The Organization of the Developmental State: Fostering Private Capabilities and the Roots of the Japanese "Miracle"

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The First Japanese "Economic Miracle" and the Developmental State

Chalmers Johnson's *MITI and the Japanese Miracle*, more than any other single work, focused American attention and debate on the role of the Japanese developmental state in creating the post war "economic miracle." Johnson's orientation emphasized the continuity between pre and post war policy development in the formation of Japanese industrial policy. This paper is based on complementary research in the sense that it emphasizes the development of organizational capabilities in the private sector, and seeks to study the interaction of business and government policies. But in doing so, it calls for a revised perspective on Johnson's assessment of the relative importance of public policy.

If the dual achievements of pace-setting national growth rates and international competitiveness define the performance of a "late" developing economy as "miraculous," then indeed, the inter-war era marked the first Japanese "economic miracle". Of course, one connotation of the word "miracle," that phenomenal Japanese economic success could not be explained on the basis of preceeding conditions, could not be more inappropriate. The remarkable fact about Japanese economic development has been the extent to which accelerated rates of industrial growth have been sustained, more often rather than not, starting even before the end of the Tokugawa period.

Johnson has claimed that the earliest use of the term "miraculous" to describe Japanese economic growth was in Hiromi Arisawa's 1937 commentary in *The Control of Japanese Industry* on the early and strong post-Depression recovery [12, p. 6]. Arisawa was referring to the 57% increase in Japanese industrial production from 1931 to 1934. Arisawa's Japanese descriptive term is perhaps more appropriately translated to mean the

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"astonishing" or "great stride" of the Japanese economic recovery, especially when compared to the continued European or American stagnation. Beyond the short term stimulus Arisawa and other observers, then and now, have rightly attributed to currency devaluation and reflationary fiscal policy, Arisawa focused on long term structural changes in the Japanese economy. Japan's average annual real GNP growth rate during the entire inter-war period exceeded 4% (see Table 1-1), a higher growth rate than any other industrial economy, even if it was far less than the growth rates during Japan's High Growth Era (HGE) from 1955 to 1973.

Table 1-1. Annual Growth Rate of Real GNP

	1870-1913		1913-38	
	Total	per capita	Total	per capita
Japan	3.6	2.5	4.5	3.6
U.S.A.	4.3	2.2	2.0	0.8
Germany	2.8	1.6	1.6	1.1
England	1.9	0.8	1.1	0.7
French	1.6	0.7	0.9	0.8
Italy	1.4	0.6	1.7	1.0

Source: [25]

The fundamental debate about the "astonishing" growth of the inter-war period, then and now, is the relative importance and relationship between the export growth of light industries, especially cotton textiles, and the pace of import substitution in heavy industries, principally iron and steel, chemicals, and machinery [10]. This issue overlaps and intersects with related debates about the influence of militarist priorities on development prior to the late 1930s; the role of small and medium versus medium and large enterprises; and the speed and quality of transition from "traditional" to "modern" technologies [25].

The perspective of the present authors builds upon recognition of the growing diversification of interwar Japanese industrial production, and its simultaneous association with the predominant importance of sustained export growth in cotton textiles. The central feature of Japanese export led growth was not just its magnitude, but its manner of success and its integration with industrial diversification and successful import substitution.

Theory and Policy

Prior to assessing the degree of success of state policy in contributing to economic development, the fundamental dynamic and attributes of economic development must be identified. Our framework is focused upon the features emphasized by Joseph Schumpeter's analysis of the role of innovation and William Lazonick's extension of that framework [13]. In Lazonick's contrast of innovative strategies, at least at their earliest stages, he identifies the necessity of a High Fixed Cost strategy as concommitant with the trials and experiments of developing new supply sources, new products, new processes, new distribution channels, and new barriers against rivals. The high fixed costs are initially incurred on the prospect that the subsequent utilization of the innovation over time will lower costs and/or improve product qualities and market value.

Our focus begins with the fact that the process of innovation, and the associated high fixed costs, requires subsidization. The questions we explore to a limited and varying extent in the inter-war Japanese context are: Which industries are subsidized? Who decides which ones and how much? How does subsidization take place? What insures that the resources made available are devoted to innovative efforts and those innovative efforts are successful? How broadly are the innovations diffused or their benefits otherwise distributed? These questions and their investigation are obviously interrelated. For example, the benefits and distribution of innovations will influence the degree to which subsidies for innovative efforts are forthcoming. We refer to the necessary investments in innovative activities as subsidies since the funding may include public monies, high consumer prices created by protectionist measures, foregone employee earnings and of course private funds as well as other sources.

From the early 1970s non-Japanese scholars have typically studied Japan as a case of late industrialization. Increasingly, comparative scholars have begun viewing Japanese development as a more thoroughgoing elaboration of capitalism, perhaps evolving faster and in a unique form, but in a similar, increasingly organized direction as are other capitalist economies [7, Afterword; 13]. This paper seeks to investigate the roots of this type of development by focusing on the relationships among managerial enterprises, the developmental state and intermediate organizations. The latter are presented as the key to understanding the organizational advantages of the evolving Japanese economy and the successful maturation of coordinated private and public developmental strategies.

Dual Strategies of the Developmental State: Export Expansion and Import Substitution, 1914-1938

Since the early stages of Japanese industrialization, the form and priorities of export expansion and import substitution strategies have changed in response to both external and internal factors. Key policy formulating committees are listed in Table 2-1, and the main changes in developmental strategy are summarized immediately below.

Table 2-1. A Brief Summary of Key Industrial Policy Committees

1914	A	Research Council for Chemical Industries (Kagaku Kogyo Chosakai)
1917	B	Council for Economic Situation (Keizaiz-Chosa-kai)
1918	C	Special Committee for Economic Problems (Rinji Zaisei-Keizai Chosa-kai)
1924	D	Committee of Imperial Economy (Teikoku Keizai-Kaigi)
1927	E	Commerce and Industry Deliberation Council (Shako-shingi-Kai)
1929	F	Committee of Industrial Rationalization (Rinji Sangyo Gorika Shingi-kai)

(1) **World War I.** The government began to consider new measures for promoting domestic chemical industries to replace imports after the outbreak of the war. Committee A (above) proposed establishing national research laboratories and it played an important role in setting up the Japanese chemical industries, as explained in section 4 below. However, rapidly rising prices during wartime were the basic forces in stimulating firms entry into industries where imports were restricted or export opportunities were enlarged. Government activities were still ad hoc and did not have a clear strategic character [19].

(2) **1918-24.** Toward the close of the war, the Japanese government established Committee B to investigate how to sustain industries first established during wartime. Anticipating the peace time resurgence of import competition, both committees B and C investigated the overall challenges facing newly strengthened domestic industries, but since business conditions were still favorable, no clear policy recommendations were formulated. In this context, interest group competition inhibited strategic industry prioritization for targetting subsidies necessary to insure import substitution. Later, as the 1920 post-war recession deepened and the newly established firms were critically challenged by renewed foreign competition, the government's rising fiscal deficit constrained the possiblities for direct subsidization.

On the export side, the most urgent government problem was managing excessive competition, and the resulting low quality of export goods. In 1920, the Trade Association Act of 1900, which originally prohibited cartel activities, was revised and the prohibitions were relaxed. However, the changes in the law were insufficient to curtail competitive excesses [4, 19].

On the import substitution side, many protective measures were recommednded by committees B, C and D, but they were not applied. Although the tariff rates were revised in 1920, and 1921, the number of protected items were very few. The government failed to set a general principle for guiding the imposition of tariff rates, a necessary precondition for balancing the need for protection to aid import-substituting industries against

the interests of import-dependent, but export competitive industries which favored Free Trade [22].

(3) **1925-28.** The strategy of the developmental state began to be clearly formulated during this period. An important precondition was the establishment of the Ministry of Commerce and Industry (MCI). MCI was the central government organization in representing and organizing business and industrial interests. This organization began to formulate special policies regarding both export expansion and import substitution.

On the export side, one important MCI initiative was the enactment of the Manufacturers Association Law for Export Goods in 1925. By allowing manufacturing associations to require compulsory membership, this law limited free rider benefits to firms unwilling to bear the developmental costs of collectively upgrading product quality. In addition, Industrial Experimental Laboratories (hereafter the labs) became increasingly active in support of export oriented small and medium firms.

On the import substitution side, industrial targeting policy was clearly taking shape. The MCI created the Commerce and Industry Deliberation Council (CIDC) and investigated what industries were central or key to Japanese present and future development, and what measures were necessary or desireable for the promotion of these industries.

The basic ideas for industrial targeting had been formulated in 1925 and can be summarized by four main points [19]:

a) protect existing companies' interests
b) escape from the market control of foreign firms
c) develop technologies central to industrial development
d) set a goal of self-sufficiency

A primitive industrial structural policy, aimed at forecasting the allocation of resources in relation to the subsidies needed by specific companies in targeted industries, was definitively established. The three main industries initially targeted for promotion were dyestuffs, iron and steel, and soda ash.

(4) **1929-1932.** In 1929 the Japanese government returned to the gold standard. To cope with deflationary pressures, the Japanese government initiated an industrial rationalization policy which was largely influenced by the German industrial rationalization movement [12, pp. 102-6]. The basic idea behind this policy was that the cartel activities contributed not only to price stability, but also cost reduction. The latter was accomplished by concentrating cartel member production in relatively high productivity facilities. The government enacted the Important Industries Control Law in 1931, requiring compulsory cartel membership in 21 designated industries, and granting MCI authority to review cartel production and pricing policy. This marks a watershed in the evolution of industry level competition policy in Japan. (Miyajima [22] describes this policy more fully as Industrial Organization Policy.) MCI also intervened in cartel activities via administrative guidance, as MCI used the threat of its legal authority over production and pricing policy to gain "voluntary" cooperation.

Outside of the designated industries, the rationalization movement fostered cartelization, but the most direct support of import-substitution came from increased tariffs, anti-dumping laws, and direct sudsidies.

On the other hand, the government revised the Manufacturing Association Law in 1931, extending the objectives aimed at export industries to all industries, including industries oriented to the domestic market. Legal reforms included in the revision, promoted the spread of manufacturing associations whose activities were increasingly effective in organizing industry production [18].

(5) **1933-37**. Prolonged global stagnation forced changes in Japan's developmental strategies. In terms of export oriented policy, the urgent priority was to maintain open markets and therefore to restrain dumping abroad which could induce trade restrictions against Japan. Nationalistic and geopolitical competition led to the transformation of import substitution priorities in favor of military-related industrialization over the period 1932-36.

Given this general policy background, the sections that follow review in greater detail how other sector-specific policies of the Japanese developmental state contributed to export success and the advancement of import substitution.

Trade Associations: Export Success and Technological Diffusion

In the late 19th and early 20th centuries, other national cotton textile industries succeeded at import substitution to varying degrees, but only the Japanese industry succeeded significantly in export markets. Overall cotton textile exports rose as a share of total Japanese exports from 3.3% in 1900-1902 to one-quarter or more of exports from the mid 1920s until 1937 [31]. By 1933, Japan had surpassed Britain as the world's leading cotton textile exporter.

TABLE 3-1. Main Sanchi (Districts) of Cotton Cloth

		Product 1,000 Yen				Export Share %	
	Type	1919	(%)	1937	(%)	1923-5	1933-35
Senan (Osaka)	A	72,136	(8.8)	108,541	(13.4)	48.8	82.8
Enshu (Shizuoka)	B	67,842	(8.3)	149,279	(18.5)	21.0	43.1
Senboku (Osaka)	A	40,591	(4.9)	109,347	(13.5)	-	-
Chita (Aichi)	A	33,474	(4.1)	92,142	(11.4)	27.5	59.1
Banshu (Hyogo)	B	15,394	(1.90	34,415	(4.3)	36.9	98.3
Imbari (Ehime)	B	21,456	(2.6)	29,811	(3.7)	32.8	34.3
Total of All Sanchi		820,707		808,923			

Source: [2, pp. 36-7, p. 46].

Sanchi = textile districts principally dominated by small and medium size weaving mills.

Type A = Wide Cloth, relatively large firm

Type B = Narrow Cloth, small firm, trade association

A shift in the industry's structure occurred between the 1920s and the 1930s that accompanied the continuing rise in the world market share of Japanese cloth exports. While the first decades of the century saw the increased concentration of weaving capacity in large integrated "spinning" companies, the 1930s saw an increased share of Japanese exports originating in the **Sanchi**, the districts or producing centers where specialized weaving mills were concentrated. From 1928 to 1936, the quantity-measured share of exports from the Sanchi rose from 41% to 55%, while the relative value share of Sanchi exports increased from 49% to nearly 63%. The value-added per unit of cloth originating in the Sanchi was greater than in the integrated mills. Not only was cloth production increasingly based in the Sanchi, but as Table 3-1 indicates the share of all Sanchi production was increasingly concentrated in the 6 largest cloth manufacturing districts, nearly 65% in 1937 compared to 31% in 1919. Between 1929 and 1937, the value of total output produced by integrated mills increased only 19% between 1929 and 1937, while the Sanchi-based firms increased production by 76% over this period. Over this same period, the contrast in export sales was even greater - falling by 6% in the integrated sector, but more than doubling in the Sanchi [3, p. 4].

Table 3-2. Cotton Textile Industries Before WWII

	BRITAIN	USA	JAPAN
MATERIALS	Low Cost & Quality	High Cost & Quality	Low Cost & Quality
TECHNOLOGY	Low Throughput	High Throughput	High Throughput
MANAGEMENT	Vertically Specialized	Integrated	Dual Structure
MARKETS	Colonial	Domestic	Global

Some observers have interpreted this shift in industry structure as evidence of a convergence in the Japanese industry toward increasing vertical specialization as was typical of the British cotton textile industry. One of the present authors has emphasized elsewhere [15] that this increased strength of specialized weavers in the 1930s was preconditioned upon the competitive advantages gained in earlier decades by the concentrated organization of the general trading companies and the integrated mills, and the external economies thereby secured by independent firms. In addition, increased industrial organization in the Sanchi, as promoted by public policy and quasi-public trade associations, provided the higher degree of managerial coordination necessary for Sanchi export success. Before elaborating on the complementary public-private strategies and the manner of managerial coordination, it is important to place these developments within the context of textile industry development in Japan as contrasted with Britain and the United States.

Table 3-2 broadly compares the cotton textile industries of the three countries along four key dimensions of materials, technology, management and markets. The Japanese industry's competitive advantage was built on the twin foundations of low cost materials (blending cheaper Indian cotton with more costly, higher quality American cotton) and the complementary adaptation of high throughput technologies (ring spinning and automatic weaving). In both cases the developmental strategies required concentrated resources and coordinated R & D strategies within relatively large enterprises. From the late 19th centrury these efforts entailed intensive textile engineering within the spinning firms complemented by large scale purchases of both cotton and foreign machinery by a few dominant trading companies. During the 20th century, an additional and increasingly important factor was the concentrated industrial research pursued by textile machinery companies, principally within enterprises established by the Toyoda family [15, 16].

Modernization coinciding with increased market and product diversification within the Sanchi-based sector was increasingly important as a basis of the industry's rise to global leadership. The complete analysis of Sanchi development cannot be fully elaborated in this paper. Table 3-1 however, suggests a further distinction between two groups of Sanchi. Type A Sanchi consists of relatively larger firms, manufacturing longer runs of more standardized products such as shirting and sheeting. Type B were districts with smaller mills manufacturing shorter runs of a greater variety of higher value-added, more highly finished fabrics. (For more details on the significance of differences between Type A and Type B Sanchi see sources [2] and [3]). One of the most important and rapidly growing export oriented Sanchi was Enshu.

The Rise of Enshu Exports and the Enshu Eikyu-sha

The Trade Asociation Act of 1900 provided legal support for textile firms to establish a trade association for purposes of promoting export activities. At this time, the structure of the Sanchi textile industry consisted of both merchants and manufacturers. In Enshu, the larger, wealthier, wholesale merchants, organized and coordinated the domestic system of production, and dominated the industry. These merchant putter-outers were the primary initiators of the quality inspection process as a means to enhance their efforts at marketing higher quality Enshu cloth.

In 1900 the Enshu trade association was oriented to selling narrow cloth to the domestic market. As export markets opened in the 1910s, the low quality of Enshu cloth required significantly lower prices for sale abroad. The Enshu trade association lacked sufficient authority to improve the effectiveness of the inspection system. Over the next decade, small manufacturers tended to grow larger, and they increasingly mechanized with powerlooms.

In 1923 Takayanagi, a local manufacturer with a 52 loom facility, led a group of manufacturers in establishing a new organization, called Eikyu-sha, for ensuring cloth quality control by setting standards and collecting fees for certifying inspected cloth met these standards. The new organization sought legal standing under the auspices of the Industrial Cooperative Law governing

mainly agricultural product quality inspection. Their main purpose was to facilitate cooperative assistance in (1) selling to foreign markets and (2) cooperative use of sizing machinery, which added starch to warp yarns making them more break resistant during weaving. The Eikyu-sha membership aimed to increase their foreign sales by raising the reputation and visibility of Enshu cloth. But their efforts largely failed, in part, because without compulsory regulation of cloth quality inspection they lacked the power to control free riders, and in part because of competition from the merchant dominated Enshu Trade Association.

In 1924, Takayanagi presented a draft of a law that was used, at least in part, as a basis for new legislation. The 1925 Manufacturers Association Law for Export Goods allowed trade associations to require compulsory membership. During the Taisho Democracy period, a somewhat Laissez Faire era, the requirement of compulsory membership applied only to firms in the export sector.

The Enshu Cotton Export Manufacturers' Association Eikyu-sha (hereafter Enshu Eikyu-sha) was established in 1926 absorbing the previous organization. The local government and the Ministry of Commerce and Industry (MCI) regional offices contributed part of the funds used by the quasi-public Eikyu-sha to purchase the original facilities set up by the first, private Eikyu-sha organized by Takayanagi. The Enshu Eikyu-sha instituted an inspection control procedure whereby cloth was brought to the association facilities for inspection, the cloth producer paid an inspection fee, and then cloth satisfying certain quality standards were given a stamp for validation. The Enshu Eikyu-sha activities were not successful in the late 1920s because of poor trade, limited financial resources, and lack of membership cooperation. About 10% of Enshu manufacturers were organized into the Enshu Eikyu-sha and they faced competition in cloth quality inspection from the Enshu Trade Association.

Experimental Industrial Laboratories in Japan

Another set of laws enacted in 1900, regulated the practices and procedures of the local government officials managing the Industrial Experimental Labs. The first Enshu lab, established in 1906, focused on textiles. Its first activity was the development of dyestuffs (sulfur black and a blue dye) and regulating, inspecting, and improving the dyeing process. In 1914 the lab introduced a sizing machine used in warp yarn preparation. The lab had collaborated with the Enshu Trade Association. However, in the 1920s the lab began to cooperate with the Enshu Eikyu-sha in the hopes of greater success in improving cloth quality. The lab gave the sizing equipment to the Eikyu-sha free of charge, while the lab continued to service the debt incurred when the sizing machine was introduced.

The lab director Yamamoto worked closely with Takayanagi in support of the Eikyu-sha. Yamamoto traveled to East Asia in 1921 and in 1927 he traveled to Sumatra, Java, Mali, and Shanghai as part of his efforts at marketing Enshu textiles. The Enshu labs played a major role as a main organizer and mover of the Enshu Sanchi in the 1920s. The labs continue to

receive periodic subsidies from local governments and the MCI regional offices.

A More Effective Enshu Eikyu-sha

In the 1930s the Enshu Eikyu-sha played an increasingly important role. In the late 1920s the membership was only 10%, but grew to 100% as the compulsory membership mechanisms became increasingly effective. In 1930, possibly because of government suggestion, 200 weaving manufacturers with 4000 looms producing broad cloth left the Enshu Trade Association and switched their affiliation to the Enshu Eikyu-sha to take advantage of the available cooperative services. The Enshu Eikyu-sha secured eighty percent of its funds from fees collected for its quality inspection activities. The cartel regulation of production allotments were enforced by means of regulating the quantity of cloth inspected. From 1930, the Enshu Eikyu-sha instituted production capacity controls that became increasingly effective, established minimum wage standards, and negotiated the terms for the use of a private dye facility to service their members when their own facilities were overwhelmed. In 1932-33 Enshu Eikyu-sha bought dyeing facilities to service its membership and continually thereafter upgraded and expanded its sizing facilities.

The Enshu Eikyu-sha and lab overlapped in operation but the industrial experimental lab was most significant for the Enshu textile industry in the 1920s and the manufacturers' association's greatest effectiveness was in the 1930s. The Enshu Eikyu-sha and the lab were singularly successful, but they were far from isolated organizational forms. While few export manufacturers' associations were immediately established after the 1925 law was enacted, by 1930 there were 111 such associations, and with government support the number grew to 830 by 1936. (About one-fourth of these associations were textile related.) While the Enshu Eikyu-sha may have been the most successful association in promoting industrial development, the Banshu Cotton Export Manufacturers Association initiated similar activities with comparable success [8, 30, 3, 18].

The Advance of Chemical and Heavy Industries

East Asia markets in general and Japan in particular, were fast becoming the main outlets for European and American oligopolistic chemical and heavy industrial firms after World War I. (These sectors include the chemical, iron and steel, non-ferrous metals and machinery industries.) A rising portion of Japanese international trade was in chemicals and heavy industrial goods. Again, Japan was exceptional to the degree it successfully achieved import substitution in these sectors, overcoming the first mover advantages of its foreign rivals. (See Table 4-1.) The rapidly rising importance of these industries was reflected in the increase in their share of Japanese manufacturing output from 21.1% in 1913, a World War I peak in 1919 of 32.7%, a peacetime return to trend 26.6% share in 1924, and a steady rise in share to 45.1 % in 1936 [26].

Table 4-1. Chemical and Heavy Industries: Production and Self-Sufficiency

	1913		1920-4		1932-36	
	p	(P/C) %	P	(P/C) %	P	(P/C) %
Iron[1](a)	240	47.6	546	64.7	1,615	64.7
Iron[1](b)	240	47.6	649	76.9	2,141	85.7
Steel[1]	255	33.9	671	43.9	3,351	108.9
Dyestuff[2]	n.a.	29.6	7,804	50.0	17,131	91.2
Sulphate[1]	7.5	8.0	96.1	47.6	888.6	77.3
Soda Ash[1]	1.7	6.5	6.8	8.7	153.8	79.9
Machinery[3]	233	74.2	931	82.6	1,760	92.3
Electric Mach'y[3]	10.5	n.a.	71.2	77.6	153.8	96.3

P = domestic production
C = P + imports-exports

Units of Measure
1 = 1,000 ton 2 = 1,000 Yen 3 = 1,000,000 Yen

(a) C includes iron imported from Japanese owned factories in Manchuria and Korea.
(b) P includes iron produced in Japanese owned factories in Manchuria and Korea
Sources: [10, 21, 29]

The enterprises leading the process of import substitution can be categorized into three groups: 1) Government companies; 2) Zaibatsu line companies; 3) "New" zaibatsu companies and independent companies.

There were relatively few government companies. The most important public manufacturing enterprise was Yawata Works, an iron and steel company which produced over 50% of Japanese industry output in the 1920s. Zabaitsu family controlled holding companies held the outstanding stock of affiliated subsidiaries. Leading examples of zaibatsu affiliated companies included Mitsui subsidiaries, Mitsui Mining (dyestuffs) and Kamashi (iron and steel); Mitsubishi Iron Works and Asahi Glass (soda ash); Sumitomo Chemical (ammonium sulphates).

After World War I the top managers of the holding companies assumed greater influence than did the zaibatsu family representatives on the board of directors, and, in general, the subsidiary managers operated with increasing autonomy as well. It remains a question whether the zaibatsu structure may have been more a network than a forerunner of a Chandlerian Multidivisional firm primarily because even among the largest zaibatsu holding companies the headquarter's staff was quite small relative to the number of managers in its

subsidiaries. For instance, in 1929 the Mitsui headquarters had a staff of 153, while the (male only) officers in its leading subsidiaries were: banking (1,227), trading (3,192), and mining (3,035) [24, pp. 214-5]. Reflecting its lack of centralized authority, the holding company checked, revised and approved proposals originating from its subsidiaries. Through negotiations it coordinated policies among subsidiaries in order to try and unify the zaibatsu as a whole.

Key firms falling in the third category included the ammonium suphate producers: Nihon Chisso, Showa Hiryo, Dai-nihon Jinpi (which became Nissan Kagaku). These firms were all established by engineers, and the top managers continued to be engineers and scientists. These firms were associated with combines of firms that were structured as separate joint stock companies, even as they varied in how widely their shares were held [23, pp. 255-66].

The import substitution process was basically a result of the cumulative efforts of entrepreneurial companies in all categories. Within heavy and chemical industries, it was significantly promoted and supported by government initiatives and zaibatsu affiliated trading companies. Several brief chemical industry case studies are presented below to illustrate the mechanisms of subsidization.

The Case of Chemical Industries

The sudden shut-off of imports and the accompanying rapid rise in prices during wartime, created dramatic new opportunities for Japanese firms. Technological opportunities and capabilities varied, and the general context for legal protection shifted as patent rights owned by foreign companies were largely mitigated through the wartime Industrial Property Rights Law. Even under these favorable circumstances, Japanese firms did not easily and automatically seize upon the business opportunities presented. In these sectors in particular, Japanese companies either had little accumulated technical knowledge or limited organizational capabilities to utilize the patents they fully comprehended.

Japanese entry into the chemical industries was especially difficult since the monopoly of technical knowledge and capabilities by foreign oligopolies was very great. The government played a critical role in transferring knowledge and developing indigenous capabilities. An important and typical case was the dyestuff industries where the government directly assumed a large leading role beginning in World War I. The report of the Research Council for Chemical Industries established in 1914 resulted in a 1918 law aimed at channelling private capital into the dyestuffs industry. The law established Nihon Senryo Kaisha (hereafter NSK) with the government guaranteeing private shareholders a dividend payout rate of 8%. NSK pursued a high risk strategy of diversified product development and led the process of import substitution along with a division of Mitsui Mining Inc. The latter company's dye strategy was highly specialized and avoided government pressure for greater diversification, but at the same time it failed to receive public subsidization [29]. The government's priority on increasing the variety of available dyes was essential for the successful implementation of the varied

export strategies and market penetration achieved by the cotton textile Sanchi as described above.

The government role was strategically significant in the case of soda ash. The core technology, an ammonia-soda process, was strictly monopolized by the Solvey Association, an international patent cartel. The Japanese companies had to develop their own technology relying only on the limited information publicly available through patents [6, pp. 180-1]. The Research Council for Chemical Industries also recommended public support for special national labs for the soda industries. Although the national labs were never established, the Research Council collected the available technical information and directly transferred this knowledge to Asahi Glass, thereby reducing its initial research costs.

Government-supported national labs played an important role in the synthetic ammonium sulphate industry as well. Ammonium sulphate was an intermediate product necessary for manufacturing nitrogenous fertilizers. The Special Nitrogen Research Laboratory (SNRL) was established in 1918 by drawing upon resources from the Tokyo National Labs. Relying on published material, and cooperating with domestic machine makers, the SNRL endeavored to develop its own domestic technology. In 1926 an experimental plant of one-half ton per day was completed and the lab thereupon curtailed its industrial research activities. The technology was made available to and adopted by Showa Hiryo, one of a second wave of entrants into the industry. Showa only paid the Tokyo Experimental Labs 10% of the net profit (after deducting for special reserves) which exceeded 10% of invested capital. The resulting payments were minimal as the formula left much room for manipulation [11, p. 54].

Drawing upon publicly supported research and development, Showa was able to reduce the initial costs of developing a less mature and risky technology. More importantly for the broader development of the industry, the technicians trained in this lab were thereafter hired by private companies, including not only Showa Hiryo but also Mitsui and Mitsubishi line chemical companies, as well as a third wave of new entrants in the early 1930s [29, 6].

How To Pay For Start Up Costs

In the 1920s, the start up Japanese chemical firms were faced with severe international competitive pressures. They often suffered large losses. Without established technologies, production experience, nor sufficient production volume to gain scale economies, the Japanese firms confronted cost disadvantages compared to their foreign rivals. At the same time, European oligopolists had divided the Europe and American market through an international cartel, and coordinated their penetration of the Japanese market. The resulting start up costs, can be summarized as the additional production costs incurred by the Japanese firms in excess of the market prices set by the first mover oligopolists. Sustaining these firms during their extended start up period was a large cost and the problem was who would provide the subsidization.

For three important chemical firms for which data is available, the subsidies came, in one case from the government, and in the other two cases from the Mitsui and Mitsubishi zaibatsu [21, 5]. When the Promotion law was enacted, it was expected that the government would provide a subsidy to NSK at the rate of 0.3 million yen per year, with an expected aggregate limit of 3 million yen over 10 years. But, subsidies exceeded these anticipated amounts and often were more than half of the company's revenues. The most important aspect of the state policy was that the subsidization made it possible for NSK to maintain a high level of R & D expenditures and at the same time rapidly depreciate its assets.

In the case of the zaibatsu line companies, the start up costs were paid by the surpluses generated in other businesses. In the case of Mitsui Mining, Dyestuffs Division, the dyestuff losses were covered out of the profits of its coal businesses. The large loss of the soda ash business of Asahi Glass was also subsidized by its principle glass business. Thus, a long term management strategy was realized by the Zaibatsu system. The "High Fixed Cost" diversification strategies of Mitsui Mining and Asahi Glass required a lengthy period of cross-subsidization within these zaibatsu affiliated subsidiaries. Within the zaibatsu ownership system, the top managers of the holding companies reviewed the operations of diversified businesses and permitted diversification strategies within their affiliated subsidiaries [21, 24].

General Trading Companies and the State: Transfering Technology, Coordinating and Protecting Technology Investments

Import substitution in chemical industries advanced gradually in the late 1920s and accelerated during the Japanese Depression, 1929-31. The most important factors in the import substitution process, in addition to government and zaibatsu subsidies, were tariffs and import restrictions, and also the relations between foreign and domestic cartels and general trading companies.

As regards dyestuff trade policy, import restrictions were imposed on German products in 1924 and were transformed to voluntary export regulation of German companies in 1926. In 1926 the tariff was substantially raised by changing from a value added basis to specific duties. The former aimed at low quality goods where domestic companies were competitive, while the latter aimed at the middle grade goods where I.G Farben had competitive advantages. In 1929 the subsidies to soda ash and indigo production, the latter being the the most technically difficult high volume dye to produce, were approved by the Diet in accord with the report of the Commerce and Industry Deliberation Council (referred to above) These subsidies were crucial for decisions to enlarge a soda ash plant using the solvey alkali process and for the entry of Mitsui Mining, Dyestuff Division into indigo production [21].

In the early Japanese chemical industries, cartelization became a precondition for the realization of scale economies. For instance, in the dyestuff industry in 1926, Mitsui Mining Inc. and NSK concluded a production and market sharing agreement whereby both companies specialized their products. Mitsui concentrated on aniline oil and NSK concentrated on aniline salt.

In soda ash and ammonium sulphate industries as well, the coordination between government policy and the activities of trading companies was essential for successful import substitution, especially where international cartels coordinated foreign competition. For example, the ammonium sulphate industry faced intense international competition because of world wide excess capacity and the government threat of an anti-dumping tariff influenced the course of negotiations among domestic companies, their trade association, and the European cartel, the DEN group.

Secondly, the general trading companies took the initiative in the negotiations with the international cartel and strengthened the terms in favor of domestic companies. In the midst of the depression, the general trading companies were able to organize and control the domestic ammonium sulphate market, allowing the Japanese domestic industry to treat foreign companies as a kind of "limited or marginal supplier for the Japanese market" [11, 27].

In the case of the soda ash producers, the trading companies provided strategic information that helped identify and set the terms for transferrable technology, and influence trade policy as well. For instance, when Asahi Glass tried to change its basic technology for synthesizing ammonium from the Honigmann technique to the Solvey process, the Mitsubishi Trading Company played an intermediating and coordinating role in the negotiation of Asahi Glass with H. Arlquivst. He had worked for the Solvey process companies, and enabled Asahi to secure the Solvey technology in spite of the otherwise tight control of the international cartel [5; 6, p. 187].

In the midst of the depression and severe price competition, Mitsubishi Trading Inc., London office, reported on ICI's cost basis and the strategy they expected to be deployed in competition with Asahi Glass [20]. On the basis of this information, it was determined that ICI's Japanese market price could be regarded as "dumping". Asahi Glass and Nihon Soda pressed the government to apply anti-dumping tariff rates against imported ammonium sulphate. The threat of increased tariff rates influenced ICI's strategy. Before the end of 1930, an agreement was reached with the international cartel on the Japanese market price at a level that would permit domestic companies to expand production. General trading companies, operating under sole agency contracts with foreign manufacturers, often collected and utilized such strategic information in similar ways to contain or favor their domestic affiliates relative to their foreign clients.

What can we learn from this story? First, chemical industry development was directly subsidized by the government. Second, government guidance increased the assistance provided to import substituting manufacturers by closely allied general trading companies. Third, government policies shaped the ways in which cartel agreements prtoected import substituting production and functioned to realize scale economies. Although the Japanese original public policies toward cartels was not based on anti-monopoly concerns, nevertheless the pro-cartel attitude was strengthened starting in the late 1920s. This policy shift changed the rules of the games defining competition between foreign and domestic firms. Third, the government closely monitored international cartel activities, especially to avoid production restriction agreements between foreign and domestic companies. In effect,

government policy supported the import substitution process during the depression, by inducing a shift in the attitude of general trading companies from an emphasis on their role as agents of foreign oligopolists to coordinators of the Japanese market.

Continuity and Discontinuity in Public Policy and Organization

The dual success of Japanese export expansion and import substitution is in marked contrast to the pattern of contemporary Newly Industrial Economies. As reported by Robert Wade and widely ackowledged, the NIEs development can be predomninately characterized as **either** export oriented **or** import substitution oriented [28]. The Japanese developed both "outward" and "inward" strategies, in a complementary fashion, if not simultaneously, at least with a high degree of overlapping and linked success.

The industry case studies focus on public-private cooperation. They acknowledge intra- and inter-industry policy conflicts, but do not focus on pressures resulting in conflict resolution or compromise based on individual managerial enterprises nor the state policy making process. Rather they sharpen the focus on intermediate organizations such as trade associations, district industrial labs, and trading companies, in order to "penetrate" and better comprehend the dynamic nature of private-public interconnections. The creation of both private and quasi-private intermediate organizations - zaibatsu affiliated diversified businesses, trade associations, cartels and labs - were critically important organizations for both coordinating firm strategies across enterprises operating with varying degrees of managerial autonomy and providing access for policy implementation through forums for consolidating or reshaping individual firm interests into state supported strategies.

In summary, one major reason for Japan's inter-war economic success was the effectiveness of emerging industrial policy and intermediate organizations which supported both "managerial" enterprises and small and medium size firms. Export expansion was subsidized by the planning and coordination of government-supported local labs and trade associations. Import substitution entailed industrial policy subsidization and administrative guidance for cartels and trading companies.

In the HGE, however, the vigorous investment policies of managerial enterprises were supported by a new intermediate organization, the corporate group or keiretsu. Cross shareholding of member campanies made it possible for member companies to implement long term strategies, limiting the influence of short term capital market pressures. The main bank system with reciprocal monitoring as a de facto form of syndication became a precondition for bank financed investment in manufacturing. General trading companies played an expanded post-war role, helping affiliated companies identify the developmental potential of and gain access to transferrable technology [1, 14, 9].

In accord with HGE industrial policy, import substitution and export expansion were extended into new sectors. Targeting policies signalled the most promising industries and thereby directed private resources. However, there were important discontinuities in policy and the role of intermediate

organizations between the interwar period and the HGE. If the Chandlerian managerial enterprise is understood as large scale, multi-divisional corporations coordinated by hierarchies of salaried managers under widely diffused ownership, then managerial enterprises first became dominant in Japan in the HGE. In the interwar period, the most developed managerial structures were within the small headquarters and subsidiary branches of zaibatsu affiliated enterprises. For the most part, relatively small companies tended to be specialized, and ownership was highly personal and concentrated. The emergence of managerial enterprises gradually progressed during wartime under the planned economy and dramatically advanced after the war especially as a result of the dissolution of the zaibatsu.

Post-war industrial policy in the HGE was far more encompassing and powerful than during the interwar period. The planned economy measures, including comprehensive resource allocation plans, import restrictions and financial allotments, were introduced in a coordinated fashion during wartime and further developed in the 1950s [12].

There were important changes in the role of intermediate organizations between the inter-war era and the HGE. As a result of legislative changes in line with American anti-monopolistic priorities, government support for trade association or cartel activity was restricted although still important. On the other hand, postwar intermediate organizations in financing and in vertically structured production relations, among both independent firms and tiered suppliers, were vastly expanded.

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