

Chapter 3

COMPLEMENTARITY, LINKAGES, AND ECONOMIC DEVELOPMENT

Shigeaki Fujisaki*

1. Introduction

As de Dios and Associates (1993) suggest, most countries which have made the most rapid progress in alleviating absolute poverty are also those which have managed to sustain rapid growth in average income. Observing those countries' experience, particularly East Asia's, we can easily see that the progress in alleviating poverty was made only in a few decades. It is not tortoise-paced but cumulative growth which has led to such progress in alleviating poverty. While "high development theorists" (Krugman, 1993) stressed the importance of increasing returns and pecuniary external economies arising from the effect of market size, they mainly discussed how cumulative growth comes about utilizing such concepts. In this paper, a key concept used is complementarity or linkages. Reviewing the discussions in the 1940s and 1950s, we explore: (1) the factors underlying complementarity or linkages; (2) the mechanisms by which complementarity or linkages give rise to cumulative growth; and (3) the implication of linkage argument on poverty. A significant characteristic of the Philippine economy is that it has never gone through a dynamic structural change (as the figures and tables in the Appendix show), so linkages should be a good concept to consider.

2. The Complementarity Effect of Investment

One of the most famous and influential works on development economics in the 1950s is *The Strategy of Economic Development* by Hirschman (1958). In this book, he claims that development is held back primarily by the difficulties of changing existing or potentially existing savings into available productive investment opportunities, i.e., by a shortage of "ability to invest," in developing countries. Hence, he asserts that, in order to utilize most effectively the scarce resource, i.e., the ability to invest, it is necessary to select some limited sectors to be invested in, and to let induced investment generated by disequilibria be driving forces to expand the economy (the theory of unbalanced growth). Furthermore, the criteria in selecting the sectors, which he sug-

* Visiting Research Associate, UPSE and Overseas Senior Research Fellow, Institute of Developing Economies (Tokyo, Japan). The author would like to acknowledge the faculty of the UPSE and the members of the joint IDE-UPSE study team for FY 1997-1998; Ms. Cielo Guilatco, Ms. Jocelyn B. Paren and Mrs. Josephine Paren-Esteban for research assistance; and Ms. Odie Santos for secretarial services.

gested in the book, are the linkage effects, the most well known of which are the backward linkage effects (or input-provision effects) and the forward linkage effects (or output-utilization effects).

According to Hirschman, the aim of development policy must be to keep alive rather than eliminate the disequilibria of which profits and losses are symptoms in a competitive economy. The task of development policy is to maintain tensions, disproportions, and disequilibria. The sequence that leads away from equilibrium, then, is precisely an ideal pattern of development from his point of view. He further argues that what achieve the sequence are externalities, which in turn are essentially caused by production complementarities of one type or another. Therefore, one of the most important key concepts is the production complementarity in his argument. Due to the existence of production complementarities, for instance, investment in the production of A sets up strong pressures for an increase in the production of B and strong incentives for the start of production of C. It is such a contagious characteristic of investment that he called it the complementarity effect of investment, and he claims that:

“The complementarity effect thus reinforces and supplements the slowly growing ability to invest of underdeveloped countries. The investments of one period call forth complementary investments in the next period with a will and logic of their own; they block out a part of the road that lies ahead and virtually compel certain additional investment decisions. ... The complementarity effect of investment is therefore the essential mechanism by which new energies are channeled toward the development process and through which the vicious circle that seems to confine it can be broken. To give maximum play to this effect must therefore be a primary objective of development policy.” (pp. 42-43).

It is now obvious that the linkage effects, which are even now well known with the name of Hirschman, are only a subset of the complementarity effect of investment. As a matter of fact, the complementarity effect of investment in the sense of Hirschman is a familiar concept for most Japanese who lived in its high growth era, i.e., in the 1950s and 1960s. During that era, even the official documents of the government such as *Keizai Hakusho* (the economic white paper) frequently used a phrase that “*Toshi ga toshi wo yobu*” (investment begets investment). Later on, we will return to this point reviewing briefly the Japanese experience of post-war economic growth.

3. Division of Labor and Indivisibility

As already mentioned, Hirschman describes the development process as a chain of disequilibria. Such an idea, however, were, by and large, common among economists during the 1940s and 1950s. In his well-known article, for example, Scitovsky (1954) argues as follows:

"Profits are a sign of disequilibrium; and the magnitude of profits, under free competition, may be regarded as a rough index of the degree of disequilibrium. Profits in a freely competitive industry lead to investment in that industry; and the investment, in turn, tends to eliminate the profits that have called it forth. This far, then, investment tends to bring equilibrium nearer. The same investment, however, may raise ... profits in other industries; and to this extent it leads away from equilibrium. ... The profits of industry B, created by the lower price of factor A, call for investment and expansion in industry B, one result of which will be an increase in industry B's demand for industry A's product. This in its turn will give rise to profits and call for further investment and expansion in industry A; and equilibrium is reached only when successive doses of investment and expansion in the two industries have led to the simultaneous elimination of profits in both" (pp. 148-149).

Hirschman concedes that the passage is a most pertinent portrayal of how development is set and kept in motion, but he also blames Scitovsky for proposing to short-circuit the proceedings and reach a new point of equilibrium in a single jump. In either case, both agree with each other that the induced investment generated by disequilibrium leads further toward expansion of economy. The point here is it is not the induced investment in the same industry, but one in the other industry, which gives rise to the expansion of economy. We are thus returning to the concept of production complementarity, or simply complementarity, investigating what underlies it this time.

Again, according to Hirschman, complementarity generally means that "increased production of A will lead to pressure for increasing the available supply of B." (p. 69). This simple definition of complementarity is broadly applicable to numerous articles during the 1940s and 1950s including Scitovsky's mentioned above. We will henceforth utilize the term of complementarity in this broad sense in the following section.

Now let me raise the following questions: What brings about complementarity at all? Or, how will an increased production of A cause pressure to increasing the available supply of B? To be able to give a positive answer to these questions, we must recall Allyn Young's celebrated article titled "Increasing Returns and Economic Progress" (1928). In the article, he explores the main implications of Adam Smith's famous theorem on the manner of operation of economic forces, focusing on the division of labour. The examples he gave in the article elucidate our problem. He claims that, "it would be wasteful to make a hammer drive a single nail; it would be better to use whatever awkward implement lies conveniently at hand." Also he asserts that, "Mr. Ford's method would be absurdly uneconomical if his output were very small" (p. 530). Let me take the former quotation to answer the above questions.

Suppose that you need to drive a single nail. It would be clearly better to use an “awkward implement,” say, a stone in your backyard. If you need to drive hundreds of nails, however, you would decisively buy a hammer and use it. A society as a whole drives thousands or millions of nails daily, and consequently there are factories producing hammers as well as nails in the society. It is thus obvious that increased production of A (nail), due to, say, construction boom, will lead to pressure for the increasing available supply of B (hammer). To sum up, the necessity of division of labour and the indivisibility (in the sense of minimum economic scale or increasing return technology) give rise to complementarity.

4. Pecuniary External Economies and the Role of Government

The necessity of division of labor and specialization, on the one hand, and the indivisibility, on the other, jointly bring about complementarity which, in turn, causes various forms of externalities. And, according to Hirschman, these are externalities that achieve the sequence leading away from equilibrium, the ideal pattern of development, as mentioned earlier. Pecuniary external economies are typical cases that many economists hitherto have talked about in the context of economic development. If such external economies exist, however, they may give rise to market failures, and the role of government in economic development has hence become a matter of great concern to economists. The big push arguments are typical of those economists.

Now recall what Scitovsky claims in his paper cited above, “the same investment, however, may raise ... *profits in other industries*.” Whatever creates the profits, the profits in the other industries are called pecuniary external economies, which benefit firms in the industry. They are economies external to A but appropriable by B, and conversely are external to B but internal to A. How does it come about, however, that pecuniary external economies lead to market failures? To put it simply, when an investment causes pecuniary external economies, its private profitability understates its social desirability. First, investment market is imperfect in the sense that an individual entrepreneur's knowledge of the market is bound to be insufficient. Second, individual entrepreneurs cannot appropriate the pecuniary external economies that their own activities give rise to. Or, neither can they foresee the sequence that they will eventually be recipients of economies external to other firms but internal to themselves. Naturally, private profit calculations underestimate actual social benefit, and Scitovsky hence concludes, “profits in a market economy are a bad guide to economic optimum as far as investment and industrial expansion are concerned; and they are worse, the more decentralized and differentiated the economy” (pp.149-150). Rosenstein-Rodan (1943) puts this conclusion differently, saying that, “If the industrialization of international depressed areas were to rely entirely on the normal incentive of private entrepreneurs, the pro-

cess would not only be very much slower, the rate of investment smaller and (consequently) the national income lower, but the whole economic structure of the region would be different" (pp. 206-207).

If the central problems facing developing countries were those of externalities mentioned above, coordinated investment, which governments could promote, would be an appropriate remedy. As a matter of fact, Scitovsky suggests the necessity for centralized investment planning or for some additional communication system:

"Market prices, however, reflect the economic situation as it is and not as it will be. For this reason, they are more useful for co-ordinating current production decisions... than they are for co-ordinating investment decision... (co-ordinating investment decision) should be governed not by what the present economic situation is but by what the future economic situation is expected to be. The proper co-ordination of investment decisions... would require a signaling device to transmit information about present plans and future conditions... and the pricing system fails to provide this. Hence the belief that there is need either for centralized investment planning or for some additional communication system to supplement the pricing system as a signaling device" (p. 150).

Rosenstein-Rodan also advocates that "the whole of the industry to be created is to be treated and planned like one huge firm or trust" (p. 204).

As far as centralized investment planning is concerned, however, historical evidence has clearly shown that it did not work quite well. Simply stated, the government is also imperfect in the sense that its knowledge of the market is bound to be insufficient too, and due to such information problems, "governments are not well equipped to identify projects and motivate project managers" (Stiglitz, 1993). It is worthwhile to note that Hirschman correctly criticizes the central planning thesis as early as the 1950s:

"The fact that private entrepreneurs will be unable or unwilling to do certain jobs which we would like to see done does not in itself ensure that the government can handle them. We must examine whether these jobs are likely to be performed satisfactorily by public authorities, which function after all in the same society as the entrepreneurs" (p. 65).

Moreover, it is also worthwhile to note that if entrepreneurs are spontaneously "bullish" enough (Murphy et al., 1989), they may give rise to the similar outcomes as coordinated investment may do. If this is the case, then it may be possible to get an alternative perspective of East Asian development in the past several decades, based on not only coordinated investment, but also on bullish entrepreneurs. The alternative perspective may in turn show that one of

the important roles of government is simply to make entrepreneurs bullish "enough."

5. The Extent of Market and an Avalanche of Consumers' Goods

In his celebrated book, *Problems of Capital Formation in Underdeveloped Countries* (1953), Nurkse claims that investment incentives are constrained by the extent of market or, in his own words, "the inducement to invest is limited by the size of the market" (p. 6). Following that, he acknowledges that this proposition is no more than a modification of a well-known Adam Smith's thesis: the division of labour depends upon the extent of market. As Young emphasized, however, Adam Smith's dictum consists of two parts; the division of labour depends upon the extent of the market, *but the extent of the market also depends upon the division of labour*. Young thus asserts that:

"Adam Smith's dictum amounts to the theorem that the division of labour depends in large part upon the division of labour. This is more than mere tautology. It means...that the counter forces which are continually defeating the forces which make for economic equilibrium are more pervasive and more deeply rooted in the constitution of the modern economic system than we commonly realise" (p. 533).

It is this circumstance or circular causation in which the possibility of economic progress lies. The vicious circle of poverty to which Nurkse referred is one of such circular causation. Nurkse thus suggests the idea of balanced growth as an escape from the deadlock of the vicious circle, saying that:

"The difficulty caused by the small size of the market relates to individual investment incentives in any single line of production taken by itself. At least in principle, the difficulty vanishes in the case of a more or less synchronized application of capital to a wide range of different industries... Here the result is an over-all enlargement of the market" (p. 11).

Hirschman strongly blames the advocates of balanced growth in the sense of simultaneous multiple development, explicitly including Nurkse, as there are tasks that simply exceed the capabilities of a society. He espoused unbalanced growth mentioned above accordingly. Keeping the concept of production complementarity in mind, Hirschman claims that, "development has proceeded in this way, with growth being communicated from the leading sectors of the economy to the followers, from one industry to another, from one firm to another. In other words, the balanced growth...is the end result of series of uneven advances of one sector followed by the catching-up of other sectors" (pp. 62-63).

Mentioning Schumpeter's theory, which assigns a central role to the creative entrepreneur, however, Nurkse also shares the same view with Hirschman:

"Even if an innovation tends each time to originate in one particular industry, the monetary effects of the initial investment...are such as to promote a wave of new applications of capital over a range of different industries. These waves result, in Schumpeter's own words, 'each time...in an avalanche of consumers' goods...although in the first instance they spell disturbance, losses and unemployment'" (p. 13).

It is worthwhile to note that he never forget to add that the composition of the increased consumable output, in which the waves result, must correspond, by and large, to the pattern of consumer demands. Again in his own words, "mass production...would not be possible if it did not mean production for the masses." (p. 20). Recall that it is in East Asia where we have been seeing the phenomenon of an avalanche of consumer goods. And, conversely, recall that the shortage was the pervasive phenomenon in the former planning economies, the cause of such was not lack of investment activities, but lack of the correspondence of supply and demand (Kornai, 1980).

6. Bullish Entrepreneurs and the East Asian Miracle

The received wisdom of a well-known report of the World Bank, *The East Asian Miracle* (World Bank, 1993; henceforth referred to as EAM) is it tries to explore a third way between the market-friendly view and the development-state view. Most economists, especially in East Asia, are seemingly sympathetic with this basic orientation (Aoki et al., 1997). As its subtitle—*Economic Growth and Public Policy*—suggests, however, EAM puts too much emphasis on the role of government. It looks as if East Asia's economic success, which EAM called miracle, were entirely attributable to the governments. Somehow an interesting, or, more frankly, a peculiar feature of recent literatures of development economics, including EAM, is an important player in development process is missing in them—the private entrepreneurs. Or, more precisely, private entrepreneurs have no explicit place in the arguments due to, probably, pervasive market failures. Reviewing recent arguments, it seems to me that only the market as a mechanism or an institution and government matter, and that the only central problems are hence whether the market and government are substitutes or complements, and which is more harmful, market failures or government failures. But, is there no explicit place at all for private entrepreneurs, to which Schumpeter and probably Nurkse assigned a central role, and whose ability to invest Hirschman shed light upon?

Now let us recall briefly the historical experience of Japanese. Thirty or forty years ago, Japan was still a developing economy. Income levels were low, and there was an extremely strong yearning for affluence. This was Japan's high-growth era period, a time when "investment begets investment." Entrepreneurs' enthusiasm for investment was sustained by dynamic changes in the

patterns of consumption, and by the belief that Japan was moving rapidly toward the attainment of American lifestyles.

The high-growth era also brought about a revolution in consumption. Ownership of a television, washing machine, and refrigerator symbolized affluence. Parents were forced to buy television when their children started to visit neighbors' house to watch television and failed to return home for dinner. Husbands bought washing machines for their wives who complained that washing clothes was hard labor. Refrigerators became part of the Japanese family life after households were told by itinerant fish sellers that theirs was the only house in the neighborhood to which it was necessary to bring ice in order to sell sashimi. These three products had a revolutionary impact on people's lives. The entrepreneurs who produced and sold them, notably Konosuke Matsushita who was known as the "god of business," became national heroes.

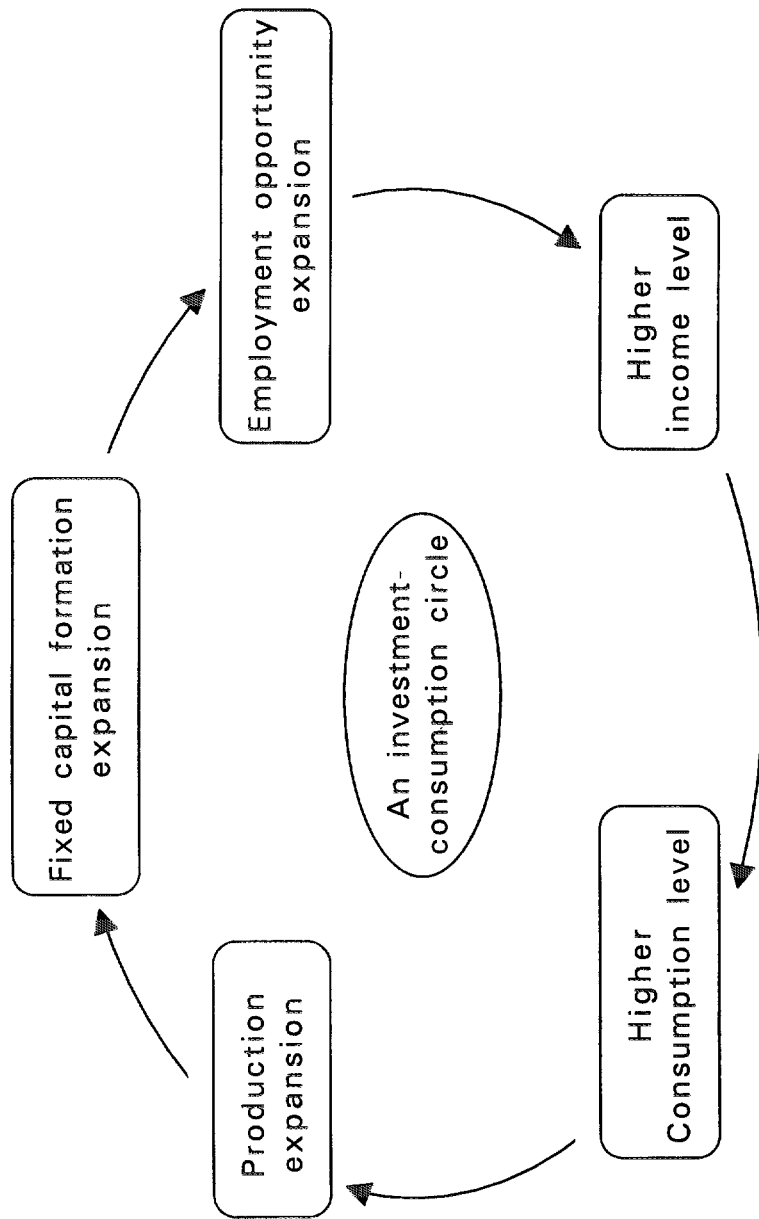
These symbols were later replaced by the three C's—car, cooler (air conditioner), and colored television. Although the products changed, the high growth of the Japanese economy continued to be driven by the powerful urge of the Japanese people to achieve affluence. Japan's high-growth era was, thus, characterized by a virtuous circle in which capital investment boosted personal incomes, leading to increased domestic demand and more capital investment.

In sum, the Japanese entrepreneurs in the high-growth era were bullish enough and the waves of innovation that they initiated resulted in the phenomenon of an avalanche of consumer goods. They had both eye of faith to see the potential market and act of faith to realize such market. The secret was the advantages of backwardness in the sense that it was not difficult for the entrepreneurs to foresee on what the Japanese people would spend their wages.

7. The Export-Push Strategy and Domestic Markets

With respect to a way out of the vicious circle of poverty, Rosenstein-Rodan (1961) suggests a virtuous circle that an increase in investment gives rise to an increase of income, and the additional income results in more savings, which, in turn, allow additional investment. However, due to the independence of investment and savings decisions, more savings does not necessarily lead to additional investment. Nurkse thus claims that capital formation requires an act of investment, as well as a capacity to save, and, as mentioned above, he also asserts that investment incentives are in turn constrained by the size of market. Thus, the virtuous circle, mentioned in the previous section, is simply the one that restates Nurkse's dictum in a different manner. Let me call it an investment-consumption circle or Nurkse's Circle (Figure 1). As table 1 clearly shows, Japan, in its high-growth era, had never heavily depended upon external demand as recent Japan has been doing (Saito, 1991).

Figure 1.
An Investment-Consumption Circle:
Nurkse's Circle



**Table 1. Contribution of Expenditure
Items to Economic Growth
JAPAN**

	1962-73	1974-87
Personal Consumption Expenditure	5.5	2.1
Private Fixed Capital Formation	3.2	0.4
Government Expenditure	1.8	1.1
Export	1.3	1.1
Import	1.6	-0.4
GNP	10.1	4.2

Source: Saito, M. (1991), p. 188.

Unlike Japan, East Asian developing economies' success has been attributed to its high dependence on external demand. Table 2 shows how Taiwan, one of the notable High Performing Asian Economies (hereafter referred to as HPAEs), had been depending heavily upon external demand, especially up to the middle of the 1980s. Observing rapid industrialization in the region, many economists assert that it relies largely on an export promotion policy. Another form of "circular" relation may help in understanding how such a policy boosts economic growth. Suppose that, first, a government encourages entrepreneurs to export their products with some policy measures, therefore, an increased investment creates more export capacity. Suppose further that the export capacity successfully increases the country's ability to earn foreign currency, hence, its capacity to import. Now again the government encourages the entrepreneurs to import capital goods for expanding their export capacity, leading to more investment. Let me call it an investment-export circle (Figure 2). This relation, of course, never forms a virtuous circle based upon any circular causality, since the circle does not automatically work without intended policy measures as mentioned above, at least at its initial stage. Hence EAM calls such policy measures as a whole the export-push strategy, and furthermore asserts that, "export-push strategies have been by far the most successful combination of fundamentals and policy interventions, and hold the most promise for other developing economies" (p. 24).

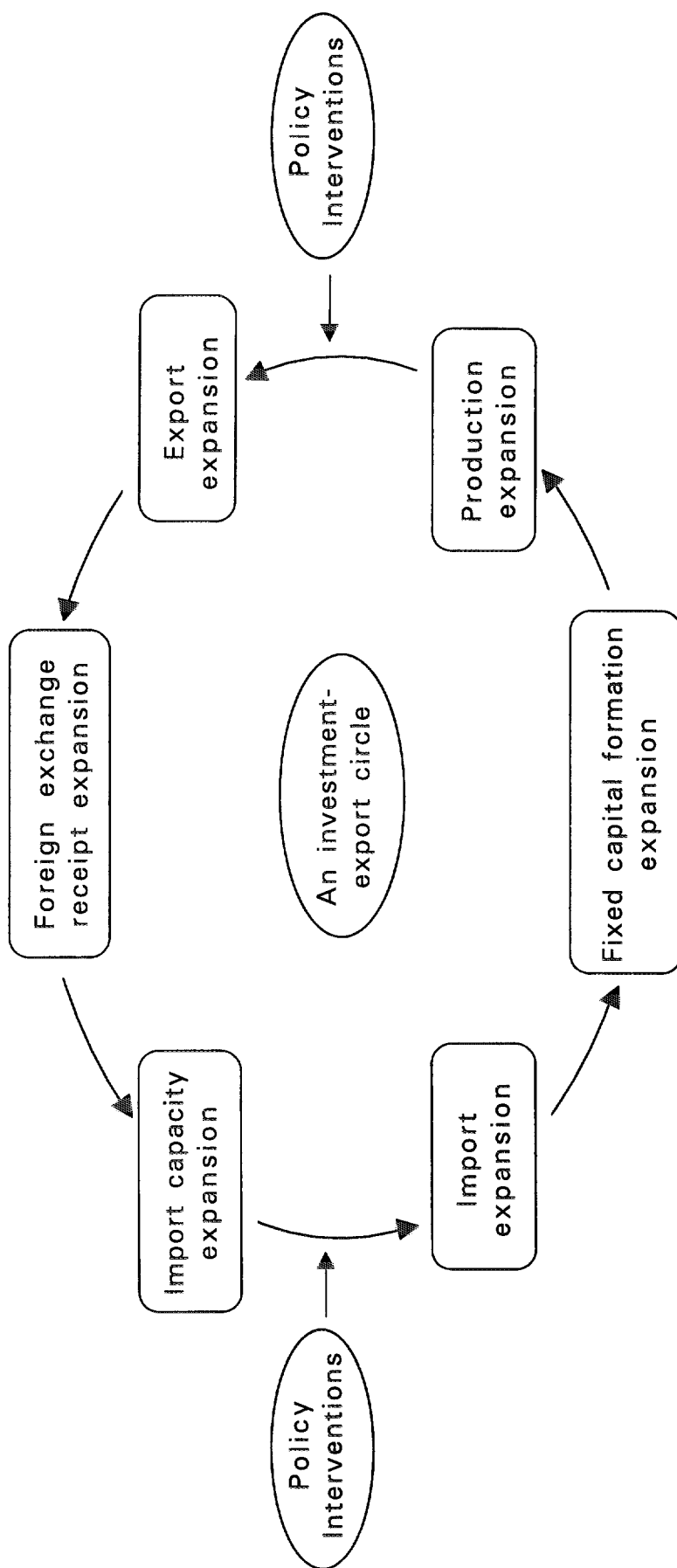
It seems to me that such a strong emphasis on the export-push strategy is somewhat misleading. Recall that we have been seeing the phenomenon of an avalanche of consumer goods in the region. Ranis et al. (1987), for example, pointed out a strong tendency for rising expenditure on consumer durables in rural area in Taiwan, even during the period before 1980. Even if the export-push strategies boosted economic growth in the region at the initial stage and has, by and large, maintained the momentum of economic expansion, the sustained growth has continually raised the income level there on the other hand. The increased income level has consequently led to the sustained growth of domestic markets. The phenomenon of an avalanche of consumer

**Table 2. Contribution of Expenditure
Items to Economic Growth
TAIWAN**

	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991
Personal Consumption Expenditure	2.69	3.41	4.70	3.02	3.61	5.40	6.20	6.40	3.80	3.50
Government Consumption Expenditure	1.07	0.79	1.22	0.98	0.66	1.30	1.30	1.60	1.90	1.20
Fixed Capital Formation	0.03	(0.62)	0.77	(1.18)	1.86	3.30	2.80	3.10	1.60	2.10
Changes in Stock	(2.29)	1.22	0.38	(0.69)	(0.85)	2.00	1.60	(1.80)	(0.80)	0.80
Net Exports (Exports less Imports)	2.05	3.65	3.53	2.82	6.36	0.30	(4.60)	(1.70)	(1.60)	(0.30)
Total GNE	3.55	8.45	10.60	4.95	11.64	12.30	7.30	7.60	4.90	7.30

Source: Executive Yuan, National Income in Taiwan Area of Republic of China 1991, Taipei, 1991, pp.40-41.

Figure 2.
An Investment-Export Circle:
Export Push Strategy



goods clearly shows that the virtuous circle, such as the one observed in Japan's high-growth era, already has worked in the region as well. The investment-consumption circle begins with increased investment, whether the investment is originated in export sector or not. Furthermore, as Aoki et al. (1997) suggest, "in Japan, the leading export industries of various phases of economic development (textile and garment industries in the prewar period and the 1950s; shipping and electric appliances in the 1960s; car, manufacturing machinery, semiconductors, and electronics products in the 1970s and 1980s) were those industries whose products had been first widely marketed and tested in domestic markets. They were not necessarily nurtured by government industrial policy (except for shipbuilding) because of their intrinsic export capability" (p. 28).

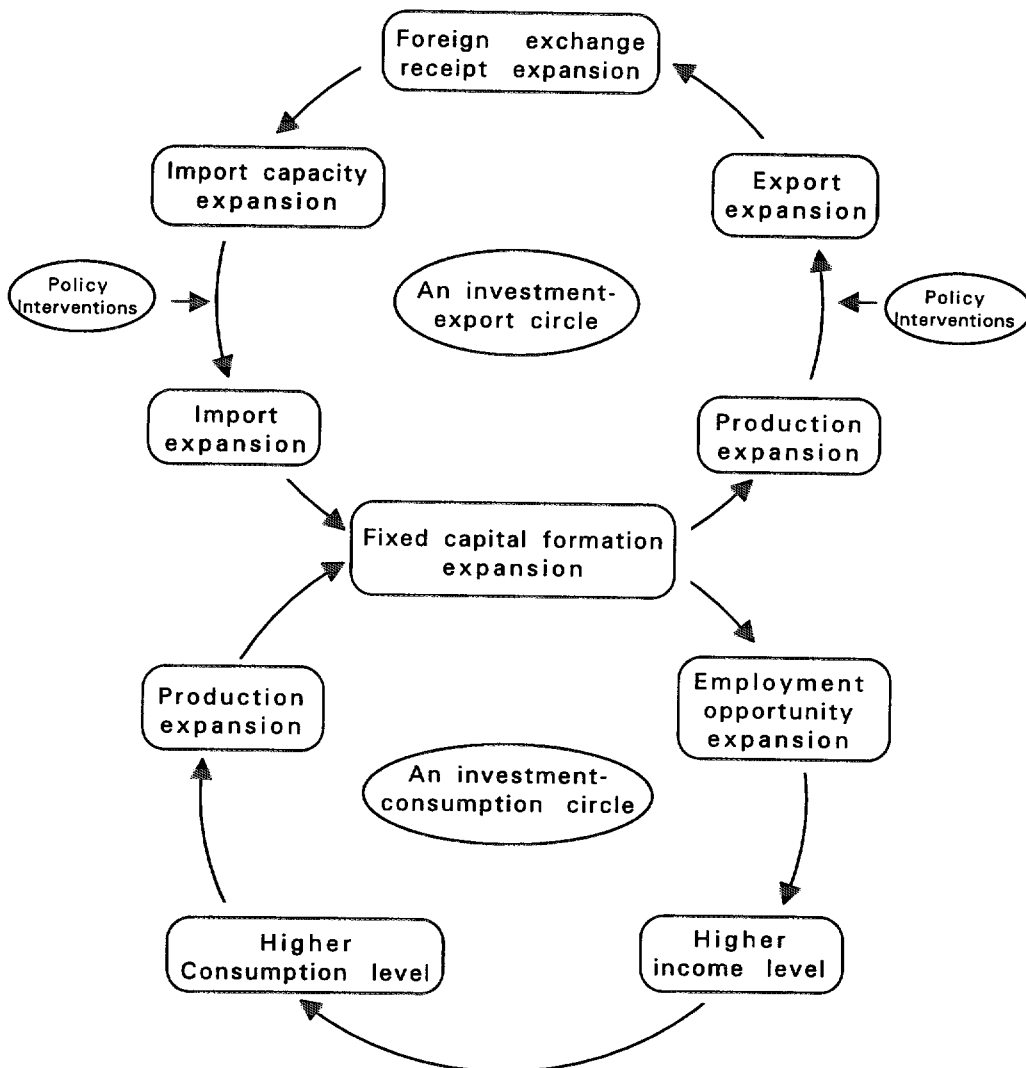
In sum, the export-push strategy used so far to account for one of the essential reasons of the rapid growth of the region is insufficient as an explanation. If the growth of domestic market is a main rocket engine, export-push strategy only plays the role of booster rocket, especially at the initial stage of development (Figure 3). The importance of domestic markets, claimed by Murphy et al. (1989) is, thus, valid in this light. Furthermore, if the main objective of economic development is the alleviation of poverty, the economic development should eventually result in the growth of domestic markets, or the ultimate target should be placed upon the latter.

8. Poverty Alleviation and Linkages

One of the important aspects of the experience of East Asia including Japan is that the economic growth has, by and large, resulted in poverty alleviation—the eventual objective of development. EAM describes the experience as "shared growth." Naturally, and as EAM itself acknowledges, "few political leaders anywhere would reject, on principle, either the desirability of growth or that the benefits of growth should be shared." EAM then asserts that "what distinguished the HPAEs' leadership was the extent to which they adopted specific institutional mechanisms tailored to these goals, and that worked" (p. 157).

Apart from such mechanisms as the comprehensive land reform programs in Korea and Taiwan, rice and fertilizer price policies to raise rural incomes in Indonesia, EAM's argument over the institutional basis for shared growth is highly questionable to me as one of the insiders. As Rodrik (1994) claims, the relative equality of income and wealth, particularly landholding, were a significant initial condition rather than a consequence of economic development in the region. Let us remember that we have been seeing the phenomenon of an avalanche of consumer goods in the region, and also Nurkse's words that mass production would not be possible if it did not mean production for the masses, including especially the lower income groups.

Figure 3.
Export-Push Strategy
and
Nurkse's Circle



When Nurkse refers to the primary determinant of a mass market, he asserts that the determinant is high productivity of workers or workers being well equipped with capital instruments. How do workers become well equipped with capital instruments? Of course, it is investment that brings about high productivity, following which investment the complementarity effect results in cumulative advance and eventually in a mass market. As Hirschman suggests, the primary objective of development policy must be to give maximum play to the complementarity effect of investment.

The word complementarity is used here in the sense of Hirschman—increased production A will lead to pressure for increasing the available supply of B. It is almost identical with the word linkages, which Ranis and Stewart use in their studies, while they are using the concept in a broader but more strict sense than Hirschman. For instance, Stewart et al. (1991) argues that:

“Externalities occur where market-priced transactions do not fully incorporate all the benefits and costs associated with transactions between economic agents. Externalities thus constitute market failures. Linkages describe all transactions between economic agents, whether through the market or outside it, fully or partially priced. Consequently, externalities are subset of linkages” (p. 569).

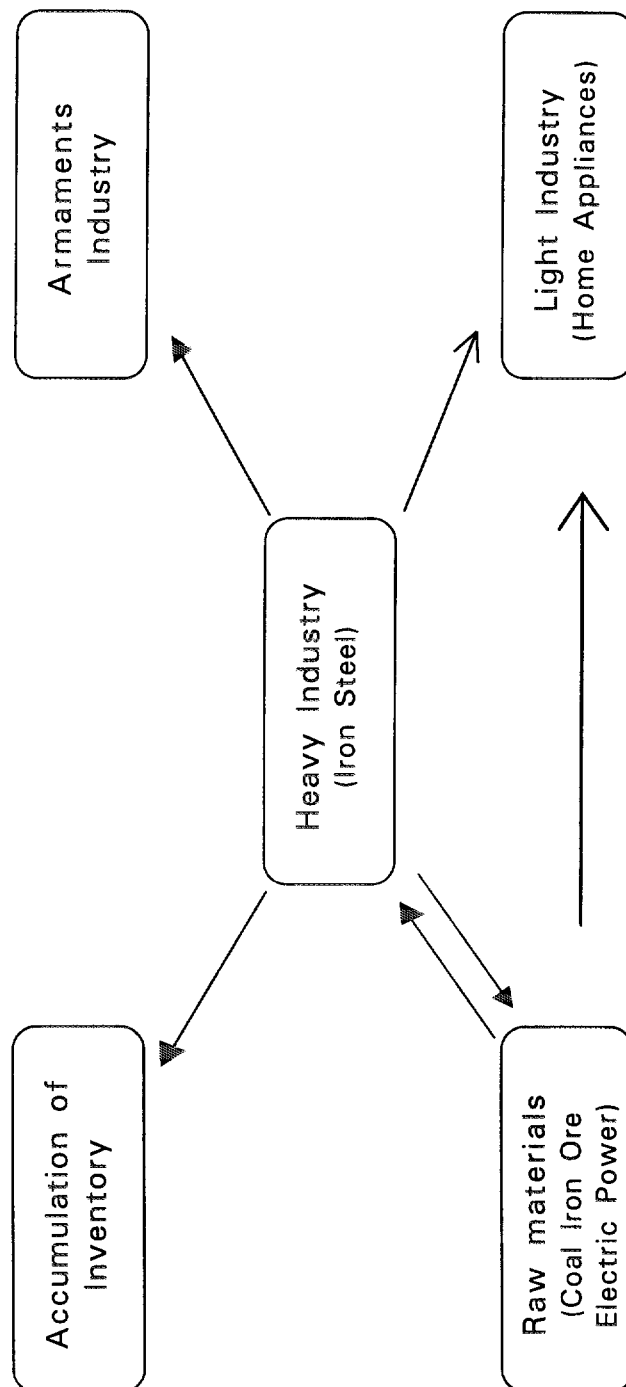
In Ranis et al. (1990), the word linkages is utilized identically with the word sectoral interactions. From this point onwards, the word linkages will be used to describe sectoral and even spatial interactions, or transactions between agents, and we thereby examine how and why a favorable change in a sector is transmitted to other sectors in one case, but not in the other.

9. China's Economic Reform and Linkages

First, let me take the case of China. It clearly shows how linkages between sectors have ill or well affected the country's economic performance. Before the economic reform in 1978, the economy, which was then under the system of planned economy or under the “soft budget constraints” (Kornai, 1980), had failed to provide agents with appropriate incentives. Apart from the interesting issues of incentive system or information, we can point out an obvious defect in the economic structure itself—lack of linkages between sectors. Now consider the case of heavy industries like iron steel industry, on which the government had put high priority continuously. The industry had mainly supplied its products to armament industry and its linkages to the light industries, such as home appliances, had remained very weak (Figure 4).

As Kornai frequently suggests, the “investment hunger” of the managers generally tends to cause supply capacity of an industry to increase regardless of demand for its products under the planned economy. Furthermore, when

Figure 4.
Lack of Linkages
The Case of China



ever the supply exceeds the demand, what the managers do is to just accumulate inventory in the backyard of the factory even indefinitely; thanks to the soft budget constraints, the managers never fail to keep their positions. This explains what had been happening in the iron steel industry in China under the planned economy regime. After the economic reform, the government changed the policy and somehow put more priority on light industries. The policy change has enormously strengthened the linkages between both sectors. While the agricultural reforms rendered the farmers strong incentives to increase their production, the increased production, and thereby the rise of income level, has expanded the domestic markets. As a result, for example, the country is now the world's top producer of TV sets, while it was the largest producer of iron steel in the world in 1996 and 1997.

10. Rural Linkages in the Punjab and the Philippines

Poverty is a predominantly rural phenomenon in most developing countries, and thus realization of rural linkages is of much importance for poverty alleviation. First, let me take an example of the Indian Punjab where rapid growth in agriculture has been accompanied by even faster growth in industry.

According to Stewart et al. (1991), in the 1950s, growth in agricultural production and productivity in Punjab was relatively low, but since the 1960s, it has consistently exceeded the national average. From 1965-66 up to 1978-79, cereal production in the Punjab grew by 10.7 percent per year compared to 5 percent for the whole India. The adoption of new technology, the green revolution, were the main reason for this change in performance. An important point here is the rapid growth in agricultural sector has given rise to even faster growth in industry. Stewart et al. assert that strong externalities are to be found both within agriculture and industry and through intersectoral linkages and that realization of these linkages permitted the growth. In the early stages, much of the industrial growth was due to pecuniary externalities, namely, improved markets for industrial products arising from linkages with agriculture. Increased production of industry in turn gave rise to decline of industrial products' prices. The lower-priced industrial goods made agriculture more profitable. New farm lands were then brought under HYV seeds, and growth in agriculture further increased the demand for industrial inputs. The increasing size of the market meant that the firms could take advantage of economies of scale and learning-by-doing. Stewart et al. thus conclude that external economies resulting from linkages between agriculture and industry mutually reinforced growth in the two sectors.

Mutually reinforcing growth of industry and agriculture as observed in the Punjab has, unfortunately, never been found so far in the Philippines. As a matter of fact, rapid agricultural growth did occur during the green revolution period

in 1965-80. According to Bautista (1997), for example, rice production in the Philippines grew rapidly at an average annual rate of 4.3 percent during 1965-80—nearly double the 2.3 percent growth in the preceding ten years. But this did not result in equitable overall growth. Bautista (1996) argues the reasons and gives particular attention to the weak demand linkages of agricultural growth and the policy distortions behind them.

Issues of the sectoral and spatial linkages in the Philippines are discussed in detail in Ranis et al. (1990). Let me explain briefly their argument. Assuming two sectors, the agricultural sector and nonagricultural sector, they show how the linkages realize between the sectors and affect the outcomes of the entire economy. According to them, linkages take these forms: (1) consumption linkages, where income generated by activities in one sector lead to demand for output of another sector; and (2) production linkages, which may be backward or forward, in the sense of Hirschman.

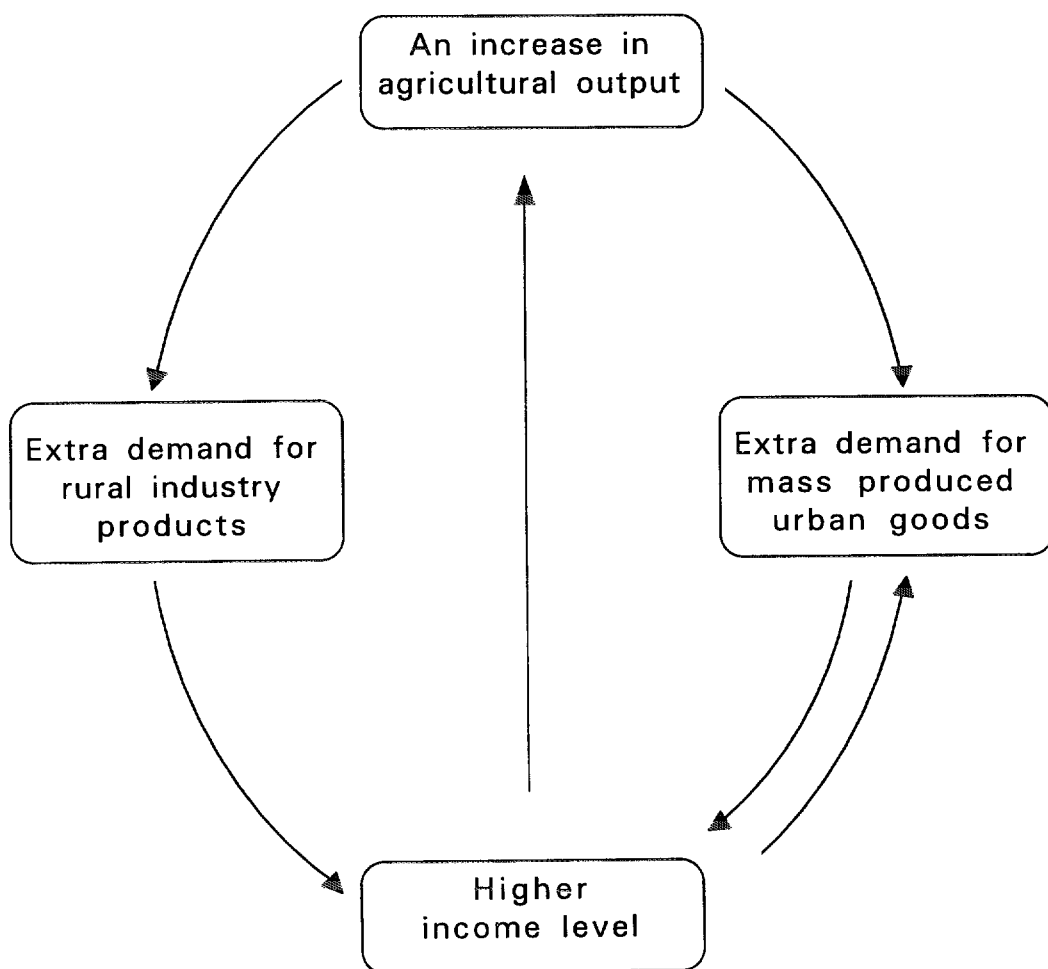
One of the most interesting features of their discussion is they, using the concept of linkages, suggest that dynamic mutually reinforcing patterns of “consumption and production,” a virtuous circle (Figure 5), may occur:

“Suppose there is an increase in agricultural output which is fairly equally distributed, in terms of extra incomes, among rural households. This would be associated with extra demand for the products of rural industry, as well as for mass-produced urban goods. The extra rural nonagricultural activity will further raise rural incomes and therefore consumption, while additional labor incomes generated by the expansion of demand for mass-produced urban goods will increase the demand for agricultural products. Hence, a virtuous circle may develop of increasing demand and supply of agricultural products, rural nonagricultural products, and mass produced appropriate urban products. This would be associated with increased participation of underemployed in both production and consumption, and an improvement in the distribution of income” (p. 11).

Furthermore, according to them, this kind of virtuous circle is not necessarily initiated in the agricultural sector. They assert that, “a virtuous circle of the type described here does not need to be initiated in the agricultural sector. It could be initiated by an increase in industrial production, which would be associated with extra demand for agricultural products (for food and/or food processing) and extra demand for mass-produced, labor-intensive commodities; or it might be initiated by improvements in the quality of transport and communications linking the sectors” (p. 12).

Unfortunately, as I already suggested, this kind of virtuous circle had never came about, as far as the period up to the late 1980s is concerned. A primary cause of that, according to Ranis et al., is the heavily skewed asset and income distribution in the country and hence weak rural linkages. Recall that, in

Figure 5.
A Virtuous Circle of
Consumption and Production



their discussion, an important prerequisite to which the virtuous circle may occur is fairly equally distributed income or asset. Also, recall the words of Nurkse that mass production would not be possible if it did not mean production for the masses, including especially the lower income groups. I would like to finally add that the relative equality of income and wealth, landholding in particular, is an important prerequisite to make entrepreneurs bullish enough, and eventually for sustained economic growth.

11. Concluding Remarks: Toward a Tiger in the 21st Century

In the very first paragraph of a famous paper now widely recognized as an origin of the Big Push, Rosenstein-Rodan (1943) claims:

"If the principles of international division of labour are to be applied, labour must either be transported towards capital (emigration), or capital must be transported towards labour (industrialisation). From the point of view of maximising the world income, the difference between these two ways is one of transport costs only, and may be assumed to be negligible. Emigration and resettlement would, however, present so many difficulties in immigration areas (and in emigration areas) that it cannot be considered feasible on a large scale. A very considerable part of the task will have to be solved by industrialization" (p. 202).

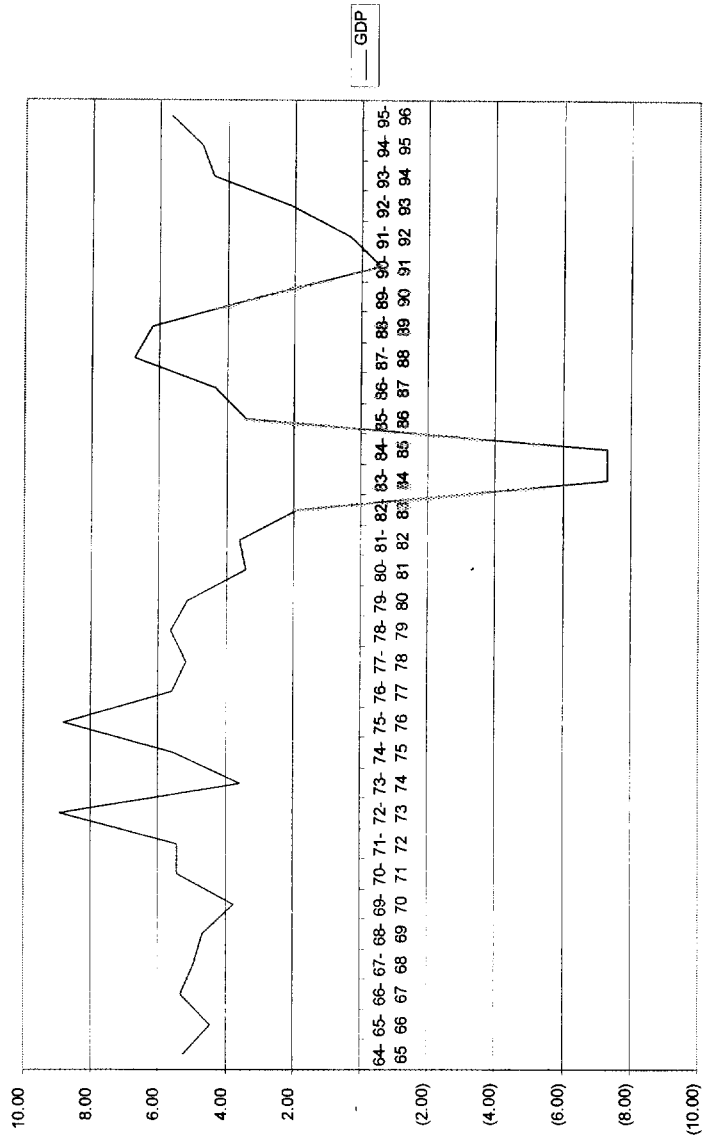
Regarding the two ways Rosenstein-Rodan suggests, the Philippines in the recent past decisively reinitiated the latter (industrialization), and has adopted appropriate policy measures to tailor to the goal, after the prolonged political and economic turmoil, which forced the Filipino people to even choose the former (emigration) to a certain extent.

In his celebrated book *Institutions, Institutional Change, and Economic Performance*, Douglas C. North (1990) makes the following observation: "The central puzzle of human history is to account for the widely divergent paths of historical change. How have societies diverged? What account for their widely disparate performance characteristics?" (p. 6). He also raises an important question, why the convergence of economies, which is suggested by economic theory, has not occurred. Yet what the world is witnessing on the threshold of the 21st century must surely be seen as a giant shift toward the convergence of economies. It is not the so-called advanced countries that are today experiencing rapid growth and buoyant economic performance, but rather the "emerging markets" of East Asia, India, and Latin America. This change reflects the increasing erosion of national borders, as manifested in cross-border flows of goods, capital and even labor.

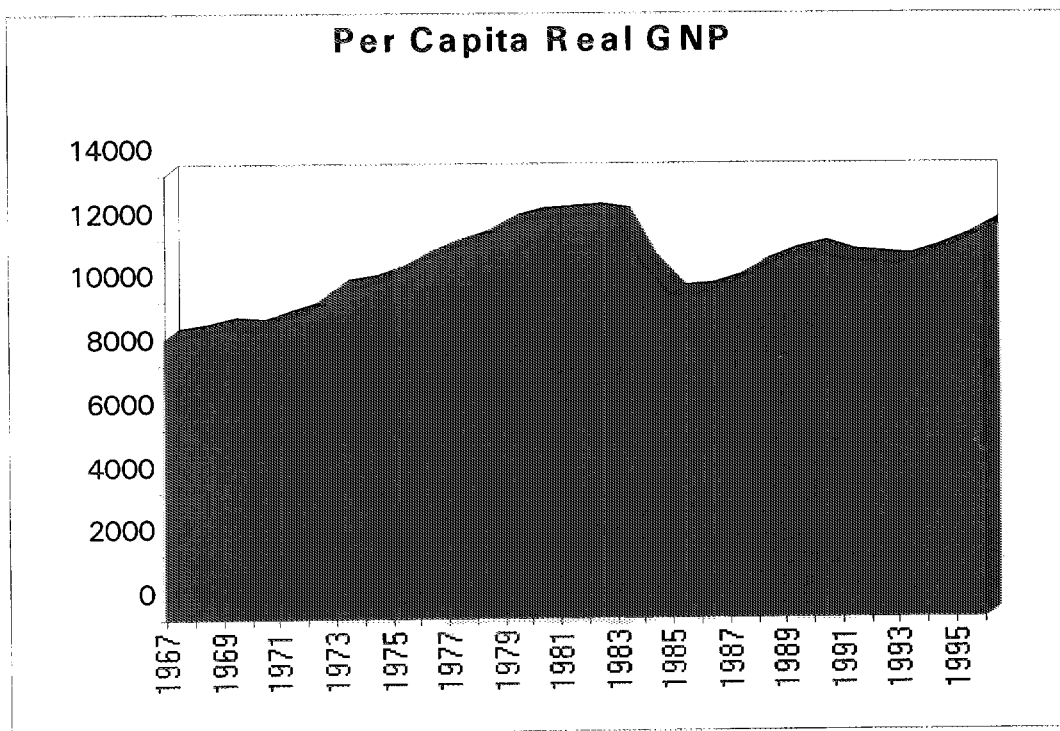
The emerging markets, especially East Asia, have been confronting economic and even political turmoil, which originally arose from the financial crisis

since the middle of 1997. The primary cause of the crisis is a government's failure that the authorities encouraged the entrepreneurs, particularly financial institutions, to be bullish "too much." It seems to me that, however, sooner or later, the economies will definitely return to their sustained growth paths, since they, as a whole, still have a potential for the larger mass market in the near future than any other regions attracting investors. The Philippine economy, fortunately, remains in much better shape than any other East Asian economies despite suffering from the crisis to some extent. Hoping the country to be a "real tiger" in the 21st century, I would like to conclude this paper with the following Nurkse's words, "I myself believe that the note to be stressed above all is that of self-help."

Appendix 1. GDP Growth Rate



Appendix 2.



Appendix 3.
GDP Average Growth Rate

	1965-70	1970-73	1973-79	1979-82	1982-83	1983-84	1984-85	1985-86	1986-92	1992-96
A, F & F	3.64	5.93	3.49	2.88	(3.38)	(0.93)	(1.88)	3.68	2.04	2.23
Ind Sec	6.29	10.04	9.40	4.19	1.52	(11.51)	(15.75)	2.30	3.43	5.57
Mfg	7.73	9.86	5.70	2.63	(0.32)	(10.11)	(7.90)	1.81	3.81	4.82
Serv Sec	5.16	5.18	6.14	5.17	5.56	(6.53)	(2.08)	4.23	4.67	4.86
GDP	5.07	7.03	6.59	4.23	1.87	(7.32)	(7.31)	3.42	3.59	4.50

Legend:

A, F & F = Agriculture, Fishery & Forestry
Ind Sec = Industry Sector

Mfg = Manufacturing
Serv Sec = Service Sector

GDP = Gross Domestic Product

Appendix 4. Sectoral GDP Shares (%)

	1965	1970	1973	1979	1982	1986	1992	1996
A, F & F	29.88	28.18	27.41	23.75	22.90	24.64	22.75	21.00
Ind Sec	32.13	33.70	36.22	40.59	40.55	34.69	34.41	35.65
Mfg.	24.48	27.07	28.97	27.86	26.68	24.76	25.03	25.29
Serv Sec	37.98	38.12	36.37	35.66	36.55	40.67	42.84	43.35

Legend:

A, F & F = Agriculture, Fisherty & Forestry

Ind Sec = Industry Sector

Mfg = Manufacturing Sector

Serv Sec = Service Sector

Appendix 5. Sectoral Employment Shares (%)

	Oct 1965	Census 1970	Aug 1975	3rd Qtr 1980	3rd Qtr 1986	April 1992	Oct 1996
Agri	56.67	53.71	53.51	51.44	49.96	45.42	41.73
Ind	14.27	16.52	15.20	15.54	13.33	16.21	16.64
Mfg	10.90	11.92	11.37	11.04	9.25	10.69	10.04
Serv	28.59	28.16	31.02	32.99	36.71	38.30	41.61
Oth	0.47	1.62	0.27	0.04	0.00	0.07	0.02

Legend:

Agri = Agriculture

Ind = Industry

Mfg = Manufacturing

Serv = Services

Oth = Others

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