

## Japan as a Newly-Industrializing Economy

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## **Japan as a Newly-Industrializing Economy**

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### **Introduction**

In this paper an attempt will be made to trace the experience of Japan as a newly-industrializing economy (NIE) over a period of postwar high growth, 1950—1970. The twenty-year period is characterized by sustained high rates of economic growth accompanied by steady changes in output and trade composition. One of the main purposes of this paper is to place the postwar experience within a longer-term perspective of transitional growth from economic backwardness to fully modernized economy. In such a long-range perspective the newly-industrializing economy is viewed as going through a unique stage of economic history that is marked by structural change and rapid growth of the economy. The NIE stage can be conceptualized as a sequence of two (possibly overlapping) transitional substages: transition out of the stage of backwardness and transition into the stage of advanced economy. The first substage is characterized by a rise in the weight of industrial activities in the composition of production and export and the second substage by an increased share of technologically sophisticated branches of manufacturing in both production and export. In Japan's case the first substage was already completed before WW II and the second substage was well in progress in the 1920s and 1930s. The postwar industrial development represented a continuation and successful termination of the second substage of the NIE stage. From this historical viewpoint, cumulative aspects of industrial development will be identified and pre-war heritages in industrialization will be emphasized as a basis for the postwar success story.

The second task of this paper is to present stylized facts about economic growth and transformation in postwar Japan and to offer some hypotheses concerning the mechanism of and underlying factors for growth and structural change. Particular attention will be paid to the role of exports both as a supply-side factor and as a demand-side factor. Growth of manufactured exports was certainly one of the most conspicuous aspects of Japan's postwar growth. Discussion in this part of the paper will first focus on the relationship between investment and export at the macroeconomic level. The remaining portion of the section will trace compositional changes in production and export of manufactures over the postwar high-growth period. A cross-sectional perspective of Japan's position as an NIE within the international economic configuration will be introduced in discussing the regional

composition of exports in addition to the time-series perspective presented in the previous section. Patterns of compositional change will be identified and illustrative accounts of development paths of some leading industries will be provided.

Another major topic to be taken up in this paper is the place and role of industrial policy in the rapid economic growth of postwar Japan. Following brief discussion of macroeconomic planning, the basic thinking and approach to industrial development adopted by the Ministry of International Trade and Industry (MITI) will be summarized and contrasted with the orthodox neoclassical approach. Discussion on the need for and effect of MITI's industrial policy which constitutes the rest of the section is admittedly speculative and might be found controversial.

Brief remarks on lessons from the Japanese experience will close the paper.

## **I. Japan as an NIE: Historical Perspective**

The transition process of modern economic growth in Japan started in the 1870s after the Meiji Restoration when the country entered into external economic relations after three hundred years of self-imposed isolation from the rest of the world. The process of modern economic growth was characterized by a rising trend of the share of the nonprimary sector in total output and employment (Table 1). The other side of the same coin, of course, was a decline in the primary sector's share in output and employment. By around 1930, the primary sector's share in NDP became less than 20% and its share in the labor force was below the 50% mark. The postwar process of industrialization started as a partial replay of the historical trend already established in the prewar period. The mid-1930s levels of the secondary sector's share in output and employment were regained by the beginning of the 1960s and further advancement was made over the decade, thereby completing the process of modernization of the economy.

Turning now to the compositional changes within the manufacturing sector, the share of the heavy and chemical industry (comprising chemicals, metals and machinery) began to show a rising trend after the turn of the century, led by metal products and machinery (Figure 1). Those industries tended to maintain higher growth rates than the light manufacturing branches although there were considerable fluctuations in the growth rates of individual subdivisions from decade to decade (Figure 2). The relative contribution of the heavy and chemical industry to the growth of the manufacturing sector, which was around 10% before the turn of the century, rose to more than 40% in the 1900s and 1910s and exceeded 60% in the 1920s and 1930s. Within the light manufacturing sector, two main components, i.e., food and textiles, exhibited a contrasting pattern over the prewar period. The share of the food industry declined throughout the period while that of textiles went up before the turn of the century, more or less maintained that level through the 1920s, and declined in the 1930s as the growth of the heavy and chemical industry accelerated and its own growth rate followed a downward trend.

The postwar industrial development is characterized as continuation of the long-term change in relative shares between the heavy and chemical industry on the one hand and the light industry on the other. In the postwar years, however, compositional changes within the heavy and chemical industry took on an added

**Table 1 Long-term Changes in Sectoral Composition**  
Sectoral Composition of Net Domestic Product  
(Percentage in current prices)

|      | Total | Primary | Secondary | Tertiary |
|------|-------|---------|-----------|----------|
| 1885 | 100.0 | 45.2    | 14.7      | 40.1     |
| 90   | 100.0 | 48.4    | 15.3      | 36.2     |
| 95   | 100.0 | 42.7    | 18.1      | 39.2     |
| 1900 | 100.0 | 39.4    | 21.2      | 39.4     |
| 05   | 100.0 | 32.9    | 21.1      | 46.1     |
| 10   | 100.0 | 32.5    | 26.0      | 41.5     |
| 15   | 100.0 | 27.6    | 32.4      | 40.0     |
| 20   | 100.0 | 30.2    | 29.1      | 40.7     |
| 25   | 100.0 | 28.1    | 27.1      | 44.7     |
| 30   | 100.0 | 17.6    | 31.6      | 50.8     |
| 35   | 100.0 | 18.1    | 36.6      | 45.3     |
| 40   | 100.0 | 18.8    | 47.4      | 33.8     |
| 47   | 100.0 | 35.4    | 28.5      | 36.0     |
| 50   | 100.0 | 26.0    | 31.8      | 42.3     |
| 55   | 100.0 | 23.1    | 28.6      | 48.3     |
| 60   | 100.0 | 14.9    | 36.3      | 48.9     |
| 65   | 100.0 | 11.2    | 35.8      | 53.0     |
| 70   | 100.0 | 8.6     | 43.0      | 48.4     |

Sectoral Composition of Labor Force  
(Percentage)

|      | Total | Primary | Secondary | Tertiary |
|------|-------|---------|-----------|----------|
| 1872 | 100.0 | 72.7    |           | 27.4     |
| 85   | 100.0 | 70.1    |           | 29.9     |
| 90   | 100.0 | 67.8    |           | 32.1     |
| 95   | 100.0 | 65.3    |           | 34.7     |
| 1900 | 100.0 | 65.0    |           | 35.0     |
| 05   | 100.0 | 69.5    | 15.5      | 15.0     |
| 10   | 100.0 | 67.1    | 16.7      | 16.1     |
| 15   | 100.0 | 62.5    | 19.5      | 18.0     |
| 20   | 100.0 | 55.3    | 24.1      | 20.6     |
| 25   | 100.0 | 52.4    | 23.6      | 24.0     |
| 30   | 100.0 | 52.1    | 21.9      | 26.1     |
| 35   | 100.0 | 48.7    | 23.0      | 28.3     |
| 40   | 100.0 | 47.7    | 27.0      | 25.4     |
| 47   | 100.0 | 54.2    | 22.6      | 23.3     |
| 50   | 100.0 | 48.3    | 21.9      | 29.8     |
| 55   | 100.0 | 41.0    | 23.5      | 35.5     |
| 60   | 100.0 | 32.6    | 29.2      | 38.2     |
| 65   | 100.0 | 24.6    | 32.0      | 43.4     |
| 70   | 100.0 | 19.4    | 33.9      | 46.7     |

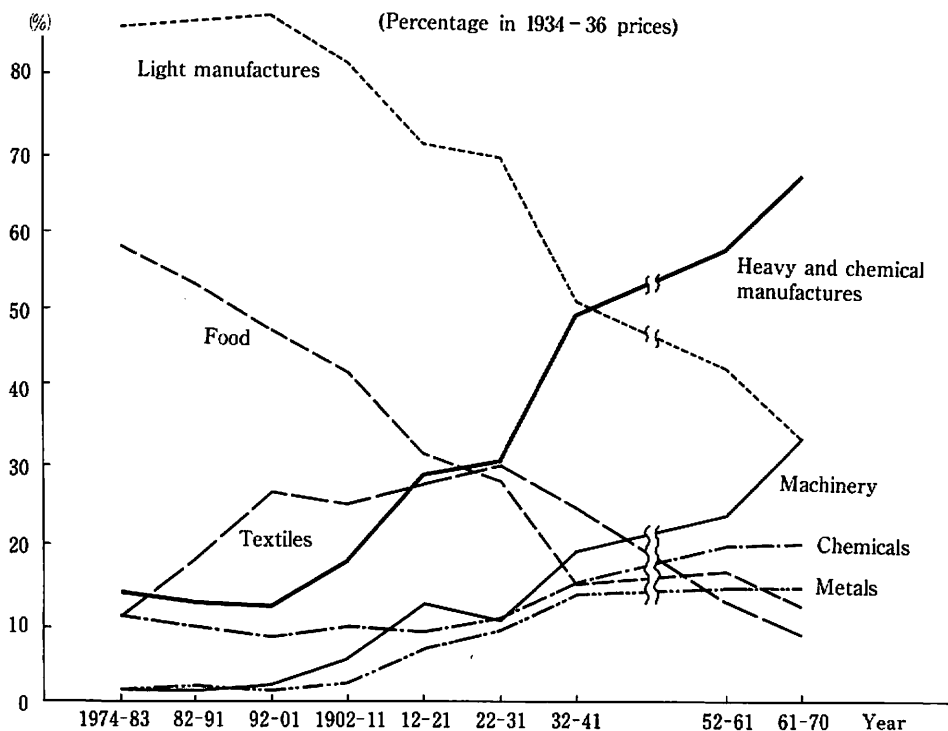
Source: Cited from Takafusa Nakamura, *Nihon Keizai [The Japanese Economy]*, Second Edition, University of Tokyo Press, 1981, pp.34,35.

Note: The sector classifications are as follows:

Primary: Agriculture, forestry & fishing

Secondary: Mining, manufacturing and construction

Tertiary: Transport & communication, electricity, gas & water, commerce, finance, service and public administration



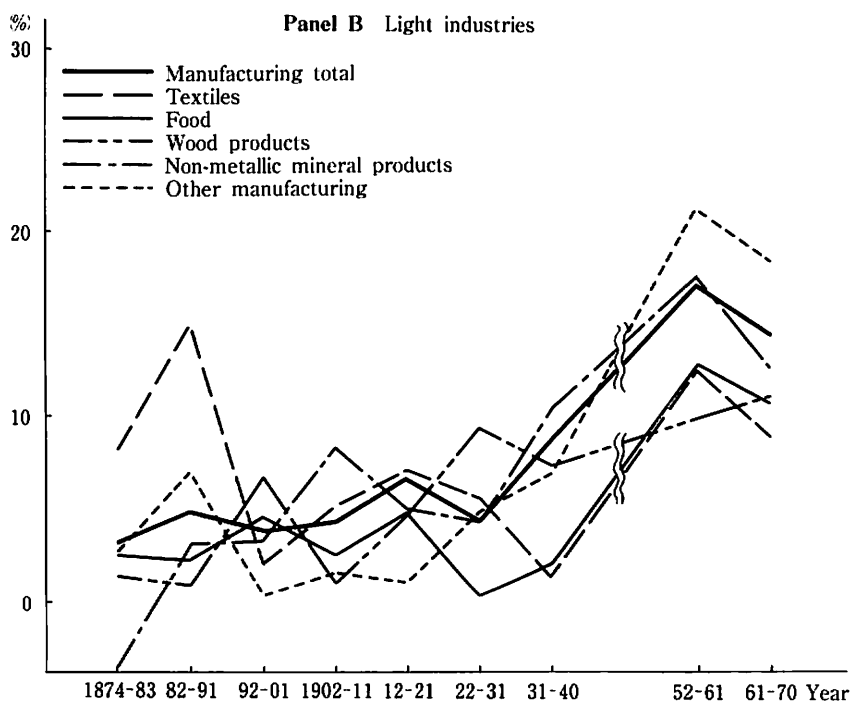
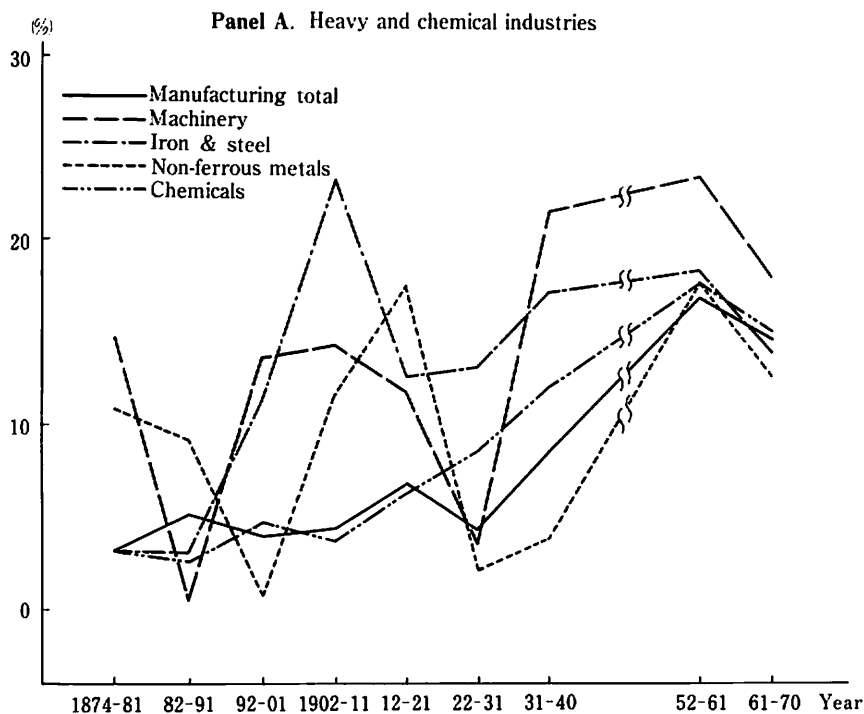
**Figure 1 Compositional changes in manufacturing**

Source: Kazushi Ohkawa and Miyohei Shinohara, eds., *Patterns of Japanese Economic Development: A Quantitative Appraisal* (New Haven: Yale University Press, 1979), Appendix tables A21 and A22.

importance. The high growth rate and resulting rise in the weight of the machinery industry was the most conspicuous aspect of the postwar industrialization. We will examine patterns of industrialization in the 1950s and 1960s in the next section.

Let us now trace shifts in the composition of imports and exports (Table 2). Over the hundred-year period since the 1870s Japan's trade structure was completely changed from one of primary products export and manufactures import to the opposite. The initial phase of the shift in trade structure was characterized by rapidly declining shares of textiles (mainly cotton yarns and fabrics) and other light manufactures in imports and by a large and increasing share of textile exports (initially, silk products and, subsequently, cotton goods). The share of the heavy and chemical manufacturing in total imports was on the rise through the 1910s, and its share in exports remained modest before the 1930s. The trade pattern observed in the postwar period reflected the long-term trend in compositional changes in imports and exports. At the same time, however, there were some new developments: the share of manufactures in total imports was drastically reduced from the prewar level, but it was on the rise throughout the 1950s and 60s; the share of heavy and chemical manufactures in total exports was much higher than the prewar level, and it continued rising until it reached nearly 70% in the second half of the 1960s.

A rough indication of the trade orientation of various branches of manufactur-



**Figure 2 Growth rates of manufacturing industries: 1870s - 1960s**

Source: Same as in Figure 1.

Note: Average annual growth rates for the decades indicated measured between the given years.

Table 2 Compositional Changes in Imports and Exports: 1870s - 1960s (Percentage in current prices)

| Period    | Imports          |                  |                              |              |          |                            | Exports          |                                 |       |          |
|-----------|------------------|------------------|------------------------------|--------------|----------|----------------------------|------------------|---------------------------------|-------|----------|
|           | Primary Products |                  |                              | Manufactures |          |                            | Primary Products | Manufactures                    |       |          |
|           | Total            | Crude food stuff | Raw Materials<br>Fuels Other | Total        | Textiles | Other light manufac- tures |                  | Heavy & Chemical manufac- tures | Total | Textiles |
| 1874-83   | 8.8              | 0.7              | 5.0 3.1                      | 91.2         | 54.0     | 17.8                       | 42.5             | 42.4                            | 6.9   | 8.2      |
| 1882-91   | 18.7             | 5.0              | 6.4 7.3                      | 81.3         | 37.4     | 17.4                       | 33.0             | 45.6                            | 9.1   | 2.4      |
| 1892-1901 | 36.4             | 9.9              | 4.5 22.1                     | 63.6         | 16.8     | 14.2                       | 21.0             | 52.6                            | 13.2  | 13.2     |
| 1902-11   | 45.2             | 12.5             | 4.0 28.8                     | 54.8         | 9.6      | 10.8                       | 14.1             | 53.8                            | 17.2  | 14.9     |
| 1912-21   | 52.6             | 12.5             | 2.2 37.9                     | 47.4         | 3.3      | 8.5                        | 9.0              | 56.4                            | 15.3  | 19.3     |
| 1922-31   | 56.6             | 18.8             | 4.3 35.5                     | 43.3         | 5.5      | 11.6                       | 6.8              | 65.8                            | 14.5  | 12.9     |
| 1931-40   | 58.0             | 17.5             | 7.6 33.0                     | 42.0         | 2.4      | 8.3                        | 6.9              | 45.7                            | 18.7  | 28.7     |
| 1951-55   | 87.8             | 26.9             | 11.3 49.6                    | 12.2         | 0.6      | 1.2                        | 3.6              | 38.6                            | 17.4  | 40.4     |
| 1956-60   | 77.3             | 14.8             | 16.5 46.0                    | 22.7         | 0.5      | 2.0                        | 4.2              | 31.6                            | 19.9  | 44.3     |
| 1960-65   | 73.6             | 14.9             | 18.4 40.3                    | 26.4         | 0.5      | 3.9                        | 3.3              | 21.1                            | 19.0  | 56.6     |
| 1966-70   | 70.8             | 14.4             | 20.6 35.8                    | 29.2         | 1.3      | 4.5                        | 2.4              | 14.4                            | 12.2  | 68.2     |

Source: Cited from Ipei Yamazawa and Yuzo Yamamoto, "Trade and Balance of Payments", in Ohkawa and Shinohara, eds., op. cit.

Notes: All figures are percentage shares of total imports or exports calculated from ten-year (prewar) or five-year (postwar) averages of the current price series.

ing may be seen by comparing their shares in the output, import and export of total manufacturing (Table 3). Textiles' share in imports was higher than its share in output in the 1870s and 80s but not thereafter. This shift reflected the progress of import substitution in cotton textiles. Textiles' share in exports was much higher than its share in output throughout the decades covered here, indicating the export orientation of the industry. There were a series of fast-growing export products within the textile industry, changing over time from silk to cotton to rayon and, in the postwar period, to synthetic fiber. On the other hand, heavy manufactures continued to be an "import-oriented" industry ever since the 1880s, and its export-orientendness declined over the first three decades of the twentieth century. Since the 1930s and especially in postwar years, its share in export rose at a quick pace and, during the first half of the 1960s, exceeded its share in output which itself was at a much higher level than in prewar years.

In order to get a more precise idia as to the degree to which import dependence changed over time, let us look at the movement of the import ratio (value of import/value of domestic production) for selective manufacturing industries (Figure 3). The contrast between textiles and heavy and chemical industries is very clear: in textiles, the import ratio showed a steady decline all through the prewar decades; in heavy and chemical industries the import ratio first went up, reached a peak around the turn of the century and then declined throughout the rest of the prewar period almost completing the process of import substitution. In terms of type of product by demand category, the import ratio for the consumer goods category showed a steady deline, while the ratios for capital goods, construction materials and intermediate goods followed a pattern of initial rise and subsequent decline (Table 4).

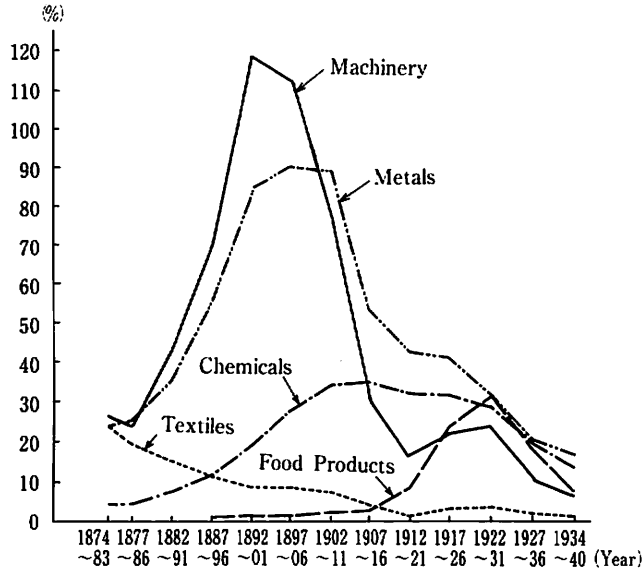
Compositional change in manufacturing output by demand category exhibited

**Table 3 Manufacturing: Structural Changes in Domestic Output and Foreign Trade (In percentage)**

|           | Imports                       |          |        | Output                        |          |        | Exports                       |          |        |
|-----------|-------------------------------|----------|--------|-------------------------------|----------|--------|-------------------------------|----------|--------|
|           | Heavy & Chemical manufactures | Textiles | Others | Heavy & Chemical manufactures | Textiles | Others | Heavy & Chemical manufactures | Textiles | Others |
| 1874-83   | 21.3                          | 59.2     | 19.5   | 24.0                          | 26.5     | 49.5   | 14.4                          | 73.6     | 12.0   |
| 1882-91   | 32.6                          | 45.9     | 21.5   | 18.9                          | 33.1     | 48.0   | 18.5                          | 68.5     | 13.0   |
| 1892-1901 | 51.4                          | 26.4     | 22.2   | 16.1                          | 40.2     | 43.7   | 16.7                          | 66.6     | 16.7   |
| 1902-11   | 62.7                          | 17.4     | 19.9   | 20.9                          | 32.6     | 46.5   | 17.4                          | 62.7     | 19.9   |
| 1912-21   | 74.2                          | 7.0      | 18.8   | 32.5                          | 34.8     | 32.9   | 21.2                          | 61.0     | 16.9   |
| 1922-31   | 60.7                          | 12.7     | 26.6   | 27.0                          | 35.7     | 37.3   | 13.8                          | 70.7     | 15.5   |
| 1930-39   | 74.5                          | 5.7      | 19.8   | 49.2                          | 24.3     | 26.5   | 30.8                          | 49.2     | 20.0   |
| 1951-55   | 85.3                          | 4.9      | 9.8    | 46.8                          | 18.2     | 35.0   | 41.9                          | 39.8     | 18.3   |
| 1956-60   | 88.6                          | 2.2      | 9.2    | 54.1                          | 13.0     | 32.9   | 46.2                          | 32.9     | 20.9   |
| 1961-65   | 83.3                          | 1.9      | 14.8   | 56.8                          | 9.6      | 33.6   | 58.5                          | 21.8     | 19.7   |
| 1966-70   | 80.1                          | 4.5      | 15.4   | 60.3                          | 8.2      | 31.5   | 72.0                          | 15.2     | 12.7   |

Source: Same as in Table 2.





**Figure 3 Import ratios for selected manufacturing industries**

Source: Cited from Yuichi Shionoya "Sangyo Kozo no Henka: Kogyo [Change in Industrial Structure: Manufacturing]" in Koichi Emi and Yuichi Shionoya, eds., *Nihonkeizai-ron [Japanese Economy]* (Tokyo: Yuhikaku, 1973).

**Table 4 Import Ratio of Manufacturing Subsectors by Demand Category: 1870s - 1930s (Percentage in current prices)**

|           | Consumer goods | Capital goods | Construction materials | Intermediate goods | Manufacturing total |
|-----------|----------------|---------------|------------------------|--------------------|---------------------|
| 1874-83   | 10.5           | 25.1          | 3.5                    | 27.3               | 13.0                |
| 1882-91   | 7.5            | 26.6          | 7.6                    | 38.3               | 13.0                |
| 1892-1901 | 7.9            | 38.9          | 15.0                   | 31.5               | 14.5                |
| 1902-11   | 6.9            | 37.3          | 19.0                   | 39.5               | 14.6                |
| 1912-21   | 3.4            | 11.3          | 22.2                   | 25.8               | 11.1                |
| 1922-31   | 4.6            | 26.8          | 24.8                   | 24.9               | 12.2                |
| 1931-40   | 3.0            | 8.1           | 9.6                    | 14.6               | 7.9                 |

Source: Same as in Figure 3.  
 Note: Same as in Figure 3.

**Table 5 Composition of Manufacturing Production by Demand Category: 1870s - 1930s (Percentage in current prices)**

|           | Consumer goods | Capital goods | Construction materials | Exports | Intermediate goods | Manufacturing total |
|-----------|----------------|---------------|------------------------|---------|--------------------|---------------------|
| 1874-83   | 59.0           | 2.6           | 9.7                    | 7.5     | 21.2               | 100.0               |
| 1882-91   | 58.5           | 5.5           | 7.1                    | 11.4    | 17.2               | 100.0               |
| 1892-1901 | 50.7           | 7.1           | 6.1                    | 14.5    | 21.6               | 100.0               |
| 1902-11   | 47.8           | 5.8           | 6.2                    | 19.9    | 20.3               | 100.0               |
| 1922-31   | 38.3           | 5.9           | 5.2                    | 20.3    | 30.3               | 100.0               |
| 1931-40   | 26.5           | 12.6          | 4.7                    | 17.3    | 38.9               | 100.0               |

Source: Same as in Figure 3.

the following characteristics over the prewar period (Table 5): (i) shares of consumer goods and construction materials declined continuously; (ii) the share of exports increased rapidly before the turn of the century remaining at a plateau of around 20% for the rest of the period; and (iii) shares of capital goods and intermediate goods remained more or less stable before the 1910s but recorded sudden, upward jumps in the 1910s and 1930s. It is worthy of mention that these jumps are reflected in sharp declines in import ratios for the two categories over those two decades. It is also interesting to note that capital goods' share in manufacturing output declined and its import ratio jumped upward in the 1920s while intermediate goods slightly raised their share in output and marginally reduced their import ratio over the decade. The setback in import substitution in capital goods is also reflected in a faltering performance of the machinery industry over the 1920s (Figures 1, 2 and 3). Technological catchup in the machinery industry, especially in the areas of industrial machinery and machine tools, was carried over to postwar years as the final step of industrial development to be completed by Japan as an NIE.

## II. Growth and Structural Change in the Postwar Period

### (A) Macroeconomic Mechanism of Rapid Growth

Growth performance of the Japanese economy over the 1950s and 1960s was spectacular by any standard, although it is no longer without parallel after equally impressive growth records of Asian NIEs over the 1960s and 1970s. One notable feature of the growth process in postwar Japan was a constancy of the ratio of exports to GNP at around 11% (in current prices). Contribution of exports to eco-

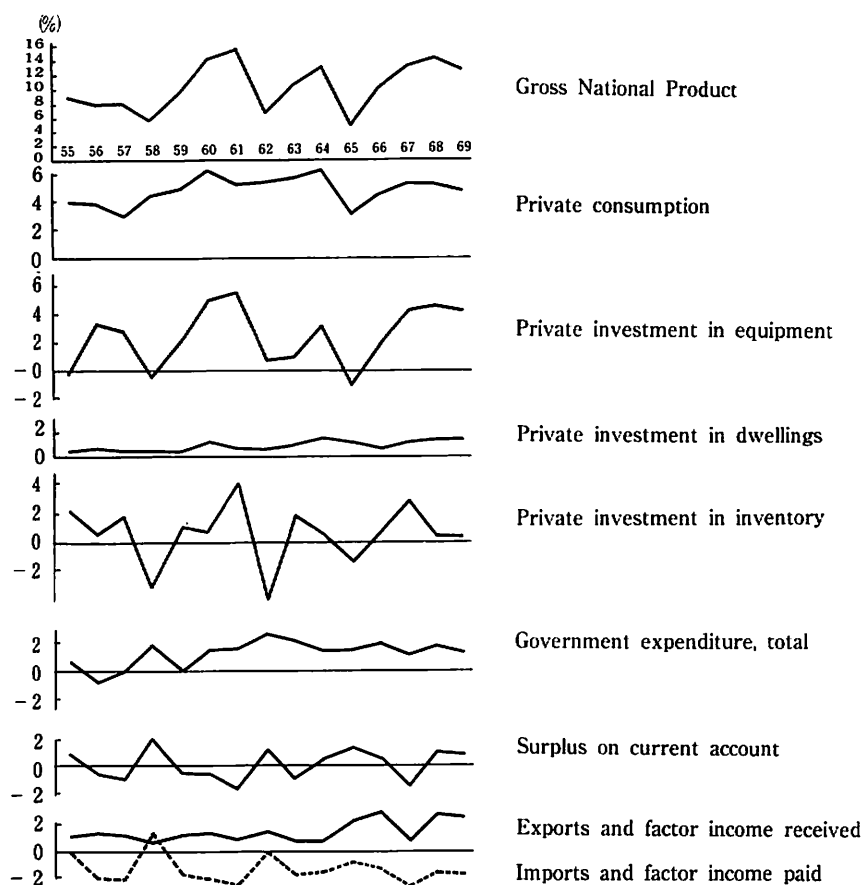
**Table 6 Contribution of Final Demand Components to the Growth of Gross National Product**

|   | (%)     |         |         |         |
|---|---------|---------|---------|---------|
|   | 1951-55 | 1955-60 | 1960-65 | 1965-69 |
| Consumption expenditure, total  | 75.6    | 53.6    | 64.5    | 54.7    |
| Private consumption expenditure   | 66.3    | 46.5    | 55.2    | 47.4    |
| Government consumption expenditure                                      | 9.3     | 7.1     | 9.3     | 7.2     |
| Gross domestic capital formation, total                                 | 25.8    | 47.2    | 33.6    | 43.9    |
| Gross domestic fixed capital formation                                  | 23.9    | 41.2    | 32.5    | 38.1    |
| Increase in stocks  | 1.9     | 6.0     | 1.1     | 5.8     |
| Surplus on current account  | -1.5    | -0.8    | 1.8     | 1.4     |
| Exports of goods and services and<br>factor income received from abroad | 8.6     | 10.0    | 11.0    | 11.6    |
| Imports of goods and services and<br>factor income paid abroad          | -10.1   | -10.8   | -9.2    | -10.2   |
| Total   | 100.0   | 100.0   | 100.0   | 100.0   |

Source: EPA, *National Income Statistics*, various years

Note: Calculated from three-year moving averages of the current price series.

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**Fig. 4 Weighted rates of growth for final demand components**

Source: Same as in Table 6.

Note: Annual rates of change in real terms.

**Table 7 Growth Rate, ICOR and Investment Ratio**

(%)

|                           | 1951-55 | 1955-60 | 1960-65 | 1965-70 |
|---------------------------|---------|---------|---------|---------|
| Growth rate of GNP        | 7.6     | 8.5     | 9.8     | 11.2    |
| ICOR                      |         |         |         |         |
| IFT                       | 2.2     | 2.5     | 2.9     | 2.9     |
| IFE                       | 1.0     | 1.3     | 1.5     | 1.5     |
| Investment ratio (to GNP) |         |         |         |         |
| IFT                       | 16.7    | 21.2    | 28.2    | 32.6    |
| IFE                       | 8.0     | 11.2    | 14.9    | 17.8    |

Source: EPA, *National Income Statistics*, various years

Notes: All rates and ratios calculated on the basis of the 1965 constant price series.

ICORs are calculated by dividing investment ratio by growth rate for each period.

IFT: Gross domestic fixed capital formation, total

IFE: Private fixed investment in equipment

conomic growth recorded a slight, rising trend but remained modest throughout the 1950s and 1960s (Table 6 and Figure 4). At the same time, leakage of effective demand (negative contribution to growth) due to imports was rather small and showed a declining trend through fluctuations from one period to another. It is to be noted that the net contribution of the current account was negative in the 1950s but turned positive in the 1960s. This phenomenon is of significance because the "balance of payments ceiling" constituted an effective constraint on economic growth in the postwar period. This will be discussed at greater length later in this paper.

What was most remarkable about the high growth performance of the postwar Japanese economy is the large contribution made by investment. As clearly shown in Figure 4, the level and fluctuation of the weighted growth rate of private equipment investment largely determined those of the growth rate of real GNP. Ups and downs of private equipment investment were also reflected in those of private inventory investment and of imports.

Economic growth in postwar Japan was investment-led, rather than exported-led, with private equipment investment as the most dynamic driving force. Its ratio to GNP (in real terms) was as low as 8% over 1951-55 but increased steadily to reach almost 18% in the second half of the 1960s (Table 7). The incremental capital output ratio (ICOR) was initially extremely low and remained very low (by international standards) throughout the 1950s and 1960s. Efficiency of investment as indicated by the low values of ICOR over the twenty-year period was the most essential factor that led to the continuous growth in capital formation. Investment opportunities were abundant throughout the high growth period, initially to meet reconstruction requirements and pent-up consumer demand and, subsequently, to meet increasingly diversified demands for consumption and investment that arose in the process of economic growth. On the technological front there was a backlog of advanced foreign technology to be imported in the process of modernization and expansion of production facilities in a wide range of industries after many years of technological isolation from the Western countries.

Table 8 gives rough estimates of proportions of private equipment investment induced by various final demand components for periods of high investment growth. Each period indicated in Table 8 is characterized by certain unique features: in the 1955-57 period the growth of exports was an important factor in the rise of private

**Table 8 Proportion of Private Equipment Investment Induced by Final Demand Components**

|                              | 1955-57 | 1959-61 | 1963-64 | 1966-68 |
|------------------------------|---------|---------|---------|---------|
| Private consumption          | 35      | 32      | 47      | 38      |
| Private equipment investment | 30      | 37      | 22      | 31      |
| Increase in stocks           | 11      | 13      | 9       | 7       |
| Government expenditure       | 8       | 10      | 11      | 11      |
| Exports                      | 16      | 8       | 11      | 13      |

Source: EPA, Domestic Research Division, Cited from EPA, *White Paper on Japanese Economy*, 1969, P.54.

Note: Estimated under the assumption that all of private equipment investment was induced by increases in final demand

equipment investment; the 1959-61 period is marked by the large contribution made by private investment as a demand component in inducing a further rise in equipment investment; in 1963-64, contribution of private consumption was nearly as high as 50% while the contributions of investment components were considerably lower; and in the 1966-68 period a more balanced pattern of contributions by final demand components appeared.

Let us try to examine the relationship between export growth and investment growth from a different perspective. As has been discussed above, the role of exports as a demand-side factor was rather modest throughout the postwar period. Growth of exports was, nevertheless, a crucial factor in securing growth of investment and, therefore, in achieving rapid economic growth. Over the 1950s and 1960s investment demand for technological innovation and capacity expansion was always strong but had to be curbed periodically through contractionary monetary policy to cope with the deterioration of the balance of payments situation arising from rapid growth of imports. Balance of payments set the ceiling on the realization of growth potential in postwar Japan by placing constraint on investment growth. It was only through export growth that the Japanese economy, with its extremely high dependence on imported raw materials and fuels, was able to raise the "balance of payments ceiling" on investment growth (Table 9).

In Table 9, the periods of Japan's worsening trade balance are all marked by rapid growth rates in GNP and in imports, which, as discussed previously, were brought about by sharp rises in private equipment investment. On the other hand, the periods of improvement are characterized by a sharp curtailment in import growth and a boost in export growth. There are, however, considerable differences in the growth rates of GNP and also of imports from one period to another. The contraction in economic activities and, hence, in imports was much greater in early episodes of the balance of payments adjustment. As a matter of fact, over the last two periods indicated in Table 9, the growth rate of GNP was higher in the period of improvement than in the preceding period of worsening. In the 1967-68 adjustment period, the growth rate of private equipment investment remained high, and

**Table 9 Balance of Payments Adjustment: Worsening of and Improvement in Trade Balance**

|                        | Average annual growth rate (%) |                |                      |            | Elasticity        |                   |
|------------------------|--------------------------------|----------------|----------------------|------------|-------------------|-------------------|
|                        | Exports<br>(1)                 | Imports<br>(2) | World Imports<br>(3) | GNP<br>(4) | Export<br>(1)/(3) | Import<br>(2)/(4) |
| Periods of worsening   |                                |                |                      |            |                   |                   |
| 1958 II - 61 III       | 14.8                           | 24.4           | 8.2                  | 13.0       | 1.80              | 1.88              |
| 1962 III - 63 IV       | 12.6                           | 36.1           | 9.5                  | 13.4       | 1.33              | 2.69              |
| 1966 II - 67 III       | 7.4                            | 23.4           | 4.1                  | 12.6       | 1.80              | 1.86              |
| Periods of improvement |                                |                |                      |            |                   |                   |
| 1961 III - 62 III      | 22.0                           | -14.0          | 7.4                  | -2.0       | 2.97              | -                 |
| 1963 IV - 66 II        | 22.0                           | 3.6            | 10.0                 | 6.6        | 2.20              | 0.55              |
| 1967 III - 68 IV       | 28.2                           | 11.2           | 14.3                 | 16.1       | 1.97              | 0.70              |

Source: Cited from EPA, *White Paper on Japanese Economy*, 1969, p.6.

Note: Periods of worsening (improvement) are defined to cover those quarters over which trade balance on a seasonally adjusted basis worsened (improved).

the brunt of the balance of payments adjustment was borne by a slowdown in inventory investment. The growth of the GNP was accelerated by a rapid rise in the growth rate of exports (See Figure 4).

As described above, the “balance of payments ceiling” on economic growth was gradually lifted through export growth (and partly through import substitution, as will be discussed later) until it ceased to be a binding constraint on sustained capital formation in the late 1960s. It is true that the process of balance of payments adjustment was aided by the buoyant world trade environment in the 1960s, especially toward the end of the decade (See Table 9). More important, however, were the supply-side factors of reduced production cost and expanded production capacity, realized through the accumulated effects of previous investment activities. In this way there came about a series of positive feedbacks between export growth and investment growth: investment laid the supply-side foundations for export growth by upgrading and expanding productive facilities; and export growth made growth in investment possible by raising the “balance of payments ceiling”.

In the preceding paragraph we referred to the supply-side factors that contributed to the growth of exports. Let us review how Japan’s export growth performed vis-a-vis the rest of the world (Table 10).

Japan’s exports maintained average annual growth rates (in nominal terms) of 17.3% over the 1950s and of 16.7% over the 1960s as compared with world trade expansion of 7.6% and 9.3%, respectively. Japan’s share in world exports rose from 1.3% in 1950 to 6.2% in 1970. Over the twenty-year period the composition of Japanese exports underwent a drastic change with metals and machinery assuming the leading role in the 1960s in place of textiles and other light manufactures. Heavy and chemical industries accounted for 77.8% of export growth in the 1960s as compared with 46.7% in the 1950s.

As summarized above, and as will be elaborated further below, the high growth rate of Japan’s exports was accompanied by a fundamental change in export composition that reflected a change in output composition. Such compositional changes were made possible only through investment activities in new leading industries. This was an essential element of structural change behind the macroeconomic mechanism of a virtuous circle between export growth and investment growth.

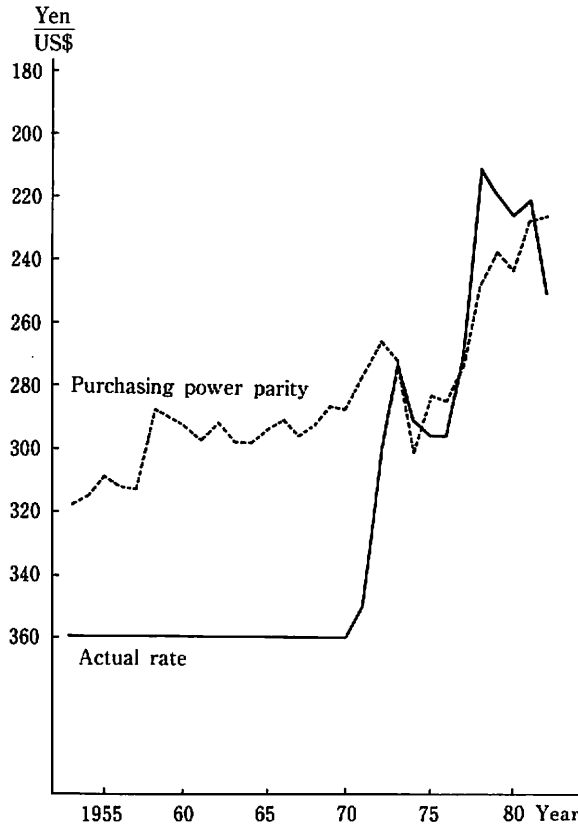
One important factor behind the rapid economic growth during the postwar period is the undervaluation, on the basis of purchasing power parity, of the Japanese yen vis-a-vis the US dollar. As indicated in Figure 5, the actual exchange rate, pegged to the US dollar at ¥360/\$1, represented a gross undervaluation of the yen over the entire period of postwar high growth. Other things being equal, the undervalued yen made possible the higher levels of exports and, hence, of imports. Thus, it constituted a crucial prerequisite for high levels of investment, the driving force of the postwar economic growth, and provided an effective support to the unfolding of the virtuous circle between export growth and investment growth.

Table 11 summarizes the balance-of-payments situations in postwar Japan. In the latter half of the 1960s Japan rapidly expanded exports of heavy and chemical manufactures, such as steel products, electronic products and automobiles, and came to exhibit an embarrassingly large surplus in its balance of payments. Thus the final phase of economic development for Japan as an NIE inevitably led to a new phase where the undervalued yen would no longer be allowed to persist.

Table 10 World Trade: Growth and Regional Composition

|                      | (in billion US dollars) |                      |                      |                      |                      | Average annual growth rate (%) |                      |
|----------------------|-------------------------|----------------------|----------------------|----------------------|----------------------|--------------------------------|----------------------|
|                      | 1938                    | 1950                 | 1960                 | 1970                 | 1950→1960            | 1960→1970                      | 1970                 |
|                      | Value of exports (%)    | Value of exports (%) | Value of exports (%) | Value of exports (%) | Value of exports (%) | Value of exports (%)           | Value of exports (%) |
| World total          | 23.5                    | 61.2                 | 127.8                | 311.3                | 7.6                  | 7.6                            | 9.3                  |
| Advanced countries   | 15.2                    | 37.0                 | 85.4                 | 224.7                | 8.7                  | 8.7                            | 10.2                 |
| North America        | 3.9                     | 13.1                 | 26.0                 | 59.3                 | 7.2                  | 7.2                            | 8.3                  |
| (US)                 | 3.1                     | 10.2                 | 20.4                 | 42.6                 | 7.2                  | 7.2                            | 7.6                  |
| Western Europe       | 9.3                     | 20.4                 | 51.5                 | 138.1                | 9.7                  | 9.7                            | 10.4                 |
| (EC)                 | 4.4                     | 9.3                  | 29.7                 | 88.5                 | 12.4                 | 12.4                           | 11.6                 |
| (UK)                 | 2.4                     | 6.1                  | 10.2                 | 19.4                 | 5.4                  | 5.4                            | 6.6                  |
| Japan                | 1.1                     | 0.8                  | 4.1                  | 19.3                 | 17.3                 | 17.3                           | 16.7                 |
| Others               | 0.9                     | 2.7                  | 3.8                  | 8.0                  | 3.6                  | 3.6                            | 7.7                  |
| Developing countries | 5.9                     | 19.3                 | 27.3                 | 54.2                 | 3.4                  | 3.4                            | 7.1                  |
| Socialist countries  | 2.4                     | 4.9                  | 15.0                 | 33.0                 | 11.8                 | 11.8                           | 8.2                  |

Source: United Nations, *Yearbook of International Trade Statistics*, various years



**Figure 5 Exchange rate of the Japanese yen vis-a-vis the US dollar**

Source: IMF, *International Financial Statistics*, various issues.

Note: The purchasing power parity rate was calculated using the overall wholesale price indices for Japan and the United States under the assumption that the 1973 rate of 272 yen to one US dollar represented a parity.

**Table 11 Balance of Payments in Postwar Japan**

(in millions of US dollars, annual averages)

|                              | 1946-50 | 1951-55 | 1956-60 | 1961-65 | 1966-70 |
|------------------------------|---------|---------|---------|---------|---------|
| Current account              | 146     | 105     | 23      | -272    | 1,240   |
| Trade account                | -188    | -393    | 94      | 391     | 2,725   |
| Exports                      | 395     | 1,506   | 3,120   | 5,887   | 13,454  |
| Imports                      | 583     | 1,899   | 3,026   | 5,496   | 10,729  |
| Invisible account            | -68     | 443     | -21     | -608    | -1,310  |
| Transportation and insurance | -100    | -181    | -294    | -482    | -916    |
| Travel                       | 5       | 4       | 6       | -10     | -62     |
| Investment income            | -2      | -22     | -39     | -129    | -223    |
| Governmental transactions    | 26      | 665     | 429     | 341     | 541     |
| Other services               | 3       | -23     | -118    | -328    | -649    |
| Transfers                    | 401     | 55      | -50     | 55      | -175    |
| Long-term capital account    | -16     | -26     | -5      | 64      | -721    |
| Short-term capital account   | 0.4     | 12      | -18     | 81      | 311     |
| Errors and omissions         | 15      | 1       | 28      | 5       | 75      |
| Overall balance              | 145     | 93      | 28      | -121    | 905     |
| Increase in foreign reserves | 108     | 155     | 122     | 41      | 537     |

Source: Bank of Japan, *Monthly Report on Balance of Payments*, various issues



## **(B) Maturing of Industrial Structure and Shift in Export Composition**

As indicated in Section I, the share of heavy and chemical manufactures in total production of manufacturing showed a steady rise in the postwar period. Textiles lost their share precipitously while other manufactures as a whole experienced a slight loss in their relative weight. The initial indications of these trends were already observed in the prewar period. Most remarkable about the postwar period was a compositional change within the heavy and chemical industries group.

Structural change in the process of rapid growth in the postwar Japanese economy is summarized as a shift toward heavy and chemical industries spearheaded by the rising share of the machinery industry. The shift first took place in output composition over the 1950s and later manifested itself in export composition over the 1960s. The staggered pattern of shift toward the heavy and chemical industries group reflected the process of development of those industries, initially developing as domestic market-oriented industries and subsequently intensifying their export orientation. Heavy and chemical industries, on the whole, did not go through the phase of import substitution in the postwar period. For one thing, the import substitution phase had already been passed before the WWII. Another factor was the import control policy adopted for balance of payments management and for infant industry protection. Import demands that might otherwise have been realized were suppressed and were directed toward domestic substitutes.

The ratio of import to domestic demand was well below 10% for all but a few industries in the heavy and chemical products group throughout the 1950s and 1960s (Table 12). Exceptions included petroleum products, non-ferrous metals and precision machinery (only toward the close of the 1960s). At a finer level of disaggregation, there were few but important instances where a high initial import ratio was reduced over time. Machine tool, metal-working machinery, and office machinery were major examples of industries that underwent import substitution during the 1960s.

Let us now examine the ratio of export to domestic production. Behind a constancy of export ratio for the manufacturing sector as a whole (at around 9%), there was a contrasting pattern in the movement of export ratio over the 1960s between light manufactures on the one hand and heavy and chemical manufactures on the other: the export ratio declined in almost all industries under the former category while it went up in most of the industries under the latter category. In postwar Japan, traditional export-oriented industries in light manufactures tended to reduce the degree of export-orientedness while heavy and chemical industries gradually increased export orientation and emerged as new leading export industries. Rapid growth of exports was characterized by a drastic shift in export composition, to which we now turn our attention.

In this and the following paragraphs we will examine the composition of Japan's exports both in terms of product categories and in terms of destination by country groups (Table 13). This latter viewpoint will help identify Japan's position as an NIE between industrialized countries and non-industrialized countries.

Japan's intermediate position between advanced and backward countries and its process of industrial sophistication clearly manifested itself in the composition

**Table 12 Changes in Export and Import Ratios over the 1960s**

(%)

|                                     | Export Ratio |      |      | Import Ratio |      |      |
|-------------------------------------|--------------|------|------|--------------|------|------|
|                                     | 1960         | 1965 | 1970 | 1960         | 1965 | 1970 |
| Meat and dairy products             | 1.1          | 0.4  | 0.3  | 10.6         | 8.4  | 0.9  |
| Sea food, preserved                 | 13.2         | 8.0  | 9.5  | 0.9          | 5.6  | 0.8  |
| Grain mill products                 | 0.2          | 0.2  | 1.0  | 1.4          | 4.5  | 0.5  |
| Other food products                 | 1.8          | 1.3  | 1.1  | 8.4          | 9.0  | 8.5  |
| Beverages                           | 0.3          | 0.3  | 0.3  | 0.5          | 0.9  | 1.6  |
| Tobacco                             | 0.2          | 0.1  | 0.0  | 0.5          | 0.5  | 0.5  |
| Natural fiber, spinning             | 9.3          | 5.8  | 5.7  | 2.3          | 1.9  | 7.8  |
| Artificial fiber, spinning          | 4.0          | 5.2  | 9.2  | 0.6          | 0.0  | 0.3  |
| Fabrics and other fiber products    | 20.1         | 15.9 | 13.5 | 0.6          | 1.1  | 3.2  |
| Wearing apparel                     | 15.8         | 11.3 | 7.2  | 0.6          | 0.8  | 1.6  |
| Wood and wood products              | 5.5          | 3.6  | 2.0  | 0.5          | 1.5  | 4.7  |
| Furniture and fixtures              | 1.8          | 0.9  | 0.9  | 0.1          | 0.2  | 0.2  |
| Pulp, paper and paper articles      | 2.6          | 1.9  | 2.2  | 1.9          | 2.8  | 3.0  |
| printing and publishing             | 0.7          | 0.7  | 0.8  | 1.1          | 0.8  | 1.4  |
| Leather, fur and products           | 7.6          | 8.8  | 10.4 | 3.0          | 5.1  | 7.0  |
| Rubber products                     | 14.6         | 16.7 | 16.1 | 0.6          | 0.6  | 1.0  |
| Basic industrial chemicals          | 4.2          | 8.3  | 8.7  | 9.2          | 6.5  | 5.3  |
| Artificial fiber materials          | 5.4          | 14.5 | 16.1 | 0.2          | 0.4  | 0.8  |
| Other chemical products             | 2.9          | 3.5  | 5.0  | 9.5          | 9.3  | 11.8 |
| Petroleum refinery products         | 1.1          | 3.5  | 1.9  | 13.8         | 11.3 | 10.7 |
| Miscellaneous coal products         | 0.1          | 0.1  | 0.2  | 0.3          | 0.3  | 0.3  |
| Non-metallic mineral products       | 9.0          | 7.4  | 4.7  | 1.2          | 0.7  | 0.8  |
| Iron and steel materials            | 0.5          | 0.4  | 0.2  | 9.3          | 6.3  | 5.2  |
| Basic iron and steel products       | 7.5          | 16.4 | 13.4 | 0.7          | 0.1  | 0.1  |
| Basic non-ferrous metal products    | 2.6          | 6.4  | 4.9  | 15.3         | 15.5 | 18.4 |
| Metal products                      | 9.5          | 7.3  | 6.7  | 0.6          | 0.9  | 0.8  |
| General machinery                   | 5.0          | 8.0  | 8.4  | 6.4          | 5.5  | 4.7  |
| Electrical machinery and appliances | 7.1          | 12.2 | 12.1 | 1.3          | 3.4  | 3.9  |
| Transport equipment                 | 11.9         | 14.3 | 16.4 | 2.2          | 2.6  | 2.8  |
| Precision instruments               | 17.4         | 17.9 | 21.9 | 8.3          | 8.2  | 12.4 |
| Miscellaneous manufacturing         | 26.3         | 16.7 | 11.6 | 1.4          | 4.3  | 5.0  |

Source: Calculated from Input-Output Tables

Notes: Export ratio = Exports/Domestic production

Import ratio = Imports/Domestic demand

of export by commodity group and country group (Panel A). In terms of export composition by product group, the share of heavy and chemical industry products remained less than 50% until the early 1960s. There was, however, a strong trend of increasing shares for heavy and chemical products, their combined shares exceeding 70% of the total value of exports by 1970. Turning now to the regional composition of Japanese exports, the relative weight of the industrialized region was only slightly over one third in 1957 but continued to rise during the 1960s. By 1970 the industrialized region came to absorb nearly half of Japan's exports.

The shift in Japan's export composition is best illustrated by identifying the cells in Panel A that held the highest share in the respective years indicated in Table 13: in 1957 textiles exports to non-industrialized countries occupied the highest share; in 1960, 1963 and 1967, that position was held by exports of heavy and chemical manufactures to the same regions: and finally in 1970, the share of

Table 13 Japan's Export Composition by Product Group and Region

(%)

| Panel A |         | 1957  |      |      |   | 1960  |      |      |     | 1963  |      |      |     | 1967  |      |      |     | 1970  |      |      |     |
|---------|---------|-------|------|------|---|-------|------|------|-----|-------|------|------|-----|-------|------|------|-----|-------|------|------|-----|
| Region  | Product | Total | I    | N    | C | Total | I    | N    | C   | Total | I    | N    | C   | Total | I    | N    | C   | Total | I    | N    | C   |
|         | Total   | 100.0 | 34.5 | 65.5 | - | 100.0 | 41.8 | 60.6 | 1.8 | 100.0 | 43.0 | 52.4 | 4.6 | 100.0 | 45.1 | 49.9 | 5.0 | 100.0 | 48.7 | 45.9 | 5.4 |
|         | F       | 10.9  | 7.5  | 3.4  | - | 8.5   | 5.7  | 2.8  | 0.1 | 7.0   | 4.6  | 2.3  | 0.0 | 4.6   | 2.7  | 2.0  | 0.1 | 4.4   | 1.8  | 2.4  | 0.1 |
|         | L       | 51.9  | 20.5 | 31.4 | - | 52.3  | 25.3 | 28.3 | 0.5 | 44.6  | 22.0 | 21.4 | 1.0 | 29.0  | 13.8 | 14.4 | 0.9 | 22.4  | 10.5 | 11.0 | 1.0 |
|         | T       | 35.0  | 10.9 | 24.1 | - | 30.2  | 10.9 | 18.9 | 0.3 | 22.9  | 8.1  | 14.0 | 0.7 | 16.3  | 5.6  | 10.0 | 0.8 | 12.5  | 4.4  | 7.3  | 0.8 |
|         | N       | 4.1   | 1.5  | 2.6  | - | 4.2   | 2.3  | 1.8  | 0.0 | 3.9   | 2.3  | 1.5  | 0.0 | 2.8   | 1.8  | 1.0  | 0.0 | 1.9   | 1.1  | 0.8  | 0.0 |
|         | O       | 12.9  | 8.2  | 4.7  | - | 18.0  | 12.0 | 7.5  | 0.2 | 17.8  | 11.6 | 6.0  | 0.3 | 9.9   | 6.4  | 3.3  | 0.2 | 8.0   | 5.0  | 2.9  | 0.1 |
|         | H       | 37.8  | 7.7  | 30.1 | - | 43.7  | 13.8 | 28.6 | 1.3 | 53.1  | 19.3 | 30.1 | 3.6 | 65.7  | 28.3 | 33.4 | 4.0 | 72.4  | 35.8 | 32.2 | 4.3 |
|         | CH      | 4.4   | 0.5  | 3.9  | - | 4.5   | 1.2  | 3.2  | 0.1 | 5.8   | 1.2  | 3.8  | 0.7 | 6.6   | 1.5  | 3.9  | 1.2 | 6.4   | 2.0  | 3.4  | 1.0 |
|         | ME      | 11.4  | 3.6  | 7.8  | - | 14.0  | 4.6  | 7.8  | 0.7 | 17.3  | 7.8  | 8.3  | 1.2 | 17.1  | 8.5  | 7.2  | 1.4 | 19.7  | 9.7  | 8.1  | 1.7 |
|         | MA      | 22.0  | 3.6  | 18.4 | - | 25.2  | 8.0  | 17.0 | 0.4 | 30.0  | 10.3 | 18.0 | 1.7 | 42.1  | 18.4 | 22.3 | 1.4 | 46.3  | 24.2 | 20.8 | 1.8 |

| Panel B |         | 1957  |       |       |   | 1960  |       |       |       | 1963  |       |       |       | 1967  |       |       |       | 1970  |       |       |       |
|---------|---------|-------|-------|-------|---|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Region  | Product | Total | I     | N     | C | Total | I     | N     | C     | Total | I     | N     | C     | Total | I     | N     | C     | Total | I     | N     | C     |
|         | Total   | 100.0 | 100.0 | 100.0 | - | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 | 100.0 |
|         | F       | 10.9  | 21.7  | 5.2   | - | 8.5   | 13.5  | 4.6   | 3.6   | 7.0   | 10.7  | 4.3   | 1.2   | 4.6   | 6.0   | 4.0   | 1.7   | 4.4   | 3.9   | 5.2   | 1.7   |
|         | L       | 51.9  | 59.5  | 47.9  | - | 52.3  | 60.4  | 46.7  | 26.0  | 44.6  | 51.3  | 41.0  | 23.0  | 29.0  | 30.6  | 28.8  | 18.9  | 22.4  | 21.6  | 24.0  | 17.4  |
|         | T       | 35.0  | 31.4  | 36.8  | - | 30.2  | 26.1  | 31.3  | 16.4  | 22.9  | 18.9  | 26.7  | 16.7  | 16.3  | 12.4  | 20.0  | 15.2  | 12.5  | 9.1   | 15.9  | 14.1  |
|         | N       | 4.1   | 4.3   | 4.0   | - | 4.2   | 5.6   | 3.0   | 0.0   | 3.9   | 5.4   | 2.9   | 0.4   | 2.8   | 3.9   | 2.1   | 0.4   | 1.9   | 2.3   | 1.7   | 0.7   |
|         | O       | 12.9  | 23.8  | 7.1   | - | 18.0  | 28.7  | 12.4  | 9.6   | 17.8  | 26.9  | 11.4  | 6.0   | 9.9   | 14.3  | 6.7   | 3.0   | 8.0   | 10.2  | 6.4   | 2.7   |
|         | H       | 37.8  | 22.3  | 46.0  | - | 43.7  | 32.9  | 47.2  | 74.0  | 53.1  | 44.9  | 57.6  | 78.2  | 65.7  | 62.9  | 66.9  | 79.2  | 72.4  | 73.5  | 70.2  | 80.0  |
|         | CH      | 4.4   | 1.5   | 6.0   | - | 4.5   | 2.8   | 6.3   | 5.5   | 5.8   | 2.9   | 7.3   | 15.5  | 6.6   | 3.3   | 7.7   | 24.0  | 6.4   | 4.0   | 7.3   | 18.9  |
|         | ME      | 11.4  | 10.4  | 11.9  | - | 14.0  | 11.0  | 12.9  | 41.0  | 17.3  | 18.1  | 15.9  | 25.4  | 17.1  | 18.9  | 14.4  | 27.0  | 19.7  | 19.8  | 17.7  | 35.7  |
|         | MA      | 22.0  | 10.4  | 28.2  | - | 25.2  | 19.1  | 28.0  | 26.0  | 30.0  | 23.9  | 34.3  | 36.9  | 42.1  | 40.7  | 44.7  | 28.3  | 46.3  | 49.6  | 45.2  | 33.7  |

| Panel C |         | 1957  |      |      |   | 1960  |      |      |     | 1963  |      |      |      | 1967  |      |      |      | 1970  |      |      |      |
|---------|---------|-------|------|------|---|-------|------|------|-----|-------|------|------|------|-------|------|------|------|-------|------|------|------|
| Region  | Product | Total | I    | N    | C | Total | I    | N    | C   | Total | I    | N    | C    | Total | I    | N    | C    | Total | I    | N    | C    |
|         | Total   | 100.0 | 34.5 | 65.5 | - | 100.0 | 41.8 | 60.6 | 1.8 | 100.0 | 43.0 | 52.4 | 4.6  | 100.0 | 45.1 | 49.9 | 5.0  | 100.0 | 48.7 | 45.9 | 5.4  |
|         | F       | 100.0 | 68.8 | 31.1 | - | 100.0 | 66.5 | 32.5 | 1.0 | 100.0 | 66.4 | 32.8 | 0.8  | 100.0 | 56.7 | 41.6 | 1.8  | 100.0 | 43.1 | 54.8 | 2.1  |
|         | L       | 100.0 | 39.6 | 60.4 | - | 100.0 | 48.4 | 56.3 | 0.9 | 100.0 | 49.5 | 48.1 | 2.4  | 100.0 | 47.4 | 49.4 | 3.3  | 100.0 | 46.8 | 49.0 | 4.2  |
|         | T       | 100.0 | 31.0 | 69.0 | - | 100.0 | 36.2 | 62.8 | 1.0 | 100.0 | 35.6 | 61.0 | 3.4  | 100.0 | 34.2 | 61.2 | 4.7  | 100.0 | 35.4 | 58.5 | 6.1  |
|         | N       | 100.0 | 36.3 | 63.8 | - | 100.0 | 56.2 | 43.8 | 0.2 | 100.0 | 60.5 | 39.0 | 0.5  | 100.0 | 62.0 | 37.4 | 0.7  | 100.0 | 57.8 | 40.6 | 1.9  |
|         | O       | 100.0 | 63.7 | 36.3 | - | 100.0 | 61.0 | 38.1 | 0.9 | 100.0 | 64.9 | 33.5 | 1.5  | 100.0 | 65.0 | 33.5 | 1.5  | 100.0 | 61.9 | 36.4 | 1.8  |
|         | H       | 100.0 | 20.4 | 79.6 | - | 100.0 | 31.9 | 65.5 | 3.1 | 100.0 | 36.4 | 56.8 | 6.8  | 100.0 | 43.1 | 50.8 | 6.1  | 100.0 | 49.5 | 44.5 | 6.0  |
|         | CH      | 100.0 | 11.6 | 88.5 | - | 100.0 | 26.0 | 71.8 | 2.2 | 100.0 | 21.6 | 66.0 | 12.4 | 100.0 | 22.7 | 58.9 | 18.4 | 100.0 | 31.0 | 52.5 | 16.0 |
|         | ME      | 100.0 | 31.6 | 68.4 | - | 100.0 | 35.0 | 59.4 | 5.6 | 100.0 | 45.0 | 48.2 | 6.8  | 100.0 | 49.9 | 42.2 | 8.0  | 100.0 | 49.0 | 41.2 | 9.8  |
|         | MA      | 100.0 | 16.3 | 83.7 | - | 100.0 | 31.4 | 66.8 | 1.8 | 100.0 | 34.3 | 60.0 | 5.7  | 100.0 | 43.6 | 53.0 | 3.4  | 100.0 | 52.2 | 44.8 | 3.9  |

Note: Region I: Industrialized countries (North America and Western Europe)  
 N: Non-industrialized countries (Asia, Africa, Latin America, Middle East, Oceania)  
 C: Centrally-planned countries

Product F: Food and raw materials & fuels

L: Light manufactures

T: Textile products

N: Non-metallic mineral products

O: Other light manufactures

H: Heavy and chemical manufactures

CH: Chemical products

ME: Metal products

MA: Machinery

Source: MITI, *White Paper on International Trade*, various years.

heavy and chemical products exported to industrialized countries was the highest of all.

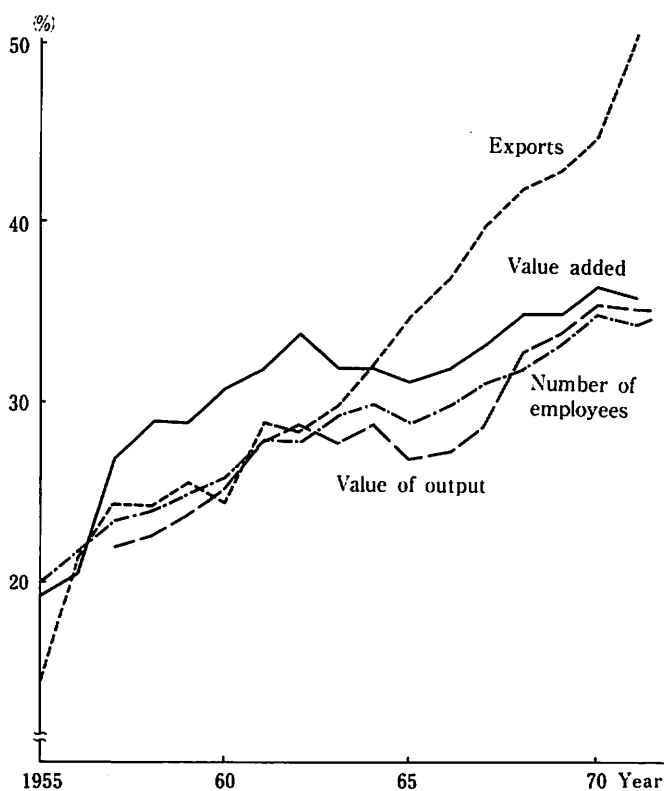
Composition of Japan's exports by product group was initially quite different from one region to another but showed a strong trend toward convergence over the 1960s (Panel B). The share of heavy and chemical manufactures continued to rise in exports to all three regions but went up most rapidly in exports to industrialized countries. The most remarkable rise was observed in the share of machinery in

exports to industrialized countries; by 1970 it became higher than machinery's shares in exports to the other regions.

Let us now see how regional composition of exports differed across product groups and how such a pattern changed over time. As shown in Panel C, the share of the industrialized region in Japan's exports of heavy and chemical manufactures was initially very small but rose at a quick pace until it reached fifty percent by 1970. The same pattern applied to all three sub-groups within the heavy and chemical category but was most marked with regard to machinery exports. In light manufactures exports, the share of the industrialized region first went up and then declined starting around the mid-1960s, while in food and raw materials and fuels it was on the decline throughout the period. It is, therefore, clear that the industrial region's rising share in Japan's total exports was brought about by a strong upward trend in its share in Japan's exports of heavy and chemical manufactures.

As has been suggested in preceding paragraphs, the hallmark of the final sub-stage of Japan's industrial development as an NIE was the high growth rate of the machinery industry and an increase in its weight in total manufacturing (Figure 6). The rise in the machinery industry's share was most remarkable in export composition.

The postwar growth in many branches of the machinery industry exhibited a development pattern characterized by a declining import ratio and a rising export

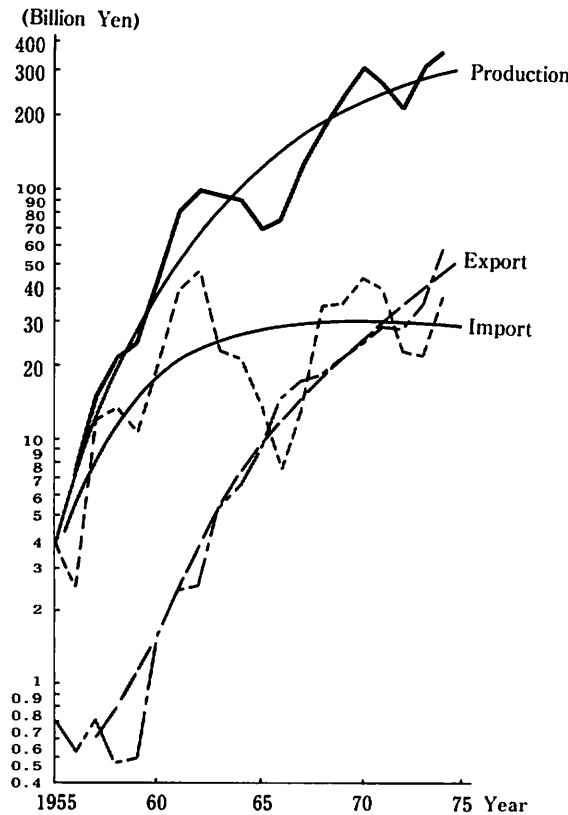


**Figure 6 Share of machinery industry in manufacturing**

Source: MITI, *Industrial Statistics*, various years.

ratio. Similar development patterns were recorded for cotton textiles and steel products in prewar years and for petrochemical products in the postwar period. What is characteristic of machinery industries is a tendency toward increasing participation in intra-industry trade among developed countries. In the case of intermediate goods such as textiles, steel products and petrochemical products, the import substitution process was characterized not only by a relative decline in the ratio of imports to production but also by an absolute decline in the import volume. In the case of machinery industries, the level of imports tended to keep rising or at least stay flat even after exports registered a strong showing. Figure 7 presents an illustration of such a pattern with regard to machine tools.

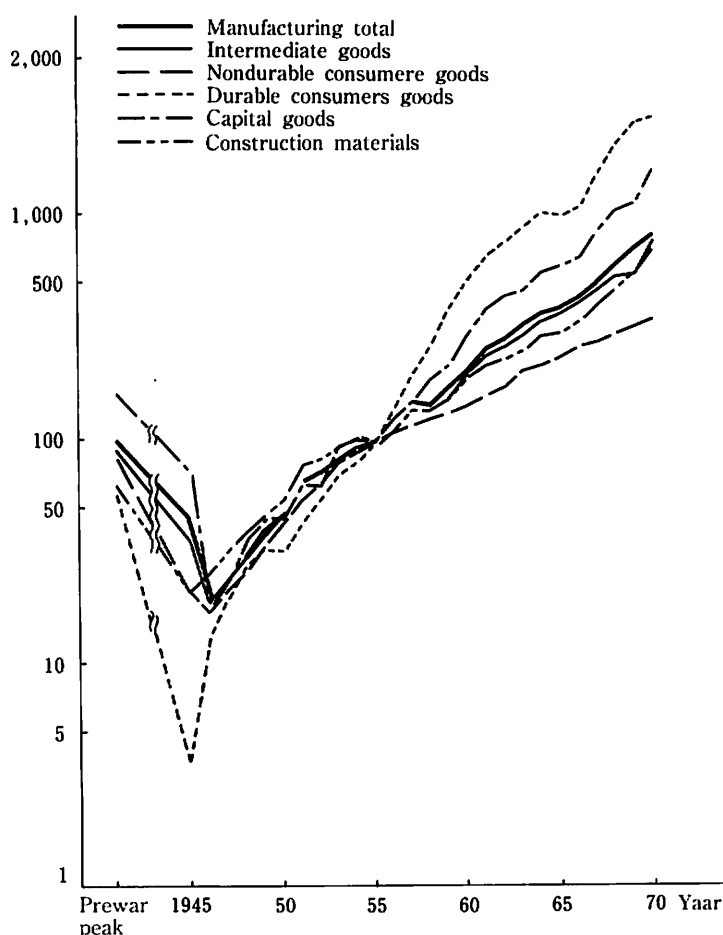
Another indication of the increasing importance of the machinery industry is found in the higher growth rates of production volume for durable consumer goods and capital goods compared to those for other categories of manufacturing production (Figure 8). Within the two categories related to the machinery industry, the relative importance of consumer durable goods vis-a-vis capital goods increased over the 1950s and 1960s. This represents a clear contrast with the prewar pattern of demand for machinery with heavy emphasis on capital goods. A similar pattern of change was also observed in the composition of exports with consumer durable goods and capital goods rapidly increasing their shares.



**Figure 7** Production, import and export of machine tools  
 Source: Japan Machine Tool Association, *Main Statistics on Machine Tools*, 1974.

One notable feature of compositional change in industrial production in the postwar period is increased shares of higher-stage processing and assembly activities compared to those of industrial materials production. The compositional change in the value of shipment and in export by stage of manufacturing production reveals that assembly-stage products increased their share at the expense of those held by industrial materials in shipment and, more markedly, in export (Table 14). This trend was observed in Western advanced countries and could be regarded as a sign of the maturing of the industrial structure.

Let us consider three cases of such a trend (Figure 9): the first pair consists of textiles as a materials-producing industry and apparel and other ready-made articles as a processing industry; secondly, wood manufactures as contrasted to furniture; and thirdly, basic metals vis-a-vis metal products and machinery industries. In the first case, enterprises in upper-stream textiles tended to be large-scale ones while down-stream apparel and ready-made articles were traditionally the domain of small business. In the second case, both wood products and furniture industries



**Figure 8** Trend of industrial production by usage  
(Index numbers with 1955=100)

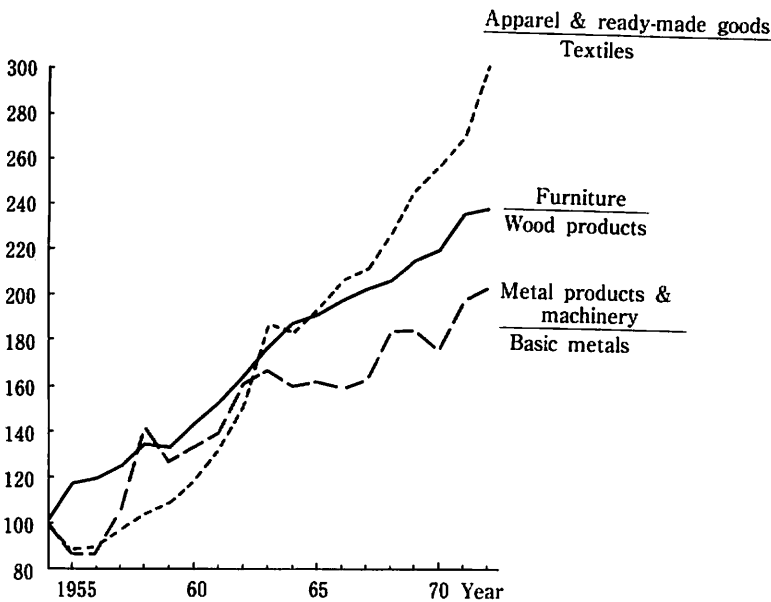
Source: MITI, *Industrial Statistics*, various years.

**Table 14 Composition of Shipment and Export in Manufacturing by Stage of Production**

(%)

|      | Shipment  |            |          | Export    |            |          |
|------|-----------|------------|----------|-----------|------------|----------|
|      | Materials | Processing | Assembly | Materials | Processing | Assembly |
| 1951 | —         | —          | —        | 68.4      | 22.8       | 8.8      |
| 1955 | 39.9      | 46.9       | 13.2     | 59.8      | 27.7       | 12.5     |
| 1960 | 35.0      | 42.7       | 22.3     | 46.2      | 29.7       | 24.1     |
| 1965 | 30.9      | 47.3       | 21.8     | 42.0      | 27.1       | 30.9     |
| 1969 | 27.6      | 47.1       | 25.4     | 36.4      | 25.9       | 37.7     |

Source: Cited from Miyohei Shinohara, *Sangyo-Kozo-ron [Industrial Structure]* (Tokyo: Chikuma-Shobo, 1976), p.248.



**Figure 9 Rise in the weight of processing and assembly activities vis-a-vis materials production (Index with 1954=100)**

Source: MITI, *Industrial Statistics*, various years.

were dominated by small-scale producers. In the third case, basic metals were produced by large-scale manufactures while metal products and machinery industries comprised both large and small- and medium-size enterprises (with tendencies of large enterprises engaging in assembly and smaller ones in processing and parts manufacturing).

In what follows we will shed light on some of the technological and organizational factors that contributed to the maturing of industrial activities in postwar Japan.

### (C) Parallel Growth Patterns in Industrial Development

Industrial development in postwar Japan was characterized by a number of

parallel growth patterns: machinery industries grew parallel with metal industries; production of synthetic fabrics and plastic products increased along with basic petrochemical products; and small- and medium-scale enterprises thrived and prospered side by side with corporate giants. "Dual structure" in the economy, which in early postwar years was deemed as an inescapable mark of Japan's backwardness, was resolved in the process of the rapid economic growth of the 1950s and 1960s. In what follows we will try to indicate some of the important factors that contributed to the realization of the parallel growth patterns in postwar Japan. First let us try to clarify what we mean by the term "parallel growth".

In the process of industrial growth in postwar Japan, there were two important sources of efficiency improvement. One was the realization of scale economies at factory level through the introduction of the latest vintage and largest scale production facilities. The other was the realization of economies of scale at industry level based on standardization and specialization through the formation and strengthening of networks of social (inter-firm) divisions of labor. The first type of scale economy was the hallmark of capital-intensive processes in metals and chemicals as well as in large-scale processing and assembly operations in metal products and machinery industries. The second type of scale economy characterized the development of many small- and medium-scale industries. Initiatives for the reorganization and modernization of those industries came from large enterprises in their efforts to establish a network of subcontractors and from the government in its pursuit of the strengthening of international competitiveness of the manufacturing sector as a whole and out of its concern with income disparities among workers associated with the size of enterprise.

What we mean by "parallel growth" is the simultaneous realization of these two sources of efficiency improvement. The first type of efficiency improvement (intra-firm economies of scale) was carried out, initially at least, through transfer of technology from advanced countries either in the form of imported equipment or technical agreement (or both). The second type (inter-firm economies of scale) was accomplished in no small part through transfer of technology to small-scale manufactures from large enterprises and through technical assistance from agencies of central and local government. Quality improvement and cost reduction on the part of small-scale manufacturers through the adoption of high-grade or specialized equipment and better production management was the prerequisite for successful operation of production networks involving small producers. There were, broadly speaking, two contrasting modes of subcontracting arrangements between large enterprises and small manufacturers. In the case of apparel and ready-made goods, small-scale subcontractors were consigned to engage in the weaving and finishing stages of processing, final goods to be sold under the brand names of large-scale textile companies. In machinery industries, on the other hand, large-scale assemblers organized small-scale manufacturers as suppliers of parts and components.

It is well-known that export competitiveness of the Japanese machinery industries derives in no small measure from efficiency of inter-firm division of labor based on subcontracting arrangements between large-scale assemblers and small-scale suppliers of parts and components, of which shipbuilding, automobiles and electronics are typical examples. What is less well-known is the formation of the division of labor within small industries. Many of the export-oriented industries in



the early postwar period—binoculars, sewing machines, textile machinery, bicycles, and apparel—were characterized by efficiency improvement and cost reduction resulting from the development of a system of social division of labor among small-scale producers, each producer specialized in a narrowly-defined type or process of manufacturing. In those instances, technical and managerial assistance from government agencies seems to have played a crucial role in bringing about industrial reorganization aimed at taking full advantage of the economies of scale based on standardization and specialization.

### **III. Nature and Role of Industrial Policy**

#### **(A) Macroeconomic Plans and Industrial Development Programs**

In postwar Japan, macro plans and sectoral programs became institutionalized and came to serve as main governmental documents indicating the future course for the economy or the sectors and identifying policy needs to be met. Throughout the 1950s and 1960s, there was a national consensus as to the goal of economic development, e.g., catching up with advanced countries, and that goal was more or less identified with the upgrading of industrial structure. MITI's industrial development programs, therefore, constituted the central pillar of macroeconomic plans over that period.

Let us first review macroeconomic plans in the postwar period (Table 15). As indicated in Table 15, these plans characterized the main theme of economic development at different stages and in changing conditions. The first officially-adopted macro plan, the Five-Year Plan for Economic Self-Support, was drawn up in 1955. By that time the Japanese economy had undergone the period of postwar reconstruction and the first round of rationalization programs in major existing industries like iron and steel, electric power, shipping, coal mining and fertilizer. The prewar peak levels of key macroeconomic and industrial production indicators had been reached, and the nation was in need of a new goal for economic development. The most urgent issue then was to attain external and internal balances of the economy. Over the first half of the 1950s Japan's balance of payments situation was greatly improved by special procurement orders arising from the Korean War. With the special procurement bound to be phased out, there was a strong sense of alarm concerning the balance of payments position. The external balance related to achieving "self-support" through import substitution and export expansion. The internal balance referred to a large pool of the unemployed and underemployed in the economy. What is worth noting in this plan is the emphasis placed on the upgrading of industrial structure as the key requirement for meeting these macroeconomic goals in the process of economic development.

The emphasis on the upgrading of industrial structure, or promotion of heavy and chemical industries, was further articulated in the New Long-Range Economic Plan and the Doubling National Income Plan. More attention came to be paid to the machinery industry in view of its growth potential and high labor intensity and subsequently to the newly-established petrochemical and electronics industries. The clear identification of the direction of economic development summarized as

Table 15 Selected Features of Economic Plans in Japan

| Name of Plan   | Five-Year Plan for Economic Self-Support   | New Long-Range Economic Plan   | Doubling National Income Plan  | Medium-Term Economic Plan  | Economic and Social Development Plan   | New Economic and Social Development Plan  | Basic Economic and Social Plan  | Economic Plan For the Second Half of the 1970s   | New Economic and Social Seven-Year Plan  |
|--|--|--|--|--|--|---|---|--|--|
| Date published<br>Cabinet at the time of plan approval | December, 1955<br>Haloyama   | December, 1957<br>Kishi  | December, 1960<br>Ikeda  | January, 1965<br>Sato  | March, 1967<br>Sato  | April, 1970<br>Sato   | February, 1973<br>Tanaka  | May, 1976<br>Miki  | August, 1979<br>Ohira  |
| Plan period (Fiscal years)                             | 1956-60  | 1958-62  | 1961-70  | 1964-68  | 1967-71  | 1970-75   | 1973-77   | 1976-80  | 1979-85  |
| Economic growth rate                                   | F. 1952-55 8.6%<br>F. 1956-60 5.0%<br>" 8.7%   | F. 1953-57 7.3%<br>F. 1958-62 6.5%<br>" 9.9%   | F. 1956-60 9.1%<br>F. 1961-70 7.8%<br>" 10.7%  | F. 1960-64 11.3%<br>F. 1964-68 8.1%<br>" 10.6%   | F. 1962-66 10.0%<br>F. 1967-71 8.2%<br>" 10.9%   | F. 1965-69 12.7%<br>F. 1970-75 10.6%<br>" 5.9%  | F. 1968-72 10.4%<br>F. 1973-77 9.4%<br>" 4.2%   | F. 1971-75 5.1%<br>F. 1976-80 a little over 6%<br>F. 1976-78 5.7%  | F. 1974-78 4.0%<br>F. 1979-85 5.7%<br>—  |
| Method for projection                                  | Coin method (Labour × productivity)  | Desirable balance chosen from 3 cases with different growth rates  | Growth rate previously decided   | Econometric model  | do.  | do.   | do.   | do.  | do.  |
| Aims   | Self support of the economy,<br>Full employment  | Maximization of growth,<br>Improvement of national living,<br>Full employment                              | do.  | Rectifying imbalances  | Balanced and steady economic development   | Construction of admirable society through balanced economic growth  | Promotion of national welfare<br>Promotion of international cooperation   | Realization of a richer national life and stable development of our country's economy  | Shift to a stable growth path<br>Enrichment of quality of national life<br>Contribution to the development of the international economic community   |
| Major policy objectives                                | Modernization of production facilities,<br>Promotion of international trade,<br>Reduction of dependence on import,<br>Encouraging saving | Improvement of infrastructure,<br>Heavy industrialization,<br>Promotion of exports,<br>Encouraging savings | Improvement of social overhead capital,<br>Improvement of industrial structure,<br>Rectifying the dual economy and improvement of social stability | Modernization of low productivity sectors,<br>Efficient use of labour force,<br>Qualitative improvement of national living | Stabilization of prices,<br>Improvement of economic efficiency,<br>Promotion of social development | Improving economic efficiency from an international viewpoint,<br>Securing price stability,<br>Promotion of social development,<br>Maintaining adequate economic growth and cultivating development foundations | Creating comfortable environment,<br>Securing a stable and comfortable life,<br>Stabilization of prices,<br>Promoting international cooperation | Stability of prices and securing of full employment of labor,<br>Securing of stabilized life and creation of favourable living environments,<br>Cooperation with and contribution to the development of world economy,<br>Securing of economic security and fostering of grounds for long-term development | Attainment of full employment and stabilization of prices,<br>Stabilization and enrichment of national life,<br>Cooperation in and contribution to the development of world economy and society,<br>Ensuring economic security and fostering the foundations of further development,<br>Reconstruction of public finance and new monetary responses. |

Source: Economic Planning Agency, Planning Bureau.

the upgrading of the industrial structure was the key element of all macro plans over the high-growth period. Macroeconomic goals, e.g., growth, employment, balance of payments, were expected to be attained through the pursuit of industrial upgrading. It is only natural that industrial programs and policies occupied the central position in the management of economic development.

The Doubling National Income Plan adopted in 1960 was epoch-making in many ways. Based on the record of sustained growth after the reconstruction period and rapid advance in industrialization, the plan presented the optimistic view that the Japanese economy was entering upon a new stage of development characterized by the spread of technical progress. The plan aimed at maintaining the growth potential and eliminating constraints on growth. Main policy objectives included provision of social overhead capital from a long-range viewpoint, guiding the upgrading of industrial structure, manpower development and promotion of science and technology, and rectifying the dual structure in the economy.

The plan was a manifestation of the growth-oriented economic policy promoted by Prime Minister Hayato Ikeda. Ikeda, with his background as career MOF official, was powerful and effective in having his philosophy of "positive finance" accepted by the Ministry of Finance. Ikeda pushed for and won large increases in public expenditures and income tax reductions in central government budgeting in Fiscal 1961 and 1962 and also had the low interest rate policy installed by the Bank of Japan. Its impact was extensive. It created an atmosphere of future-orientedness dispelling pessimism and disseminating positive thinking about the growth potential of the Japanese economy. Growth expectation was raised and, spurred by stimulative fiscal and monetary policy, there developed a "Doubling National Income" boom.

A change in tone took place in the Medium-Term Economic Plan prepared in 1965 with the stated aim of "rectifying imbalances" created in the process of high and continued growth. Emphasis was placed on modernization of low-productivity sectors like small-scale industries and agriculture and improving living environments and social welfare. The new emphasis on balance and social development was carried over to the subsequent plans entitled Economic and Social (Development) Plan. The focus of industrial programs came to be centered upon internationalization as the liberalization of trade and foreign investment proceeded. "Improvement of economic efficiency" was the catchall phrase which included the upgrading of industrial structure with emphasis gradually shifting toward knowledge-intensive activities.

In understanding the nature of macroeconomic planning in Japan, it is useful to distinguish between two components of the national economic plan. First, macro plans present projection of macroeconomic variables over the plan period. Macroeconomic figures are nothing more than a prediction or forecast and are not regarded as targets in any strict sense of the word. Secondly, macro plans compile sectoral programs as determined by the ministries concerned. Goals of those sectoral programs are supposed to be achieved through governmental effort, although there is little coordination to secure consistency among various sectoral targets. Thus, macro plans in Japan are loosely constructed guideposts almost completely lacking means of implementation.

To say this is not to deny the useful functions they have served, however. Macroeconomic planning in postwar Japan can be characterized as “indicative” concerning quantitative targets related to private sector performance. It was also “indicative” in the sense that macro plans indicated the direction of economic development and the place and role of individual sectors. The process of plan preparation provided a forum where future policy needs could be identified and examined from varied viewpoints. It also enabled private enterprises to consider their problems in a broader perspective. The essence of planning in Japan consists of consensus formation among various government ministries and between the government and the private sector. Planning, thus, takes on the strong nature of “human administration” among diverse interests and opinions. Consensus was often reached by way of vague and non-committal expressions with the possibility of multiple interpretations. Still the process of plan preparation served a useful educational function in indicating what macroeconomic challenges the nation was facing and placing industry-specific issues within a broader macroeconomic perspective.

### **(B) Industrial Policy (Chronological Survey)**

As has been stated above, the backbone of macroeconomic development plans over the 1950s and 1960s was industrial policy designed and implemented by the Ministry of International Trade and Industry (MITI). The objectives and instruments of industrial policy underwent a number of marked shifts over the two decades. The immediate post-war period was characterized by efforts directed toward recovery of industrial production. The “priority production scheme” was adopted with a view to concentrating limited resources on the production of coal and steel. The recovery of industrial production up to 1948 was accompanied by rampant inflation fueled by public loans and subsidies. A drastic stabilization program was carried out in 1948 and the goal of industrial policy was shifted to “industrial rationalization”. Rationalization programs were formulated for key industries such as iron and steel, coal, electric power, shipping, fertilizer and textiles. The first half of the 1950s saw the establishment of the institutional setup for the protection and promotion of infant industries. The legal basis for the protection of industries from foreign competition was the Foreign Exchange and Foreign Trade Control Law (1949) and the Foreign Capital Law (1950). Protective tariff was another means of lesser importance. Policy measures for infant industry promotion included fiscal incentives and financial supports for selected industries as well as public investment in industry-related infrastructure. Tax exemptions and special depreciation allowances were granted for promoted industries, and various kinds of tax-exempt reserves were designated. It is noteworthy that export earnings and reserves against loss of export earnings enjoyed tax-exempt status. Financial supports comprised provision of public funds at low interest rates. A large number of public financial institutions were established during the first half of the 1950s, and the Fiscal Investment and Loan Plan was organized in the present form in 1953 to facilitate systematic deployment of governmental investment funds.

During the second half of the 1950s the emphasis of industrial policy was shifted to the promotion of machinery industries and of new industries such as petro-

chemical, plastic, synthetic fiber and electronics. Fiscal incentives and financial preferences were mobilized to promote investment in those branches of manufacturing, which were to become the cutting edge in the upgrading of industrial structure toward heavy and chemical industries. Industrial policy in the form of support to selected industries made substantial contributions to the rapid growth of those industries. Provision of public funds facilitated financing of new and (ex ante) uncertain projects by providing a "seal of approval" for private financial institutions to follow suit. Tax exemptions reduced the effective tax rate on corporate earnings and enabled fledgling firms to retain higher percentages of profit.

One notable feature of industrial policy in machinery and electronics fields was the emphasis placed on the upgrading of small- and medium-scale manufacturers of parts and components. Technical and managerial improvements in small- and medium-scale industries achieved under government-sponsored rationalization and modernization programs constituted one of the essential aspects of productivity increases that took place in machinery and electronics industries. Small- and medium-scale industries exhibited a high capacity to absorb employment and thus contributed to the achievement of improved income distribution in the process of rapid economic growth.

Industrial Policy over the 1960s was characterized by the pursuit of the strengthening of international competitiveness through the restructuring of industrial organization. Concern with international competitiveness took on an urgent note as the Japanese government committed itself to programs of trade and capital liberalization. MITI's worries were twofold. On the one hand, it was concerned about the less-than-efficient scale of domestic producers. At the same time it was also alarmed at the loss of legislative basis for effective influence over private industries through control on foreign trade and direct investment. MITI responded to this dual crisis situation with the advocacy of new legislation, the Special Measures Law for the Promotion of Designated Industries (1963), which was originally named the Law for the Strengthening of International Competitiveness of Designated Industries. The basic problem addressed by the proposed new law was the presence of too small a scale of production units engaged in excessive competition. In MITI's view it was absolutely necessary that existing production units be integrated into larger and more efficient enterprises and that such re-organization be carried out under the effective leadership of the government. Liberalization raised the specter of foreign dominance, thus, possibly nullifying the post-war industrialization efforts. The sense of crisis was deep and wide-spread and the implementation of liberalization programs proceeded only gradually and selectively. Although the above-mentioned new legislation failed to pass the Diet, MITI continued to be active in the pursuit of industrial re-organization arranging mergers and coordinating investment projects. Lacking legal authority, MITI relied more heavily on informal means of persuading and guiding the private sector, e.g., administrative guidance.

### **(C) Need for and Effect of Industrial Policy**

The Japanese experience in promotion of industries and upgrading of industrial structure constitutes a success story in the postwar history of the world economy. In the following paragraphs we will present views and evaluations on the effective-

ness of MITI's industrial policy. The first issue to be addressed is concerned with the *raison d'être* of industrial policy in a market economy and the second topic with the manner in which policy was formulated and implemented.

In addressing the issue of justification of industrial policy, we will try to present our case along the framework of the infant industry argument to the extent possible. Our argument will of necessity rather judgemental, however, since strict application of cost-benefit analysis is neither feasible nor relevant.

In a preceding section, we have identified the goal of MITI's industrial policy as the upgrading of the industrial structure. The concept encompasses both compositional changes in the manufacturing sector (i.e., increased shares initially of heavy and chemical industries and subsequently of knowledge-intensive industries) and restructuring of industrial organization within each industry (i.e., strengthening of international competitiveness through realization of scale economies).

The first goal was pursued by combining protection from foreign competition and promotional incentives for priority industries. The main effect of such policy measures was to offer support and guarantee to the investment decisions of private enterprises. Investment decisions are made in anticipation of supply-side and demand-side conditions over a period of ten to fifteen years. Private firms face risks and uncertainties concerning future developments in financial, labor and product markets. Market prices, no doubt important and effective signals in adjusting demand and supply in the short run, play a much more limited role in investment decisions involving choice of technique and scale of production as well as choice of product. Protective and promotional policy measures served to reduce those risks and uncertainties on the supply side and economic plans and industry-wise programs did so on the demand side. Incentive measures also affected cost-benefit calculations of investment projects more directly by increasing net cash flow (tax exemptions and accelerated depreciation allowances) and reducing the discount rate (low-cost financing).

This last point might be considered in the context of the choice of appropriate industry and technology in a developing economy. Two criteria for choice of industry adopted by MITI, i.e., high income elasticity and high rate of technical progress, were based on dynamic characteristics of industry and were in conflict with the doctrine of comparative advantage based on the criterion of static efficiency of resource allocation. In order to promote investment in dynamically appropriate industries and technologies it was necessary, or at least helpful, to modify relative factor prices so that they would reflect factor endowments in some future period.

Besides the issue of factor proportions, there was also the issue of appropriate scale in the choice of technology. Market structure cannot sustain perfect (atomistic) competition in the presence of scale economies. Efficiency of resource allocation under the condition of decreasing long-run average cost requires that production units be of large enough size to enjoy economies of scale. This consideration prompted MITI to intervene into the investment decisions of private enterprises since free competition tended to result in excessive competition among smaller-than-optimal scale producers. MITI tried to realize scale economies by controlling technology imports, by coordinating joint or staggered investment plans through administrative guidance, and by arranging mergers.

As has been discussed in preceding paragraphs, MITI's policy for the upgrading

of industrial structure was remarkably successful. The essential pre-condition of the success story is the dynamism of the private sector, it is true; industrial policy was also crucial in realizing growth potentials latent in the Japanese economy, and the manner in which industrial policy was formulated and implemented was an important factor in ensuring its adequacy and effectiveness. MITI officials, in close consultation with industry people, studied industrial situations to identify both needs and seeds for the upgrading of industrial structure. Deliberative councils, for which they served as secretariat, provided a forum where their policy proposals were scrutinized from varied viewpoints. Industrial policy was formulated to cope with challenges and problems facing various industries. As such it was sometimes nothing more than ad-hoc responses to immediate concerns. At the same time, however, there were always efforts to provide long-term and overall perspectives for policy formulation, presented as visions for individual industries and for the whole industrial sector. In the process of policy formulation MITI officials served as mediators and coordinators between interested parties in the private sector. Rival companies were in fierce competition over market shares, and it was next to impossible to reach consensus concerning the allocation of production or investment without MITI involvement. Insofar as the process of policy formulation represented a mechanism of consensus formation, it also constituted a vehicle of policy implementation. To the extent that MITI visions reflected the needs and desires of industries, they served as guidelines for coordinated action.

#### **(D) Characteristics of MITI's Infant Industry Policy**

The goal of MITI's industrial policy, nurturing infant industries and strengthening the international competitiveness of Japanese industries, was successfully achieved. There are two characteristics worth noting with regard to MITI's policy of infant industry protection and promotion in view of the general discussion surrounding the infant industry argument. The first is that nurturing measures were applied to almost all the industries under MITI's jurisdiction, albeit with differing scopes and intensities according to the relative importance attached to individual industries. The second characteristic is that protective measures were lifted after certain periods, thereby forestalling the indefinite continuation of a protective environment and resulting dangers of a collusive and corruptive relationship between government and industry. The first characteristic, across-the-board nurturing of infant industries, ran counter to the generally accepted premise of the infant industry argument. In postwar Japan infant industry protection was the rule rather than the exception. The phenomenon was brought about by the bottom-up approach of policy formulation in Japanese bureaucracy. Each section in MITI is responsible for designing policy measures for the industry under its charge. MITI officials had a strong sense of mission in bringing up Japanese industries to the level of those in advanced countries. They studied industrial situations in Western countries to set goals and examined conditions and potentialities in Japanese industries to identify problem areas and design policy measures. The extent and nature of support varied from one industry to another; and so did actual growth performance. In early postwar years there was no conscious, comprehensive design of the infant industry promotion scheme involving choice of industries to be nur-

tured. Only in the early 1960s, based on the accumulated experience of industry performances, a general principle of industrial policy was conceptualized, i.e., the shift of industrial structure toward heavy and chemical industries, and theoretical criteria for choice on industry were conceptualized, i.e., income elasticity criterion and technical progress criterion.

What were the conditions or background factors for the successful nurturing of infant industries across the board? Here again the basic precondition must be sought in the dynamism and aggressiveness of private enterprises in various industrial fields. The basic nature of industrial policy consisted of providing incentives to private investment. In postwar Japan the across-the-board industrial development was carried out without direct involvement of either state enterprises or foreign companies.

Another important factor was the maintenance of the under-valued exchange rate of 360 yen to the US dollar. At the time the 360-yen exchange rate was set up, it would probably have been difficult to achieve an equilibrium in the international balance of payment, but with the normalization of the world economy, and with Japanese companies beginning to operate a large network of foreign branches, the potential for excess in exports grew larger.

Both of the above-mentioned background factors are also relevant underlying conditions for the second characteristic of postwar Japan's infant industry policy, i.e., the limited duration of protection. To these should be added attitudinal and environmental factors involved in the design of industrial policy.

The widely shared goal of postwar development was to catch up with the advanced countries of the West and an essential aspect of that goal was to strengthen the international competitiveness of Japanese industries. It should be recalled that the central pillar of industrial policy was promotional in nature, designed to strengthen supply-side conditions. Those promotional measures served to strengthen dynamic competition among private enterprises, thus, forestalling a tendency toward inefficiency and stagnation under protection from international competition.

There was another, more tangible reason behind the goal of strengthened international competitiveness. It is Japan's exceptionally high import dependence for essential raw materials and fuels. The ever present sense of urgency underlying the strong emphasis placed on export promotion is well summarized in the expression "export or perish". It was deemed absolutely necessary that heavy and chemical industries develop into export industries for the Japanese economy to attain sustained growth. In this context again it should be noted that industrial policy not only offered general incentive for exportation but provided support for the improvement of productive efficiency. Modernization and reorganization of small-scale industries was of particular importance in this connection.

Japan's desire to join the ranks of advanced countries and, probably more importantly, pressures from Western countries led to the acceptance of the principle of liberalization at the beginning of the 1960s. An import liberalization program was drawn up for the period 1960-63. Japan moved to the Article 11 status in GATT in 1963 and the Article 8 status in the IMF in 1964. Japan joined OECD in 1964, thus, committing itself to capital liberalization, which was initiated three years later. MITI, along with its client industries, took a very cautious stance concerning the preparedness of Japanese industries and tried to postpone decon-



trol of import or foreign investment for what were considered as vulnerable sectors. Detailed studies of the effects of liberalization were carried out, and timetables for liberalization were prepared for various industries. Industry-wise programs were formulated to strengthen competitiveness through investment and innovation. In this way the targeted removal of protection was made to serve as an effective policy instrument to stimulate improvement in efficiency.

## **Concluding Remarks**

Rapid economic growth in postwar Japan is characterized by an across-the-board and cumulative process of industrial development. Industrial policy played a crucial supportive role in realizing growth potentials of Japanese industries by presenting visions and providing protective and promotional measures to infant industries. Macroeconomic policies also provided favorable conditions for economic growth by combining an easy money (low interest rate) policy with a tight fiscal (balanced budget) policy. The Ministry of Finance saw to it that construction and maintenance of social overhead capital would be carried out to meet the needs of industrial development by according priority to these areas in the annual budgeting and allocation of public funds under the Fiscal Investment and Loan Plan. Over the high growth period government revenue continued to record automatic increases year after year, and financing priority projects were easily incorporated in the budgeting practice of incrementalism.

The basic precondition for successful development in postwar Japan was the level of technical and managerial development that had been achieved over the eighty-year period since the time of the Meiji Restoration. The postwar economic reforms broadened the basis of growth by eliminating control over industry by the zaibatsu group (through dissolution of zaibatsu groups and breaking up of monopolies) and by improving economic conditions of workers and farmers (through authorization of labor unions and land reform). There was a huge backlog of advanced technologies to be imported and applied in a wide range of industries. Thus, both the supply-side and demand-side conditions for dynamic competition were present at the start of the postwar period. Industrial and macroeconomic policies added further impetus to and, if and when deemed necessary, applied restraints on private investment behavior.

The postwar economic development was characterized by various kinds of parallel growth phenomena. Mention was already made of the virtuous circle between export and investment. In most cases the initial impetus for investment came from rapidly expanding domestic markets which grew parallel with export demand. Regarding the organizational structure of the industrial sector, there developed a mutually reinforcing growth pattern between large-scale and small-scale enterprises, often through subcontracting arrangements. This kind of parallel growth was observed in a broad range of machinery industries between large-scale assemblers and small-scale manufactures of parts and components as well as in textile industries where large-scale producers of intermediate goods organized small-scale industries for final labor-intensive processes. The contribution of small-scale manufactures of parts and components to the overall development of machinery and

electronics industries is well documented. Here again the prewar heritage of technical and managerial expertise on the part of small manufactures must be emphasized. At the same time, mention should be also made of a series of MITI-sponsored programs for the modernization and reorganization of small-scale industries designed to bring about productivity increase and better quality control. The machinery industries constituted the fastest growing branches of manufacturing over the postwar period. They were characterized by relatively high labor intensity and, thus, generated a rapid growth in labor demand. There certainly developed a tendency toward increased disparities in productivity and wages between large-scale and small-scale industries in the early years of the postwar growth. The ensuring technological development in small-scale industries eventually brought about the dissolution of the dual structure in the Japanese industrial sector in the process of rapid growth.

As discussed in the preceding section, protection and promotion of infant industries in postwar Japan was successful not only in turning domestic market-oriented industries into export industries but in building up a broad-based industrial structure within the unified and modernized national economy. These achievements stand out remarkably when compared to the disappointing experiences of industrialization in many developing countries. Is Japan's success story transferable? Let us first discuss a yet untold part of the success story.

We have already touched upon a prewar heritage in the form of the accumulated production experiences in Japanese industries. Mention needs to be made also of other kinds of prewar heritage that greatly affected the efficacy of policy formulation and implementation, i.e., institutional and group-psychological traditions. In Japan there was a strong tradition of governmental leadership in industrial development from the early Meiji era on. Establishment of a comprehensive system of control and regulation of industries prior to and during the Second World War further strengthened the government's power over all aspects of industrial activities. The institutional and psychological inheritance from this period seems to have been indispensable in securing smooth functioning of the government-business cooperation. It provided a solid organizational basis for the "bottom-up" approach to the successful formulation and implementation of industrial policy. The above-mentioned historical experience seems to be equally relevant as a factor influencing the behavior of private business. Trade associations were responsible for the allocation of production quotas among their members. They also served as a system of collection and compilation of industry-related information and statistics. This setup for coordination and collaboration among private businesses under governmental supervision was carried over to the postwar period almost intact.

In the preceding paragraphs we have touched upon the historical heritage of the prewar industrial development and institutional setup. Those initial conditions at the beginning of the postwar period constituted the main underlying factors for the rapid industrial growth that ensued as well as for the successful formulation and implementation of industrial policy in a "bottom-up" approach. Strengthening the administrative infrastructure of information collection and establishing a close, cooperative relationship with the private sector is an essential precondition for the adoption of the Japanese-style "bottom-up" approach to industrial policy.

Issues relating to transferability of one country's experience to other countries

is wide-ranging and multi-faceted. We can only point out a number of areas to be considered in evaluating the transferability of the Japanese experience.

- 1) Periods of rapid industrial growth tend to produce increasing income disparities between industry and agriculture and, within industry, between the modern (large-scale) sector and the traditional (small-scale) sector. In the case of post-war Japan, the government took corrective measures to prevent actual income disparities from enlarging too much by supporting rice prices to maintain farm income and by providing various forms of assistance to small business. The problems of "dual structure" seem to be much more serious at earlier stages of development. In many cases it might be inappropriate to equate economic development with the promotion of heavy and chemical industries as in postwar Japan.
- 2) Japan, with a population of one hundred million and with household income equitably distributed, had a large and rapidly-growing domestic market, large enough to accommodate oligopolists with technically efficient scale and rapidly-growing enough to keep those oligopolists in competition, rather than collusion, with each other. The dynamism of private industries under protection seems to have been greatly promoted under the competitive oligopoly structure which combined the economies of scale and competitive incentives. Lacking domestic markets of sufficient size, many developing economies will have to face a trade-off between scale economies and a competitive industrial structure.
- 3) During the high growth period in postwar Japan, macroeconomic stability never posed a serious problem. Rapid growth of investment caused recurrent balance of payments difficulties. Contractionary financial policies were adopted on such occasions and the temporary slowdown in investment quickly produced improvements in external balance, however. Inflation was never a serious problem, either. Long-term effects of investment on productivity improvement and output growth contributed to stability of the process of capital accumulation by improving the balance of payments position through import substitution and export expansion and by realizing price stability through reduced production costs and expanded supply capacities. Investment activities, thus, eliminated macroeconomic constraints on further economic growth and were self-reinforcing. Whenever macroeconomic problems become serious in the form of accelerating inflation or accumulation of external debts, developing countries will have to face a difficult task of achieving stabilization without damaging the growth potential of the economy. More attention to demand management than in Japan's case might be called for in countries susceptible to macroeconomic disturbances.
- 4) Last but by no means least, the drastically-changed international economic environment of the present time might be less favorable than that which Japan faced in the heyday of the simultaneous growth of advanced economies, especially in terms of the prospects for the expansion of manufactured exports. Nevertheless, the author suspects that the mechanisms of high growth identified in the postwar Japanese economy, i.e., a virtuous circle between export and investment and various kinds of parallel growth patterns, remain viable and applicable for many developing economies undergoing a process of industrial upgrading.