

Chapter 5

Economic Interdependency between Japan and USA, and Asia-Pacific Region

Paper 1

The Path of Japan's Economic Growth: Dynamic Changes in Industrial Structure

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Introduction

Japan lost the major part of its manufacturing facilities in the Second World War. After the war, however, Japan brought all its strength into the reconstruction of its economy and successfully achieved high economic growth unprecedented in world history, while building up a democratic and peace-loving nation. At present Japan's economic power stands abreast with that of the United States and European countries.

Japan was able to attain such a remarkable economic growth in a mere half-century. However, this attainment would not have been possible without the diligence of Japanese people, the energetic vitality of private enterprises, and the implementation of appropriate industrial policies based on a market economy.

If the path of Japan's economic growth after the war is divided into several periods according to the characteristics of each period, it can be classified roughly as follows: 1945 to 1950, the "resuscitation period"; 1950 to 1960, the "reconstruction period"; 1960 to 1970, the "high growth period"; 1970 to 1980, the "conversion period"; and 1980 to 1990, the "transition period to stable growth."

During the resuscitation period, economic frameworks, such as the liberalization of farmland and the dismantling of financial groups, were drastically reformed under the supervision of the occupation army (GHQ).

During the economic reconstruction period, with scarce foreign currencies placed under the strict control of the Government, a "priority production system" was employed, aiming at increased production of coal, and iron and steel to improve the industrial foundation.

Then, in the high growth period, the heavy and chemical industrialization, and investments in plants and equipment were encouraged aggressively and energetically, to strengthen international competitive abilities.

In the conversion period, Japan's economy was severely damaged by the two oil crises in 1973 and 1979. However, energy- and resource-saving measures, together with policies

for the effective use of production facilities and their sophistication, were actively employed to overcome these crises.

In the 1980's, the transition period from high growth to stable growth, Japan's economy was adversely affected again by a sudden high quotation of the yen triggered by the "Plaza Agreement" in September 1985. However, this caused the competitive position of Japan's economy to stand out remarkably in the international economy, and the economic policy was converted from an export-led economy to a domestic-demand-led economy.

Incidentally, when the Government employs an appropriate industrial policy, or when individual enterprises plan management strategies, it is required to grasp the present economic situation correctly. In Japan, accordingly, efforts have always been exerted to maintain statistical data accurately. At present, Japan is considered a country whose statistical data are kept in the best condition. This is true of an input-output table, which is one of the areas the author deals with specifically. Japan employed the theory of an input-output table without delay, and completed its first table in 1955. Professor Leontief, who developed an input-output table for the first time, said that the input-output tables made by Japan were at the highest level in the world both in accuracy and analysis for use. And the fact that it is the Ministry of International Trade and Industry that practices the production of an input-output table most eagerly in Japan has something to do with the execution of elaborate industrial policies in Japan.

The report presented here today is on the structural analysis of Japan's economy after the "high growth period," based on the input-output tables prepared once every five years jointly by the ministries and agencies and the 1990 Input-Output Table for Japan (updated) released last month by the Ministry of International Trade and Industry. However, the analyses in and after Section 8, "Leading Industries," were made based on the input-output tables up to 1988.

Also, the comments given in this analysis are the author's private opinions; they do not represent those of the Japanese Government or the Ministry of International Trade and Industry.

1. The growth rate during the period from 1980 to 1990 was a third of that for the high economic growth period

When the growth rate of domestic production is evaluated by the "gross value added" equivalent nearly to the GDP in the following categories:

- 1) the 1960s, when high economic growth was maintained,
- 2) the 1970s, when the system of floating exchange rates was introduced for the yen and when the two oil crises brought down Japan's economy, and
- 3) the 1980s, when Japan's economy was being shifted into stable growth after the Plaza Agreement,

the annual growth rate was 18.9% for the 1960s (in real terms = 10.2% at 1985 prices), 14.2% for the 1970s (real = 5.4%), and 6.3% for the 1980s (real = 4.3%). Accordingly, the growth rate for the 1980s remained at the level of a third of that for the 1960s, when Japan's economy was in the high growth period.

However, when the growth rate of the second half of the 1980s is compared with the average of OECD, the growth rate for Japan is 5.1% in real terms, while the average of

OECD is 3.4%. This indicates that the growth rate of Japan is much higher than that of the OECD average (Table 1).

Table 1 Rate of Increases in Gross Output, Value Added, Export and Import

	(%)							
	Gross output		Value added		Import		Export	
	Nominal	Real	Nominal	Real	Nominal	Real	Nominal	Real
1960 ~ 1965	1.87	1.55	2.03	1.44	1.84	2.29	1.99	1.72
1965 ~ 1970	2.31	1.76	2.25	1.67	2.54	2.01	2.49	1.97
1970 ~ 1975	2.06	1.21	2.04	1.29	2.51	1.22	2.35	1.48
1975 ~ 1980	1.67	1.25	1.62	1.24	1.86	1.22	1.72	1.40
1980 ~ 1985	1.22	1.18	1.32	1.20	0.98	1.02	1.38	1.40
1985 ~ 1990	1.27	1.29	1.31	1.22	1.19	1.77	0.99	1.13

2. Dynamic Changes in Industrial Structure

During these periods, the industrial structure of Japan underwent dynamic changes. Such dynamic changes in the industrial structure, that is, flexible conversion of the industrial structure in accordance with changes in the economic conditions at home and abroad, were the driving force of the growth of Japan's economy.

What allowed this was, of all things, free competition among private enterprises based on the market economy and the implementation of appropriate industrial policies (Figs. 1 and 2).

3. Intensified Specialization of Machine and Equipment, and Business-Related Service Sectors

During the ten years from 1980 to 1990, domestic production, the export amount and the import amount of Japan increased in real terms (at 1985 prices) by 51.4%, 58.5% and 74.8%, respectively.

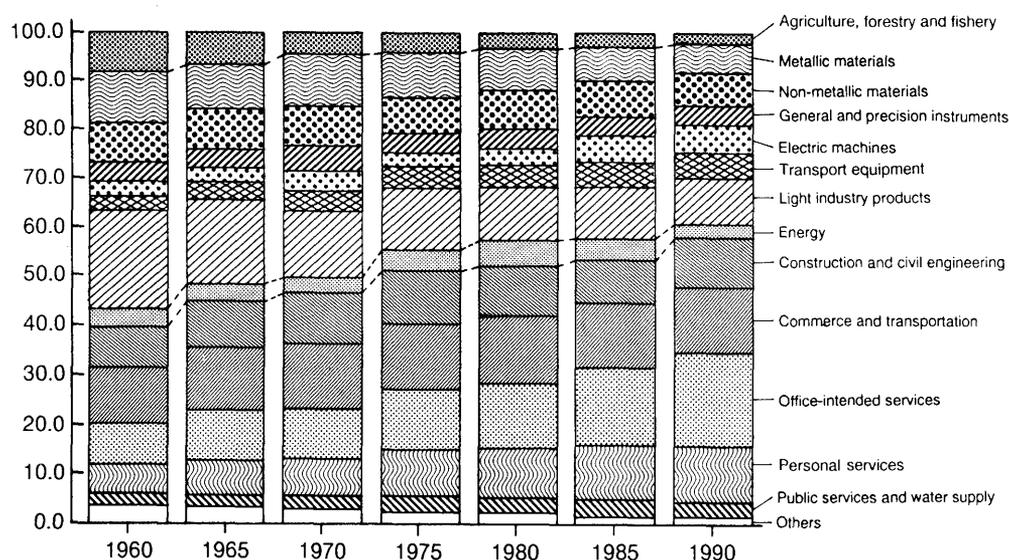
When individual industries are classified into the following three categories by using the input-output table of 46 × 46 sectors, all of those belonging to the "sectors in growth" are machines and equipments, except for plastic products (Table 2).

On the other hand, various sectors, such as foodstuffs, textile products, and petroleum and coal products, are included in the "sectors in stagnation", and forestry, fishery and mining are included in the "sectors in deterioration."

The service sectors intended mainly for financing and insurance, office-intended services, and non-profit-making private organizations also registered a high increase in domestic production. Accordingly, it can be said that recently, industries in Japan show an increased specialization toward the machine and equipment sectors and the business-related service sectors.

- Sectors in growth — Those whose increase rate of domestic production was more than the average increase of the entire industries, with their increase rate of exports exceeding that of imports.
- Sectors in stagnation — Those whose increase rate of domestic production was less than the average increase of the entire industries, with the increase rate of imports exceeding that of exports.
- Sectors in deterioration — Those whose increase rate of domestic production was negative, with the increase rate of imports exceeding that of exports.

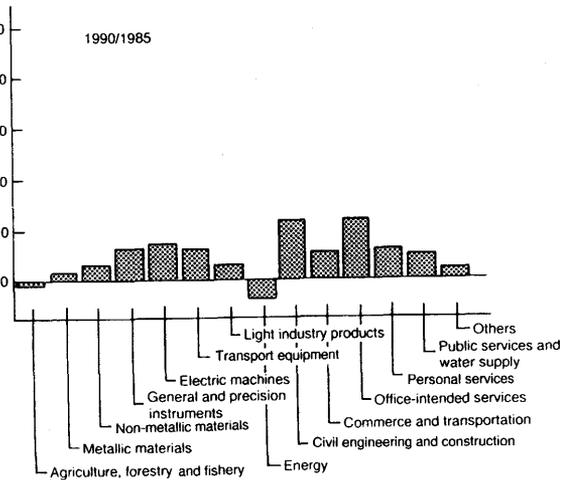
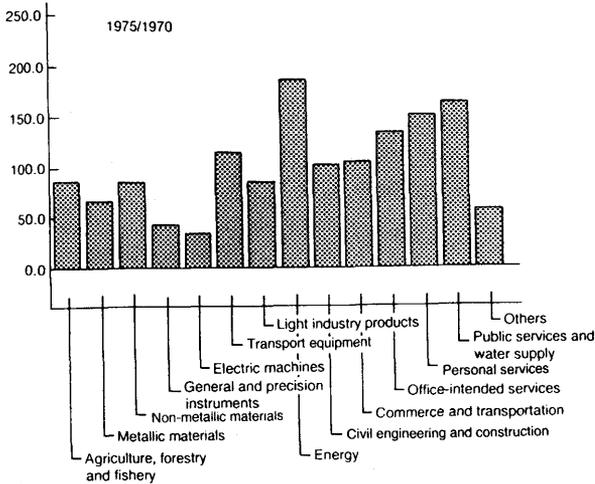
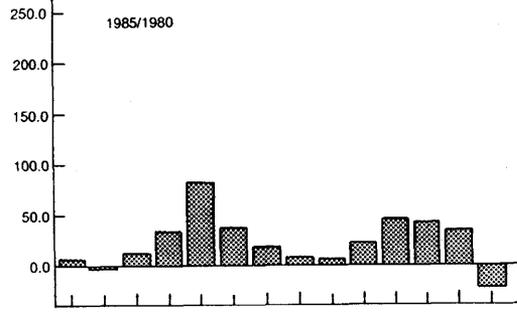
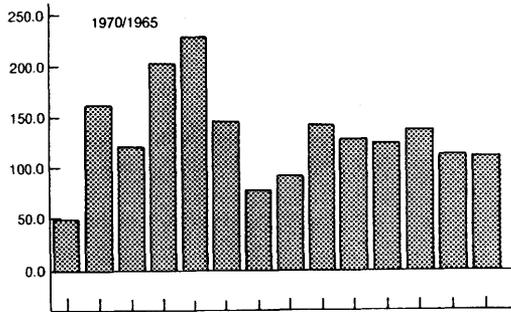
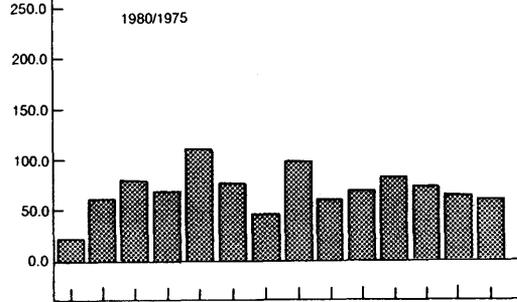
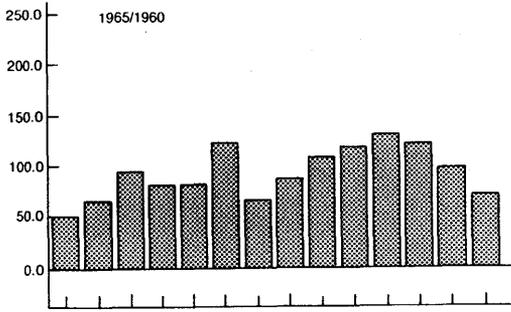
**Fig. 1 Structural Changes in Domestic Production
(in nominal terms)**



Note:

Metallic materials	Iron and steel, non-ferrous metals and metal products.
Non-metallic materials	Pulp, paper, paper products, chemical products, plastic products, rubber products, ceramics, and stone and clay products.
Light industry products	Foodstuffs, textile products, lumber, wooden products, furniture, publishing and printing, and other manufactured products.
Energy	Coal, crude oil and natural gas, petroleum- and coal-related products, power supply, gas and heat supplies.
Office-intended services	Financing and insurance, real estate, communication and broadcasting, non-profit-making private organizations, and other office-intended services including repairing of machines used in offices.
Personal services	Education and research, medical service, health care and social security service, and other services for individuals.
Public service and water supply	Public service, water supply and disposal of waste matters.
Others	Mining, office supplies and miscellaneous items.

**Fig. 2 Rate of Increase in Production by Industry
(in nominal terms)**



**Table 2 Domestic Production and Trade Balance (1990/1980)
(Real terms at 1985 Prices)**

Increase rate of domestic production (average)	1.77	Pulp, paper and paper products Financing and insurance Office-intended service	Non-profit-making private organizations	Plastic products General machines Office and service equipments Electric household machines and equipment Electronic and communication equipment Other electrical appliances and parts Automobiles
	1.51	Publishing and printing Chemical products Rubber products Communication and broadcasting	Building and repairing Medical service Health care and social security service Machine repairing	Heavy electrical machinery
	1.26	Non-ferrous metals Metal products Precision instruments Other manufactured Transportation Personal service	Civil engineering and construction Power, gas and heat supplies Water supply, disposal of wastes Real estate Education and research	Commerce
	0.00	Agriculture Foodstuffs Textile products Lumber, wooden products and furniture Petroleum and coal products Ceramics, stone and clay products Iron and steel Other transport equipment	Public service	
		Forestry Fishery Mining		Coal, crude oil and natural gas
	Increase rate of imports is higher	Non-trade items	Increase rate of exports is higher	

Trade tendency

* Exports are valued at producer prices, while imports are valued at CIF price + tariff + internal consumption tax.

4. Higher Value Added in the Stagnating Sector

The six sectors of general machines, electric machines and transport equipment (in the sectors in growth), and foodstuffs, textile products, and iron and steel (in the sectors in stagnation) that have large domestic production are selected and traced as to the weight of value added, operating surplus and the compensation of employees in the domestic production during the 20 years from 1970, before the first oil crisis, to 1990. Although the growing sector showed a higher rate of value added when viewed from the absolute level point of view, the increase rate was higher in the stagnating sector than in the growing sector. This fact indicates how the industries in the stagnating sector have been trying to add more value to their products.

Next, as for operating surplus, both sectors are decreasing. However, the rate of decrease is larger in the growing sector than in the stagnating sector. This is considered due to the fact that individual companies in the growing sector are exposed to more severe competition at home and abroad.

The compensation of employees in the growing sector remained nearly at the same level, while that for the stagnating sector rose considerably. It is considered that this tendency is caused by the fact that the weight of intellectual work has been increased in the stagnating sector, with their products having had more value added (Table 3).

Table 3 Changes in the Rates of Value Added, Operating Surplus and the Compensation of Employees (1970 to 1990)

	Rate of value added			Rate of operating surplus			Rate of compensation of employees		
	1970	1990	Percentage change	1970	1990	Percentage change	1970	1990	Percentage change
Total of all industry	47.0	50.1	3.0	24.5	20.2	-4.3	19.6	26.5	6.9
Foodstuffs	20.7	35.6	14.9	9.8	15.9	6.1	9.5	18.1	8.6
Textile products	42.4	47.9	5.5	14.5	13.1	-1.4	27.1	32.3	5.2
Iron and steel	46.7	53.7	7.0	31.1	31.1	0.0	14.1	18.6	4.5
General machines	47.1	47.9	0.8	23.1	22.2	-0.9	22.2	23.8	1.6
Electric machines	47.4	42.6	-4.8	25.5	19.9	-5.6	19.4	20.2	0.8
Transport equipment	43.8	40.8	-3.0	18.8	15.6	-3.2	21.6	20.0	-1.6

Notes:

- (1) Rate of value added = (gross value added/domestic output) × 100
- (2) Rate of operating surplus = ((value added – compensation of employees – indirect tax + subsidy)/domestic output) × 100
- (3) Rate of compensation of employees = (compensation of employees/domestic output) × 100

* Transactions on own accounts are deducted from the domestic output. Also, both gross value added and domestic output do not include subsidies (negative).

5. Since 1985, the Rate of Exports Declined Drastically, While the Rate of Imports and the Input Rate of Imported Goods Showed a Sharp Upturn

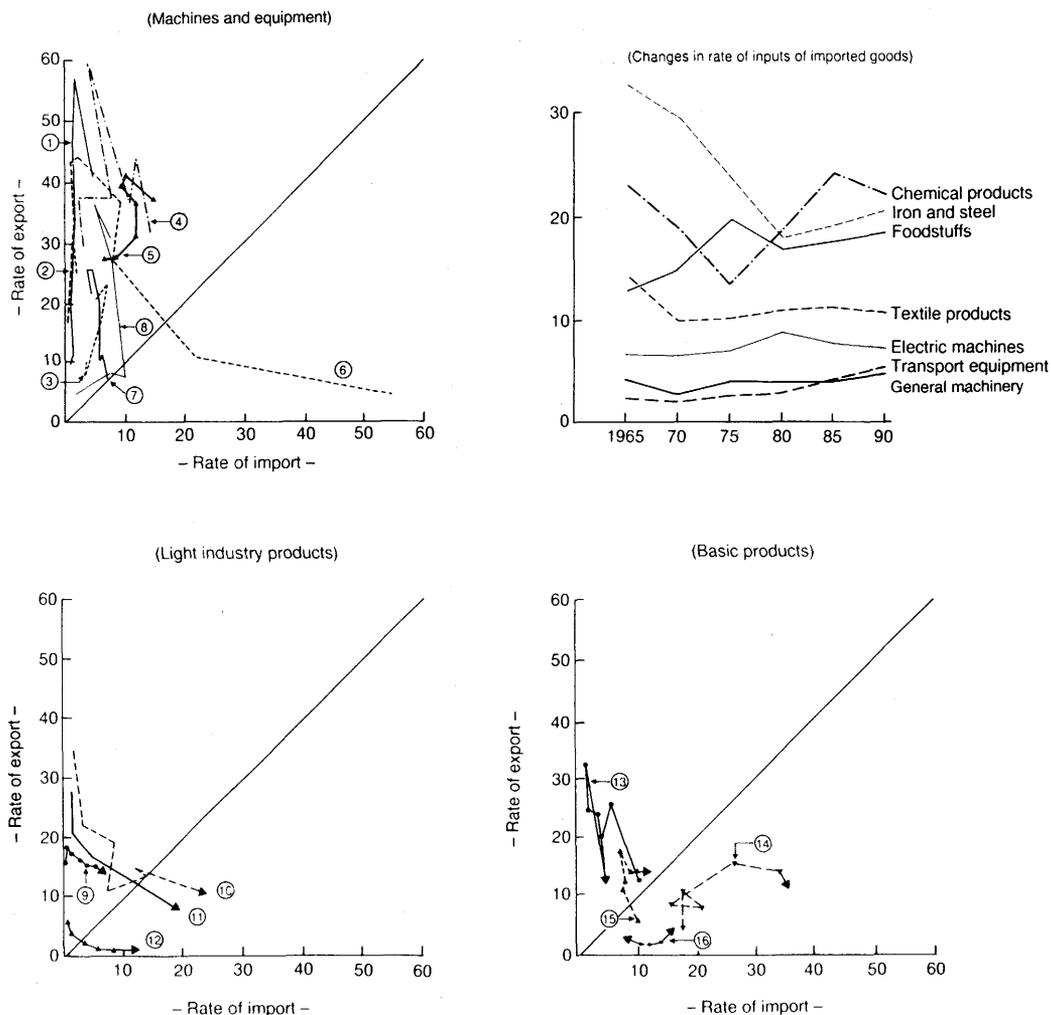
When looking at changes in the rates of import and export of major products, the rate of import showed a sharp upturn with the rate of export declining drastically since 1960 for the light industry sector, including foodstuffs, and textile products. The same was seen from around 1975 for the basic industry sector, such as chemical products, and iron and steel, and from 1985 for electric machines and transport equipment, whose competitive power is strong in international markets. Since 1975, the rate of imported goods in the entire raw materials that various industries require for the production of their merchandise (input rate of imported goods) has also increased (Fig. 3).

6. The Export of Machines and Equipment Amounted to 75% of the Total Export, While the Weight of Mineral Fuels in the Entire Import was Reduced to Less than Half of the Level at its Peak

When looking at the changes in the composition of export goods during this period, textile products, amounting to 30.2% in 1960, went down to 2.5% in 1990. Also during this same period, foodstuffs decreased from 6.3% to 0.6%, and non-metallic mineral products, like chinaware, decreased from 4.2% to 1.1%. Iron and steel, and metal products, which had shown a remarkable increase of as high as 22.5% in 1975 from 14.0% in 1960, decreased to 6.7% in 1990. On the other hand, machines, and equipment, which had registered 22.9% in 1960, amounted to 75.0% of the entire export in 1990. Of machines and equipment, ships, which had accounted for 7.1% in 1960, decreased to 1.9% in 1990, while automobiles, which had taken up only 1.9%, showed a sharp increase to as high as 17.8% in 1990. Since 1980, office equipment and electronic parts have shown a marked increase. For example, the increase of office equipment accounted for 7.2% in 1990, from 1.8% in 1980, while electronic parts showed an increase of 4.7%, from 1.8% during the same period.

Next, taking up the composition of imported goods, mineral fuels, which had accounted for half of the entire import in 1980, due to a hike in the crude oil price, went down to 24.2% in 1990. Also, the weight of industrial raw materials decreased steadily year after year, to 12.1% in 1990 from 49.2% in 1960. On the other hand, the weight of imported manufactured products, such as chemical products, and machines and equipment, increased year by year, with the composition in 1990 of 6.8% for chemical products, 17.4% for machines and equipments, and 26.0% for other products. Of the "other products," metals and metallic products, which had been 4.6% in 1960, showed a rise of 6.3% in 1990, and textile products, which had shown a remarkable upturn, recently increased to 5.5% in 1990 from 1.7% in 1970 (Figs. 4 and 5).

Fig. 3 Changes in the Rates of Export and Import



- | | |
|--|---|
| <ul style="list-style-type: none"> 1. Automobiles 2. Electric household machines and equipment 3. Electric appliances and parts 4. Other transport equipment 5. Precision instruments 6. Office- and service-intended equipment 7. General machinery 8. Electronic communication equipment | <ul style="list-style-type: none"> 9. Rubber products 10. Other manufactured products 11. Textile products 12. Lumber and primary products 13. Iron and steel products 14. Non-ferrous metals 15. Chemical products 16. Petroleum and coal products |
|--|---|

Notes:

(1) Rate of import = $(\text{import}/(\text{domestic output} + \text{import})) \times 100$

(2) Rate of export = $(\text{export}/\text{domestic output}) \times 100$

(3) Rate of inputs of imported goods = $(\text{input of imported goods}/\text{intermediate input}) \times 100$

* Transactions on own accounts and subsidies (negative) are deducted from the domestic output.

Fig. 4 Changes in Composition of Exports by Products (in dollars)

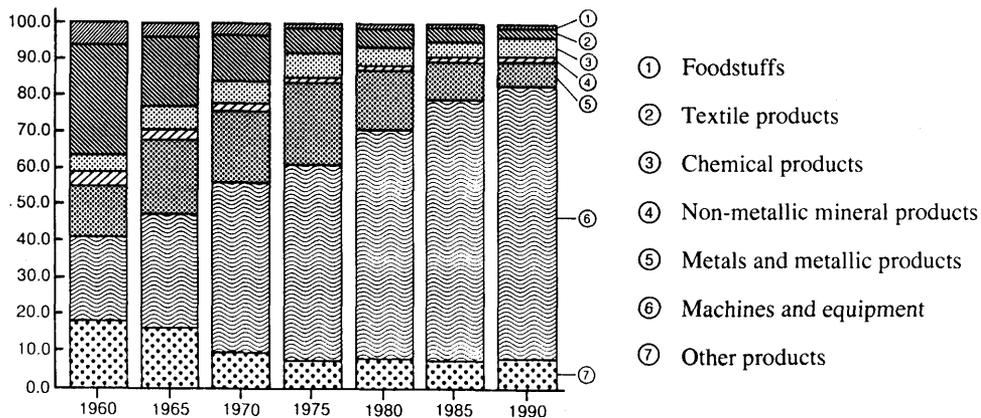
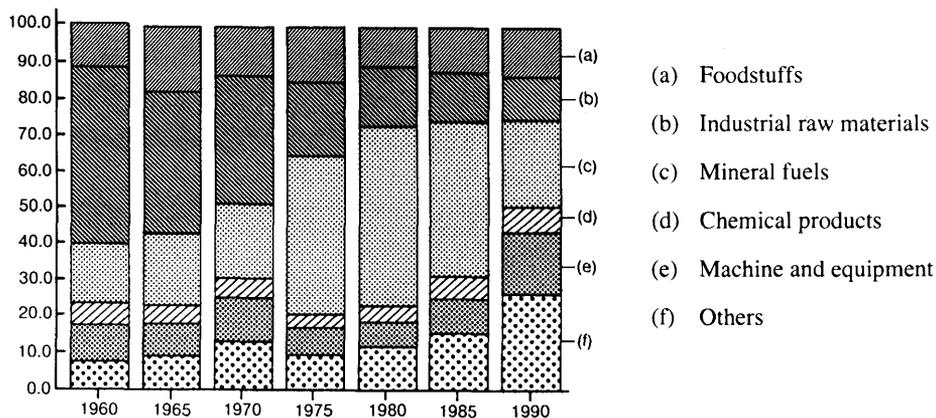


Fig. 5 Changes in Composition of Imports by Products (in dollars)



7. Export Weight to Southeast Asia and the EC has Increased, while Import Weight from the EC, China and the U.S.A. Increased

Next, we will take up the regional composition of exports. Although exports for Southeast Asia decreased to 18.9% in 1985 from 32.2% in 1960, they recovered quickly after that, and registered 30.6% in 1991. Exports for China increased to 7.1% in 1985 from 0.1% in 1960, but dropped drastically after that, and remained at the level of 2.7% in 1991. Of exports for developed countries, those for the EC have shown a remarkable increase since 1975, accounting for 18.8% in 1991. Exports for the United States amounted to 29.1% in 1991, but this figure decreased by 8.1 points when compared with the peak level marked in 1985.

On the other hand, when looking at the regional composition of imports, it is found that the weight of imports from Southeast Asia dropped during the period from 1960 to 1970,

but reversed its tendency after that, reaching 24.8% in 1991. In recent years, also, imports from China have increased rapidly, accounting for 6.0% in 1991. As for imports from advanced countries, the EC has recently increased its weight remarkably in imports as well as in exports, swinging up rapidly to 14.9% in 1990 from 6.9% in 1985. The United States showed a steady decline in its weight, to 17.4% in 1980 from 34.6% in 1960, but reversed its downward tendency after that, and recovered in weight up to 22.5% in 1991 (Tables 4 and 5).

Table 4 Changes in Export Composition by Region (in dollars)

Region	Percentage composition (%)							
	1960	1965	1970	1975	1980	1985	1990	1991
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Southeast Asia	32.2	26.0	25.4	22.5	23.8	18.9	28.8	30.6
China	0.1	2.9	2.9	4.1	3.9	7.1	2.1	2.7
Middle and Near East	4.4	4.2	3.3	10.9	11.1	6.9	3.4	3.9
EC	4.3	5.7	6.7	10.2	12.8	11.4	18.7	18.8
U.S.A.	27.2	29.3	30.7	20.0	24.2	37.2	31.5	29.1
Others	31.8	31.9	31.0	32.3	24.2	18.5	15.5	14.9

Table 5 Changes in Import Composition by Region (in dollars)

Region	Percentage composition (%)							
	1960	1965	1970	1975	1980	1985	1990	1991
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Southeast Asia	20.4	17.2	16.0	18.3	22.6	23.4	23.3	24.8
China	0.5	2.8	1.3	2.6	3.1	5.0	5.1	6.0
Middle and Near East	10.0	13.6	12.4	28.5	31.7	23.1	13.3	12.4
EC	4.7	4.8	5.9	5.8	5.6	6.9	14.9	13.4
U.S.A.	34.6	29.0	29.4	20.1	17.4	19.9	22.3	22.5
Others	29.8	32.6	35.0	24.7	19.6	21.7	21.1	20.9

8. Leading Industries Have Changed Their Position from Iron and Steel to Automobiles and to Electronics

In each period of years, we examined which industries exerted a large influence on Japan's economy in the following two standards:

- (1) Industries that accomplished growth higher than the average of the entire industries, and served as a driving engine for Japan's economic growth.
- (2) Industries that increased the amount of supply to other industries and supported their growth.

As industries that took up the role of a driving engine for Japan's economy in the 1960s, iron and steel, called the "essential ingredient of all industries" at the time, occupied first place, followed by general machines and equipment for plants and equipment investment, and then petroleum and coal products, representing the energy supply industry. In the 1970s, automobiles stood first, followed by electronic communication equipment (such as telephone sets, broadcasting equipment, and semiconductors), then electric household machines and equipment. And in the 1980s, reflecting social requirements for microelectronization, electronic and communication equipment (such as computers and integrated circuits) took up first place, followed by electric appliances and parts (such as electric measurement devices, electronic tubes, and magnetic tapes). And office- and service-intended equipment rose to third place, reflecting office automation.

Next, as industries that supported other industries from the supply side in the 1960s, the basic raw material industries of plastic products, petroleum and coal products, and chemical products were the nucleus of the entire industries. However, electronic and communication equipment (and parts) had already stood first in all the industries. This fact indicates how quickly technological innovations were introduced into the machinery industry of Japan. In the 1970s, automobiles (and parts) ranked first, followed by electric household machines and equipment (and parts). This reflects the fact that manufacturing and assembling industries, such as automobiles and electric machines, developed and formed industrial groups having a wide range of affiliated parts industries, many of which held their repairing sections as independent companies. In the 1980s, other electric appliances and parts (semiconductor wafers, electronic tubes, and magnetic tapes) took up first place. Also, foodstuffs ranked fourth, as a unique industry that had never turned up as a leading industry until then. This reflects improved processing techniques in the foodstuffs sectors, such as retort-processed foods and frozen foods, as well as the increased supply of precooked foods to the food service industry, hospitals and schools (Table 6).

Table 6 Changes in Leading Industries

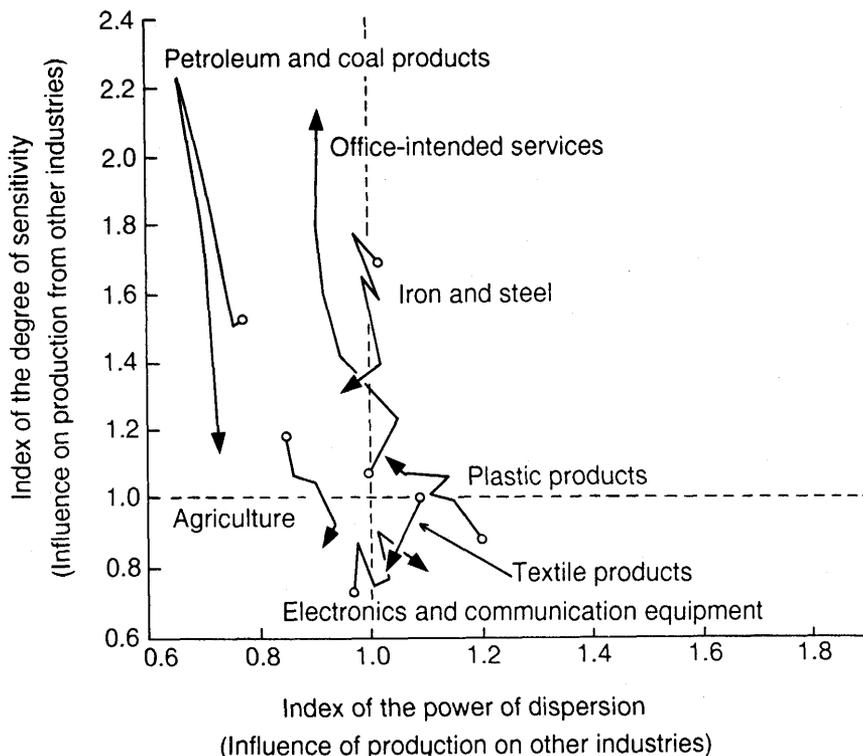
		First rank	Second rank	Third rank	Fourth rank	Fifth rank
Sectors whose production expanded remarkably	60→70	Iron and steel	General machinery	Petroleum and coal product	Chemical product	Automobiles
	70→80	Automobiles	Electronics and communication equipment	Electric household machines	Chemical product	Precision instruments
	80→90	Electronics and communication equipment	Other electric equipment	Electric household machines	Automobiles	Office equipment
Sectors that increased supplies	60→70	Electronics and communication equipment	Plastic products	Petroleum and coal product	Chemical product	Metal products
	70→80	Automobiles	Electric household machines	Metal products	Chemical product	Office equipment
	80→90	Other electric equipment	Automobiles	Office equipment	Foodstuffs	Electronics and communication equipment

9. Advanced Services Economization, Energy- and Resource-saving, Light Weight and High Functionality, and Increased Import Penetration

For individual industries, we have examined changes in the index of the power of dispersion, which represents the influence on raw materials supply industry, and the index of the degree of sensitivity, which shows the degree of influence on demand industries that consume as raw materials the products thus supplied. The characteristics of changes in the industrial structure in Japan after 1960 lie in the advancement of energy- and resource-saving, manufacturing of products with light weight and high functionality, service economization, and the international division of labor.

To be more specific, for agriculture and textile products, the index of the degree of sensitivity dropped steadily due to the increased degree of import penetration. Iron and steel showed a drop in the index of the degree of sensitivity after 1980 due to the increased light weight movement and the advanced import penetration. Plastic products had a rise in the index of the degree of sensitivity, due to the trend toward light weight and the diversification of product, while petroleum and coal products had a drop in the index of the

Fig. 6 Changes in Influences Among Industries (1965 to 1988)



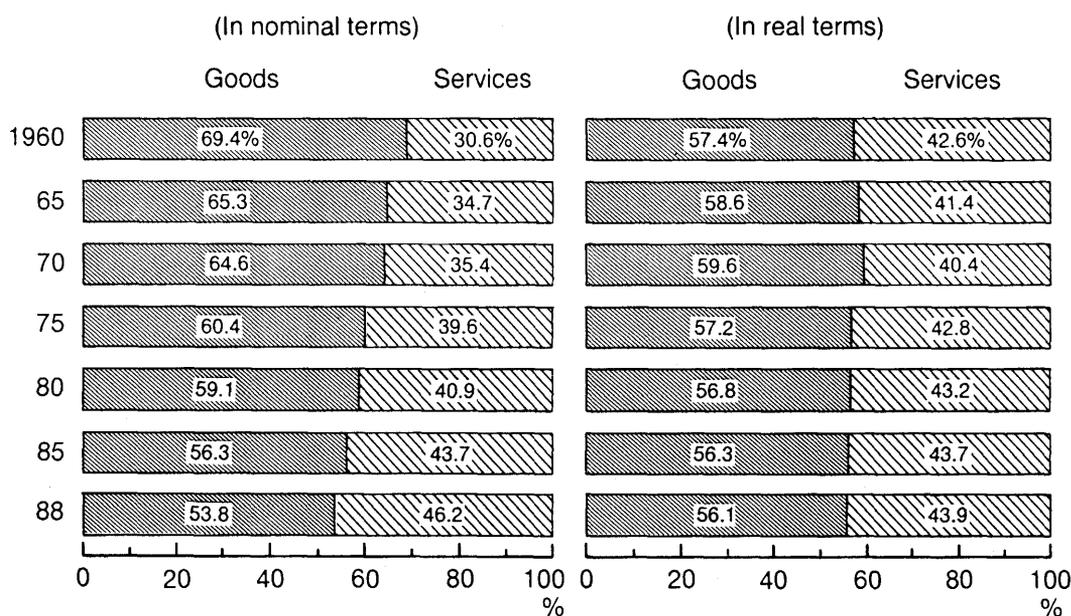
Note: The indices of power of dispersion and the indices of the degree of sensitivity were both calculated based on the input-output tables with the transactions on own accounts considered to be zero.

degree of sensitivity after 1980 due to the advancement of energy-saving. Electronic and communication equipment had a rise in the index of the power of dispersion, reflecting the diversification of raw materials to be used and the advancement of high functionality. And for office-intended services, the index of the degree of sensitivity showed a considerable rise, reflecting service economization (Fig. 6).

10. Service Economization Observed More Distinctively in the Production Sector

When looking at changes in the composition of industries with domestic production classified roughly into a goods sector and a service sector, the weight of the service sector in nominal terms showed a rise of 15.6 points during the period from 1960 to 1988. However, in real terms (at 1985 prices), this was a rise of only 1.3 points. Accordingly, a large portion of the service-intended economy was brought about by changes in the relative price between goods and services. By the way, when looking at the rate of rise in prices in 1988 compared with that in 1960, for the intermediate demand sector, goods showed a 2.4-fold rise with services in a 3.9-fold rise, while in the final demand sector, goods showed a 3.1-fold rise with services in a 6.0-fold rise (Fig. 7).

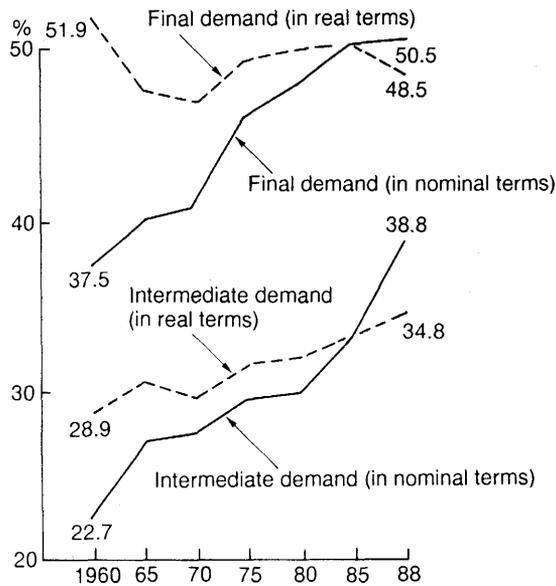
Fig. 7 Composition of Production of Goods and Services



Next, we checked which developed more service-intended production, between the intermediate demand sector and the final demand sector. In the intermediate demand sector, the input rate of services showed a rise of 16.1 points in nominal terms (5.9 points in real terms) between 1960 and 1988, while in the final demand sector, it rose by 13.0 points in nominal terms, with a 3.4-point drop in actual terms.

As seen above, service-intended production of the Japanese economy was seen more distinctively in the intermediate demand sector, that is, in the production activities of enterprises. This was considered to be caused partly due to the increased demand for new services, such as computer-related service, but even more due to the independence, or "exteriorization," of the service sector of individual enterprises (Fig. 8).

Fig. 8 Service-intended Production in Intermediate Demand and Final Demand Sectors



Note: Values in real terms are valued at 1985 prices.

11. Influences Caused by Changes in the Crude Oil Price Were Reduced to the Level before the First Oil Crisis

In 1970, about 60% of the primary energy used in Japan was supplied by crude oil. Accordingly, the two oil crises in 1973 and 1979 inflicted severe damage on Japan's economy. After that, however, supported by the higher quotation for the yen in the foreign exchange markets as well as the increased competitive power of Japan's economy in international markets, the influences of the price hike in crude oil was offset to less than half of the initial level. Also, with the advancement of high technology- and high value added-industries, the service-intended production of the economy, the transfer to overseas countries of industries that consume energies profusely, the increased dependence of power on atomic power generation, and energy saving in the ceramic industry and the iron and steel industry, in 1990 the weight of the import of crude oil in the total amount of the intermediate inputs was reduced to the level before the first oil crisis (Table 7).

Table 7 Reduction in the Rate of Intermediate Inputs of Crude Oil

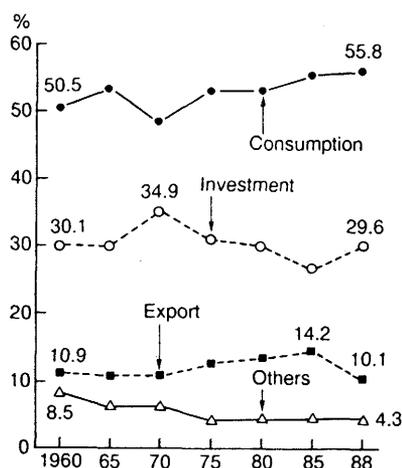
Year	Import crude oil inputs (in ¥100 million)	Intermediate inputs	Rate of intermediate inputs (in %)	Foreign exchange rate (¥/\$)	Crude oil price (\$/BL)
1970	9,131	855,201	1.07	360.0	1.8
1975	61,289	1,773,645	3.46	296.8	11.8
1980	122,521	3,049,133	4.02	226.9	33.0
1985	86,867	3,483,381	2.49	238.1	28.1
1990	48,909	4,313,703	1.13	144.9	22.3

12. Rate of Dependence on Exports was Reduced with Increased Dependence on Consumption

When looking at what kind of demands induced domestic production, the rate of dependence on exports has increased incessantly ever since 1960, reaching 14.2% in 1985. In 1988, however, it dropped to 10.1%, below the level in 1960 (but, it rose again to 12.1% in 1990).

On the other hand, dependence on consumption is steadily increasing. And it is considered that Japan is also heading toward a consumption-intended society, although gradually (Fig. 9).

Fig. 9 Changes in Percentage Composition of Induced Production by Items of the Final Demand



Note: Since the data are based on input-output tables from which transactions on own accounts are deducted, the figures above are slightly different from those in the input-output tables already released.

13. Overseas Factors Accelerate Technological Innovations

Changes in production in real terms from 1960 to 1988 are broken down into the following two factors:

- (1) Those caused by changes in the final demand, and
- (2) Those caused by changes in the production technology structure (input coefficients)

Almost all increases in the domestic production during the high economic growth period in the 1960s were caused by the increase in the final demands. In the 1970s, however, changes in the production technology structure came to considerably influence domestic production.

This reflected active energy- and resource-saving investments, labor-saving investments, the transfer of production facilities to overseas countries, and the employment of policies for improved imports, all of which were to cope with the oil crises and the higher yen quotations. As a result, it can be said that dramatic changes in overseas factors accelerated technological changes in the Japanese economy (Table 8).

Table 8 Factors of the Increase in Domestic Production in Real Terms

(Unit: in ¥100 million, %)

	60-65	65-70	70-75	75-80	80-85	85-90
Domestic production in real terms (amount of increase)	680,473	1,438,474	718,648	1,006,187	828,944	928,362
Factors						
Amount caused by changes in production technology structure	0.5	1.0	-19.6	3.1	-10.6	9.3
Amount caused by changes in final demand	105.4	100.1	127.4	99.1	115.1	89.8
Amount caused by changes in other factors	-5.9	-1.1	-7.8	-2.2	-4.5	0.9

Note: Changes in the production technology structure will act favorably when individual industries input a lot more goods and services whose transmission power is stronger than the ordinary, and act unfavorably when in the contrary state. It will also act unfavorably when the degree of import penetration of individual products increases, and favorably when in the contrary state.

Summary

When looking at the economic development from the long-term point of view, it cannot be denied that its driving force depends overall on technological innovation. As seen in the results of the analysis above, Japan has maintained its economic growth while dynamically changing its industrial structure in accordance with changes in economic conditions at

home and abroad. Its driving force was also incessant technological innovation.

Japan was favored with various advantages, such as free competition among enterprises, sufficient savings that allowed investments, business operation by management from a long-term viewpoint, a high level of education among people, favorable industrial relations, and circumstances that allowed quick introduction of new technologies.

With these advantages maintained, how should Japan reform its industrial structure in the future while meeting prevailing requirements, such as "thinking much of comfortableness and affluence," "maintenance and improvement of the earth's environment," and "international co-operation." This can be considered an important problem with which Japan's economy is confronted as it heads toward the twenty-first century.