

## The role of industrial policy: Japan's experience

### *O papel da política industrial: a experiência do Japão*

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RESUMO: Existem duas visões sobre “política industrial”, negativas e positivas. Pontos de vista negativos dizem que o mecanismo de mercado é a melhor maneira de alocar recursos com eficiência. Assim, a política governamental com tratamento preferencial para um setor específico dificulta essa força de mercado e leva a uma alocação incorreta de recursos. Por outro lado, pontos de vista positivos dizem que a intervenção do Estado é necessária, pois as forças do mercado às vezes falham em alocar recursos de maneira eficiente. Em termos gerais, trata-se de uma questão de relacionamento entre o estado e o mercado, ou em que medida podemos confiar na “mão invisível” de Adam Smith.

PALAVRAS-CHAVE: Política industrial; desenvolvimento econômico; falhas de mercado; história econômica do Japão.

ABSTRACT: There are two views on “industrial policy”, negative and positive. Negative views say the market mechanism is the best way to allocate resources efficiently. Thus, government policy with preferential treatment for a specific industry hinders this market force and leads to a misallocation of resources. On the other hand, positive views say that state intervention is necessary since market forces sometimes fail to allocate resources efficiently. Broadly speaking, this is an issue on relationships between the state and the market, or to what extent we can rely on the “invisible hand” of Adam Smith.

KEYWORDS: Industrial policy; economic development; Market failure; economic history of Japan.

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### 1. RATIONALE OF INDUSTRIAL POLICY

There are two views on “industrial policy”, negative and positive. Negative views say the market mechanism is the best way to allocate resources efficiently. Thus, government policy with preferential treatment for a specific industry hinders this market force and leads to a misallocation of resources. On the other hand, positive views say that state intervention is necessary since market forces sometimes

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fail to allocate resources efficiently. Broadly speaking, this is an issue on relationships between the state and the market, or to what extent we can rely on the “invisible hand” of Adam Smith.

### 1.1 A definition of industrial policy

Several definitions exist on industrial policy as follows:

- “Policies which are implemented by the Ministry of International Trade and Industry (MITI)” (Kaizuka, 1973).
- “Policies which promote production, investment, research and development (R&D), modernization and industrial restructuring in a certain sector or industry while restraining them in other sectors or industries” (Komiya, 1975).
- “There are three basic functions of industrial policy: (i) to limit state intervention only when the price mechanism does not work at all or work but in a very weak manner (ii) to arrange an institutional framework for free market mechanism; (iii) to clarify the role between the central and the local governments” (Tsuruta, 1982).
- “When some adverse phenomena arise on resource allocation or income distribution due to market failures, industrial policies break in to increase the level of welfare in the economy concerned. In addition, this means all policy measures to achieve the said objective by way of intervening in resource allocation among sectors or in industrial organization of a specific industry” (Itoh, Kiyono, Okuno and Suzumura, 1988).
- “The defining characteristics of industrial policy, then, is the custom design of policy instruments to fit the differing priorities, needs and circumstances of individual industries, particularly with respect to factor inputs” (Okimoto, 1989).
- “All policy instruments to intervene in industries for the purpose of a certain public objective in response to market limitations” (Goto and Irie, 1989).

Goto and Irie use a broader definition of industrial policy in their terminology when they say market limitations instead of market failures. Apart from market failures, they include some cases in which the market mechanism is not expected to solve political and social problems such as excessive concentration of the Tokyo metropolitan area and Japan-US trade frictions.

According to their typology, market limitations are classified as follows:

- Market failures as cited in “traditional” welfare economics
  - economies of scale
  - externalities
  - public goods
  - dynamic factors
  - uncertainty
  - difficulties in the movement of factors of production

- Market failures added by the recent development in applied microeconomic theory
  - Marshallian externality effects (network effects, imperfect information etc.)
  - excessive competition (excessive investment, optimum number of firms in an oligopolistic competition etc.)
- Other types of market imperfections
  - unequal distribution of income (domestically and internationally)
  - issues which supplement macroeconomic policies

Goods and services such as defense, primary education, basic health, and infrastructure are examples of “public goods” in which the private sector cannot participate since these benefits go to the public and not to private producers or consumers. In the same manner, private companies cannot bear costs, for example, of externalities such as pollution and environmental destruction. In the case of decreasing costs due to economies of scale, small entrepreneurs are unable to enter the market since a minimal level of production is required to enjoy benefits of scale. For most entrepreneurs, the necessary start-up cost is beyond the reach of available financing. Knowledge-intensive industries usually require vast expenditures on R&D. As R&D activity is an inherently risky endeavor, future results cannot be guaranteed. However, once realized, the results will easily spill over. Thus, this kind of endeavor involves both economies of scale in terms of R&D as well as economies of time. As a result, if a divergence between initial costs and future benefits exists, the private sector is unwilling to initiate extensive R&D activities. As is well known, the market mechanism also fails when a monopoly or oligopoly exists. Furthermore, income disparity cannot be corrected by private interests. Therefore, governments must intervene in these markets through such policy measures as taxes, subsidies, and regulations.

Before going to the next section, it would be better to further clarify some specific jargon and concepts such as (dynamic) economies of scale, Marshallian externalities, and start-up costs. First, economies of scale work when the average cost of production declines as production volume increases. It is generally observed that a large-scale factory equipped with high-tech machines can engage in mass production, and as a result, can decrease production costs and product prices. This is called “internal” economies of scale since this takes place within a factory. As time goes by, labourers in the factory gradually become accustomed to the production system and grow more efficient through the “learning effect” (learning by doing) or accumulation of experience. This phenomenon is called “dynamic” internal economies of scale (for example, integral circuit industries).

On the other hand, “external” economies of scale mean that the average production cost in related industries declines in proportion to a production expansion

in the main industry. For instance, if an automobile manufacturer can reduce its average costs through the introduction of new assembly lines, such a move affects the production cost of parts and component factories as well. Because subcontractors are well connected to the parent company through a tight network, technical innovations at the main factory are quickly transmitted to these subcontractors, thereby reducing their production costs ("network effects"). This is called "Marshallian externalities". In sum, the long-run average cost curve in this industry has a downward slope to the right.

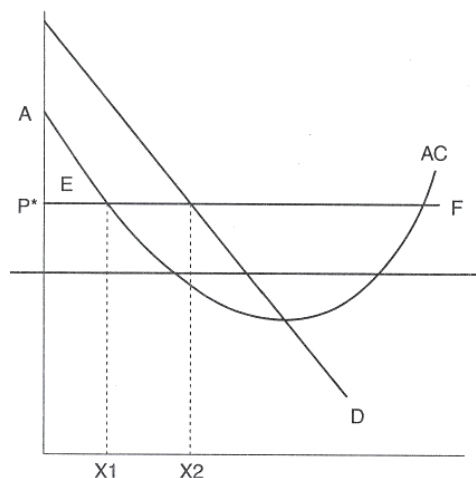
Start-up costs are a social cost to bring about a start of production in a specific industry which has characteristics of dynamic economies of scale. Dynamic economies of scale take place in the following cases: (i) dynamic internal economies of scale; (ii) Marshallian externalities; and (iii) imperfect information.

Imperfect information arises when an industry cannot perfectly estimate not only final demand of its own products, but also derived demand of related intermediate industries. For example, construction of a large-scale blast furnace requires a great amount of information to estimate final demand for the single furnace's output as well as other industries which are presumably affected by the low-cost supply of steel. Such industries as shipbuilding and automating are direct consumers of steel, so increased demand for their products and derived demand for parts and component industries are necessary information.

Moreover, production increases in parts and component industries influence further lower layers of sub-subcontractors. It is quite difficult for the owner of a blast furnace to know all these chain effects in advance, particularly regarding costs. The expense of researching direct and indirect demand as well as cost information becomes gigantic and beyond a private company's means. This is another example of externalities arising from imperfect knowledge of information.

Since the market fails in the case of dynamic economies of scale, the state has to step in to protect the industries concerned. There are two ways to do so: subsidies and import restrictions. Figure 1 shows AC as a long-run average cost curve of an industry as a whole; EF is (an import) supply curve; and D stands for a domestic demand curve. A private company does not have an incentive to enter the market up to the production level of XI since the average cost exceeds the import price  $p^*$ . In order to induce domestic industries to enter the market, the government has to pay an initial subsidy of AE. Another incentive is a temporary import of this product until the time when domestic production can reach the production level of XI. This comes at the expense of consumers who have to pay higher prices for domestically-produced goods than comparable imports.

Figure 1: Average cost curve under the Marshallian externalities



The start-up cost is, therefore, a social cost either in the form of subsidy or import restriction to induce domestic industry to begin production. It is important to note that industries which need initial protection are usually oligopolies which enjoy dynamic economies of scale.

## 1.2 Industrial policy for oligopolistic markets

Industrial policy is normally applied for two different purposes: to foster priority industries and diversify the industrial structure; to correct imperfections in the industrial economy. The former includes infant industry protection (forward protection) and protection of declining industries (backward protection). The latter includes industrial restructuring, i.e., measures against excessive competition or excessive investment.

Infant industry protection is the right solution when an industry would not be created without it. However, it is difficult to select which industry to promote and which one to abandon. In Japan, a high “income elasticity standard” and a high “productivity standard” were utilized to choose strategic industries during the 1960s. Normally, industries which require protection in order to become internationally competitive also satisfy these two standards, so that government intervention had a rationale. It is quite hard to evaluate industrial policy for declining industries. The economic impact of such protection measures as import restrictions, cartels and employment subsidies in declining industries are left to further studies. However, if Japan further emphasizes high-technology industries which have the Marshallian externalities, while transferring declining industries to developing countries, it is a possibility that the global welfare may increase (assuming the transferred industries are not environmentally destructive).

With respect to industrial organization, an argument exists regarding “exces-

sive competition”. Supporters of free competition say that the greater the competition, the higher welfare will result. The MITI belief that “if competition is too excessive and such a situation leads to a point where national benefits are less than those costs lost through competition, government intervention is necessary” (Morozumi, 1966).

Recent studies demonstrate that the promotion of competition does not necessarily bring about increases in economic welfare in the oligopolistic market and, on the contrary, a restriction of competition may result in higher welfare. In the oligopolistic rivalry, the “second-best” choice is sometimes a solution instead of the “first-best” since the market has a different character from the static free market one. Oligopolistic agents decide their actions based on their rival’s reaction (“strategic firm action”) and this competition continues through time along the line of the game theory. Dynamic competition sometimes leads to an equilibrium different from that of static theories (see, for example, *The Theorem of Excessive Entry* (Itoh, Kiyono, Okuno and Suzumura, 1988, p. 182).<sup>1</sup>

An example of policy failure because of firms’ strategic actions is that the restriction of entry based on market share or production capacity-based quotas created more excessive investment (this actually took place in the case of petrochemical industries with respect to the construction quota of ethylene production in the 1960s).

### 1.3 Industrial policy in the international context

Okimoto (1989) compared government intervention in Japan with that in the United States and concluded that “the Japanese government views its role in micro industrial management as far broader in scope than its U.S. counterpart, especially in the two areas of market imperfections and industrial catch-up. Only in national security, anti-trust, and the protection of declining industries is the U.S. more active” (see Table 1). As Okimoto pointed out, Japan, as a latecomer, emphasized policies of industrial catch-up or “targeting”. The targeting policy is defined as “coordinated government actions taken to direct productive resources to help domestic producers in selected industries become more competitive”.

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<sup>1</sup> It is possible to increase economic welfare if the number of competing firms can be restricted to less than that of the free-entry equilibrium assuming that oligopolists produce substitute goods.

Table 1: Conceptual framework for government intervention – Japan and the United States

Japan	United States
<p><i>Market imperfections</i></p> <p>Capital market deficiencies Excessive competition Regional maldistribution of resources Industrial disorderliness Production inefficiencies Resource misallocations (nonpriority sectors) Problems related to industrial structure</p> <p><i>Economic security</i></p> <p>Structural maladjustments</p> <p><i>Industrial policy fallout effects</i></p> <p>Assistance for small and medium-sized enterprises</p> <p><i>Industrial catch-up</i></p> <p>Infant industry vulnerabilities Threat of lower value added: unacceptability of certain areas of comparative advantage Loss of industrial autonomy</p>	<p><i>Market failures</i></p> <p>Externalities Neglect of collective good Antitrust abuse Business cycles Manpower needs Excessive risks Unemployment Redistribution Social injustices (need for affirmative action etc.) Loss of international competitiveness</p> <p><i>National security</i></p> <p>Supply disruptions (raw materials) Foreign market closure Dangerous foreign dependence Loss of competitiveness in vital industries Need for technological edge</p> <p><i>Distortions from government intervention</i></p> <p>Contagion effect of policies (taxes, subsidies) Remedial policies</p>

Source: Okimoto (1989), p.53.

Japan and South Korea followed this line of policy, i.e., first, identifying strategic industries to set up; second, protecting them with preferential treatment such as import controls, tax and financial incentives, and subsidies; third, promoting export competitiveness. The results gave Japanese and Korean companies an edge over the competition. This situation created trade frictions. Therefore, we have to consider the welfare not only in our own country but also that of trading partners. An aggressive policy which improves our own welfare at the cost of others cannot be permitted. Global consideration has become more important these days.

In this context, managed trade such as “voluntary export restraints (VERs)” and the Multi-Fiber Arrangement (MFA) should be re-examined from the global welfare point of view (this will be discussed later).

In sum, it is clear that after Japan joined the international economy, MITI's intervention subsided. Free trade and an open economy require competition basically free of intervention. However, the complete *laissez-faire* economy does not

necessarily bring about full social welfare in the global sense, so that new collaborative approaches among nations are required.

## 2. INDUSTRIAL POLICY – THE CASE OF JAPAN

Here we briefly survey the post-war Japanese experience on industrial policies and try to evaluate them. The post-war period is divided into five parts as follows:

- |                  |                                |
|------------------|--------------------------------|
| (i) 1945-1950    | The reconstruction period      |
| (ii) 1951-1960   | The industrial catch-up period |
| (iii) 1961-1972  | The high growth-rate period    |
| (iv) 1973-1982   | The oil-shock period           |
| (v) 1983-present | The trade imbalance period     |

### 2.1 The reconstruction period, 1945-1950

This period was characterized by efforts to reconstruct the Japanese economy from the devastation of World War II. Reconstruction of the iron, steel and coal industries was given top priority (1946-1948). Imported petroleum was preferentially forwarded to the iron and steel industry whose subsequent output was channeled into the coal industry. Next, the increased production of coal was preferentially recirculated back to the iron and steel industry. This priority treatment of the two industries resulted in surpluses of their output which later went to other industries. This was called the priority production method (or the “slope production” method).

Policy measures adopted in this period were as follows: (i) rationing of commodities; (ii) price control (including subsidies to balance the gap between administered prices and production costs); and (iii) loan rationing by the Finance Corporation for Reconstruction. In 1948, J. M. Dodge, a U.S. economic adviser, came to Japan and made a recommendation which later came to be called the “Dodge line”. It intended to wipe out many government controls and make more use of market mechanisms in order to fight against inflation. A very tight budget was introduced, new loans by the Finance Corporation for Reconstruction were cut and various subsidies were also abolished according to his recommendation. In April 1949, a new exchange rate was set at 360 yen per US dollar (which remained in effect until 1971), ending the multiple exchange rate system.

### 2.2 The industrial catch-up period, 1951-1960

The aim of industrial policies in this period was to optimize such sectors as iron and steel, coal, shipbuilding, synthetic fiber, and chemical fertilizer, all of which



suffered from chronically high production costs. These investments received preferential treatment on taxation and loans.

A mission led by Professor C. S. Shoup was sent to Japan to reform the tax system and, according to the group's advice, the corporate tax rate was set at 35% in 1950. This was increased the following year to 42% (the rate was decreased three times between 1951 and 1966 to 35% and again increased three times to the present level of 42% in 1981). At the same time, a method of accelerated depreciation and a reserve allowance for price fluctuations were introduced. The former allowed a special deduction for depreciation purposes for the first three years after machinery purchases and the latter allowed for the creation of a nontaxable reserve fund for future price fluctuations of inventory assets.

The fiscal investment and loan system was also reinforced during this period. The government utilized special funds to promote "target" industries through state-owned financial intermediaries. The Export-Import Bank of Japan (EXIM Bank) was established in 1950 and the Japan Development Bank was set up in 1951 (replacing the Finance Corporation for Reconstruction). Primary funding for these banks was channeled from post-office savings and social insurance accounts. The Japan Development Bank distributed loans primarily for infrastructure and financed projects such as electrical generation plants and sea transport. Such industries as coal, iron and steel, fertilizer and machinery were also emphasized. At the same time, the EXIM Bank put priority on shipbuilding and export industries. Lending terms and restrictions offered by both government financial institutions were more favorable than private-sector banks, providing for lower interest rates and longer repayment periods (see Tables 2 and 3).

Table 2: Japan – evolution of fiscal and loan investment (%)

	1953-55	1956-60	1961-65	1966-70	1971-75	1976-81
Basic industries	23.6	16.6	9.9	6.3	3.7	2.9
Trade and eco. corporation	2.8	4.3	7.9	10.4	8.8	6.4
Regional development	5.7	9.0	7.5	4.6	3.7	2.6
infrastructure	26.4	21.6	26.1	24.3	23.2	18.1
Modernization of low - productivity sectors	18.6	20.9	19.0	20.1	19.6	22.6
(Small business)	(-)	(13.7)	(12.9)	(15.6)	(15.2)	(17.7)
improvement of living condition	22.9	27.6	29.6	34.3	41.0	47.4
Total amount (billions of yen)	9,218	23,360	61,958	137,716	340,736	925,471

Source: Kosuge, M. and Yoshino, N. "Zeisei to Zaisei Toyushi" (Tax systems and fiscal investment and lending), in Komiya, Okuno and Suzumura (1984).

Table3 : Japan: evolution of social overhead capital (billions of yen)

	Total invest. social overhead capital	Infrastructure					Rail-way
		Subtotal	Road	Harbor	Disposal indl.	Indl. water	
1955	148,7	79,9	23,0	4,4	0,0	0,0	52,5
1956	158,1	89,8	26,4	4,4	0,0	0,2	58,7
1957	230,6	151,2	45,9	6,8	0,3	0,3	98,7
1958	292,3	229,3	133,6	8,2	0,3	0,5	87,3
1959	398,6	293,7	164,0	20,8	0,4	0,9	107,6
1960	501,0	339,3	197,6	23,5	0,6	1,3	116,4
1961	741,3	554,0	311,8	46,5	0,7	2,5	192,5
1962	850,9	686,4	420,6	57,4	1, 1	3,8	203,5
1963	1.122,8	856,7	488,0	69,7	2,2	5,4	291,3
1964	1.248,4	931,3	580,3	80,4	4,3	7,0	259,3
1965	1.457,6	1.136,0	704,7	87,2	4,6	8,3	331,2
1966	1.645,0	1.348,5	876,2	111,0	3,2	8,2	350,0
1967	1.858,6	1.512,1	1.001,1	124,0	2,7	6,2	378,0
1968	1.965,5	1.608,5	1.081,0	121,6	3,0	6,6	396,3
1969	2.217,4	1.278,8	1.254,1	154,2	3,3	7,4	399,8
1970	2.565,1	1.875,5	1.275,3	185,1	3,6	10, 1	401,5
1971	3.010,4	2.354,7	1.688,1	220,0	4,4	13,4	428,8
1972	3.714,7	2.908,9	2.055,1	267,3	8,4	18,8	559,3
1973	4.747,5	3.593,7	2.439,5	326,8	16,3	23,3	787,8
1974	4.831,3	3.624,5	2.464,6	328,0	18,6	23,1	790,1
1975	4.758,7	3.627,6	2.507,6	316,2	23,3	21,4	759,0
1976	5.522,9	3.980,7	2.730,2	361,2	28,0	24,3	837,1
1977	6.572,3	4.904,7	3.399,7	412,8	34,6	26,3	1.031,2
1978	8.320,0	5.730,0	4.048,7	487,5	48,3	25,0	1.120,4
1979	9.967,0	6.370,7	4.386,8	583,4	63,5	23,9	1.313, 1
1980	9.896,1	6.683,8	4.756,2	579,9	66,2	22,6	1.258,9
1981	9.850,5	6.600,8	4.789,4	585,9	67,1	21,0	1.137,5
1982	9.883,2	6.770,4	4.982,5	591,1	66,5	19,6	1.110,7

Source: Kosuge, M. and Yoshino, N. "Zeisei to Zaisei Toyushi" (Tax systems and fiscal investment and lending), in Komiya, Okuno and Suzumura (1984).

During the last half of the 1950s, such industries as synthetic fiber, plastics, petrochemicals, electronics and general machinery were considered "growth industries" suitable for promotion. The automotive and heavy electric industries were highly protected by tariffs and import quotas. In addition, high-technology imports were encouraged to catch up with advanced countries. On the other hand, coal had gradually been replaced by petroleum.

## 2.3 The high growth-rate period, 1961-1972

In 1960, the Prime Minister Ikeda launched the “Doubling National Income Plan, 1961-1970” and the government set an objective of trade liberalization as shown in the “Outline Program for Liberalization of Trade and Foreign Exchange” approved the same year. The acceptance of obligations under Article 8 of the IMF and entry into the OECD in 1964 finally committed Japan to keep an open international economic system (except free movements Smith capital).

It is important to mention three points with respect to industrial policies during this period. First, structural rearrangement and orderly competition among industries were advocated and guided by MITI with mixed results. As the export sector prospered and domestic investments heated up (a so-called virtuous circle of exports and investments), MITI feared cut-throat competition among industries. Therefore, MITI suggested that several industries merge with the intention of avoiding excessive competition and maintaining orderly markets. In 1964, Mitsubishi Heavy Industries Co. was set up, followed by the merger of automakers Nissan and Prince in 1966. Fuji and Yawata joined to become the giant Nippon Steel Co. in 1970. However, the “Grouping Plan” (1961) of automotive industries never materialized and the “Temporary Measures Law for Promotion of Specific Industries” (1962) did not pass the Diet due to strong opposition from the private sector. MITI believed these “specific industries” should have been automobile, special steel, and petrochemicals.

Second, industrial policies for small and medium-sized firms were promoted. The “Basic Law for Small and Medium-sized Industries” was promulgated in 1963. In order to modernize and strengthen these firms against international competition, they were given fiscal and financial incentives to modernize equipment and absorb new technology. The Agency for the Promotion of Small and Medium-Sized Industries was established in 1967 to accomplish these objectives (the Finance Corporation for Small and Medium-sized Industries had already been established in 1953).

Third, the Council for Industrial Structure (1964) had played a vital role in assisting the formulation of industrial policies. This Council consisted of members from government (usually retired government officials), private business, scholars, and journalists to form a consensus on industrial policy and to report the results to the Minister of MITI. Although a similar system was practiced as early as 1949 (e.g., the Council for Industrial Rationalization), the style became standardized and effective during this period. In particular, the process of exchanging information among representatives made great contributions to all industries concerned since imperfect information was one of the decisive causes of market failures.

In summary, MITI’s intervention peaked during this period, endorsed by an unprecedented rate of growth and the confidence that Japan had succeeded in the industrialization of heavy and chemical industries. However, as previously noted, its influence has since gradually weakened as the private sector has expanded and come to participate in the open international economy. As a result, industrial policies gradually changed from strict control to mere guidelines.

## 2.4 The oil shock period, 1973-1982

The first oil shock and the adoption of the flexible exchange rate system made 1973 a memorable year in Japanese economic history. Such energy-intensive industries as iron and steel, nonferrous metal, chemical, and paper and pulp declined to the point of depression while automotive and electronic industries barely survived due to their relatively lighter energy requirements. In a sense, the demarcation of industries according to energy consumption levels began and industries subsequently pursued more knowledge-intensive and technologically advanced markets.

In this period, the social aspects of industrialization were also taken into consideration. Rapid industrialization during the 1960s led to increased levels of pollution and environmental destruction. By the late 1960s, problems such as smog and water pollution (e.g., “Minamata disease” caused by mercury poisoning) forced the government to acknowledge and address these externalities.

Another consideration was Japan’s participation in the world economy. Capital liberalization, which began in 1967, finally reached full liberalization in 1973. In that year, direct overseas investments by Japan jumped to a record level of US\$ 3,491 million from US\$ 2,338 million in 1972 and US\$ 858 million in 1971. Japan’s participation in the international economy in terms of both trade and capital also created new problems, namely trade friction and/or trade imbalances with other countries. For example, the U.S. claimed Japanese textile, iron and steel industries dumped products below fair market value.

Industrial policies thus reflected these trends, and four points are worth mentioning in this context. First, rescue packages were provided for declining industries affected mainly by the change in economic conditions. For example, the aluminium industry was directly influenced by increases in energy prices, and shipbuilding and textile industries became less profitable in the face of increasing competition from Asian NIES. As a result, the government provided assistance to several depressed industries negatively affected by a less hospitable economic climate through: (i) the creation of credit lines to renovate and/or scrap equipment and machinery; and (ii) allowing the formation of cartels which scrapped idle facilities as necessary. In order to address these needs, the “Temporary Measures Law for the Stabilization of Specific Depressed Industries” (1978) was established. In making this law, the government addressed “structurally depressed industries”, which included aluminium, synthetic fiber, shipbuilding, chemical fertilizer, cotton and chemical fiber yam, corrugated cardboard, and steel materials (materials from electric open-hearth furnaces).

Second, the government announced the “Basic Law for the Prevention of Public Nuisances” in 1967 to fight against pollution and other negative effects of industrialization. Related laws and ordinances were soon passed and addressed problems such as water pollution (1966), noise (1968) and air pollution (1968). With respect to smog devices, the “Clean Air Act, Amendment of 1970” (Muskie Act) in the U.S. stimulated Japan to formulate an equivalent standard. By 1978, Japanese

automotive companies had achieved the strictest carbon dioxide and nitrogen standard worldwide.

Third, trade friction issues emerged as Japan penetrated international markets. For example, Japanese steel exports to the U.S. increased rapidly from 4.5 million tons in 1967 to nearly 7 million tons in 1968. In response to U.S. criticism, Japan carried out “voluntary export restraints” from 1969 to 1974. Later, the U.S. imposed the “trigger price” system on Japanese steel imports in 1978. This system set a minimum price for Japanese steel products, and when import prices went below the set price, the U.S. Treasury Department would initiate an investigation into the matter. Textile trade also experienced trade friction. In addition to Japanese textile exports, Asian NIES exports also rapidly expanded and resulted in conflicts in the U.S. and European markets. The Multi-Fiber Arrangement was concluded in 1974 to settle this problem and both exporting and importing countries agreed to put import quotas on textiles bilaterally according to the arrangement.

Finally, information industries (especially worldwide computer industries) were virtually controlled by IBM’s monopolization of the market. In an attempt to reduce IBM’s monopolistic presence in Japan, MITI began to form group-oriented R&D. In 1962, the Computer Technology and Research Consortium was established by MITI with the intent of developing large-scale computer systems. Computer manufacturers such as Fujitsu, NEC and Oki Electric Co. joined this project. The formation of this consortium was the prototype for subsequent joint R&D efforts (e.g., the Super LSI Technology and Research Consortium established in 1976, set out to develop super LSIs for use in the development of the fourth-generation computer systems). In addition, MITI extended trade and capital liberalization policies in computer-related industries (including software) until April 1976 and provided subsidies and financial assistance primarily through the Japan Development Bank for domestic computer industries.

The introduction of an R&D consortium in response to the huge presence of large foreign competitors has three merits: (i) to avoid duplication of investments by each member company in the consortium; (ii) to share results of R&D among member; and (iii) to make product markets competitive. Unfortunately, market competitiveness is not guaranteed since cartels, informed, can engage in price-fixing policies detrimental to free-market forces. Another negative aspect is that non-members of the consortium are at a disadvantage while a less-competitive member might survive because of the favorable treatment it may receive.

## 2.5 The trade imbalance period, 1983 – present

Japan overcame the second oil shock, and its exports grew very rapidly despite the appreciation of the yen. Its trade surplus with respect to the U.S. exceeded US\$ 20 billion in 1983. The resulting imbalances with trading partners became a serious problem. Exports of cars, color TVs and numerically controlled machines were similarly restricted.

Regarding industrial policies during this period, declining industries were af-

forded some protection measures similar to that in the 1970s. Such industries as aluminium, chemical fiber, chemical fertilizer, ferroalloy, paper, and petrochemicals were identified as affected industries under the “Temporary Measures Law for Structural Improvement of Specific Industries” (1983). It is somewhat contradictory that the Japanese government protected infant industries during their growing years, but when the established industries took a downturn, the government still protected them. Although protection measures are at ongoing effort, the method of intervention by MITI during this period became less coercive and more suggestive in nature.

### 3. CONCLUDING REMARKS

After experiencing complete devastation in World War II, Japan had to reconstruct its economy. Catching up to the industrialization level of advanced countries was given first priority. “Guided industrialization”, as a result, has made Japan one of the most successful industrial countries. MITI applied industrial policy without having a concrete theoretical basis, resulting in some successes and some failures.

Five points are worth mentioning from Japan’s experience with industrial policies. First, it is interesting that MITI protected infant industries during their initial growth periods (forward protection) but also had to protect them after facing subsequent difficulties (backward protection). Also, expenditures for backward protection seems greater than those for forward protection. For example, subsidies still continue to flow into the coal, textile and marine transportation industries (see Table 4). It is amazing to note that agriculture receives the vast majority of subsidies as compared with those of other industries. Except for its usefulness in income redistribution, the benefits of protection for declining industries are a matter of question.

Table 4: Japan – evolution of subsidies (billions of yen)

	Marine transporte	Coal	Small business Andt extiles	Advanced technology	Agriculture forestry And fishery	Total
1955	3.5 (5.0)	0.0 (6.0)	0.5 (0.6)	0.5 (0.7)	65.7 (93.4)	70.3 (100.0)
1956	3.2	0.0	0.7	0.5	59.4	63.8
1957	0.05	0.0	1.9	0.4	64.2	66.7
1958	0.04	0.0	3.1	0.6	70.3	74.1
1959	0.5	0.0	2.2	0.5	81.9	85.3
1960	1.7 (1.7)	5.8 (6.0)	2.6 (2.6)	0.5 (0.5)	86.1 (89.0)	96.7 (100.0)
1961	1.5	5.8	4.6	0.6	95.2	107.9
1962	1.6	10.8	9.1	0.7	126.2	148.8
1963	2.1	18.0	11.8	0.8	146.0	179.0
1964	10.1	18.3	16.6	0.9	167.5	713.8

1965	13.6 (5.5)	20.1 (8.1)	21.8 (8.8)	0.8 (0.3)	190.1 (76.9)	246.9 (100.0)
1966	14.5	24.0	29.8	1.9	246.0	316.7
1967	15.4	37.7	36.2	4.2	277.2	371.6
1968	15.7	42.3	39.3	5.5	318.6	422.6
1969	15.2	69.9	43.6	6.4	351.4	487.8
1970	15.4 (2.3)	78.8 (11.8)	51.6 (7.7)	7.7 (1.1)	510.7 (76.7)	665.2 (100.0)
1971	15.6	68.0	59.2	8.2	664.5	816.6
1972	16.1	58.7	90.8	20.0	806.0	992.1
1973	16.1	63.9	85.4	31.9	952.5	1,151.0
1974	15.6	55.2	103.7	44.5	996.6	1,216.8
1975	15.0 (1.1)	61.1 (4.5)	129.4 (9.5)	43.3 (3.2)	1,102.3 (81.5)	1,352.2 (100.0)
1976	13.6	58.7	166.4	36.3	1,268.8	1,545.0
1977	11.5	57.6	173.6	31.3	1,514.6	1,789.7
1978	9.5	59.5	206.8	31.4	1,992.3	2,300.7
1979	5.5	52.2	232.6	34.1	2,345.6	2,671.4
1980	9.5 (0.3)	48.8 (1.7)	243.7 (8.6)	34.6 (1.2)	2,473.8 (87.9)	2,811.8 (100.0)
1981	10.5	44.4	249.9	36.3	2,552.7	2,895.1
1982	11.0	48.1	251.0	37.2	2,695.1	3,043.7

Figures in parentheses show a percentage composition.

Source: Kosuge, M. and Yoshino, N. "Zeisei to Zaisei Toyushi" (Tax systems and fiscal investment and lending), in Komiya, Okuno and Suzumura (1984).

Second, infant industry protection was also applied in the case of knowledge-intensive industries (to compete with foreign monopolies) since the private return sometimes diverges from the social return due to externalities and the special characteristics of the industry. Japan succeeded in this area (e.g., computers, ICs and LSI's) by forming research consortia. Consortia are understood as a kind of cartel formation and this field is likely to come under further investigation from the welfare point of view.

Third, the government determined methods for the transmission and feedback of information. Council related activities helped private sectors eliminate information gaps in technology, markets, policies, future prospects and so on. Councils thus played a vital role in the exchange of information much like a switchboard connecting all branches of institutions. From the oligopolistic competition point of view, Councils offered an opportunity of "preplay communication" for all participants.

Fourth, industrial policy is always influenced by the changing world. Policy responses for externalities such as pollution and environmental destruction are one example and trade frictions are another. For example, Japan's voluntary export constraints on cars still continue. Taking advantage of these voluntary restraints and the ensuing supply shortage, U.S. auto manufacturers raised prices of domestic cars. Japanese auto makers subsequently followed the price increase for exported

cars (a typical case of an oligopolistic coalition). In the case of textiles, the international Multi-Fiber Arrangement cartel continues to expand. However, this implies that once protection is carried out, it is difficult to stop. Moreover, consumers usually suffer from being forced to pay higher prices than would occur without the existence of industrial protection.

Therefore, we have to respond adequately to changes in the contemporary economic situation and, in particular, consider the following new factors: (i) giving more weight to consumers sovereignty; (ii) demand changes (from mass production to small quantity with many varieties); (iii) expansion of service industries; and (iv) globalization.

Finally, we should always consider the case that government policy can also fail. Governments are not always rational decision-makers and they are not necessarily able to collect perfect information. Since governments are not omnipotent, we have to accept second-best or third-best policies which are intended, at least, to improve the social welfare of society.

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