: Pyun (1985), Lee (1990), Lii (1994), Braga & Bannister (1994), Zhang (1995), and Adams & Shachmurove (1997).
5. Ozawa (1996) presents an excellent model for the trade-augmenting type of FDI by treating it as an international transfer of knowledge, that is, a public good.
6. Such regional development is the same as what Myrdal (1957) called as a “virtuous circle” due to “the principle of circular and cumulative causation.”
7. The FG model also is frequently referred to in the UN *World Investment Report* (1997).
8. Fan (1992), Chen (1990), Chew (1990), Ding (1990), Fong (1990), Chen & Drysdale (1995), Ariff (1991), Garnaut (1996), and Boltho (1996).
9. Ihaza (1999) interprets that Akamatsu’s original FG model was meant to serve as a theoretical justification for the Greater East Asian Coprosperity Sphere. This interpretation is completely wrong, because the post-catch-up development process was discussed not in his 1935/1937 originals, but in his 1961 and posthumous 1975 articles.
10. An excellent outlook is presented in Japan Center for Economic Research (1999) along the line of the FG model.
11. We must remember a proposal for an “East Asian Economic Caucus” by the Malaysian Prime Minister, Mahathir Mohamad, in 1991 (see Korhonen 1994, p. 180).



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