

# Chapter IV

## Singapore: Regional Development as a Cause of Instability

### 1. Changes in the Economy in 1996

#### (1) Slower Growth

Since the second quarter of 1996, the economy of Singapore has been approaching a turning point. From 1993 to 1995, the GDP in real terms had high growth rates of 10.4%, 10.5%, and 8.8%, respectively (Fig. 4-1). In the first quarter of 1996, growth was 11.5% (compared with the same quarter of the previous year). The growth then slowed to 7.6% in the second quarter and to 3.3% in the third (Table 4-1). In the fourth quarter, the growth rate recovered somewhat to 5.8%, and the rate for 1996 as a whole came to 7.0%. However, there were no signs that the economy had stepped back from the precipice as 1997 began, and the feeling became stronger that a return to the path of high growth would have to wait until the second half of the year.

There were two important reasons for this growth slowdown. First, the domestic manufactur-

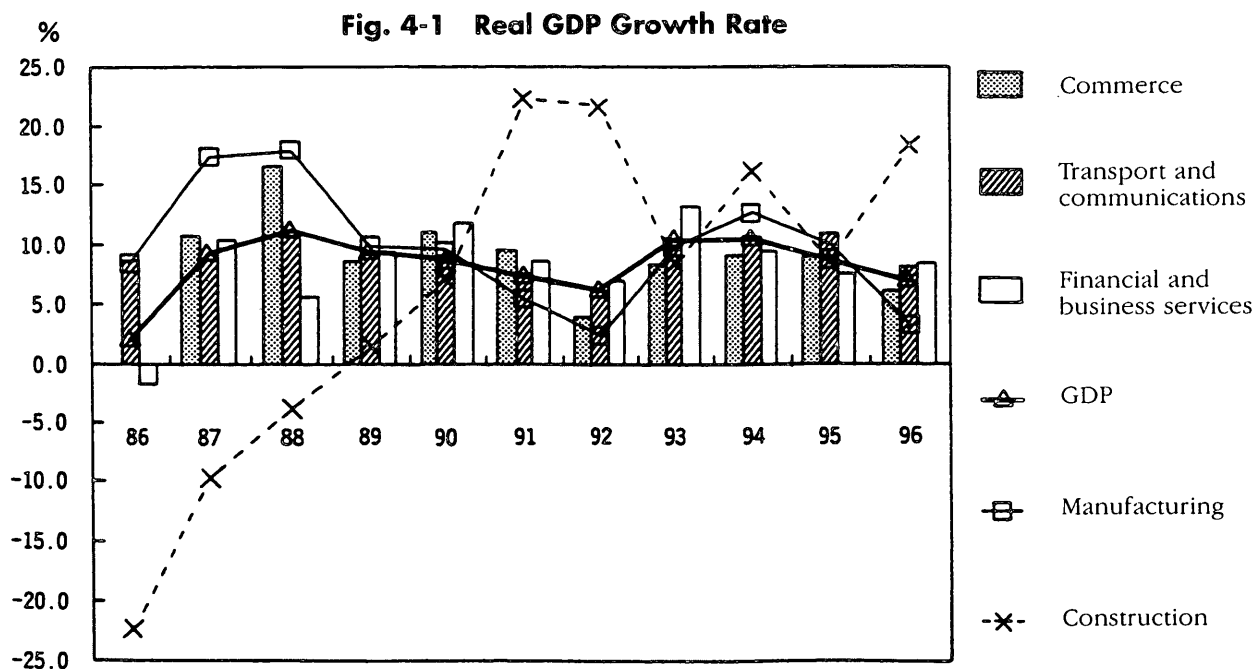
ing industry was forced to implement inventory adjustments in response to a decline in worldwide semiconductor trade. Second, the economies of the other ASEAN countries were all experiencing a similar slowdown, and the growth of exports from Singapore to these countries weakened substantially, both for domestic products and for re-exports.

**Table 4-1 Quarterly Changes of Real GDP Over the Previous Year, 1996**

(Unit: %)

Industrial sector	1st quarter	2nd quarter	3rd quarter	4th quarter	All of 1996
Manufacturing	13.6	6.4	-3.9	-0.7	3.4
Construction	26.9	18.4	16.3	13.7	18.4
Commerce	10.4	6.3	2.1	5.4	6.0
Transport and communications	10.7	8.2	6.2	7.6	8.1
Financial and business services	9.1	7.5	6.4	10.0	8.2
GDP	11.5	7.6	3.3	5.8	7.0

Source: *Economic Survey of Singapore, 1996*



Sources: 1985-1990, *Yearbook of Statistics Singapore*, 1994 (1985 prices); 1991-1993, *Yearbook of Statistics Singapore*, 1995; 1994 onward, *Economic Survey of Singapore*, 1996 (1990 prices)

## **(2) Spreading Influence of Inventory Adjustment in the Electronics Industry**

Growth rates of value added for the manufacturing industry dropped from the double digits of the first quarter of 1996 to negative figures in the third and fourth quarters, as shown in Table 4-1. Although the electronics industry increased its production of disk drives and computer peripherals, the production volume of PCs, semiconductors, consumer electronics, and telecommunications equipment dropped. In 1996, the production index for the electronics industry as a whole increased only 6.7% over the previous year's figure. (In 1995, the production index increased by 19.1%.)

Singapore's manufacturing industry had recorded real growth in the three years from 1993 at annual rates of 9.8%, 12.7%, and 10.0%, respectively. In 1995, this sector accounted for 27.8% of Singapore's GDP, and it was an important engine of economic growth during this period. In particular, the electronics industry has benefited from the explosive growth of world demand, particularly in the United States, for telecommunications equipment, PCs, and computer peripherals. The current value of production in 1993 grew by a full 24.3%, this in comparison with the previous year's growth figure of 10.7%. This robust growth continued in the succeeding years, with the figures for 1994 and 1995 being 23.9% and 18.7%, respectively. As a result, the share of the value added in the manufacturing sector as a whole accounted for by the electronics industry grew from 35.7% in 1992 to 43.6% in 1995. In addition, the share of domestic exports during this same period increased from 36.2% to 42.9% for the two product categories of office equipment and telecommunications equipment alone. Singapore's share of the total value of world semiconductor production in 1995 reached 7.4%. Consequently, the cyclic effects of worldwide oversupply, dropping prices and stock adjustments, especially with regard to memory chips, served to pull down the performance of Singapore's economy, which was so heavily dependent on its electronics industry.

## **(3) Synchronization with the Regional Economy**

The slowdown of the ASEAN regional economy, which was cited as the second factor in

the decelerated growth of Singapore's economy, is also intimately related to the effects of the worldwide inventory cycle in the electronics industry, which in turn is due to the large relative proportion of exports of electronics products by the ASEAN countries. For example, commodity exports accounted for 82.7% of Malaysia's GDP in 1995, and 53.0% of these exports were electronic and electrical products. This means that the economy is very sensitive to changes in worldwide supply and demand for electronics products. Furthermore, most of the intermediate goods used by the electronics industry are either produced in Singapore or are imported from advanced countries and NIEs via Singapore. In addition, many of Malaysia's exports go either to Singapore or via Singapore to other destinations. In this way, the worldwide semiconductor stock cycle has slowed simultaneously with the economic growth of Singapore's neighboring countries. The slowdown in trade between Singapore and these countries has brought business conditions in Singapore to a turning point.

## **(4) Cyclical Effects Only Slight**

The expression "turning point" might be something of misnomer when used to characterize a growth rate of 7.0%, so we should look at the economic trends in 1996 a little more closely.

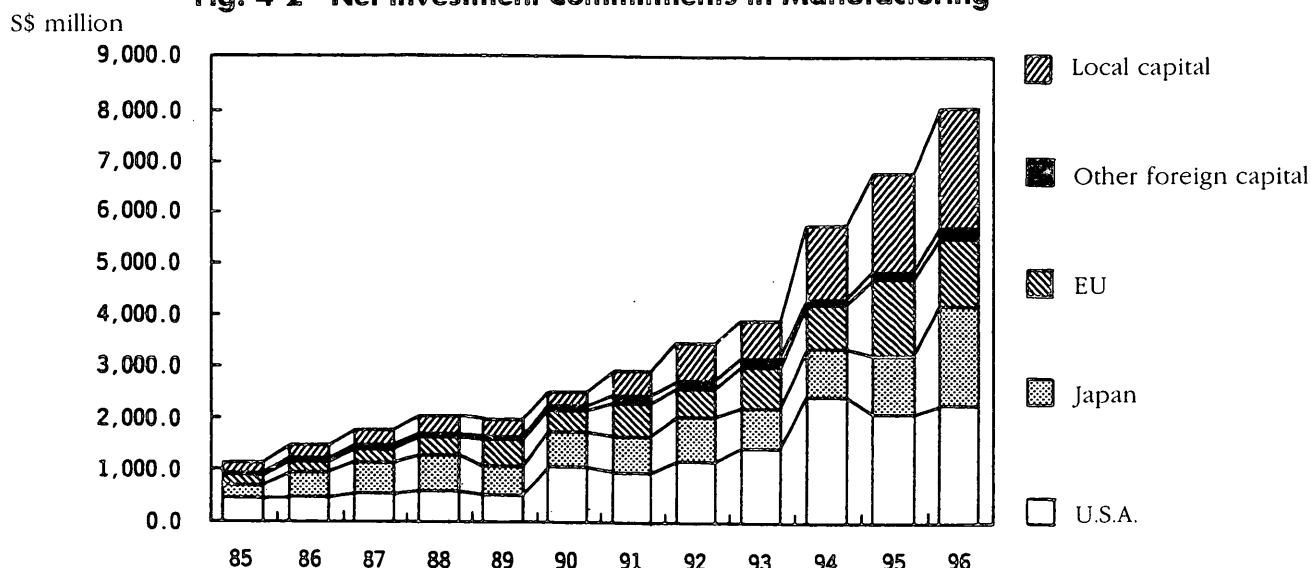
In spite of the standstill at which the manufacturing industry found itself, the Singaporean economy still posted a good growth figure because its other pillars such as the financial, business services and communications sectors continued their steady growth, while the construction industry achieved a large increase of 18.4% in value added (Table 4-1). The rapid growth in the construction industry was due to housing construction, this being spurred on by both the private and public sectors. This boom was the result of efforts made by the People's Action Party, as the general election scheduled for January 1997 approached, to rebuild and refurbish many blocs of the public housing estates in which approximately 85% of all Singaporean households live. This had the additional result of prolonging the general sense of economic prosperity. Real consumption increased rapidly, growing at a rate of 5.3% in 1995 and 8.0% in 1996 in the private sector, and at a rate of 9.6% in 1995

and 18.9% in 1996 in the public sector. It is therefore also necessary to note that there were strong fears that the economy might overheat. With regard to fixed capital formation, private investment in plant and equipment – particularly office equipment – grew at a rate of 4.9% in 1995 and 13.8% in 1996. This was in the context of a continuous inflow of foreign direct investment, which broke records year after year, beginning in 1991 (Fig. 4-2).

As the foregoing comments show, the majority

of the economic growth in 1996 was due to the ability of domestic demand in Singapore to withstand the suppressive effects of the worldwide stock adjustment in the electronics industry. In addition to it, the tailwind from the foreign direct investment, which fueled growth through the early 1990s, continues to be quite strong. However, it seems clear that a portion of the growth was due to a governmental decision to postpone the solution of structural problems, albeit temporarily.

**Fig. 4-2 Net Investment Commitments in Manufacturing**



Source: Same as Fig. 4-1

## 2. Development Strategy for the 1990s

### (1) Arriving at a "Strategic Economic Plan"

Before we consider the structural problems, let us examine the policies of the government of Singapore during the first half of the 1990s, which were aimed at making the structure of the principal industries more sophisticated.

In 1984 and 1985, Singapore was trying to recover from the worst economic slump it had experienced in the postwar period. In order to accomplish this, policies were developed which aimed to make Singapore an international business center. For example, improving the investment climate by accelerating deregulation and imposing a

temporary freeze on wage hikes; fostering service industries that are mutually complementary with manufacturing industries; and attracting the regional operational headquarters and regional procurement functions of multinational corporations. These policies, together with the influx of foreign direct investment at that time, put the economy back on the path of high growth. By the late 1980s, based on this success, several sectoral development plans were drawn up, including the "Information Technology 2000 Plan," the "National Technology Plan," and the "Small and Medium-sized Enterprises Master Plan." In December 1989, a concept for a "Growth Triangle" comprising Singapore, the state of Johor in Malaysia, and the province of Riau in Indonesia was announced. The first project was to be the comprehensive development of the island of Batam.

In the same month of 1989, economists and

specialists from both the private and public sectors were mobilized to form a newly established Economic Planning Committee. Its task was to sum up the above-mentioned plans and concepts, as well as the economic performance of the 1980s, and to set targets and identify the prospects for economic development in Singapore over the next 20 to 30 years. Their report, "The Strategic Economic Plan – Becoming a Developed Nation," was issued in December 1991 and specified the basic strategy for economic development that has been followed up to the present.

## **(2) Targets and Seven Strategies**

The target in the Strategic Economic Plan is to bring Singapore into the first league of the developed nations (for example, the G7 group) through a high level of sustained growth over the next 30 to 40 years.

According to the plan, there are two basic limitations inhibiting Singapore's ability to reach the stated target: the country's limited land area (639 km<sup>2</sup> in 1991) and limited human resources (a population of 2.71 million in 1990), which have been in a state of full employment since the end of the 1970s. In addition, several new factors to be reckoned with had arisen both internally and externally during the 1980s. Of these, the plan pointed out the following: (1) neighboring countries have been catching up rapidly, and it has become difficult to achieve export-led growth based on simply attracting foreign capital; (2) there is a trend toward protectionism among the advanced countries; (3) industrial promotion methods are being developed to expand and deepen the synergetic linkages among enterprises in different industries located in the same area; (4) the value consciousness of the citizenry is becoming more diverse and complex; and (5) Singapore's economy is becoming more interdependent with the economies of Southeast Asia and of Asia as a whole.

Based on these limitations and conditions, a growth strategy for the 1990s was proposed consisting of seven items: the Growth Triangle initiative, redevelopment of domestic services, clarification of the business characteristics of Singapore as an advanced nation, development of human resources, development of a human infrastructure, formation of a global city which can tap from the world the

best talent and technologies, and the attainment of economic resilience.

## **(3) Emphasis on Development of Technology and Technical Skills**

Of these seven items, the development of human resources is considered the most important strategy. As has already been mentioned, this has become an unavoidable precondition for achieving a more sophisticated industrial structure due to the tight labor supply and demand situation. This was also based on a movement in Singapore away from economic growth based on quantitative expansion of production factors, which had previously been the case, toward the European and American academic theory that advocates proceeding with measures to promote growth through enhancing the contribution of "third factor productivity" (so-called total factor productivity). The development of human resources is also emphasized in two of the other growth strategy items. That is to say, development of a human infrastructure means creating a pool of manpower in key technologies and a social environment that encourages R&D, and the formation of a global city has as one of its concrete goals the attraction to Singapore of researchers, technicians, and skilled laborers from around the world (in numbers equivalent to 0.4% of the total population). The achievement of a more sophisticated industrial structure and sustained growth through the development of human resources and technology is one of the three pillars of the Strategic Economic Plan.

## **(4) Emphasis on Electronics in Industrial Policies**

The second pillar is the adoption of the "cluster approach" as an industrial policy. The term "cluster" refers to a whole group of enterprises of different types located in the same region in which a linkage has formed such that the growth and survival of the enterprises of one type is not possible without the business activities of other types. The Strategic Economic Plan specifies a total of fourteen clusters: goods trading, sea transport, precision instruments, electronics, information technology, petroleum and petrochemicals, construction, heavy machinery, finance, insurance, general

support industries, tourism, international hub, and local industry. From this line-up of clusters, it can be safely said that the electronics cluster is expected to play a leading role. For each of these, several government agencies (for example, the Economic Development Board, the National Science and Technology Board, and the Singapore Institute of Standards and Industrial Research for the electronics cluster) are working together as lead agencies to draw up a detailed cluster plan.

### **(5) Asia-centered Strategy**

The final pillar is the strategy of incorporating the high economic growth in Asia at the time as a factor for growth in the Singaporean economy.

It goes without saying that the opportunity provided by the appreciation of the yen accompanying the Plaza Accord of 1985 led to a rapid advance in reorganizing the international division of labor throughout East Asia as a whole. The resulting flood of direct investment, not only from the advanced countries such as Japan and the United States but from the Asian NIEs as well, was an important factor in the economic growth of the ASEAN countries and China during the 1990s. This economic growth in the ASEAN countries expanded demand within the region, which in turn attracted more foreign direct investment. Thus, a favorable cycle was formed. However, at the same time, there was a growing concern among the ASEAN countries that the flow of foreign direct investment might shift to Eastern Europe and China, as well as to countries of the EU and of the North American Free Trade Agreement (NAFTA), which was at that time nearing realization.

Singapore's concept of the Growth Triangle was one answer to such issues. It would also make it possible to apply a combination of production factors with the comparative advantages of the three countries — Singapore's accumulated financial, transport, and communications functions, as well as its know-how in the construction and management of industrial estates; and the cheap labor, land, water, etc., of Indonesia and Malaysia on the island of Batam and in the state of Johor. The concept would provide those enterprises facing cost difficulties, not only in Singapore but also in advanced countries and the Asian NIEs, with a new place to move into within the region.

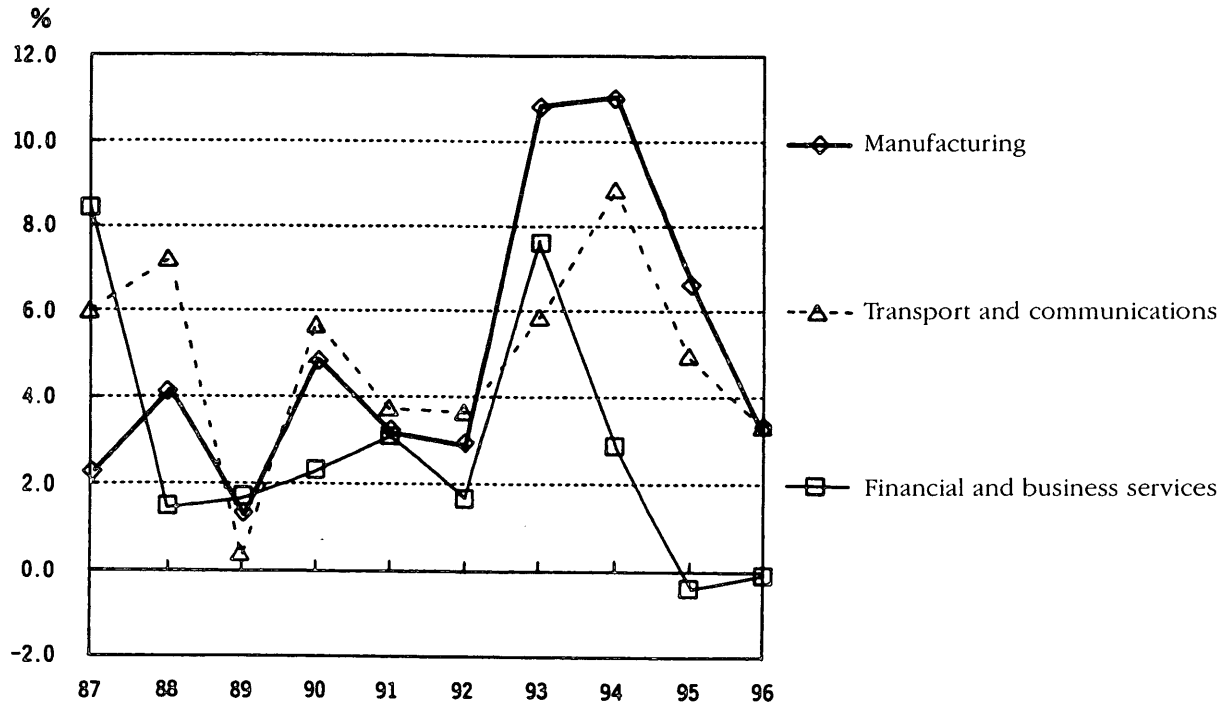
Along with the concept of the growth triangle, the Strategic Economic Plan advances the global city concept as a strategy for economic internationalization. This concept promotes advancement into overseas markets and overseas direct investment by Singaporean enterprises, while working to tap research and development personnel from overseas. These two strategies are bearing fruit in the development of overseas direct investment by Singaporean enterprises centered on the creation and management of industrial estates in China (Suzhou and Wuxi), India (Bangalore), the Philippines, Vietnam, and Myanmar. In this way, Singapore put into effect at the beginning of the 1990s an economic strategy that would become a major element in its growth. This strategy consisted of, domestically, improvement of technology and technical skills as well as the formation of clusters to create an industrial synergy; and overseas, using a favorable economic cycle and horizontal specialization within the Asian region to create a mutually reinforcing effect.

### *3. Effects of the Strategic Economic Plan and Related Issues*

#### **(1) Development of Human Resources and Rising Costs**

Let us begin by examining the development of human resources, in particular with regard to R&D. Under the National Technology Plan that has already been mentioned, quantitative targets were proposed: raising gross expenditure on R&D from 0.8% of GDP in 1990 to 2% in 1995, raising the number of research scientists and engineers per 10,000 members of the workforce from 27.7 in 1990 to 40 in 1995, and raising the proportion of R&D expenditure accounted for by the private sector to 50%. Of these, gross expenditure on R&D accounted for only 1.13% of GDP in 1995. The other two targets were exceeded, however, with the number of researchers and engineers per 10,000 members of the workforce reaching 47.7 in 1995, and the proportion of R&D expenditure accounted for by the private sector reaching 62.7%.

It is difficult to measure the economic effects of development of human resources by using variables related to R&D alone. Nevertheless, let us

**Fig. 4-3 Rate of Change in Productivity\* by Sector**

\* Value added per worker adjusted for hours worked

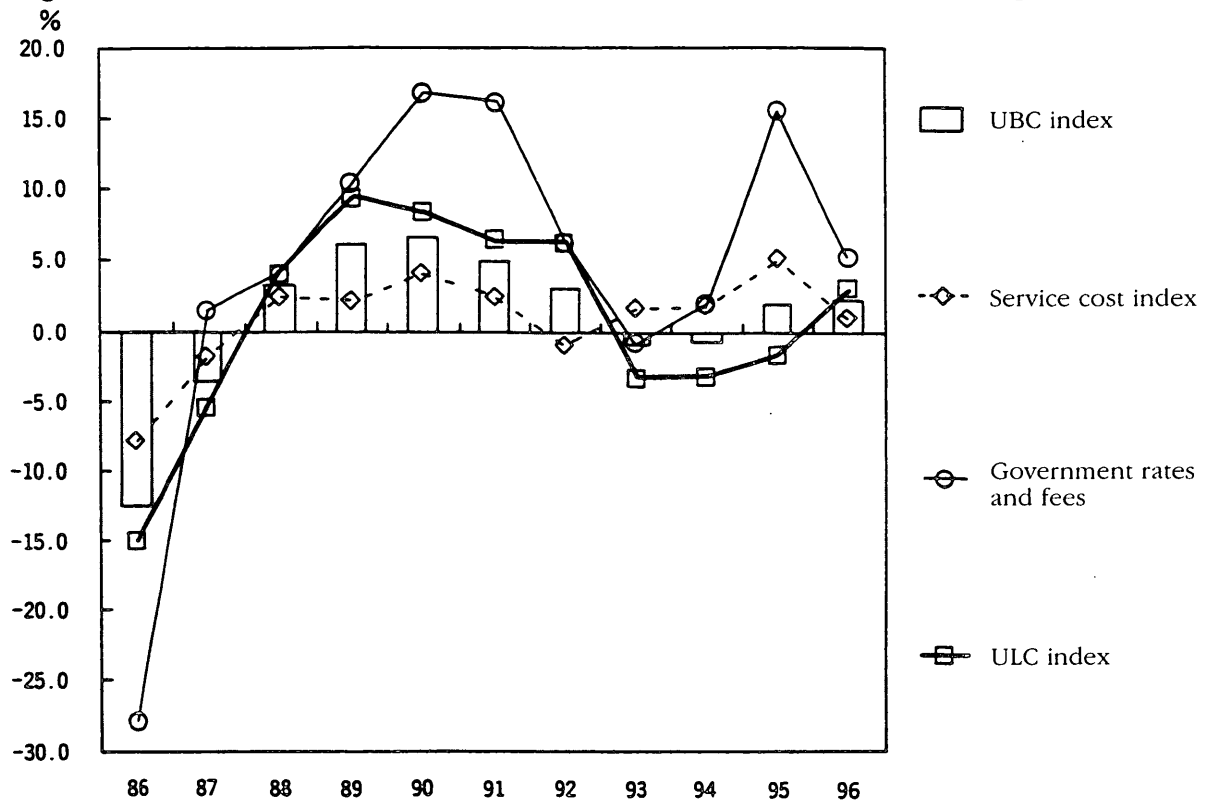
Source: Same as Table 4-1

consider the trend in industrial productivity shown in Fig. 4-3. The rate at which productivity rises is cyclical, lagging behind the operation rate, in other words the business cycle. The trend shows that the period from 1993 onward followed a cyclical path at a higher level than that of the latter half of the 1980s. This can be seen as reflecting a part of the effects of the development of human resources, as well as of higher productivity than before thanks to machinery and equipment purchased by foreign direct investment in the first half of the 1990s.

Nevertheless, it is evident that these effects have begun to weaken by the mid-1990s, if we examine Fig. 4-4, which shows the annual change in the index of unit business cost (UBC) in the manufacturing industry. The UBC figure comprises the unit labor cost (ULC), services cost, and government rate and fees per unit produced. The ULC figure consists principally of wages; the services cost comprises the cost of public utilities such as electricity, as well as warehouse and port charges and taxes vary from year to year, especially with changes in the property tax on industrial land. The weight given to these various factors when calculat-

ing the UBC figure is unclear, but it appears to break down to approximately 0.5 for ULC, 0.45 for service cost, and the rest for taxes. Of these, particular attention should be paid to changes in the ULC figure. Since ULC represents the cost per unit produced, it is determined by changes in productivity and wages. Generally, when the business cycle hits bottom, the value of this index drops as the operating rate starts to rise. As the business cycle nears its peak, the magnitude of fluctuations in the rate at which productivity rises becomes smaller, and the index rises if wages rise faster than productivity.

During the 1990s, there was a slight business downturn, during which the growth rate in the manufacturing industry stayed at around 2.4%, and for three years starting in 1993, the ULC figure dropped. Then it began to increase again in 1996. In short, we can see that the cost reduction effect of the massive foreign direct investment and the higher-quality capital equipment is beginning to weaken. This shows once again that bringing the industrial structure to a new level of sophistication combined with R&D is not enough; promotion of human resource development is also required.

**Fig. 4-4 Unit Business Cost and Labor Cost Indices in the Manufacturing Industry**

Source: Same as Fig. 4-1

## (2) Deepening Dependency on the Electronics Industry

Among the manufacturing industries, the Strategic Economic Plan identified the electronics industry, together with precision machinery, heavy machinery, general support industries, and petroleum and petrochemicals, as priority development clusters. Consequently, in the 1990s, the government built an industrial estate with the necessary infrastructure for semiconductor pre-processing at Woodland and implemented policies aimed at attracting major foreign wafer manufacturers. However, although government policies have been effective in encouraging the concentration of enterprises in the electronics industry and related industries in Singapore, the choices made by the enterprises deciding to set up in Singapore have also been a big factor.

The ASEAN countries had been spurred on by the above-mentioned fear of a shift in foreign direct investment and at the beginning of the 1990s,

expectations quickly began to rise regarding the concept of attracting foreign direct investment by liberalizing trade within the region, which would in turn expand the scale of the market and improve the prospects for horizontal division of labor within the ASEAN region. It goes without saying that the expectation was that growth in the economies of the member nations brought about by the development of division of labor within the region would have a synergetic effect. In this way, the ASEAN Free Trade Agreement (AFTA) project was launched in 1993. This then led in 1996 to the start of the ASEAN Industrial Cooperation Scheme (AICO).

In this way, the electronics industry has come to shoulder the burden of structural reorganization required for regional division of labor and has become the leading growth industry of the period, although at times it has reacted oversensitively. Although enterprises from the advanced nations and from the Asian NIEs have established production facilities in the ASEAN countries, they have also been set up throughout the entire East Asian region, including China, in

locations where a comparative advantage was seen to exist. Acting as hubs, regional operational headquarters such as those in Singapore and Kuala Lumpur are building a production system in the form of a network that can be reorganized whenever necessary to respond sensitively to changes in the comparative advantage of different countries.

Through this production system, the business cycles of the Asian economy became influenced by all of the growth and changes in the fast-paced electronics industry that had been occurring on a global scale. The fact that the reason for the downturn in Singapore's economy in 1996 was a downturn in the regional economy synchronized with the semiconductor cycle indicates that a new source of instability has arisen for the manufacturing industry in Singapore, which is very dependent on the semiconductor industry. The new instability is an unavoidable result of the fact that Singapore's government has pursued during the first half of the 1990s a development strategy focusing on a limited number of manufacturing clusters, among which the electronics industry has been expected to play a leading role.

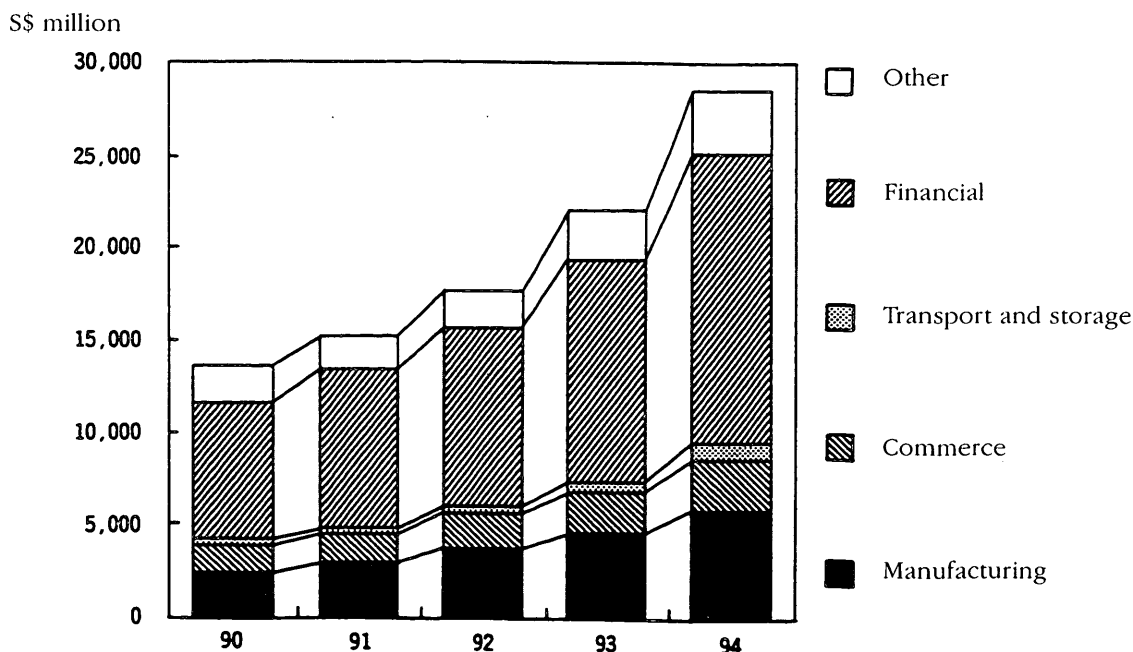
Now, in 1997, the Economic Development Board is requesting that foreign manufacturers in Singapore design new products and start production. This request is just a first-aid treatment in nature and a new strategy based on innovative

conception has yet to come.

### (3) Causes of the Increasing Emphasis on Asia

Calculated on an outstanding basis, Singapore's overseas direct investment increased rapidly year by year between 1991 and 1994 (Fig. 4-5). Furthermore, the proportion of this accounted for by investment in manufacturing industries expanded from 17.6% in 1990 to 20.5% in 1994. By 1995, the growth rate of the amount outstanding had decreased to 21%, but it was still at a high level. An examination of the figures for those countries receiving investment shows that, even among the Asian countries, the share of ASEAN members is high, and steadily expanding. Although China's share is currently small, it is growing rapidly (Table 4-2). Not included in the tables and figures is investment in Vietnam and India, which is also growing quickly. It appears that regional development by Singaporean enterprises is taking place at an even quicker pace than that envisioned in the Strategic Economic Plan. If we interpret the portion of GNP accounted for by "factor income abroad" to be the contribution by enterprises engaged in overseas operations, we can see that the share of GNP accounted for by such enterprises reached 11% in 1996.

**Fig. 4-5 Overseas Direct Investment\* Originating in Singapore**



Note: \* Stock at the end of the term

Source: Yearbook of Statistics, 1995



**Table 4-2 Singapore's Overseas Investment\* by Country (Share of Total)**

(Unit: %)

	1990	1991	1992	1993	1994
Asia	51.5	48.7	51.9	52.5	55.8
ASEAN	26.2	26.3	27.6	27.5	30.0
Indonesia	1.7	1.8	1.8	2.8	3.4
Malaysia	20.5	20.6	22.1	20.8	22.5
Thailand	2.8	3.0	2.6	2.7	2.5
Hong Kong	16.6	15.6	17.2	17.3	16.1
China	1.8	1.4	1.6	2.9	5.3
Taiwan	3.6	1.9	2.0	1.8	1.7
Japan	0.4	0.5	0.4	0.4	0.4
Europe	8.0	9.2	8.3	7.1	7.7
U.S.A.	5.1	8.6	9.0	8.0	6.6
Total capital investment	100.0	100.0	100.0	100.0	100.0

Note: \* Stock at the end of the term

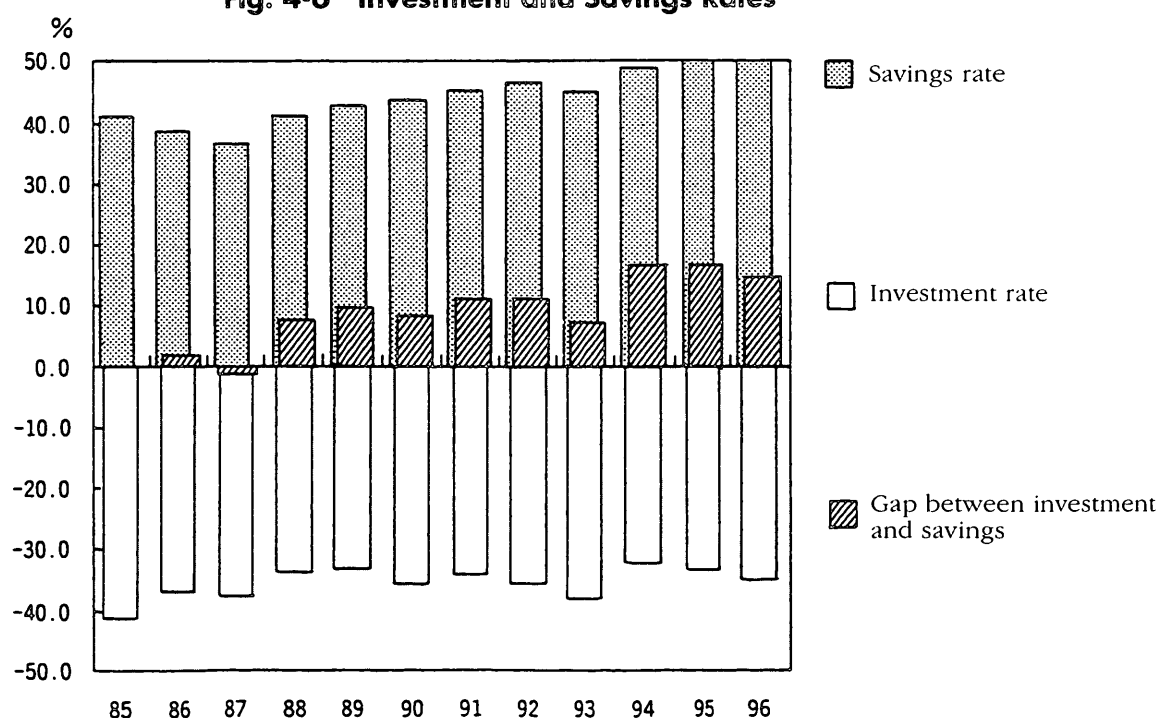
Source: Same as Fig. 4-5

Nevertheless, the fact that Singapore's economy is becoming increasingly dependent on overseas markets through direct investment is an unavoidable result of government policies aimed at

incorporating Asia's capacity for high growth into the economy of Singapore. At the same time, it must be borne in mind that such policies were in a sense unavoidable due to limited domestic demand.

Fig. 4-6 shows changes in the rate of investment and savings. The savings rate was nearly 45% in the period between 1990 and 1992. Between 1993 and 1996, it rose to a level of approximately 49%. On the other hand, the rate of investment fluctuated between 32% and 38%. In 1994, excess savings reached 16.9% of GNP. This high rate of savings is largely due to the Central Provident Fund (CPF), the compulsory savings system for workers that was introduced by Singapore in the 1960s. The government must engage in overseas investment for reasons that include preserving the value of private savings, and particularly the CPF. There is also the calculation that direct investment entails less risk than investment in financial assets in the Asian region.

With respect to both maintaining the sources of growth and of preserving the value of private savings, there is no likelihood that Singapore will reduce its Asia-centered overseas investment in the intermediate term.

**Fig. 4-6 Investment and Savings Rates**

Source: Same as Fig. 4-1

#### 4. Conclusion

Due to cost factors, Singapore's manufacturing industry cannot avoid becoming more sophisticated, but development outside the existing clusters will be difficult within the intermediate timeframe. As we have already seen, it will probably go no further than the development of new products. However, we cannot look forward to another explosive increase in demand for PCs and peripherals like the one brought about by the worldwide expansion of Internet services between 1993 and 1995.

On the other hand, faced with industrial adjustment and the predicted restrictions on wage increases, there is little likelihood that the savings rate will decline. Furthermore, it would be difficult to raise substantially the current level of domestic investment. This being the case, it would appear that the pressure to invest overseas will continue.

With the promotion of liberalization in East Asia, and in particular the implementation of the AICO, international division of labor is likely to increase to a new level in the automotive and electronics industries. This will probably cause the linkage between the electronics industry in Sin-

gapore and that in the other countries of the region to deepen still further. Also, as can be seen in the building of a "Multimedia Super Corridor" in Malaysia, efforts to further develop the information and communications industry in different countries within the region and, at the same time, to make their electronics industry more sophisticated, are being strengthened.

As such, increasing dependence on the electronics industry causes the cycles of the region's economies to become synchronized and causes fluctuations in business activities to be wider. In other words, there is a significant danger that it may create economic instability. It is not only the electronics industry that exercises such an influence. The effect will probably be similar within the region — not only in Singapore — in the petrochemicals industry and in other industries that benefitted from the influx of foreign direct investment in large amounts that occurred during the first half of the 1990s.

In the intermediate term, Singapore's economy will probably experience a period of growth at a lower level than has previously been the case. In addition, the fluctuations in the economic cycle will likely be larger than before.