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THE INDUSTRIAL AND COMMERCIAL STRATEGY OF JAPAN

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THE INDUSTRIAL AND COMMERCIAL STRATEGY OF JAPAN

INTRODUCTION

This study describes the evolution of Japan's industrial and commercial strategy since 1945 and the prospects for the 1980s. Besides indicating the policies and official measures that have been used to shape these developments, the document considers the underlying industrial structure of Japan and the changes that have occurred in individual sectors.

The study is divided into three parts:

I. Developments 1945-1970

A summary of the results achieved during the post-war reconstruction period and in the high-growth years of the 1950s and 1960s.

II. Japan's present position

A description of the position Japan reached by the end of the 1970s and developments during that decade, which again saw high growth and a further advance into new sectors, as well as the need to grapple with the problems resulting from the rise in oil prices.

III. The perspectives for the 1980s

A survey of the outlook during the 1980s, as this emerges from official studies and reports made by the leading Japanese research institutes.

The final section is evidently speculative in that it involves a number of uncertain factors, but sufficient is known or can reasonably be assumed to enable an account to be given of the direction Japan's industrial and commercial strategy appears likely to take during the years immediately ahead.

More generally, it is not possible in a document of this kind to give a complete description of the development of the Japanese economy since 1945 and of all the elements that have influenced this. The study is necessarily concentrated on what appear to be the main aspects, in particular those of special interest from the viewpoint of the Community and its Member States and EC industries. More detailed information on certain issues and a series of tables are contained in the Annex to the text.

Attention is called to the other studies which the Commission staff have prepared and which provide supplementary information (1).

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- (1) -Initial Analysis of the Concentration of Japanese Exports to the European Community. Commission staff paper, 9 February 1981.
-Structure et perspectives de l'industrie automobile japonaise - stratégies industrielles et commerciales. Février 1981.
-Structure and Prospects of the Japanese Colour Television Industry. March 1981.
-Structures et stratégies de l'industrie japonaise de la machine-outil, 3 mars 1981.

PART I. DEVELOPMENTS, 1945-1970

Summary. Japan has undergone two major medium-term investment cycles since 1945, and a third is now in progress. The first of these cycles in the 1950s was devoted to the development of basic and heavy industries. The second was concentrated on efforts to improve production processes, in particular in sectors engaged in large-scale manufacturing (e.g. in the case of consumer goods). The third cycle, which will have been completed by about 1984-85, is intended, while improving the energy-efficiency of the economy, to strengthen branches of Japanese industry which will be increasingly characterised by high technology, high value-added production.

In the course of this development the aims of official policies have changed considerably, from focusing on the building up of the basic economy (e.g. steel, coal) to encouraging high-growth rates in a range of areas (e.g. cars, optics, cameras, electronics, watches) and, since the 1973 oil shock, the adoption of measures to adjust production (ship-building, aluminium) and to foster development in selected fields judged to be of crucial importance for the future (e.g. microprocessors, energy-saving research). (1) The means used to bring out these broad shifts have also evolved. During the post-war reconstruction period, direct governmental intervention was widespread. This was followed by the development of a looser and more consensual system in which, through an elaborate process of consultation amongst the major parties involved (government, in particular the bureaucracy, industrial and business sectors), agreement has been reached on the objectives to be pursued and the way in which these are to be implemented. The Government and Ministries (notably the Ministry of International Trade and Industry (MITI) and the Ministry of Finance) have played, and retain, the leading rôle in devising policies and in "master-minding" their application, and in providing various forms of "guidance". The consultation process and consensus building have always been of central importance however. The use of direct powers has tended to decline in many areas as the Japanese economy has become stronger and as industries have become less dependent on official help.

Japan made unparalleled progress. Whereas Japan's GDP was relatively small at the start of the period(2), Japan had overtaken the United Kingdom by 1967, France in 1968 and the Federal Republic of Germany in 1969. Japan's GDP is now roughly equal to that of Germany and Italy combined and about two-fifths of that of the United States(3). GDP per head of population is close to the average for the European Community. In external trade, Japan's share of world exports increased from 0.5% in 1948 to 7.9% in 1980(4). Japan's exports have grown overall at a faster rate than world exports of manufactured goods as a whole.

(1) Not all of Japan's endeavours have been successful; the aircraft industry has not developed on a major scale and attempts to merge efforts in the computer field in the 1970s did not prove fruitful.

(2) Japan's GDP was a third of that of the United Kingdom in 1950.

(3) GDP in 1980 (at market prices) (in \$ bn.) :

US	: 2,575	Denmark	: 66	Italy	: 394
Japan	: 1,080	F.R.G.	: 824	Neths.	: 159
EC-10	: 2,800	Greece	: 42	Belgium	: 118
		France	: 655	Lux.	: 4
		Ireland	: 17	U.K.	: 518

(Source : Estimate of Commission Staff)

(4) For details of evolution and comparative figures for EC see subsequent tables, in particular that on page 11.

1. The Post-War Reconstruction Period

As a result of war-time destruction and the loss of overseas territories, efforts were centred on reconstructing the economy. As in Europe, this involved the major areas of food supply, housing and transport. Lacking in raw materials and food, Japan sought from the beginning to rebuild and strengthen its industry in order to pay for imports. Coal and steel production received initial priority in the allocation of scarce raw materials, energy and capital (the "Priority Production Policy"). Other basic industries which were fostered were power generation, rail transport and the chemical industry (fertilisers). By the early 1950s, pre-war levels of production had broadly been achieved in basic and heavy industries, a major impulse coming from the increased demand which resulted from the Korean War.

A range of means were used to shape these developments, with a shift from the more direct controls instituted during the American occupation after 1945, to a more gradual and pervasive system as the Japanese administration got into its stride. The winding-up of the Economic Stabilisation Board in 1952 signified the end of the period of direct governmental intervention. The means employed may be classified as domestic-market related, monetary and fiscal, and foreign-trade related. The domestic-market measures were designed to promote production in the heavy and chemical industries by preventing erratic price fluctuations through government controls, encouraging economies of scale, and accelerating technological progress through the purchase of foreign "know-how". Sectoral cartels were formed in certain instances to aid the rationalisation process.

As regards monetary and fiscal measures, the yen, like other currencies, operated under the system of fixed exchange rates which lasted until 1971 (1). Credit and capital were generally in short supply. A public body, the Reconstruction Finance Bank, which operated between 1947 and 1952, was responsible for providing initial capital to basic sectors such as power generation, steel, coal and fertiliser industries. Other financial institutions established were the Japan Development Bank, the Export-Import Bank and the Small Business Finance Corporation. The Japan Development Bank loans carried interest rates lower than market rates; initially provided to heavy and chemical industries, these were progressively extended to other areas. The Bank of Japan (the central bank) provided the commercial banks with guidance as regards the credit to be supplied to meet capital demands. Government-imposed ceilings on short-term lending rates, which lasted until the mid-1970s, were of fundamental importance for the expansion of Japan's economy (2). In general the commercial banks regarded government loans or other signs of official encouragement for a project or industry as a sign that they should be supported, thus reinforcing the impact.

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(1) The yen-dollar value remained at ¥ 360 to the dollar from 1949 to 1971. For a discussion of the effect of exchange rates and comparative prices on external trade, see Annex, section 3.

(2) Japan's interest-rate structure has been liberalised slowly and remains subject to a considerable degree of official supervision and control. On the rôle of banks in relation to company financing, see generally the note on page 19 below.

Foreign trade was extensively controlled. Imports were governed by a system of licences and quotas, operated chiefly by the Ministry of International Trade and Industry (MITI), which was responsible for their allocation between sectors and firms. MITI likewise played a major part in determining the purchase of foreign technology. The entry of foreign investments and technology was regulated by the Foreign Exchange and Trade Control Law (1949) and the Foreign Investment Law (1950), which have only slowly been relaxed (1). A "Foreign Currency Budget System" operated to allocate the limited amount of foreign currency available to priority areas (besides imports of essential foodstuffs and energy, for the heavy and chemicals industries).

Even after the reconstruction of the basic industries had been completed in the 1950s, the balance of payments deficit remained a major constraint on economic growth. Japan's exports recovered more slowly in fact than those of the other developed economies. Japan did not get back to its pre-war quantum level of exports until 1959 (2), and even in that year its exports accounted for a smaller percentage of world trade than in 1938. Textiles were the largest single export sector (37% of total exports in 1955 (3)).

2. The High Growth Period of the 1950s and 1960s

During the 1950s and 1960s, when GNP increased by 9 to 10% a year in real terms (4), there was a steady shift in Japan's industrial structure, away from labour-intensive towards capital-intensive sectors, notably in the areas of steel and machinery. A solid, more broadly-based economy emerged, showing the signs of a linkage effect as earlier advances were consolidated. The development of the steel industry, where production rose rapidly, had a beneficial effect on the automobile, ship and machinery sectors, as well as in construction activities. The progress made in petrochemicals led to further steps as regards plastics and synthetic fibres. Textiles continued to be of major importance, though already beginning their relative decline.

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- (1) Most notably by the amended version which came into force on 1 December 1980.
 - (2) "Positive Adjustment Policies : Trade Policy in Japan", OECD document CPE:PAP(80)35, of 6 November 1980, table 1.
 - (3) Textiles had however been 48% of Japan's exports in 1950 and 64% in 1930. See tables on pp. 8 - 10, showing Japan's production and the distribution between domestic and export markets in various sectors.
 - (4) Average rates of real GNP growth were : 9.1% (1946 - 1955) and 10.2% (1955 - 1973) a year.

A series of national plans which were produced, beginning in 1955, served to set objectives and the orientations for development (1). Besides this overall framework, specific measures taken included tax provisions for the modernisation of facilities, steps to ensure the availability of risk and loan capital, and sustained efforts to raise productivity and encourage the use of new technology (2). Productivity rose sharply in the steel, machinery and equipment sectors.

Japan joined GATT in 1955, although a number of signatories made their acceptance conditional on the application of Article XXXV treatment. In the course of the following years Japan engaged in negotiations to reduce these conditions. The "General Programme for the Liberalisation of Foreign Trade and Foreign Exchange", which was adopted by Japan in June 1960, had as its aim to raise the percentage of goods freed from import restrictions from 40% to 80% in three years. A faster liberalisation plan adopted later that same year set a liberalisation target of 90% within one year. The degree of liberalisation, which had been below 40% when Japan entered GATT, reached approximately 93% in 1964. Further steps taken included the ending of quantitative restrictions on automobile imports in October 1965.

In 1964 Japan relaxed the controls on foreign exchange for current payments (except in the case of residual import restriction items) and the foreign currency allocation system was abolished.

The current account of the balance of payments continued in deficit until 1964, as a result of sharp increases in imports due to the economic expansion. With a further rise in exports, however, the current account moved into surplus from 1965 until the oil crisis of 1973. Japan's exports grew by 16.9% a year between 1961 and 1968, compared with a 9.6% rise in world exports. The main sectoral increases were in machinery and equipment and in steel exports. Machinery and equipment, which had been 10% of total exports in the early 1950s, increased to 46% by 1970, ship exports being 7.3% and motor vehicles 6.9%. Steel products constituted 15% of exports in 1970. Textiles declined from 48% in 1950 to 12.6% in 1970 (3).

(1) For a list of the plans and the results achieved see Annex, section 1. GNP rates exceeded those set in national plans each year between 1955 and 1970. The MITI "Visions" of Japan's economy, which began in the early 1960s, also indicate the direction of official thinking.

(2) As regards R&D, besides the introduction of special tax incentives in 1967, the "Association of Mining and Industrial Technology Study Law (1961) encouraged companies to undertake joint studies, while the "Subsidy System for the Research and Development of Important Technology" (1968) provided grants-in-aid to cover a portion of the cost incurred by private firms engaged in R&D in the fields of energy, environment and other fields regarded as important, the subsidy being repaid in the event of successful development.

(3) See tables on pages 8 - 12 for changes in industrial production and export structure. In a study made of the factors for Japan's export growth over the decade 1961-71, it has been estimated that:

- 40% came from the growth of world income and international trade;
- 35% from structural change in Japanese manufactured output (new products);
- 12% from the price competitiveness of Japanese manufactured goods (approx. equally divided between domestic developments and higher foreign inflation);
- 6.7% from developments in commercial policy through the Kennedy Round tariff reduction; and,
- 6% from increased US procurement in S.E. Asia arising from the Vietnam War.

100%

Japan's exports increased in value by \$ 19 billion between 1961-71.

(L. Krause and S. Sekiguchi, "Japan and the World Economy", in H. Patrick and H. Rosovsky, eds., "Asia's New Giant : How the Japanese Economy Works", Brookings Institute, 1976, pp. 418-423.)

PART II. JAPAN'S PRESENT POSITION.

1. The position achieved by Japan. Up until the 1970s external economic conditions were regarded more or less as "given"; Japanese planners took almost for granted ever-expanding overseas markets, a continued supply of raw materials, including energy, and fixed exchange rates. Before the end of the 1960s the balance of payments constraint had all but disappeared. The stable world of fixed exchange rates came to an end in 1971, however, and in 1973 oil ceased to be an inexpensive source of energy. The drive to produce an increasing range of more sophisticated goods was accentuated. Externally, pressure mounted as Japan's exports continued to expand to US and Europe, themselves facing similar problems.

Taking the 1970s as a whole, Japan again achieved a remarkable success. After the first oil shock, the increased oil bill was met through higher exports by 1975; the recovery after the second wave of increases was even more rapid. Inflation remained generally low (despite a sharp rise in 1973-74) and certainly lower than in most of Japan's industrial competitors. Japan continued to make a steady progress in upgrading its industry, the main sectors of advance being cars, cameras and optical goods, radios and TV products, watches, and a widening range of products incorporating electronic components. By the end of the 1970s Japan's industry had managed to improve its product competitiveness vis-à-vis European industry in a series of major sectors and to move away from those where it was in danger of losing ground to the newly-industrialised countries.(1)

A general point which may be emphasised is that Japanese exports, at least up to the 1970s, were developed essentially in order to finance necessary supplies; the growing internationalisation of the Japanese economy is a relatively recent phenomenon. The growth of the Japanese economy has been based overall on the development of the internal market, although export-led growth has occurred at certain times (e.g. in 1980).

As regards the question of productivity, it is in those sectors which participate strongly in world trade that productivity is high and exceeds the EC level. There are considerable variations even within such sectors, however, notably between the levels achieved by the big firms and those attained by small and medium-sized companies associated with them, which makes straightforward comparisons difficult. The position as regards productivity in Japan is dealt with more fully in a special section in the Annex (Annex, Section 4).

(1) For a detailed examination see "Changes in Industrial Structure in the European Economies since the Oil Crisis 1973-78. Europe - its capacity to change in question". Report of the Group of Experts on Sectoral Analysis, European Economy, Special Issue 1979, esp. at pp. 40-47. This refers to the "spectacular transformation of the Japanese system of production ... in particular the rapid abandonment of its specialisation in products with low-skilled labour and physical capital content. In 1963 Japan was still at the level of the least-advanced EEC countries whereas by 1977 it had caught up with the USA and the Federal Republic of Germany" (at p.43). "The relative dependence of the Community on low skilled labour/capital content has accentuated and is now higher than that of Japan and the USA"(idem).

The position achieved by Japan by the end of the 1970s is summarised below in terms of three main aspects:

- (a) Japan's overall economic development and changes in industrial structure;
- (b) Japan's export growth in relation to the growth of world exports;
- (c) ^{Changes} ~~Europe~~ in the composition of Japan's exports and imports (by product and geographical area).

In a further section Japan's export and import structure is compared with that of the European Community and of the United States.

(a) Japan's economic development and changes in industrial structure

The following tables set out the growth in Japan's GDP, industrial production and in total exports and imports.

Average annual growth rate	1955-60	1960-70	1970-74	1975 (1)	1976-80
GDP (real terms)	8.6 %	11.0 %	7.2 %	1.4 %	5.1 %
Industrial Production (real terms)	16.4 %	14.6 %	6.9 %	- 11 %	7.3 %
Exports of goods (current prices)	15.1 %	17.7 %	14.1 %	0.4 %	18.6 %
Imports of goods (current prices)	35.0 %	16.5 %	34.8 %	- 7 %	19.7 %

(1) 1975 was a recession year following the oil crisis.
Source: OECD and Ministry of Finance, Japan.

	1952	1955	1960	1965	1970	1975	1980 (1)
Value of GNP (bn. Yen) (current prices)	5,883	8,142	15,214	31,787	70,731	148,798	242,800
Exports as % of GNP	7.8 %	8.9 %	9.6 %	9.6 %	9.8 %	11 %	12.1 %
Imports as % of GNP	12.4 %	10.9 %	10.6 %	9.2 %	9.6 %	11.5 %	13.2 %

(1) Estimate based on first three quarters at annual rate.

Source : Ministry of Finance, Japan

In view of the substantial rise in GDP and the size of the Japanese economy, it is necessary to look at the evolution in particular sectors in order to see what changes occurred within the overall development and to trace the part played by external trade in individual areas. As the tables above show, global exports and imports have followed a closely parallel course, both in growth rates and as a percentage of GDP. The next set of tables show production growth in major industrial branches and the extent to which production has been concentrated on the domestic market or has been exported in these areas.

As regards the effect of exchange rates and comparative prices on Japan's external trade, see the account given in the Annex, Section 3.

Changes in Production, in Relative Domestic and Exports Shares, and in Import Penetration Levels, in Japan's Major Manufacturing Sectors, 1950-1979 (1).

Iron and Steel	1950	1955	1960	1965	1970	1975	1977	1979
Production (\$ bn.)	0.61	1.81	4.59	6.97	18.23	38.07	48.97	77.69
Domestic share (%)	88.2	85.7	91.5	81.5	84.4	73.5	71.2	80.2
Export share (%)	11.8	14.3	8.5	18.5	15.6	26.7	28.8	19.4
Share of imports in domestic consumption (%)	n.a.	0.4	2.1	2.4	1.8	0.7	2.7	1.5

Textiles (inc. garments)

Production (\$ bn.)	1.49	3.19	5.21	6.99	14.85	29.08	35.99	49.89
Domestic share (%)	76.2	76.5	76.5	79.4	85.1	88.8	88.4	91.3
Exports share (%)	26.8	23.5	23.5	20.6	14.9	11.2	11.6	8.7
Share of imports in domestic consumption (%)		n.a.	n.a.	1.0	2.5	4.8	5.2	7.8

Transport equipment

Production (\$ bn.)	0.34	1.02	3.68	7.36	20.21	49.81	70.40	99.43
Domestic share (%)	n.a.	88.3	88.3	83.1	83.0	70.8	66.7	74.1
Export share (%)	n.a.	11.7	11.7	16.9	17.0	29.2	33.3	25.9
Share of imports in domestic consumption (%)	n.a.	2.5	2.6	2.5	2.4	2.1	1.5	2.3

Of which Motor Vehicles and parts, inc. motorcycles

Production (\$ bn.)	0.10	0.53	2.39	5.14	15.19	35.43	53.32	
Domestic share (%)	n.a.	96.4	95.5	91.7	87.8	77.1	72.8	
Export share (%)	n.a.	3.6	4.5	8.3	12.2	22.9	27.2	
Share of imports in domestic consumption (%)	n.a.	2.7	0.6	0.6	0.4	0.9	0.7	

Notes

- .../...
- (1) The figures for domestic and export shares show the division of Japanese production between these in percentage terms.
 - (2) The share of imports in domestic consumption is calculated as imports divided by (production plus net imports)
 - (3) In "Textiles", textile raw materials are excluded from export and import figures.
 - (4) Sources. Production figures are from the Census of Manufacturers (1950-1978 edition). Export and import figures are from the White Paper on International Trade (1951-1980 editions), both issued by MITI. Production values are at current prices.

Passenger cars (in volume)	1950	1955	1960	1965	1970	1975	1977	1979
1,000 units	n.a.	n.a.	165	696	3,180	4,570	5,430	6,480
Domestic share (%)			91.6	83.0	77.2	60.0	45.5	47.8
Export share (%)			8.4	17.0	22.8	40.0	54.5	52.2
Share of imports in domestic consumption (%)			2.3	2.2	0.8	1.7	1.7	2.1

Ships

Production (\$ bn.)	0.13	0.31	0.85	1.34	3.21	9.58	13.21	
Domestic share (%)	87.7	74.9	66.1	44.3	56.1	37.4	38.5	
Export share (%)	12.3	25.1	33.9	55.7	43.9	62.6	61.5	
Share of imports in domestic consumption (%)	12.3	1.5	4.9	6.6	3.3	2.4	2.5	

General machinery

Production (\$ bn.)	0.31	0.85	3.35	6.18	18.89	35.73	46.87	71.84
Domestic share (%)	n.a.	88.6	93.4	89.9	89.4	81.2	78.5	79.3
Export share (%)	n.a.	11.4	6.6	10.1	10.6	18.8	21.5	20.7
Share of imports in domestic consumption (%)	n.a.	10.9	8.3	7.5	7.0	6.6	5.6	5.3

of which Machine Tools

Production (\$ bn.)	0.0014	0.013	0.14	0.26	1.28	1.30	1.85	
Domestic share (%)	n.a.	95.4	95.9	82.7	94.8	84.0	76.6	
Export share (%)	n.a.	4.6	4.1	17.3	5.2	16.0	23.4	
Share of imports in domestic consumption (%)	n.a.	57.8	31.6	22.4	12.2	6.2	3.9	

Chemicals

Production (\$ bn.)	0.84	2.05	4.05	7.69	15.39	35.14	46.25	68.98
Domestic share (%)	98.2	95.4	95.8	92.9	92.0	88.9	90.7	91.2
Export share (%)	1.8	4.6	4.2	7.1	8.0	11.1	9.3	8.8
Share of imports in domestic consumption (%)	6.5	5.4	6.4	5.4	6.6	6.2	6.7	7.6

Electronics : Colour TV receivers

Production (\$ bn.)				n.a.	1.60	2.14	3.27	3.82
Domestic share (%)				n.a.	90.0	23.6	70.3	75.9
Exports share (%)				n.a.	10.0	26.4	29.7	24.1
Share of imports in domestic consumption (%)						n.a.	0.0	0.2

Of the sectors covered above, only textiles and, to a lesser extent, iron and steel, show a significant drop in the percentage of Japanese production devoted to exports. In the other sectors a steadily rising export percentage is to be observed, subject to relatively minor fluctuations, over the years. In the case of passenger cars and ships, exports represent over 50% of production (52% and 61% respectively, in the latest years covered). The export share in the case of colour TV receivers, machine tools and transport equipment is in the region of 24-25%.

The upward trend as regards exports has been accompanied by very substantial increases in the value of annual production, with the period 1970-1975 marking in most cases the beginning of very big rises in production value.

Imports, even where they have increased in relative terms, have remained a very low share of Japanese domestic consumption. Of the sectors covered, only chemicals at the present time has anything approaching a significant impact, and even here imports have rarely kept pace with an expanding Japanese market. In other cases, most strikingly machine tools, the market share held by imports has decreased. Textile imports have risen since 1970, but overall in this sector, as in others where Japan has reduced its relative export effort, Japanese industry has continued to hold its home market.

(b) Japan's export growth in relation to the growth of world exports

As shown in the table below, Japan increased its share of world exports rapidly between 1948 (0.5%) and 1958 (3% - a sixfold increase), and again up until 1970, by which time Japan's share had more than doubled again to reach 7.2%. Between 1970 and 1980 there was a further increase, Japan's share of world exports remaining over 7% despite the greater part taken by oil in world trade, while the share of the EC and the US declined overall. In 1979, however, Japan's relative share fell from 9.2% to 7.8%; the preceding yen appreciation contributed to this, together with a general policy of export restraint which was observed between late 1978 and autumn 1979.

The evolution of Japanese exports in various sectors (electrical and non-electrical machinery, motor vehicles, chemicals, iron and steel and textiles), by comparison with those of the EC and the US, is shown in section 5 of the Annex.

EXPORTS OF WORLD, EC, US AND JAPAN (Value, Distribution, Growth)

	EXPORTS OF				EXPORTS AS % OF WORLD			INDEX OF GROWTH (1968=100)			
	WORLD ¹⁾ \$ bn.	EC 1) \$ bn.	US \$ bn.	JAPAN \$ bn.	EC %	US %	JAPAN %	WORLD	EC	US	JAPAN
1948	57	-	12.5	0.3	-	22.0	0.5	-	-	36.7	2.0
1958	97	22.1	17.9	2.8	22.8	18.5	3.0	48.3	50.5	51.7	22.1
1963	131	28.4	23.4	5.4	21.7	17.8	4.2	65.4	64.9	67.5	41.9
1968	200	43.8	34.6	12.9	21.8	17.3	6.5	100.0	100.0	100.0	100.0
1970	257	55.7	43.2	19.3	21.7	16.8	7.2	128.2	127.2	124.8	148.6
1973	465.4	99.2	71.3	36.9	21.3	15.3	7.9	234.0	226.5	206.0	283.7
1976	821.8	157.9	114.9	67.2	19.3	14.0	8.2	408.7	360.6	332.0	517.1
1978	1,060.8	221.5	143.6	97.6	20.9	13.5	9.2	528.9	505.9	414.8	750.9
1979	1,317.1	266.1	181.8	103.1	20.2	13.7	7.8	719.7	607.5	524.9	793.2
1980	1,636.5	306.9	220.6	129.9	18.7	13.5	7.9	815.8 2)	700.6 2)	636.9 2)	999.3 2)

(1) From 1958, excludes internal trade of EC of nine.

(2) Estimate based on figures for Jan.-Nov. 1980.

Source : Derived from U.N. Statistical Yearbook 1977, Eurostat Monthly Bulletin of External Trade, Special Number 1958-79, GATT Study "International Trade in 1980 and Present Prospects" (GATT/1285), and Eurostat.

(c) Changes in composition of Japanese exports and imports by product and geographical area

(i) Changes in composition by product

Japanese exports of industrial products have evolved as shown below, away from labour-intensive industries towards knowledge-intensive products.

(\$ m. current price)

Category		Year						Description of Categories
		1955	1960	1965	1970	1975	1976	
I	Value	929	1748	2433	4078	7294	8348	Category I: Labour intensive industries (e.g. leather, wood and textile manufacturers)
	% share	53	53	31	23	14	13	
II	Value	255	753	1969	5328	18413	24116	Category II: Industries with above average knowledge intensity but below average intensity of capital (e.g. cars, ships, electronics)
	% share	15	23	25	30	35	38	
III	Value	384	543	2004	4317	14627	14740	Category III: Capital intensive as well as energy and raw material intensive (e.g. petroleum products, fertilisers, iron and steel, synthetic fibres)
	% share	22	16	26	24	28	24	
IV	Value	170	281	1323	4164	11999	15493	Category IV: Knowledge intensive industries (e.g. general machinery, pharmaceuticals, aircraft, telecommunications, computers)
	% share	10	8	17	23	23	25	
Total in 4 categories	Value	1738	3325	7729	17887	52333	62697	
	% share	100	100	100	100	100	100	

Source : E. Wilkinson "Changement de Structure des Exportations du Japon 1955-1976 et ses Implications pour la Communauté Européenne", Chroniques d'actualité de la S.E.D.E.I.S., 15 avril 1978, p. 244, where detailed description is given of categories and method of calculation.

Japanese imports have been marked by a rise in the value of oil imports since 1973, but have otherwise shown a broadly stable pattern.

Composition of Japanese imports by sectors (SITC chapters)(cif value)

Category		1950	1955	1960	1965	1970	1975	1980
Total	Value (\$ bn)	2.4	2.5	4.5	8.1	18.8	57.7	\$133.0
Food	Value	0.6	0.6	2.52	1.4	2.48	8.36	\$ 13.9
	% share	25	25	11	17	13	14.3	10.6%
Beverages & Tobacco	Value	0.02	0.01	0.02	0.05	0.09	0.4	\$ 0.7
	% share	0.8	0.4	0.5	0.5	0.6	0.7	0.6%
Crude materials (except fuels)	Value	1.15	1.2	2.2	3.17	6.59	11.5	\$ 21.4
	% share	48	49	49	39	35	20	16%
Fuels	Value	0.29	0.3	0.74	1.6	3.9	25.6	\$ 70.0
	% share	13	13	16	20	21	44.4	52.7%
Oils, fats, waxes	Value	0.02	0.04	0.04	0.05	0.08	0.2	\$ 0.4
	% share	0.8	2	1	0.5	0.6	0.3	0.4%
Chemicals	Value	0.07	0.08	0.26	0.4	1.0	2.0	\$ 6.2
	% share	3	3	6	5	5	3.5	4.7%
Manufactured goods	Value	0.06	0.06	0.32	0.55	1.87	3.64	\$ 5.6
	% share	0.3	0.2	7	7	10	6.5	4.4%
Machinery & Transport Equipment	Value	0.16	0.13	0.40	0.71	2.13	3.8	\$ 9.8
	% share	8	6	9	9	11	7	7%
Miscellaneous manufactures	Value	0.02	0.03	0.06	0.16	0.6	1.99	\$ 4.5
	% share	0.8	1.2	1	2	3	3	3%
Others	Value	-	-	0.007	0.02	0.09	0.2	\$ 0.5
	% share					0.6	0.4	0.4%

Source : Ministry of Finance, Japan

(ii) Japan's trade by area

Exports (% distribution)

	1955	1960	1965	1970	1975	1980
<u>Developed area</u>	43.4	47.4	50.9	54.0	42.0	47.1
Canada		2.9	2.5	2.9	2.0	1.9
US		27.2	29.3	30.7	20.0	24.2
Western Europe		11.8	12.9	15.0	14.6	16.6
EC (9)		7.3	8.6	9.3	10.2	12.8
EFTA					2.6	2.4
Others		1.9	1.8	2.8	1.8	1.4
Oceania,S.Africa		5.5	6.0	5.3	5.4	4.4
<u>Developing area</u>	47.8	50.7	43.4	40.5	49.6	45.8
SE Asia		32.2	25.9	25.4	22.5	23.8
Middle East		4.4	4.2	3.3	10.9	11.0
Latin America		7.5	5.8	6.1	8.5	6.9
Africa		6.2	7.1	5.2	7.3	3.8
Others		0.4	0.4	0.5	0.4	0.3
<u>Communist area</u>	8.2	1.9	5.6	5.4	8.4	7.1
China		0.06	2.9	2.9	4.0	3.9
USSR		1.5	2.0	1.8	2.9	2.1
East Europe		0.09	0.7	0.6	0.4	0.6
TOTAL	100	100	100	100	100	100

Imports (% distribution)

	1955	1960	1965	1970	1975	1980
<u>Developed area</u>	47.5	57.5	51.3	55.2	41.3	34.9
Canada		4.5	4.4	4.9	4.3	3.4
US		34.6	28.9	29.4	20.0	17.4
Western Europe		8.8	8.9	10.4	7.6	7.4
EC (9)		6.8	6.7	7.9	5.8	5.6
EFTA					1.3	1.4
Others		0.7	0.4	0.6	0.5	0.4
Oceania,S.Africa		9.6	8.9	10.5	9.4	6.7
<u>Developing area</u>	48.7	39.8	42.3	40.1	53.5	60.4
SE Asia		20.3	17.2	15.9	18.3	22.6
Middle East		10.0	13.6	12.4	28.5	31.7
Latin America		7.8	8.6	7.3	4.4	4.0
Africa		1.7	2.3	3.7	1.9	1.5
Others		-	0.6	0.8	0.4	0.6
<u>Communist area</u>	3.8	2.7	6.4	4.7	5.2	4.8
China		0.5	2.8	1.4	2.6	3.1
USSR		2.0	3.0	2.6	2.0	1.3
East Europe		0.2	0.6	0.7	0.6	0.2
TOTAL	100	100	100	100	100	100

Source : Ministry of Finance, Japan

In the case of exports, there has been a steady increase in the relative importance of the EC. The increase to the Middle East has been marked : there was a more than three-fold increase over the last decade (from 3.3% (1970) to 11% (1980)). Japan's dependence on S.E. Asia as a market has shown a relative decline.

As regards imports, the EC share has declined from 7.9% in 1970 to 5.6% in 1980 (EC of nine). The share of imports from the US has also fallen. The major increase has been imports from the Middle East (oil) and, to a lesser extent, from S.E. Asia and China. So far as imports of manufactured goods are concerned, S.E. Asia's share rose from 10% in 1970 to 20% in 1980. The US share fell from 40% to 33% while the EC share declined from 25% to 21%.

(d) Japan's import and export structure by comparison with that of the European Community and the United States

Imports

	Manufactured Goods (1980)	Per capita	As % of total imports
EC	\$ 164 bn	\$ 627	43.8 %
US	\$ 130 bn	\$ 588	51.8 %
Japan	\$ 30 bn	\$ 260	21.6 %
	Raw materials, foodstuffs, energy	Per capita	As % of total imports
EC	\$ 198 bn (energy \$ 120 bn)	\$ 892 (\$ 541)	53.1 % (32 %)
US	\$ 114 bn (" \$ 82 bn)	\$ 516 (\$ 370)	45.6 % (32.6 %)
Japan	\$ 107 bn (" \$ 68 bn)	\$ 925 (\$ 592)	76.7 % (41 %)

Exports

	Manufactured Goods (1980)	Per capita	As % of total exports
EC	\$ 249 bn	\$ 956	81.6 %
US	\$ 143 bn	\$ 645	66.8 %
Japan	\$ 120 bn	\$ 1,031	92.6 %
	Raw materials, foodstuffs, energy	Per capita	As % of total exports
EC	\$ 48 bn	\$ 187	15.9 %
US	\$ 61 bn	\$ 277	28.7 %
Japan	\$ 3 bn	\$ 29	2.6 %

Sources : EC Eurostat; US Department of Commerce; Japan, Ministry of Finance. EC figures are for extra EC trade of EC of nine. Based on estimates for 1980.

As regards exports, all three areas concentrate on the export of manufactured goods. Although the US and EC export raw materials, foodstuffs and energy, the amount is much less than that of exports of manufactured products (considerably less than half even in the case of the United States, and a fifth in the case of the EC).

So far as imports of raw materials, foodstuffs and energy are concerned, the European Community and Japan are in a very similar position in per capita terms - relative import levels are virtually the same. In the case of imports of manufactured products, however, the differences are striking : Japan's imports of manufactures are very low in absolute terms, and not merely in relation to other imports (1).

The result is that, in the case of the EC, an increase in imports of manufactures has added to the overall trade deficit, while Japan's trade deficit is relatively smaller since its imports of manufactured products have remained at a low level. The consequences of this trend, which has tended to become more pronounced over the past decade, are evidently of major significance.

Looking at the matter in terms of changes in domestic demand in Japan, the position may be broadly summarised as follows: when Japanese domestic demand rises, the absolute increase in manufactured imports remains low in relation to Japanese output and world trade in manufactures generally; when domestic demand falls on the other hand, the corresponding increases in Japanese exports of manufactures are much higher. It is essentially Japanese imports of fuels and raw materials that change with domestic demand.

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(1) The following tables give further information of the comparative position of Japan, EC and the US.

1. Shares of total exports and manufactured exports to one another and to GDP.

	Total exports/GDP	Manufactured exports/ total exports	Manufactured exports/ GDP
Japan	10%	97%	9.9%
EC	11%	85%	9.5%
US	8%	71%	5.4%

2. Shares of total imports and manufactured imports to one another and to GDP.

	Total imports/GDP	Manufactured imports/ total imports	Manufactured imports/ GDP
Japan	11%	26%	2.8%
EC	13%	48%	6.0%
US	9%	57%	5.0%

Source : Eurostat. Data refers to 1979. EC of 9; intra-EC trade excluded

2. Japan's Industrial and Commercial Structure

The preceding section sets out the results which Japan has achieved to date in major branches of its economy and the external trade component. A principal part of the explanation of how it proved possible for Japan to carry through this development, is to be found in Japan's distinctive industrial and commercial structure. It is this structure which, in conjunction with official policies and the rôle of the administration, shapes much of Japan's economic behaviour and gives Japanese industry the resilience and capacity to implement sectoral changes that are such marked features.

The special characteristics of this structure are:

- (a) The existence of a limited number of groupings of major firms. The members of these groups are loosely linked together but aware of a certain family relationship;
- (b) A very large number of small and medium-sized companies which do not normally have the strength to withstand competition on their own and which therefore seek affiliation with the larger firms;
- (c) The creation of bonds between the major firms and small and medium-sized business such that a set of close relationships is created.

The advantages of the resulting structure is that the large firms can provide the drive in instituting new developments and in securing economies of scale in production, while the small firms enable changes in production to be made rapidly and with lower overheads.

The interconnection between Japanese firms means that a foreign supplier who seeks to enter the Japanese market finds himself not merely competing directly with Japanese companies making similar products, but engaged in an effort to deal with the network of firms involved; to an extent not easily paralleled elsewhere, it is the system or structure itself in the particular sector which will determine whether the import penetration becomes effective. Japanese industry is thus, in its structure and the way it operates, resistant to imports of goods already manufactured in Japan; although tariff barriers are now relatively low (with some significant exceptions), this has had little effect in practice on the market share of imports of manufactured products.

(a) The Big Business Groups. Looked at in terms of company size, the Japanese economic structure is divided between a relatively small number of large firms on the one hand and numerous small and medium-sized enterprises on the other (1). Although the small and medium-sized firms

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(1) The account given in this section is based largely on the size and nature of Japanese firms. It is also possible to describe Japan's industrial and commercial structure in terms of major area of concentration. Thus one well-known commentator has distinguished between four main branches:

1. Heavy industry. Steel, chemicals, aluminium, ships, synthetic fibres. These are marked by overcapacity.
2. Agriculture, retail and wholesale distributors, regional industries (textiles, dyeing, cutlery). These constitute "political wards".
3. Public corporations. NTT, railways. These have been in a monopoly-like position.
4. Modern manufactures. Cars, electronics, fine chemicals. Japan is extremely competitive in these sectors.

In considering the question of increasing exports to Japan, the matter may accordingly be viewed in the light of this breakdown as well as that given in the text. J. Abegglen and T. Hout, "Facing up to the trade gap with Japan", Foreign Affairs, vol. 57, no. 1, Fall 1978, p. 146.

play an important part as suppliers for big business, as explained further below, it is the big business firms that shape and provide the main driving force of the Japanese economy. It has been said that, though employing less than one-fifth of the labour force, these firms account for about half of the industrial added value (1). It is notably in the large companies that the system of life-term employment is practised and where wages increase with seniority, thus encouraging company loyalty and a positive approach to changes in working practices. These lifetime employees are recruited from among the best university graduates and most highly-skilled workers.

But these factors are not sufficient to explain why a comparatively small number of companies is able to be the principal driving force of the economy. These firms are able to do so because of two structural phenomena which have their common root in the inherent Japanese preference for group action, namely

- the existence of a limited number of competing big business groups; and
- affiliations between individual big business and small firms.

There are less than a dozen of these major groups. The composition of the group and the relative importance of the firms within it vary from case to case, but a standard group includes a leading bank (city bank), a general trading house (sogo shosha) and a number of major companies from key industries (2). The group maintain their solidarity by giving preference to dealings within the group and by showing cohesion when expanding activities or when facing outside competition. The leaders of the companies within the group meet together, exchange information and are available to help settle any disputes that arise. It would nevertheless be exaggerated to assert that these groups function as centrally-controlled concerns; the sheer size of the firms has made the exercise of central direction as such impossible (3).

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(1) Mr. L. de Guiringaud, "Euro-Japanese Symposium - Trade, Finance and Politics in the 1980s", 3 and 4 May 1979. Speakers' Papers, at p. 70.

(2) The six main conglomerates are Mitsubishi, Mitsui, Sumitomo, Fuyo, Sanwa, Dai-Ichi Kangyo. The Fuyo Group includes, for instance, besides the Fuji Bank (one of the largest in the world), Marubeni Trading Corporation (major trading company or "sogo shosha", the Yasuda financial group, Nippon Kokan, Canon (cameras, etc.), Oki Electric (communications equipment), Keihin and Tobu Railways, as well as the more independent Nissan Motors and Hitachi (electronics), which also form giant corporate groups of their own.

The Mitsui Group is linked to Mitsui & Co. (sogo shosha), Mitsui Bank, Toray Industries (textiles), Mitsui Engineering and Shipbuilding, Toshiba and, to a lesser extent, Toyota Motors.

The total number of companies involved in the major groups, through the establishment of separate firms in different sectors, is approximately 2,000, with a core group of about 1,000.

(3) A steering rôle was performed by the general trading companies in the case of the pre-war conglomerates ("Zaibatsu"), but the relative power of the trading houses within the groups has declined with the expansion of manufacturing industry.

Because of the low equity levels under which Japanese companies operate, the banks within the groups have been in a key position. Although the banks' rôle as a provider of relatively low-cost funds has been of crucial importance, they have not assumed a commanding position within the groups (1). The distribution of debts and cross-liabilities within the group has nevertheless reduced the commercial risks involved.

The groups, and the companies within them, are engaged in close competition, both on the Japanese market and on third markets. Each major group seeks to gain a foothold and then to increase its share in all the growth sectors. In the case of overseas activities, the trading companies play a major part in collecting information (together with JETRO), enabling them to provide probably the most extensive collection of commercial data in the world, in purchasing raw materials, and in exporting Japanese manufactures (2). In this instance also, there is a specialisation of function within the overall framework.

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(1) The supply of finance for Japanese firms is a further important aspect in assessing the operation of Japanese industry. The Japanese capital market itself is relatively small in proportion to the size of the economy. The government's "tax take" is likewise small by European and US standards (Japan's overall tax burden in terms of GDP was 18.1% in 1978, compared with 30.8% in the UK, 31.6% in the FRG, 35% in France and 26.5% in the US; source: OECD Revenue Statistics 1965-1979). This is counterbalanced, however, by a very high level of savings (20% of disposable household income), which are paid into the banks. In recent years there has also been a high level of government indebtedness, covered through the issue of bonds which have been taken up through the banks.

Large Japanese firms procure their funds very largely from commercial banks and, to a lesser extent, from trading houses. Small and medium-sized businesses which are affiliated to large companies are often supported by credits from these firms, or from trading houses and wholesalers, who have extensive knowledge of the firm's financial condition. In practice both large and small firms are able to pursue a growth-oriented investment pattern even if their net-worth ratio declines to a level which in Europe or the US would be considered dangerously low. An 85:15 debt/equity ratio is not uncommon. Through a combination of causes (the position of the company within the group, the degree of capital indebtedness to others, notably the banks, the importance of the sense of obligation owed to the employees), the result arrived at is: an "economic phenomenon unique to Japan: private firms are rarely put up for sale on the market", Y. Nakagawa and N. Ota "The Japanese-style Economic System: A new balance between intervention and freedom", Foreign Press Center, Japan 1981.

The commercial banks in turn are subject to careful official guidance from the central bank. The Bank of Japan operates a system whereby it sets quarterly ceiling for the loan programmes of the commercial banks ("window guidance") as a supplement to the normal controls (reserve requirements, discount rate changes, etc.) operated by central banks.

(2) The nine major trading companies are responsible for over 70% of total imports (especially of raw materials and bulk goods) and 50% of exports.

(b) Vertical Affiliations and the rôle of Small and Medium-sized Enterprises (SME)

With the major groupings occupying, so to speak, the high ground, the other four-fifths of the Japanese labour force are employed by more than 600,000 small or medium-sized firms (those employing less than 1,000 people (1)). The productivity of the SME is less than 70% of that of the companies with more than 1,000 employees; they pay smaller wages and offer less social security facilities to their staff than big companies; life-time employment is relatively the exception and side benefits are rare.

Broadly SME may be classified in three groups: (a) those which act as adjuncts or sub-contractors of larger companies (e.g. in the car industry); (b) those engaged more independently in artisanal activities (e.g. in the cutlery industry); and (c) those in the distribution sector.

It is in the case of the first and, to a considerable extent, the third group, that the phenomenon of affiliation between big and small firms, which is a distinctive feature of Japanese industrial structure, is most marked. This system of affiliation (known as "Keiretsu") is at least as important for the functioning of the Japanese economy as the existence of the major groups. Whereas not all leading manufacturing or trading companies belong to big business groups, it can safely be assumed that all major Japanese manufacturers, trading houses and banks, without exception, have a large number of small and medium companies under their "umbrella". Keiretsu affiliations exist in relation to the production activities of leading manufacturers or trading houses, as well as on the distribution side (2). In the distribution chain furthermore domestic wholesalers above a certain size tend to play a similar rôle vis-à-vis smaller wholesalers and retailers.

Japanese company affiliation, unlike European- or US-style vertical integration, is not normally easily discernable because there is rarely any shareholding of significant size by the bigger company in the smaller one. At first glance therefore, it looks as if company affiliations constitute nothing but sub-contractor or supplier/buyer relations between independent enterprises. This is normally not the case. As regards manufacturing, very few medium-sized companies in Japan specialising in particular fields have reached a status that allows them to be independent suppliers to more than one leading enterprise. The normal relationship between a leading manufacturer and its small/medium-sized supplier or dealer is that the small and medium company works exclusively for the group-leading manufacturer. Based on this, the leading manufacturer is, in its own interest, concerned about productivity and quality in the companies affiliated to it. The leading company quite often helps therefore to finance technical innovations, and even supplies the machinery, trains staff, and provides business credit, to a sub-contracting company.

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(1) SME with less than 300 employees represent 99.5% of all firms and employ 75.2% of all employees.

(2) Since these keiretsu links normally take the form of a multi-tier system (i.e. one subsidiary sub-contracting work, which again is sub-contracted etc.) the counting of keiretsu-linked companies is difficult. Judging from the material available, a company like Nippon Steel, which does not have any apparent connection with a big business group, has in fact about 2,000 companies that are directly or indirectly keiretsu members. In the case of electric equipment manufacturers like Matsushita (brand name: National, Technics) or a car manufacturer like Toyota, their number might be even greater.

In exchange for this, the keiretsu leader expects from his sub-contractor exact delivery, quality and competitive pricing, and even full cooperation up to acceptance of bankruptcy if the leading company is in an economic "squeeze" (1). A recent example where big manufacturers shifted income losses on to their sub-contractors and suppliers occurred in 1978, when the yen suddenly started to rise against the dollar, and leading exporters had to squeeze production costs in order to absorb foreign currency losses.

In this keiretsu relation both sides profit. The leading company has a number of advantages by using sub-contracting rather than in-house production. These advantages are : avoidance of rigidity connected with the lifetime employment system (SME do not give guaranteed lifetime employment); lower average labour costs at the sub-contractor level; passing on of costs of stockholding of parts and goods and other cost-cushioning functions; and greater elasticity in operation rates. In one word, sub-contractors constitute a security belt around the leading company, which protect it from the full impact of changes in economic circumstances and help it to survive in competition with other leading companies (2).

The advantage for the SME on the other hand, in the fiercely competitive climate of Japan, with limited access to bank finance and with new technology often only economically viable in a larger tie-up, is that belonging to a keiretsu group gives the SME security and the means to advance. The sub-contractor thus has an interest in the prosperity of the group as a whole and in the business success of the leading company in general. The small and medium company, for its part, tries to further sub-contract part of the business it takes on, in order to provide itself with similar cushioning such as the leading company has provided for itself. A multi-tier system of sub-contractors, sub-sub-contractors, etc., is thus a regular feature of a keiretsu.

What is said above relates mainly to keiretsu groups led by big manufacturing companies, and in particular as regards the production side. Similar keiretsu exist on the marketing side, though here the situation varies from product to product area. In household electric and electronic appliances, for example, 80% of the domestic distribution is handled by captive sales through wholesalers and retailers, who deal exclusively with a single brand product, e.g. Hitachi products would be exclusively sold in Hitachi stores. Besides the manufacturers, the leading general trading houses also have an extensive network of affiliated companies within Japan, not only in the distribution system, - where as said earlier large domestic wholesalers also form keiretsu of their own - but quite a number of which are engaged in production. The same is true as regards direct investment overseas. About 20% of Japan's manufacturing investment abroad is done by the large trading houses.

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- (1) Legislation exists forbidding deferment of payment by big business to sub-contractors. There are grounds for doubting how strictly this legislation is observed.
 - (2) It is estimated that in the car sector, for example, whereas European manufacturers are responsible for 50% on average of the motor vehicles they produce, this figure is 40% to 20% in the case of Japanese automobile producers. As a result the number of employees is considerably lower in Japanese car firms than in Europe or the US.

In order to avoid oversimplification, it may be mentioned again that a considerable number of SME exist in some areas of light industries, in particular in artisanal activities, which have no firm affiliation directly or indirectly to a leading company. These SME are, however, connected mainly through important regional wholesalers with the distribution system. Nevertheless there is no doubt that in this field the level of organisation is much below what is to be found in other areas described above. The great number of bankruptcies recorded each month is mainly to be found amongst these companies or the ones at the lower end of the sub-sub-contracting chain of a keiretsu. These companies are also the ones most likely to suffer from competition of LDCs and NICs since they compete directly with their products.

There have been a number of governmental measures in the 1970s, or envisaged for the 1980s, aimed at raising the level of SME so as to enable them to keep pace with the demands of the major companies, as well as to protect them from increases in value of the yen and help them to adapt to competition from newly industrialised countries. Special governmental measures have provided a variety of incentives (e.g. as regards financing, training and management, energy consumption, improvement of employee welfare). Sectors which have been particularly aided are cutlery, textiles, silk and wooden products (1). Export expansion is a substantial aspect of such plans, covering new products and markets (2). There are indications that Japanese SME export operations may be largely designed in terms of devising an integrated exchange with neighbouring NICs.

3. Specific Policies pursued during the 1970s

So far as specific governmental policies and measures are concerned, particular attention may be called to the following:

- (a) restructuring programmes in industrial sectors where this had become necessary in the aftermath of the energy crisis;
- (b) efforts to further technological development in the field of "knowledge intensive" industries (e.g. very large-scale integrated circuits);
- (c) energy programme and energy-saving measures.

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- (1) See the 1978 Law on Extraordinary Measures for Relief of Small and Medium Enterprises Affected by the Yen Appreciation.
 - (2) See MITI "Visions of the Small and Medium Enterprises and their Policy Direction in the 1980s".

(a) Structural problems in recession-hit sectors. Following the 1973 oil crisis it was agreed that operating capacity should be reduced in a number of "structurally depressed" industries: shipbuilding, aluminium refining, electric furnace steel making, cotton and synthetic fibres, and chemical fertilisers. The 1978 "Law of Extraordinary Measures for the Stabilisation of Designated Depressed Industries", jointly sponsored by MITI and the Ministry of Transport, created machinery for deciding the amount of capacity to be scrapped in each industry and for financing the process. Industry advisory councils, composed of senior members of the industries concerned and MITI and MOT officials, help draw up the scrapping programme, including the allocation of cuts between different companies.

The programme undertaken is summarised below:

Industry	Capacity cut (%)	Scrapping deadline	Freezing period until
Shipbuilding	35 (1)	March 1980	June 1983
Aluminium refining	32	March 1980	June 1983
Electric furnace steel	14	March 1979	March 1981
Nylon filament	19	January 1979	March 1981
Polyester filament	10	January 1979	March 1981
Cotton spinning	6	October 1979	June 1983
Ammonia	26	June 1979	June 1983
Urea	45	June 1979	June 1983

In the shipbuilding sector, administrative guidance was used to limit the utilisation of the remaining capacity of the 40 most important firms. This was replaced by an anti-crisis cartel of these firms after 1 August 1979.

The reduction of shipbuilding employment, which began even before the adoption of the 1978 Law, took the industry's labour force back to 65% of its peak 1974 level. The reductions were planned so as to protect "lifetime" employees so far as possible. The use of public subsidies on a wide scale was avoided, though the industry was aided by official credit facilities for new orders.

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(1) Concerned the 60 most important firms.

(b) Technological Developments. Japan regards the 1970s as the period when its industrial technology caught up with the US and Europe, except in some sophisticated fields such as aircraft and nuclear power equipment. In terms of trade in technology, the total balance remains in deficit - the amount to be paid for imported know-how, licences, etc., outweighs the value of exports. So far as new contracts are concerned, however, exports of Japanese technology have exceeded imports each year since 1972. Whereas Japan's objective earlier was to follow a "buy and improve" pattern whereby foreign technology was acquired and efforts concentrated on finding ways of applying this in large-scale production - a course which Japan pursued with success - increasingly Japan has sought to develop its own technology in new areas.

The Japanese Government supplies about 30% of R. and D. funds (with a tendency for the percentage to rise), the remainder coming from industry; the proportion of direct support has thus been considerably less than is provided in most other industrialised countries (1). According to official plans the current 1.7% of GNP which goes towards R. and D. at present will be increased to 2.5% by 1985 and 3% by 1990.(2)

It is important to note the key rôle played by joint action on the part of Government and industry. If it is true that Japanese firms compete strongly on internal and world markets, this does not apply to the phase which precedes the production of high technology goods. It is the normal procedure that in strategic areas, and in accordance with long-term targets, the responsible government bodies and agencies join with the main industrial firms to conduct research through sharing the efforts involved. It was in this way that the problems relating to the development of micro-electronics were tackled in 1972/73. A similar course occurred in 1980 when the formation of a "Biotechnology Forum" was announced, comprising the five major Japanese firms and MITI. A Yen 35 bn. (140 m. Ecu) 10-year programme will seek to develop technologies in four areas : bioreactors, cell cultivation, genetic engineering and cell fusion. The development of computer software has been fostered by the activities of the Information Production Association, in which

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(1) The comparable proportions are 50% in the case of France, UK and US and 46% in the case of Germany. An account of Japan's R. and D. efforts would not be complete without emphasising the large number of qualified Japanese personnel. (Data from 1975; Source: UN Statistical Yearbook 1978.)

	US	Japan	Germany	France	UK	Italy	Neth.
Scientists and engineers	541,100	399,842	103,857	65,643	79,300	37,925	23,750
Technicians	44,500	90,562	100,276	154,486	75,800	27,494	30,540

(2) "Long-term Prospects on Science and Technology", Advisory Committee on Science and Technology, May 1977.

industry representatives, research workers and governmental officials participate, as well as through specific official projects(1).

By these means the Japan Government and industry succeed in using relatively small amounts of money in order to develop products with a high net value-added, and with a concentration on the industrial application and manufacture of the product concerned.

The following strategic areas have been the subject of legislative measures designed to promote technological development: new generation computers and software, semi-conductors, optical communications, lasers, medical electronics, industrial robots and numerically-controlled machinery, aircraft and nuclear engineering (2). Under the 1978 Machinery and Information Industry Promotion Law, Development Bank loans and various tax advantages are available, as well as officially-guided joint development activities.

Industrial R. and D. programmes of national importance, requiring a high level of funding and some degree of risk, have mostly been conducted under the aegis of the Agency of Industrial Science and Technology (AIST), MITI's agency for technological affairs, within the framework of National Research and Development Programmes (NRDP). The AIST takes the lead for planning and financing the research project, which is then put out for tender, the work itself being normally carried out in one of AIST's 16 institutes. Staff from the major firms frequently take part in such projects using the facilities of the official institutes. NRDP projects now in progress include those on turbofan aircraft engines and manufacturing application of lasers. Projects on alternative energy sources and energy-saving technology development have been carried out in AIST but outside the NRDP framework.

(c) Energy policy. Japan, which relies on overseas sources for 86% of its energy, aims to reduce the share of oil imports in energy consumption from the present level of over 70% to 65% in 1985 and 50% in 1990. A considerable improvement has been achieved since 1973 in energy use, as measured by energy consumption per unit of GDP growth and per unit of production in major industries. In 1979, following the adoption of IEA targets, the Government introduced measures to reduce oil consumption

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- (1) The official four-year VLSI development project was completed in 1980. A project which started in April 1979 is aimed at developing basic software for advanced computers and peripheral equipment. The total budget is ¥ 47 bn., half of which will be provided by official funds.
 - (2) As regards future orientations, a "Long-term Vision for Technological Development" is to be drawn up identifying priority goals.
The semi-governmental Power Reactor and Nuclear Fuel Development Corporation, established under a 1967 law, is engaged in developing centrifugal uranium enrichment technology as well as reactors and equipment.

by 3%. The 1980 programme raises the target to 7%. Per capita oil consumption is already in fact relatively low in Japan (1).

The Government did not impose legislative controls on oil prices and energy conservation measures have been adopted through joint efforts in the public and private sectors, involving the industrial, commercial and transportation sectors.

Alternative energy sources are being developed or investigated.

- (i) Nuclear power. 14 power plants are powered by reactors (total capacity 15 mkw). 7 more are under construction and 7 are awaiting official clearance and are likely to operate in mid-1980s (further capacity of 28 mkw).
- (ii) Coal. Imported coal is expected to increase its share of total energy from 12% in 1977 to 17% in 1995. Considerable resources will be devoted to developing coal liquefaction and gasification technologies.
- (iii) Liquified natural gas. The share of LNG is expected to increase from 3% to 9% in 1995.
- (iv) Solar energy. It is estimated that 25% of all homes will have solar water heating by 1990.

A great deal of Japan's technology research effort is concentrated in the energy field, which receives 20% of public R. and D. expenditure. Projects such as magneto-hydrodynamic power generation, more efficient gas turbines, fuel cells and waste heat recovery systems are amongst the areas being investigated.

(1) 3 tons a year in Japan, compared with nearly 9 tons in the US, 4.4 tons in the Federal Republic of Germany and just under 4 tons in France and the UK.

PART III : THE PERSPECTIVES FOR THE 1980s

Although evidently affected by official actions, it is important to note that the structure of Japan's industry and commerce has not resulted from the imposition of a series of detailed plans, devised and implemented by the public authorities. The process of developing suitable industrial policies and securing their execution has been a more complex one. While the Japanese Government has at its disposal an array of formal powers, similar to those of other OECD countries, and uses the standard range of methods for determining the overall course of the economy, guidance from the administration, and an extensive series of consultations in order to achieve a consensus among the interested groups, have been the usual means employed to determine the course that industry should follow. Recourse by Ministries, particularly MITI, to "administrative guidance" so as to influence the conduct of private business, is a normal part of Japanese administration. It consists, on the one hand, of the formulation by the administration of official advice, as distinct from the use of direct powers of control and intervention, and, on the other, acceptance by private firms of the force of this advice (1). Administrative guidance has been used extensively in order to set up cartels or to bring about company mergers where these were thought desirable as part of the process of promoting the growth of Japanese industry. The scope for administrative guidance in the future will be affected in so far as Japanese firms develop a more independent attitude.

Consultation and consensus-building among the main participations is a further principal element. By its nature and through the lengthy procedures involved, this process aims to create a climate in which all concerned agree on objectives and their implementation. Recourse to legislation is thus more likely to follow this stage than to precede it, and its function is often to provide the supportive framework rather than to institute direct governmental powers of control in the area in question (2).

Japan's industrial and commercial strategy for the 1980s is not therefore to be found in a single document or report which Japan will proceed to execute. It is possible, however, by looking at a number of authoritative studies, as is done below, to determine how Japan's industrial structure is likely to evolve, at least in the years immediately ahead. These reports, which were mostly prepared before the second oil crisis, are the latest available. On being contacted, the institutions who did these reports have all maintained that, by and large, the conclusions drawn remain valid. Two simple observations endorse this view. First, Japan's GNP growth has so far not been too seriously affected by the second oil shock; thus performance is still more or less in line with the assumptions underlying the forecasts. Secondly, medium-term orientated investment activity designed to bring about structural improvement, upgrading and energy saving, was strong in 1980, a trend which, depending on private consumption development, is likely to be maintained this year.

The account given of these reports is divided into two sections, the first of which deals with the general contents of the forecasts and the second with Japan's future external trade structure as this appears from the reports.

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(1) Explaining to foreigners what administrative guidance meant, an official of the Ministry of Agriculture once pointed out that, though not based on law, one would be best advised to follow the guidance as if it were written law.

(2) The system used in the restructuring process in the late 1970s is a good example here. See Part II, p.23 above.

1. Forecasts regarding overall industrial structure

The following pages summarise the views and perspectives given :

- (a) by the Industrial Structure Council (ISC), a principal advisory organ of MITI (1), which submits periodic reports; and
- (b) by four leading Japanese private institutions.

The reports vary considerably in their assumptions (rates of GNP growth, oil prices, etc.) and in the extent to which they give estimates of growth in particular sectors or subsectors. The common view which emerges from these reports, however, is that Japan will make further progress in a number of machinery sectors, while relatively low growth will occur in primary industry and established industries (textiles, iron and steel). This broad conclusion conceals further points of interest in that, even in sectors which are viewed as relatively low-growth areas, significant developments may occur. (In the case of chemicals, for example, which it seems generally agreed will not undergo high growth (except as regards exports), there will be a considerable move towards production of fine chemicals and pharmaceuticals.)

(a) MITI Industrial Structure Council. Common to all editions of the periodic reports of the ISC, is the idea of making Japan's industrial structure more knowledge-intensive by raising unit value-added in production, by the creation of more sophisticated goods and services. Based on this idea, the ISC report of March 1980 entitled "A Vision of MITI Policies in the 1980s" emphasizes the following seven points :

- (i) research and development for technological innovation;
- (ii) the conservation of energy and natural resources;
- (iii) the development of tertiary industry (2);
- (iv) the promotion of the machinery and information-based industries as the leaders in the years up to 1985;
- (v) the partial retreat from industries where the developing countries hold a relative advantage;
- (vi) the location overseas of resource-consuming and labour-intensive industries;
- (vii) emphasis on maintaining a high rate of employment (the Vision is based on the assumption that a growth rate of at least 6% is necessary in the medium term if unemployment in Japan is not to increase).

(1) The ISC itself is composed of representatives of industrial and business firms, labour and a number of independent members, as well as of MITI. MITI provides the secretariat and prepares the drafts of the reports.

(2) There is a considerable divergence of view on the development of the tertiary sector. The Nomura Research Institute indicates an increase in the share of tertiary industry from 56% to 59.5% between 1975 and 1984. The ISC anticipates a levelling-off of the share of the tertiary sector. The Mitsubishi Research Institute predicts an above average rate of growth for the tertiary sector.

With regard to Japan's external policies, the 1980 Report assumes that world overall economic growth in the years up to 1985 will be slightly below the 4% recorded in the 1970s, and that, while the average growth rate of the industrialized nations will be only 3% (Japan anticipates for itself a growth of a little more than 5%), that for the developing nations will be comparatively high (in particular, the Newly Industrializing Countries (NICs) and ASEAN nations).

The 1980 edition then states as an objective that:

- "(1) In dealing with industrialized nations, Japan needs to increase imports of manufactured goods and the production of goods with larger added value, specializing in sectors with a comparative advantage.
- (2) In dealing with the newly industrializing countries, Japan needs to encourage domestic industries to switch into new lines of upgraded products.
- (3) In dealing with developing countries, Japan needs to increase imports of labour-intensive products, processed primary products and raw materials". (1)

A comprehensive structural forecast by the ISC was set out in the 1978 report, which gave a projection of the production structure of the Japanese economy in 1985 (see Annex, Table 6). Compared with 1975, this shows a broad decline in the share of primary industries and a levelling off in the case of tertiary industries, while the secondary sector is expected to increase its share. The biggest increases in volume output so far as manufacturing industry is concerned are anticipated to take place in precision machinery (9.5% average annual growth rate), general machinery (7.8%), fabricated metal products (7.3%), electrical machinery (7.2%), chemicals (6.9%) and transport machinery (6.1%). Low growth sectors are textiles (1.7%), iron and steel (3.5%) and non-ferrous metals (4%).

.../...

- (1) It may be of interest to note that the 1978 edition referred to the horizontal division of labour only in the context of relations with the "middle advanced nations".

"It must be fully recognised that external economic policies should be carried out with the aim of establishing interdependent relationships with other countries ... To assure trade interdependence it will be necessary for Japan to promote imports of goods from advanced nations, to organise the horizontal division of trade (especially the intra-industry division of trade) with middle advanced nations, to assist in the development of developing countries, and accelerate trade by maintaining domestic demand for imports and from them stable supply of the products they need."

Japan's Industrial Structure, A Long Range Vision, 1978, p. 13.

Judging from nominal growth achieved in the four years up to 1979 in some of the key growth sectors, it seems, that at least in the case of general machinery and chemicals, there might be a problem in achieving the growth target. Precision machinery showed a 14.4 per cent nominal growth in the four years; allowing for some moderate price increases, this result, with some luck, would still be in line with a 9.5% average real growth forecast up to 1985. General machinery on the other hand grew by only an average 10.1% nominally, and unless there is a strong upsurge in 1981-1985 the real target of 7.8% will not be achieved. The same holds true for chemicals where nominal growth at a 9.4% average annual rate between 1976 and 1979 tends to be insufficient to reach the 6.9 per cent average growth projected over the 1976-1985 period. This assessment is not particularly surprising since, -seen from 1981-, the underlying growth rate of 6.3% for this forecast for all industries must be considered too high. The nominal figures used here do not allow, however, for any judgement to be made on the relative growth of the sectors.

As regards the transition of Japan's economy to a lower level of growth (from the previous 10% or so a year to 5-6%), and a new industrial structure characterised by quality and technology production, the ISC established a list of the adaptation processes expected in the main industries.

A number of these were in fact incorporated in the measures instituted under the 1978 Specific Recession Industries Stabilisation Law. More generally, it appears to be broadly accepted that this transition will take six to eight years, reckoning from 1978 onwards (1). Of this, three to four years are expected to be a preparatory phase during which government expenditure can play an important growth stimulating role, whereas in the following three or four the adaptation to a lower growth pattern will be basically established and the new industrial structure will develop through increased private investment.

(b) Private Institutes

The private sources used in the following section are :

- (i) "Long-Term Outlook of the Japanese Economy to the Years 1985 and 1990", Mitsubishi Research Institute;
- (ii) "A Forecast of the Industrial and Export Structure of Japan until 1985", Industrial Bank of Japan;
- (iii) Reports by the Nomura Research Institute;
- (iv) Surveys by the Nihon Keizai Shimbun (a leading economic newspaper).

A brief summary of these studies is given below.

(i) The Mitsubishi Research Institute "Long-Term Outlook of the Japanese Economy to the Years 1985 and 1990", which was published in 1978, is based on a forecast of the world economy and related political factors in combination with management of the economy and changes in private consumption. The years 1975-80 correspond, according to the MRI, to the difficult phase of transition.

.../...

(1) This is the period specified by the Nomura Research Institute, and is in line with the other forecasts.

In 1980-85, the domestic and overseas conditions for a rebound in business will gradually fall into place. The GNE (1) average annual growth rate forecast for 1975-85 is 4.6%, basically in line with the Nomura forecast but lower than the 'governmental' forecast of 5.5% for the period 1981-1985. The MRI forecast also agrees with the Nomura paper in considering that for the first years public expenditure will be an important growth stimulant and that from about 1982 on domestic private demand will take over for all self-sustained growth.

Table 7 provides the MRI forecast of industrial structure and the growth rate by sector for 1985 and 1990. The summary of industrial structural developments states:

"The following industries will show higher growth than that of the industrial average : lumber and wood products, printing and publishing, ceramics and earthenware, metal products, general machinery, electrical machinery, precision machinery, construction, and the tertiary industry. Of these, lumber and wood products, ceramics and earthenware, metal products, and construction will be supported by the increase in public works, the growth in private housing investment, and the resultant strong domestic demand. On the other hand, the growth in all the machinery industries, except for transport machinery, will be largely due to superior technological know-how which will back up their non-price competitiveness. In particular, despite the fact that domestic demand for general machinery, in the 58-sector classification, will only rise a low average annual 3.9% due to slow demand for industrial machinery from private plant and equipment investment, this will be covered by growth in exports (7.9%). Production will consequently rise an average for the rest of the machinery industry. Demand for office machines, primarily desk calculators, for data-related machines, and precision machinery will be strong both domestically (5% to 6%) and in exports (7% to 11%). On the whole, this may well be termed a stable growth industry.

Industries stagnant in the 21-sector classification are the primary industry, foodstuffs, textiles, iron and steel, and transport machinery. Their average annual growth rates will each fall below the 4% level, being 3.0%, 3.2%, 1.1 to 1.5%, 3.7 and 3.9% respectively.

Transport machinery will be stagnant because of the strong impact of the shipbuilding depression resulting from a worldwide surplus of tonnage. Behind the slowdown in the iron and steel industry are changes in the pattern of public works (from production to living-related projects), the shipbuilding depression, resource conservation in machinery, and other factors depressing domestic demand and the dawn of the "era of orderly exports". Foodstuffs and textiles will also be slow because of changes in consumption patterns, with a resultant low growth in domestic demand, and an increase in imports from semi-advanced countries on top of that."

.../...

(1) Gross national expenditure : equivalent to GNP less net exports of goods and services.

(ii) The forecast of the Industrial Bank of Japan (a leading credit body) assumes three alternative GNP growth rates for the period up to 1985 (1). Electrical machinery will be the main growth sector according to the IBJ (see table 8). The non-growth sectors are expected to be ship-building and ship-repair (with negative rates), other transport equipment, and textiles.

Table 9 compares the forecasts by the ISC, Mitsubishi and Industrial Bank as to which will be the future growth industries. A consensus emerges from the table that electrical machinery and general machinery will be future growth industries. Beyond that the forecasts begin to differ rather widely.

The degree of disaggregation in the forecasts is too low to reflect changes which may be significant within an industry. Although the overall chemical sector is given only medium growth expectations, a shift from intermediate products to fine chemicals and so to pharmaceuticals is indicated in the Nomura forecast. This becomes even clearer from a survey covering future strategic growth products of 22 leading chemical companies in Japan; these growth products are almost exclusively in the pharmaceutical and fine chemical sector (see table 10).

Transport machinery, including cars, is also not considered to be a future high growth sector; shipbuilding and cars will be taken over increasingly by the NICs so far as products incorporating low and medium technology are concerned. As regards cars, the impact of mounting pressure against Japanese car exports, the development of sub-compact cars in the United States and direct investments abroad, have been taken into account by nearly all the studies (see also MRI comment). Japanese car manufacturers are therefore expected to shift gradually to more expensive types, with electronic components, energy-saving devices, luxury interiors, etc.

(iii) The Nomura forecasts reflect the growth assessments of various industries, refined by the Institute's own assessment; 5% average economic growth for 1978-85 was assumed. The advantage of the NRI approach is that it adopts a more disaggregated approach than the other studies (it takes a 72 industry break-down from all sectors), thus enabling high growth product categories within particular sectors to be identified. Table 11 (a) gives 27 categories which were estimated to achieve an annual average production increase of 5% in real terms over the period 1978-85. Medical equipment (growth rate 15%), followed by computers, autoparts, duplicating machines and timepieces (10-14.9% growth rate) are expected to perform best. While chemicals in general are not in the high growth group, within this sector pharmaceuticals, cosmetics and fine chemicals (dyestuffs) were identified as high growth areas.

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(1) Case I : GNP 7%, production 7.4%

Case II: GNP 5.7%, production 6.1%

Case III: GNP 3.8%, production 4.2%

(all figures are average annual growth rates)

Table 11 (b) provides an analysis of the 72 selected industries, and identifies the factors for growth (price/volume; whether the growth market is expected to be domestic or export; and whether the growth will be in existing products or new products).

(iv) The Nihon Keizai Shimbun (leading economic newspaper) conducts a regular enquiry on investment plans and production capacity developments among the 2,400 companies registered on the Tokyo stock exchange. Table 12 indicates which sectors are expected to show more than a 15% capacity increase between March 1981 and March 1984 on the basis of the latest survey (published in March 1981). In summary, the highest capacity growth (over 100%) is expected in video tape-recorders, large-scale integrated circuits and machining centres, with duplicating machines, wrist watches as well as some industrial machines including grinders, dust filters and numerically-controlled machine tools closely following behind (with an anticipated capacity increase of more than 40%). By comparison to a similar survey conducted in March 1979, the automotive sector centering around midget cars and motorcycles is also emerging as a rapid growth industry. The general picture projected by these capacity increase forecasts is in line with the other forecasts and with the actual developments over the last two years.

2. Future structure of Japan's External Trade

The reports dealt with above contain forecasts on the future development of Japan's external economic relations, i.e. exports and imports.

(i) The ISC forecast. Table 13 gives the expected changes in exports up to 1985. The result is summarised below.

In the case of machinery, the largest export sector and that which carries Japan's technology-intensive restructuring hopes, a firm advance in exports is conjectured (a growth of 8.4% a year between 1980 and 1985 in real terms, the second highest rate). While the Community sends around 70-80% of its machinery exports to advanced nations, Japan's percentage is around 55%, most of which consists of cars and household appliances. With the development of fields such as electronics, electronically-equipped machinery and precision instruments, Japan will increasingly participate in markets which until now she has left to the industries of other advanced countries. The value of machinery exports is forecast to increase to \$ 120 billion by 1985; machinery exports have in fact been increasing faster than projected (1).

Chemicals are expected to be the most rapidly growing export sector (11.7% a year). At present about 30% of Japan's exports of chemicals go to developed countries and 54% to LDCs (fertilisers, basic material for plastic resin). The shift to products with a higher degree of sophistication and value which is expected to take place is likely to increase

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(1) Actual exports in 1980 were \$ 81.5 bn, compared with a forecast figure of \$ 64.9 bn (table 13). If the linear trend underlying the de facto performance since 1974 continues until 1985, the result would be machinery exports of \$ 122.1 bn, i.e. a performance in line with the original forecast.

Japan's competitiveness on third markets as well as on the home markets of developed countries, including Japan itself. According to the ISC forecast, chemical exports will amount to some \$ 23 billion in 1985 in nominal terms. This figure is likely to prove difficult to achieve. Whereas the export forecast for chemicals for 1980 was \$ 10.5 bn, actual exports in 1980 were only \$ 6.8 bn. A linear trend projection of the de facto export performance (from 1974 on) results in a forecast for 1985 of \$ 8.8 bn. An average annual growth of 27% (nominal terms) up to 1985 would be required to reach the figure forecast by the ISC. This does not seem likely to happen, even if one allows for some surprises.

(ii) The Mitsubishi forecast is basically in line with the ISC report so far as the machinery industry is concerned, but is less optimistic as regards the chemical sector (in line with its assessment that chemicals will not be a leading growth industry in Japan). The MRI estimate of the export and import structure used a production classification of 189 sectors, consideration being given to the trend of yen appreciation, the pressure of wage rises, increases in raw material prices and subsequent changes in international competitiveness. Table 14 (a) indicates the projected share of 21 product groups in total exports in 1985 and 1990, and table 14 (b), using the same material, ranks these groups according to whether they are expected to increase their share or not. The export-import structure is broadly characterised by an increase in exports headed by machinery, combined with an increase in imports of manufactured goods, primarily those from labour-intensive and light industries.

(iii) Industrial Bank. The export structure expectations included in the model in the IBJ forecast are summarised in table 15.

High growth expectations are placed on electrical machinery and general machinery. In electrical machinery there is a shift from audio-equipment and colour TV to electrical machinery and electronics for production use; export of general machinery is expected to grow together with the growth of plant exports, and the increased international competitiveness of Japanese machinery in general.

(iv) Nomura. The Nomura forecast does not give an explicit export outlook but indicates the sectors in which exports are expected to contribute as a growth factor. These sectors are listed in table 18. A compilation of available forecasts from different sources was published by Nomura in 1980, however, from which the data in table 16 have been taken. These cover estimated production, exports and imports in 1985 in motor vehicles, consumer electronics (including colour TV and video-tape recorders), machine tools and business machines.

As far as motor vehicles are concerned, the data in table 16 forecasts an average 6% export growth between 1978 and 1985 and a production growth of 4.4 per cent for the same period. The production growth forecast is about half what was achieved in the five years between 1975 - 1979 (average growth 8.9%). Exports grew in the same period by 13.7%, more than twice the 6.1% forecast figure.

Consumer electronics are expected to remain stagnant in the "traditional" sectors or to register negative growth in production and exports. Growth is foreseen however for car stereo, videotape recorders and video disc players. In the electronic parts sector, exports are expected to grow moderately by 8%, production by 7.8% and domestic demand by 7.5% between 1977-1985.

.../...

As regards semi-conductors, it is interesting to note that one Japanese source believes that US production will grow faster than Japanese production. Finally, as regards business machines, production between 1978 and 1985 is expected to grow at a 7.77% average pace whereas exports will slightly fall behind with 7.5%. In all sectors listed in table 16, as can be easily seen, imports are not expected to grow on the same scale as either domestic demand or exports.

(v) Summary. As regards a national consensus on Japanese export strategy, table 17 gives an overall summary which ranks the results of the three general forecasts above and table 18 that of Nomura. The result is no surprise : machinery will be the future mainstay of Japanese exports.

CONCLUSION

Japan's industrial and commercial structure is now being geared towards increasing concentration on technology intensification. The pivot of this process is the development of the machinery sector, especially precision and electronic machinery. This shift will not be limited to a few sectors, however, but will manifest itself in a range of industries. General machinery and communication systems will greatly benefit from Japan's progress in electronic components and computer technology, as will areas where Japan has so far not been especially active (e.g. communications, defence equipment, aerospace products). Existing sectors like shipbuilding and automobiles will be reinforced so as to maintain their competitiveness, even if production levels are not greatly increased.

Looking back at the development of the Japanese economy since the Second World War, this process will eventually amount to the third post-war medium-term investment cycle; this cycle is already in progress and will come into full swing in the next few years. Energy-saving related investments will help to sustain and accelerate the process. Taking into account the strong economic and social basis from which Japan proceeds, as outlined in the paper, and the various special conditions prevailing in Japan, it can be expected that by this restructuring, which will be largely completed by about 1985, Japan will firmly establish herself as a leading - if not the leading - manufacturer of a range of products of an advanced calibre, which will be highly competitive on international markets in quality and price.

As regards exports, the result is similarly clear-cut. Export growth is expected to take place mainly in the different machinery sectors. Other sectors, including chemicals, can hope for export growth in the class of sophisticated products. The technology-intensive products will tend to be marketed in other industrialised countries rather than in the developing countries. To that extent these products will be in direct competition with European and United States products. There is thus little consolation in the fact that steel, shipbuilding and cars will no longer be the principal mainstays of Japan's exports to Europe and the United States (and as textiles and sundry goods were during the preceding period).

The main question as regards correcting the present unbalanced trade relations between Europe and Japan will be whether, on the one hand, Japan will be integrated more closely with the other industrialised countries, through a greater division of labour with them, so that Europe has a more substantial share of the Japanese market, with all the changes for Japan's own internal economy that this implies, and, on the other hand, how efficiently and rapidly Europe will be able to reorganise its own industrial structure in order to maintain its position on world markets, as well as in the Community itself. Europe's relative prosperity and industrial capacity will depend to a considerable degree on the response given to this question.

ANNEX

Sections relating to Parts I and II

1. Japanese Official Economic Plans
2. Japan's Exports, Imports, Trade and Current Account
3. Yen exchange rate tables and note on effect of exchange rates fluctuations on external trade.
4. Increase in Japan's productivity.
5. Evolution of global exports in sectors (value and percentage share, EC, US, Japan)

Tables relating to Part III : A. Forecasts regarding overall industrial structure

6. Change in Japanese industrial structure, 1965-85. Industrial Structure Council
7. Forecast of Industrial Structure, 1985, 1990. Mitsubishi Research Institute
8. Projection of Japan's industrial structure in 1985. Industrial Bank of Japan
9. Summary of 7 growth industries within manufacturing industry forecasts for 1975-85 by Industrial Structure Council, Mitsubishi Research Institute and Industrial Bank of Japan
10. Future strategic products in chemical sector
11. Nomura Research Institute
 - (a) Projected growth rates in growth industries, 1977-85
 - (b) Projected growth rates in Japanese industries as a whole, 1977-85
12. Nihon Keizai Shimbun : Capacity increase forecast for selected product categories
- B. Changes in External Trade
13. Commodity Structure of Japanese exports, 1970-85. Industrial Structure Council.
14. Mitsubishi Research Institute
 - (a) Trends and Percentage Distribution of Export Shares, 1985, 1990.
 - (b) Increasing and decreasing goods in export and import up to 1990
15. Industrial Bank of Japan. Projection of Japan's export structure in 1985.
16. Nomura Research Institute. Estimated production and exports in 1985 of motor vehicles, consumer electronics (including colour TV and video tape recorders), electronic parts, machine tools and business machines.
17. Ranking of industries with high export growth forecasts 1979-1985 on basis of ISC, MRI and IBJ surveys.
18. Growth impact of exports in selected industries, 1977-85. Nomura Research Institute

Title	Date of publication	Period (JFY)	Main objectives	Real annual GNP growth target (JFY)	Real annual GNP growth achieved (JFY)
5-Year-Plan for Economic Independence	Dec. 1955	1956 - 1960 (5 years)	economic independence, full employment	5 %	8.7 %
New long-term Economic Plan	Dec. 1957	1958 - 1962 (5 years)	maximum economic growth, improvement of living standards, full employment	6.5%	9.9%
Plan for doubling National Income	Dec. 1960	1961 - 1970 (10 years)	"	7.2%	10.7%
Medium-term Economic Plan	Jan. 1965 *	1964 - 1968 (5 years)	correction of economic distortions	8.1%	10.6%
Plan for Economic and Social Development	March 1967	1967 - 1971 (5 years)	development of a well balanced welfare society	8.2%	10.9%
New Plan for Economic and Social Development	May 1970	1970 - 1975 (6 years)	creation of a comfortable environment through well balanced growth	10.6%	6.1%
Basic Economic and Social Plan	Feb. 1973	1973 - 1977 (5 years)	simultaneous achievement of national prosperity and international harmony	9.4%	4.1%
Economic Plan for Second Half of 1970s	May 1976	1976 - 1980 (5 years)	achievement of stable eco.developm. and enrichment of people's lives	6 %	5.7 %
New Economic and Social 7-year-plan	August 1979	1979 - 1985 (7 years)	correction of imbalances between economic sectors, industrial restructuring, surmounting of energy shortages, creation of a new prosperous Japanese society	5.7%	1979 = 6.1 % 1980 = 4.8% (est) 1981 = 5.3% (official on Hook)

Source : Economic Planning Agency, Japan

SECTION 2.

JAPAN'S EXPORTS, IMPORTS, TRADE AND CURRENT ACCOUNT

(8 bn.)

	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961
Exports	0.8	1.3	1.2	1.2	1.6	2.0	2.5	2.8	2.9	3.4	4.0	4.2
Imports	0.97	1.9	2.0	2.4	2.4	2.5	3.2	4.3	3.0	3.6	4.5	5.8
Trade Account	-0.15	-0.6	-0.8	-1.2	-0.8	-0.5	-0.7	-1.5	-0.1	-0.2	-0.5	-1.6
Current Account	+0.07	+0.16	+0.19	-0.2	-0.1	-0.02	-0.05	-0.6	+0.46	+0.3	+0.1	-0.98

	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973
Exports	4.9	5.4	6.7	8.4	9.8	10.4	12.9	16.0	19.3	24.0	28.6	36.9
Imports	5.6	6.7	7.9	8.2	9.5	11.7	12.9	15.0	18.9	19.7	23.5	38.3
Trade Account	-0.7	-1.3	-1.2	+0.2	+0.3	-1.3	=	+1.0	+0.4	+4.3	+5.1	-1.4
Current Account	-0.05	-0.78	-0.48	+0.93	+1.25	-0.19	+1.05	+2.12	+1.97	+5.79	+6.62	-0.1

	1974	1975	1976	1977	1978	1979	1980
Exports	55.5	55.7	67.2	80.5	97.5	103.0	129.8
Imports	62.1	57.8	64.8	70.8	79.3	110.7	140.5
Trade Account	-6.6	-2.1	+2.4	+9.7	+18.2	-7.6	-10.7
Current Account	-4.7	-0.7	+3.7	+10.9	+16.5	-8.7	-10.8

Source : Ministry of Finance and U.N. Statistics

Imports CIF, Exports FOB, Customs Clearance Basis

SECTION 3 (A) : YEN EXCHANGE RATE TABLES

(a) Other currencies/yen

The following table shows the equivalent in yen of one US dollar, DM, FF, UK pound and Ecu.

Yen value of	1950*	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	Jan 1981	Feb 1981
1 \$	360	350	308	272	291.5	296.8	296.5	268.5	210.4	219.1	226.7	201.9	205.35
1 DM	85.7	96.1	96.2	100.7	112.8	120.5	117.9	115.6	104.7	119.5	124.7	94.4	95.8
1 FF	1.03	64.8	58.9	59.5	60.6	68.9	62.03	54.6	46.6	51.5	53.6	43.5	41.4
1 UKL	1,008	855.9	709.1	650.6	680.3	657.9	535.7	468.7	403.9	464.9	527.1	485.9	471.4
1 Ecu	360	351	345.5	335.0	347.7	368.3	331.5	306.4	268.1	300.3	315.6	259.8	247.8

(b) Yen/other currencies

The table below give the equivalent in the various currencies of 1,000 yen.

1,000 Yen =	1950*	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	Jan 1981	Feb 1981
\$	2.778	2.851	3.247	3.674	3.430	3.369	3.372	3.724	4.751	4.563	4.410	4.95	4.87
DM	11.67	10.40	10.39	9.93	8.86	8.30	8.49	8.65	9.55	8.37	8.02	10.59	10.44
FF	972.2	15.4	16.9	16.80	16.49	14.5	16.12	18.31	21.46	19.42	18.66	22.98	24.15
UKL	0.992	1.17	1.41	1.54	1.47	1.52	1.87	2.13	2.47	2.15	1.89	2.06	2.12
Ecu	2.778	2.85	2.89	2.98	2.88	2.72	3.02	3.26	3.73	3.33	3.17	3.85	4.03

* Notes on fluctuations in exchange rates between 1950 and 1971.

- 1) Yen/dollar. Between 1950 and 1971 (the Smithsonian agreement) the yen stayed at the same value (360 - 357 yen to the dollar).
- 2) Yen/DM. There was no change between 1950 and 1960 (1 DM = ¥ 85.7). Between 1961 and 1968, 1 DM = ¥ 89.5; 1969 - 1970, 1 DM = ¥ 98.
- 3) Yen/FF. 1950 - 1956, 1 FF = ¥ 1.03; 1957, 1 FF = ¥ 0.86; 1958 - 1959, 1 FF = ¥ 0.73. In 1960 the French franc was changed (1 new F. franc = 100 old francs) and from 1960 to 1968 1 (new) FF = ¥ 73. 1969, 1FF = ¥ 64.4.
- 4) Yen/UK pound. Between 1950 and 1966, 1 pound = Yen 1,008; 1967 - 1970 = Yen 857.8.
- 5) Yen/Ecu. The exchange rate for the Ecu/Eua is from 1958 only.

Sources : Eurostat, UN, Ministry of Finance Japan.

SECTION 3 (B)EFFECT OF EXCHANGE RATE FLUCTUATIONS AND COMPARATIVE PRICES ON EXTERNAL TRADE

The tables above provide historical information about exchange rate fluctuations in nominal terms, which are of course only one element in the determination of export and import competitiveness.

In assessing changes in Japan's international trade competitiveness, it is more useful to consider the real effective exchange rate of the yen⁽¹⁾, which takes account not only of the exchange rate of the yen against a weighted basket of other currencies, but also the disparity in the rate of inflation between Japan and its competitors. The definition of the yen real effective exchange rate and its fluctuations in the period 1973-79 are set out in the White Paper on International Trade 1980, Summary, page 20, fig. 2-2, attached.

As regards Japan's export prices, it is noted in the White Paper that during the period of yen appreciation in 1977-1978, export prices (in dollar terms) rose to a considerable extent, in line with the yen; during the 1979 yen depreciation, however, export prices did not drop to the same extent.

Japan's strategy of increasing its concentration of exports in areas with a high value-added content as well as a high technology content should enable it to achieve a declining price elasticity of demand for exports. Thus if the strategy proves successful, future changes in the real effective exchange rate of the yen may not cause the same degree of moderation of volume growth of Japanese exports as might previously have been anticipated.

With regard to imports, the 1980 White Paper states that the elasticity of manufactured imports to price is high (1.29 for the period 1966-1979). This means that, ceteris paribus, a 1% decline in comparative prices of imports would result in a 1.29% increase in import volume). If accordingly the Japanese real effective exchange rate appreciates, imports of manufactured goods in general can be expected to increase quite rapidly. However, this might be expected principally to benefit products with a relatively low value-added and technology content, since they could be expected to displace competitive Japanese goods more easily. Imports of raw materials can, on the other hand, be expected to be price inelastic, except perhaps in the long term.

The effects described above are in any case subject to a time lag; thus adjustments to trade volumes may not occur immediately in response to an increase in the real effective yen exchange rate. It is not possible, furthermore, to abstract exchange rate variations from other factors, such as the level of domestic demand, which can either reinforce or offset the effect of exchange rate variations (2).

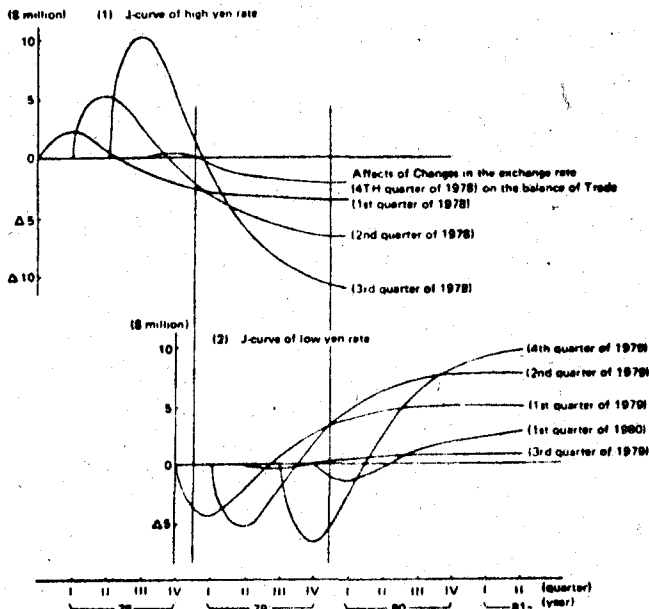
In conclusion, while the nominal exchange rate of the yen may appreciate, the extent to which the real effective exchange rate of the yen would follow suit is uncertain, having regard to Japan's marked capacity for adjustment, described in the paper, and related factors (e.g. the lower rate of Japan's domestic inflation by comparison with her industrial competitors, and the moderate level of wage increases, etc.). To the extent to which real yen appreciation occurs, however, this is likely to limit Japan's export performance.

(1) Often known as the index of competitiveness.

(2) See the comment on p. 16 of the report.

GENERAL REVIEW OF JAPAN'S FOREIGN TRADE

Fig. 2-1. Impact of Yen Fluctuations on the Balance of Trade



Note: The export-import balance was obtained by computing the impact of the yen rate fluctuations against the dollar in each quarter through the use of export-import functions, etc.

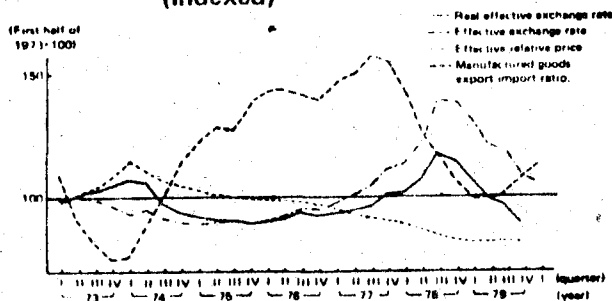
Source: Gaikoku Boeki Gaikyo (External Trade Overview); Production, shipment & inventory statistics; Bukka Shisu Geppo (Price Index Monthly); UN-MBS

2. Drastic Changes in the Yen Rate

The yen's exchange rate against the dollar fell drastically during 1979. The recovery of trust in the U.S. dollar was one reason for this change. Basically, however, the change was primarily due to the turn-around in Japan's trade balance, which posted a deficit in mid-year, and large red-ink figures in the balance of payments. The decline of the yen rate seems to have been further accelerated by psychological factors relating to the unstable oil situation. In early April 1980, however, the yen's exchange rate against the dollar turned up, due in part to the decline in interest rates in the U.S.

In terms of the real effective exchange rate (3) the yen was apparently fluctuating at a relatively low level during 1979 (see Figure 2-2).

Fig. 2-2. Change in the Real Effective Exchange Rate and Manufactured Goods Export-Import Ratio (indexed)



Note: 1. The Real Effective Exchange Rate is denoted by the following formulae:

$$R.E.Ex. Rate = \sum_i w_i \frac{R_{jit}}{R_{jio}} \times \frac{WPI_i}{\sum_i w_i WPI_i}$$

i = Country

w_i = (Manufactured exports from Japan to i country + manufactured imports to Japan from i country) ÷ the sum of 14 countries' manufactured exports from Japan + manufactured imports to Japan.

R_{jit} = The currency exchange rate of i country against the yen (denominated in yen) at time t.

R_{jio} = The average currency exchange rate of i country against the yen (denominated in yen) in the first half of 1973.

WPI_i = The wholesale price index of industrial goods of i country.

WPI_j = The wholesale price index of industrial goods of Japan.

2. Manufactured goods export-import ratio = (Manufactured export volume)/(manufactured import volume), Seasonally adjusted.

3. All the figures are indexed with those of the first half of 1973 set at 100.

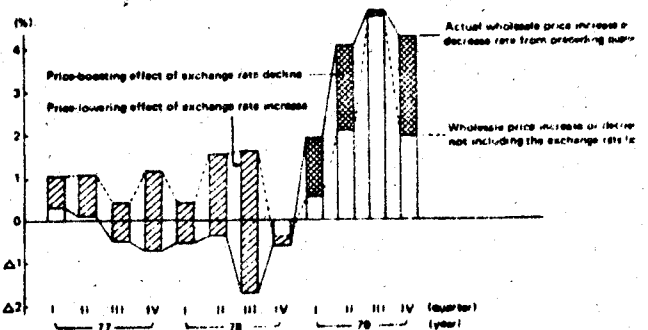
Source: Gaikoku Boeki Gaikyo (The Summary Report Trade of Japan); IMF-IMS; Keizai Tokei Geppo (Economic Statistics Monthly)

(3). The real effective exchange rate: takes into account not only the exchange rate against the U.S. dollar but also the disparity in the rate of inflation within Japan and abroad, as well as the movement of the yen against other currencies.

3. Trends in the Japanese Economy

While Japan's economy continued to expand in 1979, it witnessed an upturn of wholesale prices due to price increases of oil and other imported raw materials; all amplified by the decline of the yen's value (see Figure 2-3). In contrast, consumer prices remained relatively calm, although they are beginning to feel the increases in wholesale prices.

Fig. 2-3. Rate of Wholesale Price Increase or Decrease after Eliminating the Exchange Rate Factor



Note: The impact of the yen exchange rate fluctuations on wholesale prices of imported and exported goods are computed with functional formulae.

Source: Bukka Shisu Geppo (Price Indexes Monthly); Tsusan Tokei (Industrial Statistics Monthly); Monthly labor statistics; Ministry of Finance data; UN-MBS

SECTION 4: INCREASE IN JAPAN'S PRODUCTIVITY

Starting from a very low base after the Second World War, the rate of macro-economic productivity growth in Japan has considerably outstripped that of all the Member States (1). Nevertheless as the following table shows, the level of productivity in the Japanese economy is still somewhat below that of the EC as a whole, though considerably above the level of Italy and the UK (2).

Productivity levels : GDP/civil employment, 1970-78

	at 1975 prices				1978
	1970		1978		at 1978 prices ('000 UCE)
	Civil employm't ('000)	Productivity ('000 UCE/head)	Civil employm't ('000)	Productivity ('000 UCE/head)	
Japan	50,940	6.24	54,080	8.8	14.28
USA	78,627	13.95	94,373	15.12	17.57
EEC	101,769	9.51	102,050	12.03	15.22
Germany	26,169	11.70	24,700	15.30	20.33
France	20,393	11.01	20,912	14.6	17.87
Italy	18,514	7.42	19,932	8.61	10.25
U.K.	24,373	6.86	24,564	8.20	9.89

Source : GDP - Eurostat, National Accounts, 1980
Employment-OECD, Labour Force Statistics

This overall view obscures the fact that the spread of productivity between sectors is far greater in Japan than in the EC. The productivity level of the agriculture, forestry and fishing sector in Japan was only 25% of that of manufacturing in general in 1977 (3). Since a relatively high proportion of the working population (14.5% in 1977) is still engaged in agriculture, it can be expected that the normal transfer of labour to other sectors will provide a considerable impetus for further productivity gains. In contrast, in most EC countries (with the exception of Greece, Italy and Ireland), this source of productivity gain is now almost exhausted. Wholesaling and retailing (with 17% of the Japanese labour force in 1977) also have a very low productivity level.

.../...

(1) The pattern followed has been similar in both the EC and Japan : rising in the 1950s, a steep increase in the 1960s, and a sharp fall back after 1973 to less than half the rate for the previous period.

Labour productivity per unit hour rose on average by 8.2% a year in Japan between 1960 and 1978, as compared with 3.4% in the US and 3.2% for the UK. (Source : White Paper on International Trade 1980).

(2) In the absence of purchasing power parities for Japan, a simple calculation of GDP in a common currency divided by civil employment has been used.

(3) In France for the same year the comparable figure was 46%.

Even as far as manufacturing industry is concerned, the overall level of productivity in 1978 was only approximately three-quarters of that of the Federal Republic of Germany. Within the manufacturing sector there are also great variations in productivity. As is demonstrated by the following table, it is in these sectors of the Japanese economy which participate strongly in world trade that productivity is high and exceeds the EC level.

Japan - Productivity Index by Product (1975 = 100)

	1973	1976	1977	1978	1979	1980 (first quarter)	1973 - 79 % growth p.a.
Electric machinery	103.4	192.3	136.0	161.4	194.4	221.0	11.1
Radio, TV receivers & audio equip- ment	102.1	149.7	145.1	149.8	159.1	175.5	7.7
Motor vehi- cles	97.3	114.4	102.9	93.9	118.2	141.0	3.3
Precision machinery	89.1	124.1	164.2	192.2	247.8	303.1	18.6
Iron & steel	108.9	111.3	112.8	119.9	139.2	147.9	4.2
Shipbuilding	102.6	82.1	71.4	52.1	57.1	75.5	-6.3

Source : Productivity Research Institute, Japan Productivity Centre, 1980

The rates of growth of productivity in these sectors far exceed those in the EC. Quite remarkable is the growth from the average for 1979 to the first quarter of 1980. Even within these high productivity sectors, however, there are considerable variations in productivity levels, between the main manufacturing companies and their sub-contractors. Thus a study produced by the VDA (German Car Manufacturers Association), shows that while Japanese car producers themselves have a higher productivity level than their German counterparts, the overall productivity level of the Japanese car industry is lower, as a result of the low level of productivity of the component sub-contractors. (Sub-contractors produce 67.4% of the value of a car in Japan, as compared with 55.2% in Germany, according to the VDA study.)

The MITI White Paper on International Trade 1980 pointed out that between 1970 and 1976, the number of industries with a value-added productivity rate increase of more than 40% increased from three to five (1). It emphasised the need for a continuation of this trend towards exports with increased value-added productivity, so as to promote the development of the horizontal division of labour with Medium Developed Nations of South East Asia.

.../...

(1) The industries cited include the familiar success stories : machinery and equipment and, in particular, transport machinery.

Although the explanation for this rapid growth in productivity is undoubtedly complex, it is one more aspect of the Japanese skill at achieving success in key areas. One major reason lies in the high ratio of gross fixed capital formation to GDP, as shown in the following table.

Ratio of Gross Fixed Capital Formation to Gross Domestic Product

	1970	1975	1979
JAPAN	35.4	32.2	31.6
U.S.A.	17.3	16.3	17.9
E.E.C.	22.9	21.3	20.7
GERMANY	25.6	20.7	22.9
FRANCE	23.3	23.2	21.3
ITALY	23.1	20.6	18.7
U.K.	18.4	19.5	17.5

Source : U.S. Department of Commerce : International Economic Indicators, Sept. 1980 and EUROSTAT

The factors leading to increased productivity have shifted from time to time. Thus while in the 1960s the contribution of capital investment was dominant, after 1976 the rôle of rationalisation and labour-saving facilities, and the effects of a substantially reduced number of people employed and hours worked, became important.

So far as comparative levels of investment in particular sectors are concerned, the following figures show that in the car industry the level of investment in Japan was far higher than in either Europe or the US during the 1970s.

Share of investment in total value added in major motor-car producers

	4 main U.S. companies	10 main European companies	3 main Japanese companies
1970 - 73	15 %	25.8 %	51.8 %
1974 - 77	13.7 %	18.3 %	35.5 %

Source : Commission staff : Les changements structurels de l'industrie automobile européenne, 1973-78

.../...

As a result of the high level of investment, the key Japanese manufacturing industries have an extremely high technological level. The car industry alone absorbs half of the 10,000 robotics produced every year, far in excess of total EC production. It has also been suggested that the lag between R. & D. expenditure and its effect on output is much shorter in Japan than in most EC countries and the US.

SECTION 5

Evolution of Global Exports in Sectors (value and percentage share, EC, US, Japan)

Non-electrical machinery

	Value (\$ bn.)			Percentage share (1)		
	EC (extra)	US	Japan	EC	US	Japan
1970	11	8.4	2	42	32	8
1973	19	12.2	4.3	44	28	10
1977	37.8	22.5	10.1	44	26	12
1978	44.4	26.6	14.3	43	26	14
1979	49.6	32.4	15	42	27	13

Electrical machinery

1970	4.4	3	2.4	37	26	20
1973	7.5	5.1	4.7	36	24	22
1977	16.6	10.4	11.1	37	23	25
1978	19.9	12	13.8	37	22	26
1979	22.3	14.5	14.6	36	24	24

Motor vehicles

1970	6.1	3.6	1.9	39	23	12
1973	10.3	6.1	4.9	37	22	17
1977	18.9	11.9	14.3	33	21	25
1978	21.3	13.3	19	31	20	28
1979	25	15	20.7	33	20	27

Chemicals

1970	6.2	3.8	1.2	44	27	9
1973	11.4	5.8	2.1	47	24	9
1977	21.8	10.9	4.3	47	23	9
1978	26.5	13.7	5.1	46	24	9
1979	32.7	18.8	6.1	45	26	8

(1) In this and following tables, remaining percentage is that of other OECD countries.

Iron and Steel

1970	3.8	1.3	2.8	38	13	29
1973	6.9	1.3	5.3	41	8	32
1977	10.9	1.7	10.5	38	6	36
1978	14.3	1.8	11.9	40	5	34
1979	16.7	2.4	14.1	39	3	33

Textiles

1970	2.7	0.6	1.7	43	10	28
1973	4.6	1.2	2.4	43	12	23
1977	6.3	2.0	3.7	41	13	24
1978	7.2	2.2	3.8	41	12	22
1979	8.5	3.2	4.0	41	15	19

TABLE 6

Change in Japanese Industrial Structure, 1965-85 (1975 Prices) :

A Projection by the Japan Industrial Structure Council

Year	1965		1970		1973		1974		1975		1985		Average Annual Growth Rate (%)					
	Milliard Yen	% com- position	Milliard Yen	% com- position	Milliard Yen	% com- position	Milliard Yen	% com- position	Milliard Yen	% com- position	Milliard Yen	% com- position	1965-70	1970-75	1975-85	1976-85		
I N D U S T R Y	Agriculture, forestry, fishery	12,023	8.1	12,843	4.8	12,842	3.8	13,073	4.0	13,183	4.2	17,150	2.9	1.3	0.5	0.9	2.7	2.9
	Mining	954	0.6	1,582	0.6	1,825	0.5	1,774	0.5	1,534	0.5	2,150	0.4	10.6	0.6	4.9	3.4	4.4
	Foodstuffs	11,517	7.7	15,547	5.8	18,396	5.4	18,524	5.7	19,129	6.1	31,580	5.4	6.2	4.2	5.2	5.1	5.6
	Textiles	4,947	3.3	6,976	2.6	8,268	2.4	7,153	2.2	7,138	2.3	8,650	1.5	7.1	0.5	3.7	1.9	1.7
	Paper, pulp	2,491	1.7	4,528	1.7	5,437	1.6	5,210	1.6	4,615	1.5	8,300	1.4	12.7	0.4	6.4	6.0	5.2
	Chemicals	3,840	2.6	8,374	3.1	10,441	3.1	11,062	3.4	10,106	3.2	19,510	3.3	16.8	3.8	10.1	6.8	6.9
	Petrochemicals	3,505	2.4	7,875	3.0	10,403	3.1	10,217	3.2	9,447	3.0	15,740	2.7	17.0	3.7	10.2	5.2	4.2
	Cement, stone, glass, ceramics	2,009	1.3	4,410	1.7	5,850	1.7	5,300	1.7	4,570	1.5	8,790	1.5	17.1	0.7	8.6	6.7	6.1
	Iron and steel	7,279	4.9	16,700	6.3	20,954	6.2	20,518	6.3	17,033	5.6	26,280	4.5	18.2	1.1	9.3	4.0	3.5
	Non-ferrous metals	1,065	0.7	2,289	0.9	3,246	1.0	2,900	0.9	2,497	0.8	4,040	0.7	16.5	1.0	8.9	4.9	4.0
	Metal products	2,252	1.5	5,071	1.9	6,798	2.0	6,548	2.0	5,509	1.7	12,610	2.2	17.6	1.7	9.4	8.6	7.3
	General machinery	3,294	2.2	9,218	3.5	11,980	3.5	12,749	3.5	11,673	3.7	27,480	4.7	22.9	4.8	13.5	8.9	7.8
	Electric machinery	3,302	2.2	9,727	3.6	13,080	3.8	11,979	3.7	9,856	3.1	26,360	4.5	24.1	0.3	11.6	10.3	7.2
	Transport machinery	3,336	3.6	11,823	4.4	17,499	5.1	17,681	5.5	16,782	5.3	29,880	5.1	17.2	7.3	12.1	5.9	6.1
	Precision machinery	797	0.5	1,514	0.6	1,934	0.6	1,947	0.6	1,696	0.5	4,530	0.8	13.7	2.3	7.8	10.3	9.5
	Manufacturing, others	9,159	6.1	17,114	6.4	21,158	6.2	18,629	5.8	17,764	5.6	33,470	5.7	13.3	0.7	6.8	6.9	6.3
	Construction	17,768	11.9	33,303	12.5	45,614	13.4	31,980	9.9	33,913	10.7	68,030	11.7	13.4	0.4	6.7	7.2	7.8
	Electric power, city gas, water	2,653	1.8	4,694	1.8	6,447	1.9	6,511	2.0	6,460	2.0	12,790	2.2	12.1	6.6	9.3	7.1	7.4
	Commerce	11,140	7.5	23,040	8.6	31,519	9.3	30,185	9.3	30,449	9.6	55,750	9.6	15.6	5.7	10.6	6.2	7.1
	Finance, insurance, real estate	9,213	6.2	14,632	5.5	21,996	6.5	22,150	6.8	23,595	7.5	40,100	6.9	9.7	10.0	9.9	5.4	6.0
Transport, communications	6,418	4.3	10,901	4.1	12,447	3.7	13,487	4.2	13,628	4.3	25,620	4.4	11.2	4.6	7.8	6.5	4.7	
Services	25,251	16.9	36,188	13.6	41,524	12.2	43,948	13.6	44,777	14.2	81,340	13.9	7.5	4.4	5.9	6.2	6.5	
TOTAL:	149,204	100.0	266,829	100.0	340,480	100.0	323,627	100.0	345,660	100.0	593,590	100.0	12.3	3.4	7.8	6.3		
Primary Industries Total:	12,023	8.1	12,843	4.8	12,842	3.8	13,073	4.0	13,183	4.2	17,150	2.9	1.3	0.5	0.9	2.7		
Secondary Industries Total:	81,325	54.5	161,477	60.5	209,810	61.6	190,391	58.8	179,648	56.9	341,540	58.5	14.7	2.2	8.2	6.6		
(Of which: Manufacturing)	(62,196)	(41.7)	(125,392)	(47.0)	(160,755)	(47.2)	(155,513)	(48.1)	(143,037)	(45.3)	(268,340)	(46.0)	15.1	2.7	8.7	6.5		
Tertiary Industries Total:	55,856	37.4	92,509	34.7	117,828	34.6	120,163	37.1	122,829	38.9	224,900	38.5	10.6	5.8	8.2	6.2		

Source: The Industrial Structure Council, Japan (1978).

Δ = negative

Forecast of Industrial Structure

(Average annual growth rate from 1975
and percent distribution of production)

	1975	1985	1990		85/15	1990/1975	
			Case I	Case II		Case I	Case II
1. Primary industry	4.2	3.6	3.4	3.4	2.8	3.0	2.7
2. Mining	0.5	0.5	0.5	0.5	4.3	4.1	3.9
3. Foodstuff	6.1	5.3	5.1	5.1	3.0	3.2	2.9
4. Textiles	0.8	0.6	0.5	0.5	1.0	1.1	0.8
5. Textile products	2.3	1.7	1.5	1.5	1.3	1.5	1.2
6. Lumber, wood products, furniture	1.7	1.7	1.7	1.7	4.5	4.5	4.1
7. Pulp & paper	1.5	1.4	1.4	1.4	4.2	4.2	3.8
8. Printing & publishing	1.2	1.3	1.4	1.3	5.1	5.1	4.7
9. Chemicals	3.8	3.8	3.7	3.7	4.2	4.2	3.9
10. Petroleum & coal products	3.0	2.9	2.8	2.8	4.0	4.0	3.6
11. Ceramics & earthenware	1.5	1.5	1.6	1.6	5.0	4.9	4.6
12. Iron & steel	5.6	5.1	5.1	5.1	3.4	3.7	3.4
13. Nonferrous metals	1.0	1.0	1.0	1.0	4.3	4.1	3.8
14. Metal products	1.7	1.8	1.8	1.8	4.7	4.7	4.4
15. General machinery	3.5	3.7	3.8	3.8	4.9	4.9	4.6
16. Electric machinery	3.1	3.6	3.8	3.8	5.9	5.8	5.5
17. Transport machinery	5.3	5.1	5.0	5.0	3.8	3.9	3.6
18. Precision machinery	0.5	0.7	0.7	0.7	6.6	6.2	5.8
19. Other manufacturing industries	1.2	1.2	1.2	1.2	4.1	4.2	3.8
20. Construction	10.7	11.7	11.8	11.8	5.2	5.0	4.7
21. Tertiary industries	40.7	41.8	42.3	42.1	4.6	4.6	4.3
All industries	100.0	100.0	100.0	100.0	4.3	4.4	4.0
Manufacturing industries	43.9	42.5	42.0	42.1	4.0	4.1	3.8

Source: Mitsubishi Research Institute

TABLE 8

Projection of Japan's Industrial Structure in 1985
by Industrial Bank of Japan

(% increase in constant price)

Fiscal year	1965		1970		1975		1985 II (intermediate case)		Average Annual Growth Rate (%)			
	Milliard Yen	% compos-tion	Milliard Yen	% compos-tion	Milliard Yen	% compos-tion	Milliard Yen	% compos-tion	1965-1970	1970-1975	1975-1985	
Industry												
Agriculture, forestry, fishery	69.19	3.7	2,110	4.4	7,572	3.8	26,647	2.6	6.6	1.3	0.9	4.5
Mining	49.9	0.8	1,118	0.7	1,204	0.6	1,932	0.4	1.6	1.5	0.7	2.4
Foodstuffs	22.81	0.1	2,495	1.0	12,211	0.1	21,193	0.8	0.5	0.2	0.3	0.7
Textiles	2,444	2.9	4,423	2.0	4,716	2.3	6,201	1.7	5.1	3.2	3.2	3.9
Wood, furniture	2,113	2.4	2,351	2.1	2,693	1.8	3,013	1.9	5.7	2.9	2.7	2.8
Pulp, paper	1,478	1.7	2,037	1.6	2,922	1.5	5,124	1.4	1.3	2.1	2.1	2.1
Rubber products	422	0.5	736	0.3	830	0.4	1,440	0.4	1.6	2.6	2.0	2.7
Petrochemicals, etc.	909	1.1	2,758	1.7	3,377	1.7	6,136	1.7	2.2	4.2	3.1	2.4
Chemicals	1,904	2.1	2,409	2.1	4,162	2.1	7,171	2.0	1.2	4.1	0.1	6.6
Oil, coal	1,408	1.6	1,935	1.8	2,905	1.5	6,764	1.9	1.7	3.1	1.6	2.7
Cement, glass, stone, ceramics	1,224	1.4	2,631	1.6	3,042	1.5	5,715	1.6	1.6	2.9	3.5	3.0
Iron and steel	4,993	5.6	11,319	5.1	12,828	6.2	23,933	7.0	1.8	2.2	2.7	2.9
Non-ferrous metals	905	1.0	1,915	1.2	2,409	1.2	4,313	1.2	1.6	4.7	10.3	2.7
Metal products	1,688	1.9	2,785	2.4	4,509	2.2	8,732	2.4	1.2	3.6	10.3	3.3
General machinery	2,994	3.4	4,280	3.2	10,540	5.2	21,807	6.3	2.6	4.9	1.4	2.8
Electric machinery	2,607	2.9	2,890	2.8	5,604	2.8	23,506	6.3	2.4	4.6	1.9	11.3
Shipbuilding, repair	632	0.7	1,932	0.7	1,533	0.8	1,598	0.4	1.0	0.9	2.3	2.2
Automobile	1,428	1.6	4,361	2.7	6,781	3.4	18,553	2.9	2.6	0.2	1.6	5.1
Other transport equipment	1,425	1.6	2,122	1.3	4,067	2.0	4,746	1.3	0.3	1.9	1.1	2.8
Precision machinery	992	0.7	1,376	0.7	1,376	0.7	2,813	0.8	1.6	0.2	0.9	1.4
Other manufactured products	3,472	3.9	6,780	4.2	7,602	3.8	15,423	4.2	1.3	2.9	2.9	3.2
Construction	4,926	6.2	14,450	6.5	14,883	6.4	23,694	6.5	1.6	0.9	2.9	2.9
Civil engineering	2,074	2.4	3,324	3.1	5,008	2.8	11,172	3.1	1.6	1.1	0.2	2.7
Electric power	1,928	2.2	1,539	1.3	2,686	1.3	4,913	1.3	1.2	2.8	10.1	2.6
City gas, water	454	0.5	784	0.3	1,142	0.6	1,998	0.3	1.0	0.7	0.7	0.5
Commerce	6,987	7.9	14,102	8.8	18,742	9.3	32,507	9.8	1.3	3.9	10.4	2.7
Finance, insurance	3,335	3.7	4,910	3.0	5,879	3.3	11,709	3.2	2.7	1.2	0.9	4.1
Real estate	2,018	2.3	4,728	3.0	6,705	3.3	11,973	3.3	1.6	2.2	0.1	2.0
Transport	3,890	4.4	6,523	3.9	2,939	1.2	14,674	4.9	1.0	2.9	2.4	2.7
Communications	626	0.8	1,244	0.9	2,339	1.2	4,236	1.2	1.2	1.5	1.9	0.9
Government services	6,498	7.4	7,854	4.7	8,401	4.7	12,742	4.9	3.2	4.5	3.6	2.8
Other services	4,844	5.4	6,091	5.7	12,010	6.0	24,719	5.7	1.4	1.7	2.5	2.9
TOTAL	82,261	100.0	160,132	100.0	290,831	100.0	364,106	100.0	1.2	4.6	6.4	6.1

Source: The Industrial Bank of Japan (1977).

Notes: 1. Δ denotes negative.

2. A Japanese fiscal year runs from 1 April to 31 March the following year.

Ranking of Seven Growth Industries within
Manufacturing Industry Forecasts for 1975-85
by Industrial Structure Council, Mitsubishi
Research Institute and Industrial Bank of Japan

	ISC ('76 base)	ISC ('75 base)	MRI	IBJ (Case II)	IBJ (Case III)
Precision Machinery	1	1	1	3	4
General Machinery	2	2	5	2	3
Metal Products	3	3	6	5	6
Electrical Machinery	4	1	2	1	1
Chemicals	5	4	-	-	7
Other Manufactures	6	6	-	4	2
Transport Machinery	7	-	-	-	-
Cement, Stone, Ceramics		5	4	6	-
Paper, Pulp	-	7	-	-	-
Printing, Publishing	-	-	3	-	-
Lumber, Wood, Furniture	-	-	7	7	-
Iron and Steel	-	-	-	4	5
Petrochemicals, etc.	-	-	-	-	6

Source:

ISC - Industrial Structure Council; Longterm Vision 1976 Edition

MRI - Mitsubishi Research Institute; A Longterm Outlook, 1978

IBJ - Industrial Bank of Japan; Japan's Economy: A Mediumterm outlook of
the Industrial Structure, 1977

**Strategic Products of Future for Japan's Individual
Chemical Companies (Based on A Survey)**

Name of Company	Annual Sales 1977/78 (Mrd Yen)	Strategic Growth Products
1. Sumitomo Chemical	447	pharmaceuticals and agricultural chemicals, special synthetic resins
2. Mitsubishi Chemical	546	pharmaceuticals and agricultural chemicals, (especially contra-ceptive pills), special synthetic resins, housing construction materials, products relating to foodstuffs
3. Mitsui Toatsu Chemicals	309	pharmaceuticals and agricultural chemicals, special synthetic resins
4. Mitsubishi Petrochemical	268	special grade polymers (functional polymers), pharmaceuticals
5. Mitsui Petrochemical Industries	193	special synthetic resins (extremely thin film, synthetic pulp), fine chemicals (DCP, hydroquinone, resorcin)
6. TDK Electronics	113	special synthetic resin (impact-resistant resin), inorganic fine chemicals (boron nitride)
7. Toagosei Chemical Industry	63	spontaneous super adhesive, housing construction material, waste water treatment agent
8. Tokuyama Soda	116	ion exchange diaphragm (for osmosis), ceramics
9. Japan Synthetic Rubber	104	special synthetic resins (self-digestive resin, butadiene resin)
10. Nippon Zeon	92	medical equipment and related products (artificial liver), packaging and other products for distribution systems
11. Kureha Chemical Industry	72	anti-cancer drugs, carbon fibre
12. Asahi Glass	311	ion exchange diaphragm (caustic soda production), glass reinforced concrete
13. Nippon Petrochemical	170	unwoven cloth, EBH, SAS
14. Showa Denko	372	pharmaceuticals, new types of ceramic products