SEAS

DISCUSSION PAPER NO, 113

MOVING UP THE MARKET : TRANSFORMATION OF INDUSTRIAL STRUCTURE AND ECONOMIC POLICIES

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This is an outline of main points of the lessons to be learned from the successful experiences in the Japanese process of rapid growth from postwar devastation to the present global economic power. It is meant to supplement a paper : " Japanese Industrial Policies : An Overview ", by F. Gerard Adams and myself.

I. Overall Integration of Economic Policies and Institution

Economic policies can be effectively implemented when they are in conformity with socio-cultural conditions and institutions of the relevant national economy. The unprecedented growth of Japanese economy may be attributed to the following factors :

1. High rate of capital accumulation,

   particularly concentrated in private fixed capital formation rather than overhead capital or housing, 30 % or more of GNP is invested and its half was in industrial equipment,

2. High rate of saving,

   such a high rate of capital formation was almost exclusively warranted by domestic savings, making the control of inflation manageable ; the saving ratio kept rising with increasing per capita income.

3. Borrowed and improved technology,

   deliberate effort of learning modern technology and superseding western technology is pronen by R & D expenditure in government and private

enterprises, emphasis of engineering faculties in best universities, training on the job or Technology or QC conscious management.

4. Industrious and well-educated workers,

despite the change in fundamental values in postwar education, " Thrift and Industry " remained the absolute virtues. They are well-educated : 90 % of the same age group go to high school and finish. 40 % go to colleges and universities and graduate. The age composition is young. The inter-firm mobility among small and medium enterprises is high, though the contrary is true with large corporations.

5. Agricultural productivity increase,

land reform, government support of agricultural prices and rural investment released the enormous number of workers - estimated 22 million men in 1955 to 77 - to the manufacturing and tertiary sectors : one million a year!

6. Group loyalty and good human relations between labor and management,

except for immediately postwar turbulance and remaining radical elements in public sectors. Japanese labor has been moderate and cooperative with management. Group loyalty, life-time employment and profit-sharing(bonus) wage system seem to have worked ideally, excepting some public enterprises. This can be shown by the small number of working hours lost by strikes.

7. Flexible adjustment of industrial composition to the changing demand conditions and innovating technologies,

this can be clearly seen by contrasting the changes in industrial composition of GDP and the changes in world trade composition from one country to another. Japan supercedes any other industrialized country in 1955 to 1980. MITI's Industrial Policy played a significant role.

8. Good relations between government and business,

the whole-hearted determination of business circles, civil servants and politicians alike to reconstruct the devastated nation bred the spirits of cooperation. The success of cooperation established trust and constant consultation. This was really the basis of Japanese Industrial Policy.

9. Cooperation among commercial banks, the Bank of Japan, Ministry of Finance and private businesses.

Banks often plays the role of business consultants, and the government - in particular, the Ministry of Finance - and the Bank of Japan jointly controled fairly adequately the foreign exchange in the 50's and 60's and the supply of money in the 70's.

10. Political Stability

Rapid growth often leads to social disorder. Postwar Japan did not remain perfectly immune to this malaise, but Liberal Democratic Party has been in power all the time and successfully guided the national economy. Land reform, protection of farmers, support of small and medium enterprises, early introduction of social welfare program, adequate taxation system to equalize personal income all contributed to the stability. Above all, however, international environment surrounding Japan has been unusually favorable for Japan.

In the 1970's, which is the " shock period ", these conditions favorable for rapid growth began to change. The Nixon shocks (revaluation of Yen rate, embargo of soya beans and US - China approchement) plus oil crises revealed the valunerability of the Japanese economy vis a vis energy and food, (mineral resources and land). It was most fortunate that these shocking events occured when the Japanese industries barely managed to reach the stage in which

their exports could cover sufficiently the imports of raw materials, food and energy.

The 1980's is the " trial period ", in which Japan must find her honorable position in the world economy and succeed in integrating herself with the major trading partners. This will involve an adjustment of industrial structure vis a vis other industrialized countries and NIC's like the Republic of Korea.

The pressure placed on Japan comes from two contradicting sources :

1. the need to expand exports so that Japan can pay extra 30 billion dollars for the same quantity of oil,
2. the difficulty of finding the sufficient market for the 30 billion dollars worth of exports without causing the trade conflicts with other countries which are suffering the recessions and the structural adjustment problems.

II. Characteristics of Japanese Industrial Policy

Some characteristics of Japanese Industrial Policy are described here in order to give some relevant points of consideration for industrial development strategies to NIC's.

1. Choice of strategic industries :

Japan adopted the so-called "one set principle". She tried to develop, more or less, almost all kinds of manufacturing industries. This may be motivated primarily to reduce the imports and overcome the chronic shortage of foreign exchange. The fatal suffering of Japanese economy from the unfavorable balance of payments throughout the prewar and postwar years led to the conclusion that whatever we can produce domestically had better be produced rather than imported.

It was made possible by the fact that the market size of Japanese economy is large enough, and the Tokaido megalopolis offered a compact,

single market connected with the rest of the world by sea transportation - an extremely efficient, well-organized market.

At the same time, however, the Japanese government always chose some " future industries " which can be major " export industries ". In particular they were very conscious of the future trend of demand and supply-production technology. As for demand, the American pattern of consumption had already set a pattern so that it was not too hard to see the trend of divercification and fashion. As for production, Japan definitely chose those which are input-saving (for primary materials) and more backward-linked. The backward linkage was considered as more employment-creating and establishing the sound industrial complex at home. As the result, despite the clear emphasis of MITI's policies on heavy-chemical industries, many processing industries successfully developed themselves.

Table 1. Basic vs Processing Industries

Deliveries billion Yen

	1950	1978	(1978)/(1950)
Textiles	1,096	7,236	6.6
Apparels	85	2,764	32.5
Wood products	274	4,272	15.6
Furniture	65	2,465	37.9
Iron & steel	650	13,471	20.7
General machinery	312	13,640	43.7
Elect. machinery	251	16,311	65.0
Transp. machinery	371	20,291	54.7

2. Long term vision and dynamic change in comparative advantage

The Akamatsu-Vernon type of product cycle or industrial adjustment in stages was always kept in mind in preparing the medium term perspectives of Japanese industrial composition. Specialization in some industries was never considered permanent, although such shift in industrial composition was sometimes painful. A simplified scheme of such a shift may be demonstrated as follows :

Table 2. Shift of Industrial Composition in Stages

	Imports	Domestic Product	Exports	Direct Inv.
Primary Ind.		I	I	
Light Ind.	I	II	III	IV
Heavy-Ch. Ind.	II	III	IV	V
Tech.Intensive I.	III	IV	V	

I, II, III, IV denote the stages of industrial development.

Needless to say, the protective measures were taken for the industries whose domestic production must start. In stage III, the import of heavy-chemical industry's products was restricted on the basis of infant industries. How long the old protective measures may be maintained justifiablly is the question to be studied from the view-point of international division of labor.

The last stage of industrial development from the view-point of a single industry - not necessarily from the view-point of the engaged enterprises - is the direct investment abroad. Many textile companies in Japan made direct investment in East and Southeast Asian countries, and their joint-ventures are successfully competing in the world market.

The extent to which this kind of " technology transfer " and transplantation of some industries abroad can be successfully performed depends on the success in achieving the transformation of industrial structure at home, because the necessary foreign exchange reserve must be earned by the exports of the other new industries' products. The successful process from stage III to IV may be seen from the following table :

Table 3. Export/Production Ratio

(%)

	1960	1965	1970	1975	1979
Music Instr.	7.4	12.7	19.9	23.9	18.8
Watches	4.7	15.7	37.0	51.3	57.2
Automobiles	4.2	14.5	22.8	40.0	50.2
Work Machinery	3.6	12.7	7.7	26.7	43.4

In the late 60's and 70's, the growth rate of Japanese exports superseded that of domestic production, and that of overseas investment was even more rapid than exports'. The oil crises staggered this trend for the time being, but as the Japanese balance of payments become steadily favorable and the exchange rate of Yen becomes strong again, her overseas investment will quickly recover.

One difficulty may be anticipated. After a certain stage of industrial development, further development of more " technology-intensive " or "higher degree of technology" industries may become increasingly difficult. The main reason is that the so-called " Boomerang " effect causes the glut of some industrial products and yet the market for the product of next stage industries may not be large enough. It must be added, however, that the development of some machinery industries like ship-building in one country almost always increases the import of some complementary machinery like

diesel engines from a more industrialized country. The problem is whether the loss of market in the former can be compensated enough by the latter. Competition between US - Europe and Japan does not guarantee optimism, whereas competition between Japan and Asian NIC's seems to support optimism.

At least so far the Japanese exports successfully shifted to more and more " technology-intensive" types of machinery products. Table 4 shows this trend.

Table 4. Composition of Japanese Exports

	1960	1970	1980 (%)
Foodstuffs	6.3	3.4	1.2
Textiles	30.2	12.5	4.9
Chemicals	4.5	6.4	5.2
Metal & Metal Products	14.0	19.6	16.4
Machinery	25.5	46.3	62.8

Note that the proportion of machinery in total exports is not as high as 60 % even for most industrialized countries like West Germany (47.9), Sweden (44.0), US (43.0), UK (37.4), France (37.4), Italy (33.8) or Switzerland (33.2) in 1977.

In order to perceive the future trend of demand and supply in the world market, the collection of information and forward-looking vision is essential. The main role played by MITI and " Sogo sosha " (Trading companies) in this respect can hardly be underestimated. Slightly more than half of Japanese foreign trade is handled by Sogo-shosha : 48.7 % of exports and 56.0 % of imports in 1980. The main function of MITI's Industrial Policy was to offer such information and vision. The White Papers On Trade and various reports

on Long-Term Perspectives of Industrial Structure prepared by MITI staff are full of information on the world market and its future trend. The information was collected through various channels including JETRO or Japan trade centers all over the world. Sogo-shosha also played similar functions as well as actual trading. Even if we limit the number of staff stationed overseas by top nine Sogo Shosha (Mitsubishi, Mitsui, C. Itoh, Marubeni, Sumitomo, Nissho-Iwai, Toyo Menka, Kanematsu Gosho, Nichimen), more than 20,000 persons are working all over the world as of March, 1980.

Table 5. Overseas Staff of Sogo Shosha

	Persons from Japan (persons)	(%)	Locally hired persons
North America	1,688	28.4	3,093
Asia	1,384	23.3	5,222
Europe	1,157	19.5	2,649
Latin America	554	9.3	1,906
Middle East	482	8.1	937
Africa	372	6.3	819
Oceania	308	5.2	761
Total	5,945	100.0	15,387

Remember that the total number of officials in the Ministry of Foreign Affairs is only 3,560 and that of MITI itself is only 13,624.

While Japanese exports are expanding and overseas investment has accumulated, the exports of NIC's also quickly jumped up. Japanese exports expanded about 10 times from 1968 to 1980, whereas US. 6.5 times, F.R. Germany 7.8, France 9.0 etc. But NIC's exports expanded more rapidly. The annual rate of growth in exports from 1971 to 1980 is : South Korea 36.4 %,

Hongkong 21.5 %, Taiwan (ROC) 28.6 %, Malaysia 21.0 % and Singapore 25.5 %. This implies that the composition of exports and hence producing industries is changing among Asian countries, which requires an international adjustment of industrial structure. The subject will be discussed later.

3. Government's Limited Role and Initiatives of Private Enterprises

It is an erroneous recognition to think that Japanese Industrial Policy has given very protective support and enormous subsidies to strategically chosen industries like automobiles, electronics or computers. There are several characteristics in the government's role which are not widely recognized.

a. The various protective measures taken for a certain industries seldom lasted too long. For example, the special allowance of accelerated depreciation for machinery was given only for the initial three years after 1951. The permit to regard some depreciation allowance as current cost for taxation purposes was granted only to some favored industries, but the choice of industries has shifted, though somewhat belatedly, from iron and steel, shipping or trading companies to pollution-preventing, airplane, computers or atomic power industries. The import quota and custom duties and foreign exchange control is almost liberalized by now. The specific exceptional commodities are only 20 now, including 5 in manufactured goods.

The special protective measures are permitted only on the basis of certain regulations. The most important industry to develop in the late 50's and 60's was Machinery Industry. The two laws were particularly important : Temporary Law For Promotion of Machinery in June, 1956 and Temporary Law For Promotion of Electronic Industry in June, 1957. On the bases of these laws, special low interest loans were provided by public banks. The word temporary meant that these laws were the regulations

limited in the coverage of industries and time. They were revised in fact several times and then completely revised as Temporary Law For Promotion of Specific Electronics and Machinery Industries, in 1971. The industries to be protected became more limited. The objectives were also expanded to suggest " rationalization " and " expansion of production scale " as well as to grant generous loans. This law was again changed to Temporary Law For Promotion of Specific Machinery and Information Industries in July, 1978. The emphasis of promotion is now on electronification of all kinds of machines and development of softwares associated with it. This shows that the protective measures were only temporary. All the laws had the deadline when they became ineffective and had the specific objectives and measures permitted.

b. Japanese Industrial Policy promoted both large scale of leading industries or enterprises and the linked followers or small and medium enterprises. Parallel development of large and small enterprises as well as key industries (e.g. iron and steel) and processing industries (e.g. electrical appliances) is a characteristic of Japanese industrial development. They always protected the vested interest of small and medium size corporations. Indeed, the Agency of Small and Medium Enterprises is an important and powerful agency within MITI. For example, the proportion of different sizes of enterprises did not change over a number of years, 1965 to 1976. Table 6 shows this. Similar observations can be made in many other industries.

Table 6. Number of Establishments in Different Sizes of Enterprises

	1965	1970	1976
Textiles	52,526	52,671	43,740
Large	607	685	733
Med. & Small	19,541	20,625	20,225
Proprietors	31,659	30,564	22,090
Cooperatives	719	797	692
Apparrel	16,268	20,946	26,808
Large	35	89	160
Med. & Small	6,675	9,360	13,406
Proprietors	9,287	11,234	12,994
Cooperatives	271	263	248

c. Industrial Policy was effectively practiced also in overcoming the difficulties facing some declining industries. One example is ship-building industry. As for the ship-building industry case, the government adopted two policies. One is the short-term and another is the long-term policy.

The short-term policy was based on Ship-building Industry Law. The government advised to reduce the level of production to 72 % (large 67 companies in 1977), 67 % (large 63 companies in 1978) 39 % (large 34 companies in 1979), and 39 % (large 34 companies in 1980). Since the Fair Trade Commission complained that it is against the Anti-Monopoly Law, the Ministry of Transportation requested the ship-building companies to form a depression cartel, and they have controled the level of production among the largest 39 corporations.

The long-term policy was based on Temporary Law For Stabilizing Specific Ship-Building Enterprises, regulated in October, 1978. A new association called Specific Ship-Building Enterprises Association was established. Its function is to raise the funds for purchasing the dockyards, equipments and land from the ship-building companies and abolish them. The funds required were about 96 billion Yen. One billion Yen was given by the government, and the rest was raised from the member companies, 1 billion Yen and borrowed from Japan Development Bank and city banks. The loans are paid back over 10 years by the remaining members of the association. The abolishment was supposed to be completed by the end of March, 1980. The actual performance is as shown in Table 7 :

Table 7. Abolishment of Ship-Building Equipments

(unit : 10,000 ton age)	Total owned	Abolish Target	Actual Perform	%	Remaining
large 7 Co's (Target 40%)	569	228	224	99	343
medium 17 Co's (Target 30%)	289	87	104	119	205
med.small 16 Co's (Target 27%)	79	21	25	119	45
other 21 Co's (Target 15%)	40	6	5	81	26
Total 61 Co's (aver. 35%)	977	342	358	105	619

What is remarkable in Japanese economic growth is the fact that the Japanese manufacturers have shown unusually high capacity in transforming industrial structure. But it must be remembered that such a capacity is an outcome of painstaking effort of private enterprises, only partly and temporarily assisted by government industrial policies.

d. The cooperation of labor unions must be also recognized. When they are ideologically oriented and inflexible in perceiving the needs of the

national economy, the serious conflicts occurred even in Japan. The Miike Mining Co's case is exactly one of such examples. The severe difficulties of Japanese economy in the 1970's have become the common understanding between labor and management after two oil crises. Table 8 shows a remarkable decline of labor disputes in Japan in late 70's. The unionization rate of Japanese workers is not particularly low. It is 31.6 % in 1979 to be compared with 57.4 % (U.K), 41.9 % (Germany F.R.) and 23.4 % (US), but it seems to have a declining trend in recent years.

Table 8. Days Lost in Labor Disputes (72 - 80)

(1.000 man days)	Japan	US	UK	France	F.R.Germany
1972	5,147	27,066	23,909	3,755	66
1973	4,604	27,948	7,197	3,915	563
1974	9,663	47,991	14,750	3,380	1,051
1975	8,016	31,237	6,012	3,869	69
1976	3,254	37,859	3,284	5.011	534
1977	1,518	35,822	10,142	3,666	24
1978	1,358	36,922	9,405	2,200	4,281
1979	930	33,000	29,474	3,172	483
1980	-	32,000	11,910	1,511	-

III. International Coordination of Industrial Restructuring Policies

A number of studies seem to have shown that there is more or less a standard pattern of industrial composition appropriate for each stage of development to certain scales of national economies. The World Bank studies support this. One study by Yosuhiko Torii, " Structure of Protectionism : a view from development theory " Trade and Customs, February, 1981 (in Japanese) pointed out that if 14 advanced countries,

9 NIC's, 21 Under-developed countries, 8 Least-developed countries and 3 East European countries are lumped together, and their industrial outputs were summed up at the three digit levels of International Standard Industrial Classification, then there emerges a similar pattern of industrial composition within the manufacturing industry. The following figure is a rough presentation of this configuration. It demonstrates that except for LLDC's, the relative weight of various industries at this level of aggregation for this kind of grouping remains quite similar to all groups of the countries. This would probably imply that due to the basic similarity in consumption pattern and available technologies, the pattern of industrialization tends to be standardized. But this does not mean that within each category of industry, say Chemicals, one country's industry has a comparative advantage over another country's similar industry - horizontal division of labor. It also implies that neighboring countries in different development stages may have varied industrial structure, so that the vertical division of labor is in accordance with comparative advantage. The actual conditions are most likely to be a combination of these two types of specializations gradually shifting as both national economies develop. The above-mentioned study indicate that there are limitations to international specialization. Unless the relevant countries are aware of the development of similar countries in competing countries, the world-wide glut of the same commodities will be unavoidable. This has happened to textile industry and is happening in iron and steel, automobiles and electronics. The price fall will be unavoidable. The positive adjustment policies can only lead to protectionism. What is needed is fundamentally the trust in price mechanism, supplemented by wise Industrial Policy with future-oriented vision.

The great difference between Japan and the Republic of Korea in industrial development can be seen by comparing the last two tables. The notations are identifiable from ISIC and the same as Table 9. Additional notations are :

210 : Coal Mining

220 : Oil and Natural gas

230 : Metal Mining

290 : Other Mining

410 : Electricity, Gas, Water

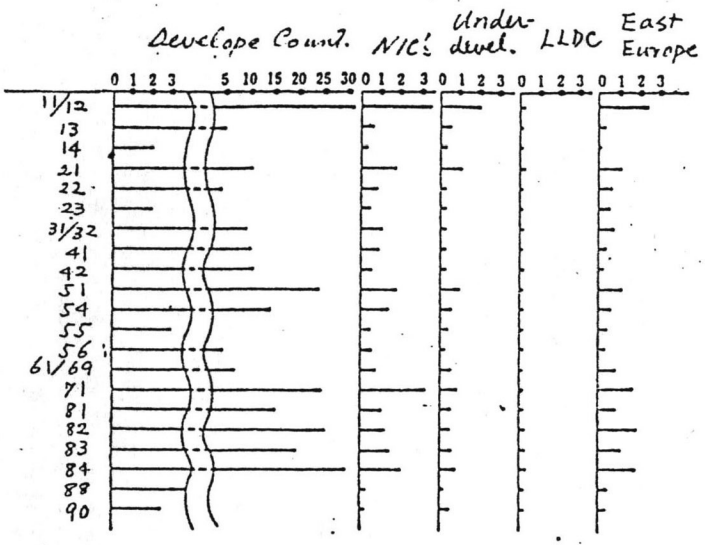
2 - 4 : Mining-Manufacturing and Public Utilities

Although the scale of actual production differs, the rate of growth in many manufacturing industries is significantly positive. This would probably imply that there are severe competition as well as complementarity between the corporations in both countries. The detailed studies of these industries may point to the kind of coordination policies required to overcome the unnecessary glut of world-wide production in some industries.

Reference :

S. Ichimura, " Japanese Industrial Restructuring Polices, " September, 1979, Discussion Paper of CSEAS, Kyoto University.
This paper gives many references in Japanese.

Table 9. Industrial Structure in the World in 1975



11/12	: Food Processing
13	: Drinks
14	: Tobacco
21	: Textiles
22	: Apparrel
23	: Leather
31/32	: Wood Products
41	: Paper Products
42	: Printing
51	: Chemicals
54	: Petro Products
55	: Rubber Products
56	: Plastic Products
61-69	: Non-Metal Products
71	: Iron and steel
81	: Metal Products
82	: General Machinery
83	: Electric Machinery
84	: Transp. Machinery
88	: Stationery
90	: Other Manuf. Products

Table 10. Industrial Development of ROK

大韓民国 R. of Korea

12. 鉱工業生産指数(1975 = 100) Prod. Index

ISIC	鉱工業	1968	1969	1970	1971	1972	1973	1974	1976	1977	RATE a/	ISIC
210	石炭鉱業	58	58	70	73	70	77	87	93	98	6.0	210
220	原油，天然ガス鉱業	...	...	...	...	...	...	...	...	...	...	220
230	金属鉱業	96	94	89	85	80	91	95	111	121	2.6	230
290	その他の鉱業 b/	45	51	60	68	63	84	90	117	138	13.3	290
2	鉱業，採石業 b/	63	64	71	74	71	82	89	102	114	6.8	2
311/2	食料品製造業	40	51	55	66	83	93	92	132	169	17.4	311/2
313	飲料製造業	37	46	56	68	66	80	89	113	146	16.5	313
314	たばこ製造業	48	52	60	73	80	80	93	106	118	10.5	314
321	繊維工業	24	32	38	46	61	76	78	131	142	21.8	321
3211	製糸，紡績，織物業	...	...	...	...	...	...	...	...	...	...	3211
322	衣類，身の回り品製造業 c/	12	12	15	22	32	60	78	142	158	33.2	322
323	皮革および同製品製造業	3	2	2	4	8	19	45	139	180	57.6	323
324	はきもの製造業 c/	...	...	...	...	...	...	...	...	...	...	324
331	木材，木製品製造業	55	57	64	74	84	102	90	132	149	11.7	331
332	家具，建具製造業	84	93	89	78	80	64	72	111	153	6.9	332
341	紙，紙製品製造業	44	44	41	53	61	80	96	121	152	14.8	341
3411	パルプ，紙，板紙製造業	...	...	...	...	...	...	...	...	...	...	3411
342	印刷，出版，同関連工業	69	71	77	82	86	89	97	117	130	7.3	342
351	化学工業基礎製品製造業	35	44	51	52	55	68	77	124	146	17.2	351
3511	肥料を除く基礎化学工業製品製造業	...	...	...	...	...	...	...	...	...	...	3511
3513	合成樹脂，プラスチック材，人造繊維製造業	...	...	...	...	...	...	...	...	...	...	3513
352	その他の化学工業製品製造業	29	29	48	54	58	74	88	134	172	21.9	352
3522	医薬品製造業	...	...	...	...	...	...	...	...	...	...	3522
353	石油精製業	39	53	66	75	78	91	90	112	130	14.3	353
354	その他の石油製品，石炭製品製造業	40	45	54	62	68	92	98	124	149	15.7	354
355	ゴム製品製造業	49	55	42	52	59	84	99	140	170	14.8	355
356	型に入れてないプラスチック製品製造業	23	30	56	71	78	79	70	133	225	28.8	356
361	陶磁器，土器製造業	146	138	133	115	73	107	94	120	182	2.5	361
362	ガラス，同製品製造業	42	45	64	93	85	99	106	115	144	14.7	362
369	その他の非金属鉱物製品製造業	48	60	55	62	64	90	99	116	146	13.2	369
371	鉄鋼一次製品製造業	18	22	24	26	31	49	94	141	171	28.4	371
372	一次非鉄金属製品製造業	41	41	39	46	53	62	71	143	179	17.8	372
381	金属製品製造業(機械，武器を除く)	22	23	24	26	23	38	55	152	208	28.3	381
382	一般機械(電気機械を除く)製造業	42	35	34	43	53	82	83	157	166	16.5	382
3825	事務用機械，計算機，会計機製造業	...	...	...	...	...	...	...	...	...	...	3825
383	電気機械器具製造業	8	13	14	18	23	48	92	173	219	44.4	383
3832	ラジオ，テレビ，通信機械器具製造業	...	...	...	...	...	...	...	...	...	...	3832
384	輸送機械製造業	12	17	18	18	17	33	81	108	150	32.4	384
3841	船舶製造・修理業	...	...	...	...	...	...	...	...	...	...	3841
3843	自動車製造業	...	...	...	...	...	...	...	...	...	...	3843
385	精密機械器具製造業	17	23	27	25	28	55	85	182	213	32.4	385
390	その他の製造業	30	43	52	46	59	70	82	124	151	19.7	390
3	工業	26	32	35	41	48	65	84	136	154	21.9	3
410	電気業，ガス業，蒸気業	...	...	...	...	...	...	...	...	...	...	410
4101	電灯，電力	31	39	46	53	60	75	85	117	134	17.7	4101
420	水道業	.	.	.	.	.	.	.	.	.	.	420
4	電気・ガス・水道業	...	...	...	...	...	...	...	...	...	...	4
2-4	鉱工業，電気・ガス・水道業結合 b/d/	28	34	37	43	49	66	84	133	152	20.7	2-4

a/ 1968年－1977年間の年成長率。
b/ 塩業を除く。
c/ 小分類324は322に含まれる。
d/ ガス業，蒸気業を除く。

Table 11. Industrial Development of Japan

日本 : Japan

－13. 鉱工業生産指数(1975＝100) Prod. Index

ISIC	鉱工業	1968	1969	1970	1971	1972	1973	1974	1976	1977	RATE a/	ISIC
210	石炭鉱業	248	238	211	178	150	118	107	97	96	-10.0	210
220	原油，天然ガス鉱業	92	97	102	104	104	108	107	101	112	2.2	220
230	金属・鉱業	144	146	146	145	130	108	96	99	103	-3.7	230
290	その他の鉱業	67	74	82	87	93	110	109	104	108	5.4	290
2	鉱業，採石業	140	141	138	130	120	113	106	100	103	-3.4	2
311/2	食料品製造業											311/2
313	飲料製造業	80	85	92	94	99	99	98	101	105	3.1	313
314	たばこ製造業	69	73	77	80	88	91	95	97	101	4.3	314
321	繊維工業	88	97	105	109	111	118	106	108	107	2.2	321
3211	製糸，紡績，織物業	...	...	...	...	...	...	...	...	...	...	3211
322	衣類，身の回り品製造業	85	94	100	103	103	116	110	108	108	2.7	322
323	皮革および同製品製造業	77	84	87	89	96	99	98	105	103	3.3	323
324	はきもの製造業	78	86	90	92	95	101	100	101	101	2.9	324
331	木材，木製品製造業	107	114	119	117	121	122	109	107	104	-0.3	331
332	家具，建具製造業	...	...	...	...	...	...	...	...	...	...	332
341	紙，紙製品製造業	77	87	98	101	107	119	114	113	115	4.6	341
3411	パルプ，紙，板紙製造業	...	...	...	...	...	...	...	...	...	...	3411
342	印刷，出版，同関連工業	...	...	...	...	...	...	...	...	...	...	342
351	化学工業基礎製品製造業	69	81	94	100	108	119	113	109	112	5.5	351
3511	肥料を除く基礎化学工業製品製造業	...	...	...	...	...	...	...	...	...	...	3511
3513	合成樹脂，プラスチック材人造繊維製造業	...	...	...	...	...	...	...	...	...	...	3513
352	その他の化学工業製品製造業	52	63	76	82	87	103	106	118	126	10.3	352
3522	医薬品製造業	...	...	...	...	...	...	...	...	...	...	3522
353	石油精製業	58	69	81	89	93	108	105	104	106	6.9	353
354	その他の石油製品，石炭製品製造業	44	57	73	78	78	98	101	96	94	8.8	354
355	ゴム製品製造業	74	81	89	92	98	110	105	111	114	4.9	355
356	他に分類されないプラスチック製品製造業	66	76	95	105	119	135	114	117	121	7.0	356
361	陶磁器，土器製造業											361
362	ガラス，同製品製造業	81	90	101	103	110	126	117	110	115	4.0	362
369	その他の非金属鉱物製品製造業											369
371	鉄鋼一次製品製造業	68	83	94	91	99	119	117	109	108	5.3	371
372	一次非鉄金属製品製造業	74	87	94	96	108	129	113	119	125	6.0	372
381	金属製品製造業(機械，武器を除く)	71	84	97	100	111	133	123	117	125	6.5	381
382	一般機械(電気機械を除く)製造業	74	88	105	102	102	128	126	110	117	5.2	382
3825	事務用機械，計算機，会計機製造業	...	...	...	...	...	...	...	...	...	...	3825
383	電気機械器具製造業	56	75	87	89	101	122	118	128	136	10.4	383
3832	ラジオ，テレビ，通信機械器具製造業	...	...	...	...	...	...	...	...	...	...	3832
384	輸送機械製造業	56	64	73	81	90	103	105	102	106	7.3	384
3841	船舶製造・修理業	...	...	...	...	...	...	...	...	...	...	3841
3843	自動車製造業	...	...	...	...	...	...	...	...	...	...	3843
385	精密機械器具製造業	56	67	80	81	86	98	108	128	166	12.8	385
390	その他の製造業	97	109	106	102	110	116	107	119	122	2.6	390
3	工業 b/	69	80	92	94	101	117	112	111	116	5.9	3
410	電気業，ガス業，蒸気業	59	66	75	80	86	97	97	108	114	7.6	410
4101	電灯，電力	...	...	...	...	...	...	...	...	...	...	4101
420	水道業	.	.	.	.	.	.	.	.	.	.	420
4	電気・ガス・水道業	...	...	...	...	...	...	...	...	...	...	4
2-4	鉱工業，電気・ガス・水道業総合 b/	69	80	91	94	101	116	112	111	116	5.9	2-4

a/ 1968年－1977年間の年成長率。
b/ 印刷，出版業を除く。