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A THEORY OF OLIGOPOLISTIC CORE AND COMPETITIVE FRINGE

—Japan's Wheat Flour Milling Industry—

by

Yoshio Satō, and Kōichi Itō

Preface

The purpose of this article is to clarify the relation of "oligopolists and competitive fringe members in the same sector" by analysis of the structure of Japan's wheat flour milling industry.

Flour milling is a typical industry in the sense that its big and smaller firms produce essentially homogeneous product, oligopoly and competitive fringe exist side by side therein and, a relation of peaceful coexistence and coordination between the core and the fringe is appearing. In these features the milling industry of Japan resembles that of U.S.A. So we take up this industry representatively for our study of the relation of core and fringe in the same sector.

In this paper structural analysis of the industry itself is not intended; the focus is placed on the proving of the theory and model of the core-fringe relation and on the elucidation of price leadership in partial oligopoly by the facts obtained through analysis.

I. Market Structure—Coexistence of Core and Fringe

1. Core and fringe

As of March 1974, firms in the industry count 221. The biggest concern (Nisshin Seifun: Nisshin Flour Milling Co.) holds a share (in output) of 33.9 per cent, the second big (Nippon Seifun: Nippon Flour Mills Co.) 22.4 per cent, the third (Shōwa Sangyo: Shōwa Industries Co.) 8.0 per cent and the fourth (Nittō Seifun: Nittō Flour Milling Co.) 4.2 per cent. Thus roughly 70 per cent of total output is in the hands of these four largest firms. The top two are national firms while the third and fourth are regional, yet Shōwa is a multi-line food producer (flour milling makes up about 22 per cent of its total shipment)

and Nittō is a large concern operating since before the War with Mitsubishi Shōji (one of Japan's two biggest trading companies), which is Nitto's sole agent. These big four constitute the "oligopolistic core."

The differences of share between these core-constituents and other firms are remarkable. The "others" may be divided into fringe A, group of some twenty firms (regional) of medium scale (share 0.5 to 1.0 per cent) and fringe B, group of some 200 small firms (local) remaining. Between A and B there are differences of capacity and market share, and each is organized separately.

The shares of the three groups are approximately 70 per cent for the core, 20 per cent for fringe A and 10 per cent for fringe B; hence we may call this structure as "bi-pole concentration type" with a heavy upper pole.

2. Basic conditions—characteristics of flour milling

(a) Food processing makes a big industry in most countries. In Japan also until 1968 it had been the largest industry (11.4 per cent of total manufacturing shipment). In 1970, however, its ranking is the fourth (10.4 per cent) following primary metals, electric appliances and transport equipment.

The percentage of flour milling shipment in the total food processing industry shipment has fallen from 9.0 per cent in 1955 to 3.0 per cent in 1970, reflecting the stagnating demand for wheat flour products.

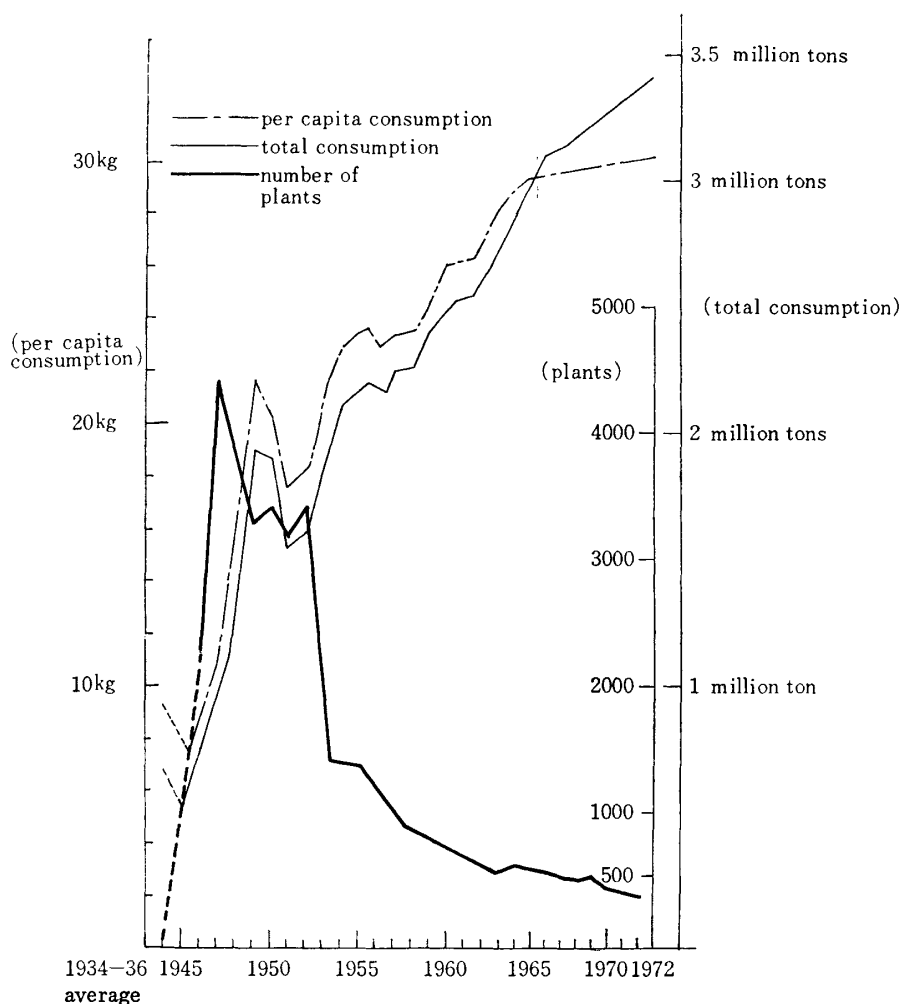
Annual per capita consumption of wheat flour is about 31 kilograms in 1972, only a slight increase since 1965 (see Figure 1).

In Japan the income elasticity of wheat flour has been positive, in contrast to rice, but nowadays its total demand may be said to have reached a plateau. And its price elasticity must be small since wheat flour products have become settled in the daily diet of the Japanese.

(b) Wheat is broken, ground and sifted into flour and bran. Flour is classified, according to the quality and quantity of gluten contained, into strong or hard type (for bread), semihard type (for bread and noodles) and soft type (for cake and biscuit). Again grades are given by color, ash content and protein level. The essential technological points are to raise the extraction rate (rate of flour to wheat), while maintaining the homogeneity of product quality.

(c) The wheat self-sustenance ratio of Japan has shown a drastic decline from 39 per cent of 1960 to 5 per cent of 1972. A little more than half of wheat imports comes from U.S.A. and the rest from Canada and Australia.

Wheat is completely subject to control by the government (Food Agency). The price for government's purchase of home-grown wheat and that for government's sale of all wheat are determined according to the calculation formula stipulated by the Food Management Law. The sale by the government is conducted on quota system. The Agency arranges the total volume of sale for each quarter, by which the upper limit of purchase for each quarter and the upper limit of purchase for each plant are decided on the base of production capacity and actual production (performance). Freight for wheat transport is

Figure 1. Changes in Wheat Flour Consumption and the Number of Milling Plants

Note: Total consumption is total production.

Source: Food Agency, *Shokuryō Kanri Tōkei Nenpō* (annual report); Nōrin Tōkei Kyōkai, *Shokuryō Jukyūhyō* (table on food supply and demand).

now paid by millers, but until 1971 it had been born by the government for the purpose of supporting smaller local firms.

(d) Wheat flour milling is unique as an oligopoly industry in that its raw material, wheat, is wholly placed under government's control while the selling price of its produce, flour, is left to free competition, and both the core and fringe deal with flour. Complexed administration and control systems are exerting various effects on the structure and behavior of the market.

Viewed from the angle of the small business problem, a remarkable phenomenon is that tiny firms have been eliminated in a large number (Figure 1, Table 1). A cause for this mass-weeding is that the economies of scale have come to work intensely in accompany with the increasing dependency on imported wheat. Another is that since 1966 the industrial modernization and structural

Table 1. Changes in Production Concentration Ratios, cumulative, 1937—1974

	1-firm	2-firm	3-firm	5-firm	10-firm	Firms	Plants
1937	34.6	64.9	71.7	—	—	ca 700	—
1949	20.6	36.5	40.3	44.6	48.6	ca 3,500	—
1950	18.7	—	38.8	42.6	47.8	—	3,094
1952	24.0	—	50.9	55.0	59.7	—	1,302
1954	27.9	—	54.4	60.0	65.3	—	1,304
1955	—	—	54.7	60.7	66.4	—	1,255
1956	28.0	—	54.8	60.6	66.4	—	1,081
1957	—	—	56.3	62.5	68.8	—	800
1958	28.0	49.6	53.9	59.8	66.4	—	782
1959	—	—	56.5	62.6	69.3	—	703
1960	30.8	53.4	60.3	67.3	73.9	—	622
1961	—	—	59.6	66.0	72.5	—	559
1962	30.3	53.8	60.2	66.3	72.8	—	535
1963	29.5	52.7	57.1	63.3	70.1	—	514
1964	29.3	53.2	57.5	63.1	69.5	* 415	487
1965	28.8	52.0	57.5	63.3	70.2	423	471
1966	29.0	48.8	56.9	62.6	70.3	* 402	480
1967	(28.2)	49.1	56.4	61.7	68.6	436	460
1968	(28.9)	50.3	56.3	61.6	68.7	* 334	425
1969	(31.0)	52.5	57.1	62.4	69.4	300	381
1970	(32.3)	54.6	57.9	63.6	70.9	* 240	346
1971	—	—	—	—	—	265	—
1972	—	—	—	—	—	256	—
1973	33.9	56.3	64.3	—	—	—	—
1974	—	—	—	—	—	221	254

Source: Materials of Fair Trade Commission, Food Agency, Seifun Shinkōkai, Nikkei Sangyō Shimbun.

Note: Figures in parentheses from *Tōyō Keizai Tōkei Geppō*, Mark * by Food Agency. other firm numbers from *Zempun Oroshi Jōhō* — unavailable.

reform program have been carried out under the cooperation of the miller circles and the government.

3. Market concentration

(a) Table 2 and Figure 2 represent the ratio of market concentration in the industry.

As for the production concentration ratio in 1937 (with firms counting about 700), the top two concerns (Nisshin and Nippun—Nippon Seifun is called thus) accounted for 64.9 per cent, and the big four 77.2 per cent (estimates by the performances of plants with five workers or more). The period immediately after the War saw a mushroom of small firms operating on the government's consignment system, and in 1949 the number of firms registered 3,500 with total output double that of 1937. Hence the shares of upper-ranking firms

Table 3. Data relevant to

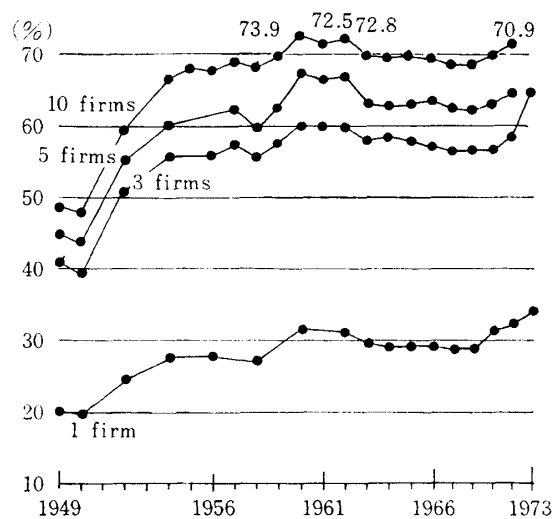
Plant size	Number of plants							Share of production (%)			
	1953	1958	1960	1964	1968	1970	1973	1958	1964	1968	1972
(tons daily)											
Above 200	} 44	} 59	} 66	38	38	39	43	} 76	67.9	68.8	70.8
100—200				38	42	40	61		18.1	19.9	23.0
(above 100 total)	(44)	(59)	(66)	(76)	(80)	(79)	(104)	(76)	(86.0)	(88.7)	(93.8)
50—100	29	69	66	70	67	37	39	14	11.4	9.9	5.5
20—50	68	151	93	64	33	17	13	8	1.7	0.8	0.4
Below 20	1, 121	412	312	237	177	121	98	2	0.7	0.6	0.3
Ordinary plant total	1, 261	691	537	447	357	264	254	100.0	100.0	100.0	100.0
Special plant total	0	12	22	24	24	24	23				
(total milling plant)*	1, 302	745	612	463	401	322					

Note: All values for end of year. Employees in parentheses are non-operative workers.

Mark * include milling plants other than wheat flour.

Source: Food Agency, annual survey on milling plants; etc.

Figure 2. Cumulative Concentration Ratios (1-, 3-, 5-, 10-firm ratios), 1949-1973



dropped. These small feeble firms began to decrease after the return to free selling of products (April 1952), causing sharpe competition; in this single year about 60 per cent of them disappeared (Figure 1).

Changes in the ranking of the top four may be summarized as below:

- ① The order of the biggest four has shown no change.

Wheat Flour Production

Rate of Production increase (base 1964)				Production capacity (%)			Operating percentage (%)			Employees	
1964	1968	1970	1972	1964	1968	1972	1964	1968	1972	1964	1971
100.0	118.4	125.4	130.0	54.9	58.5	[59.9]	56.5 150~200	60.1	62.8	6,091	6,172 (1,377)
100.0	128.7	137.1	158.5	17.1 (72.0)	19.1 (77.6)	[27.9]	43.6 100~150	61.6	54.3	2,004	2,901 (942)
(100.0)	120.5	127.9	136.0	[78.3]	[78.7]	[87.8]	(38.3)	(37.5)	(38.7)		9,073 (2,319)
100.0	101.8	64.9	60.4	16.3	15.9	[9.4]	24.7	24.7	27.8	1,450	625 (75)
100.0	53.1	34.7	30.6	6.7	3.3	[1.1]	11.6	10.8	17.2	495	145 (69)
100.0	90.5	61.9	52.4	5.0	3.2	[1.7]	6.5	8.7	8.9	938	580 (215)
100.0	117.1	118.6	124.9	100.0	100.0	[100.0]	12.6	48.0	53.9	10,978	10,423 (2,678)

② Among the four, the difference between Nisshin-Nippun and Shōwa-Nittō is large, and that between the four and lower-ranking firms is still wider.

③ The top two combined had a share of over 50 per cent by 1960, which has expanded further thereafter.

④ It is noticeable that the difference between Nisshin and Nippun is growing wider after 1965.

⑤ Among six firms lying next to the top four, the share differences are smaller than 1 per cent. The combined share of them rose between 1955 and 1960, stagnated between 1960 and 1965, and then has shown a slow-rising trend.

As to the shares of firms other than the top class, we can see from Table 3 : ① The share of medium-size firms with daily capacity of above 100 tons has shown a slight, but steady, growth since 1955; ② the share of the group of still smaller size (below 100 tons) has declined substantially (24 per cent in 1958, 6.2 per cent in 1972) being accelerated by mass elimination. In this group there is a wide gap between capacity share and output share due to operation curtailment.

II The Process of Formation and Reorganization of the Core and Fringe

1. Historical background

The prototype of core and fringe in the milling industry was molded with the introduction and foundation of the mechanized or modernized milling system.

By the moment of the increased bread production for military use during the Russo-Japanese War (1904~1905) and the swell of flour imports, a multitude of mechanized milling plants were established. The flour of mechanized milling became equal in quality and price with the imported flour, and conversion from stone milling to mechanized milling advanced. As the result, by around 1908 its output rose above the volume of imported flour and stone-milling flour. Such expanded capacity, however, turned to excess soon by the recession after the War, which led to business concentration and cartel agreements. The concentration progressed centering on Nisshin and Nippun, setting a foundation for the market domination by these two big firms in later days.

The sharp increase of flour exports and the rise of food prices during the First World War invited a favorable turn to milling business and entry of many small firms. Through this period and the subsequent business slump Nippun and Nisshin enlarged their shares—the former mainly by acquisition of smaller firms and the latter by internal growth, with their combined share of capacity reaching 37.5 per cent by 1914, 58.3 by 1921 and 82.0 by 1928. Already in the period through the 1910's and the first half of 1920's there was advancing the formation of that market structure with Nisshin and Nippun as the core, other several firms as the medium, and the rest being numerous small plants operating mainly in the wheat-growing areas. And again in this period large scale plants adjacent to ports were built by big firms in accompany with the increasing dependency on foreign wheat.

From 1920 to 1928 seven millers had a cartel agreement for curtailment of production, though confined to domestic markets, and at the same time big firms were connected with the *zaibatsu* trading firms due to export of flour to China Continent and import of foreign wheat. Furthermore, in 1930 a sales-syndicate was formed by Nisshin, Nippun and Mitsui Bussan (a *zaibatsu* trading firm), in which some medium millers participated. In the period from 1939 to the end of the Second World War the procurement of wheat and the sales price of flour were placed under government's regulations, reaching at last overall control—the consignment processing system.

All in all, the historical inheritances to the industry are (1) that the foundation epoch of modernized milling was at the same time the formative epoch of monopoly, (2) that the restraints of competition—coordinated actions—were manifestly conducted surrounding the oligopolistic core, and (3) that the governmental control has been maintained as long as nearly forty years up to the present.

2. Concentration-Process—facilitating factors and restraining factors

The basic and most effectual one of the concentration-facilitating factors is the economies of scale. Taking daily grinding capacity (tons) of one milling unit for the indicator of scale, various data show that a 200-ton per day scale is the technologically optimal size. The economies of scale, however, work better

at a plant having multi-milling units because it helps save costs for switching from one mill to another according to the types of wheat or flour. Especially in Japan, with numerous flour brands and large dependency on various imported wheat, two mills at least are required for one plant, and in this sense the multi-milling unit plant has a high degree of scale economy. (The plant with the largest number of mills is the Tsurumi Plant of Nisshin). Due to such effect of the economies of scale the difference of labor productivity by plant scale is remarkable. So, were it not for the quota system of wheat, the concentration of production would have been much accelerated.

The scale economies of firm are still more important. The multi-plant organization of major concerns (Nisshin has 17 plants, Nippun 11, Shōwa 4, and Nittō and Karakida 3 each) gives such advantages as division of work among plants, development of techniques and markets, and product differentiation (brand loyalty).

As the factors restraining concentration, to speak generally, the geographically scattered markets and the variety of demand may be mentioned. True, in those days when wheat of substantial quantity was grown domestically, it was necessary as well as advantageous to locate plants in the wheat production areas. However, as the result of the sharp rise of dependency on foreign wheat and the rapid growth of large customers, i.e. users of wheat flour, plants in the wheat areas, mostly medium or small, were driven to a decisively unfavorable position, while plants adjacent to ports became appreciably advantageous. Wage differences by firm scale and its location were a condition to sustain the existence of medium-small firms.

The most prominent restraining factor, which prevented a straightforward advance of concentration and enabled smaller firms to survive was the control (=quota system) of wheat. Although the shift of weight in the base of quota from capacity to actual performance worked to promote concentration, some quantity of wheat was guaranteed to smaller firms insofar as they had actual output above a certain level. Thus, their sustenance was institutionally protected. The freight paid by government also helped their survival.

3. Process of merger movement

The merger and acquisition movement began with free transfer of quota between firms and between plants of the same firm, effected in October 1958 by the government. For the aim of installation and expansion of plants, acquisition of existing firms receiving quota was advanced.

In 1966 the Small Enterprises Modernization Promotion Act was applied to the industry. According to the basic program of modernizing the milling industry, the aims were to dissolve various differences between big and smaller firms, to improve productivity of the industry as the whole, to check price raise of flour as a staple food by absorbing increasing cost, and to reinforce competitive position at home and abroad. Its outstanding feature is the provision that

Table 4. Changes in Number of Plants and Capacity, March 1966 to June 1971

	Below 20 tons		20~50 tons		50~100 tons		100~150 tons		150~200 tons		Above 250 tons		Total	
	March 1966	June 1971 A B	A	B	A	B	A	B	A	B	A	B	A	B
Number of plants	248	119	59	17	84	50	39	46	12	14	38	40	480	286
Ratio (%)	51.7	42.6	12.3	5.8	17.5	17.2	8.1	15.8	2.5	4.8	7.9	13.8	100.0	100.0
Change		△48		△29		△34		⊕7		⊕2		⊕2		△194 -40.4%
Capacity (tons)	1,381	571	1,754	469	5,658	3,509	4,576	5,485	1,930	2,343	16,287	17,642	31,586	30,019
Ratio (%)	4.4	1.9	5.6	1.5	17.9	11.7	14.5	18.3	6.1	7.8	51.5	58.8	100.0	100.0
Change		△810		△1,285		△2,149		⊕909		⊕113		⊕1,355		△1,567 5.2%
△ 4,244 tons														
⊕ 2,677 tons														
Application for closure consolatium, plant	number	107	35	24	4	0	0	0	0	0	0	0	170	170
	capacity	697	1,043	1,491	449	0	0	0	0	0	0	0	3,680tons	3,680tons
ditto, firm	number	107	35	23	3	1	1	1	1	1	1	1	169	169
	capacity	679	1,043	1,489	344	157	157	157	157	157	157	157	3,712	3,712

Note: Decreases in plants are adjusted for closure irrelevant to consolatium. ⊕ increase, △ decrease.
Source: Seifun Shinkōkai, Seifun Shinkō, No. 55.

millers should accumulate a sum equivalent to a certain percentage of disbursement to purchase wheat as contributions to the Milling Industry Development Foundation, by which the modernization work is to be performed. Since the amount of this contribution is taken account by the government in deciding the sales price of wheat, the expenditure of millers is unaffected. Only after paying the contribution, purchase of wheat is to be approved. In essence this measure was modernization of this industry by public funds (Food Management Account).

The work of modernization involved foundation of new plants on suitable production methods, construction of joint silos adjacent to ports, introduction of equipment for rationalization, and grant of money assistance or solatium to shutdown plants. The main task may be said to have been fostering of plant closing. Through this artificial-political reform of the market structure 169 plants out of 480 (about 35 per cent), 5 per cent of the industry's total capacity, disappeared (Table 4).

Thus by the modernization policy the competitive fringe has been contracted and reorganized, leaving a limited number of efficient fringe producers around the core. Nowadays the relations between core and fringe have entered a new phase, a process of reorganization from competition to industry stabilization.

III Competitive Aspect between Core and Fringe

1. Sales outlets and price differences

(a) When selling of flour was freed from control in 1952 miller firms were compelled to build their own sales network. The most effectual way was to organize influential wholesalers in the form of "sole agent." Nisshin immediately organized those prominent wholesalers with whom it had had business connections before the War. Nippun has now close relations with Mitsui Bussan, and Nittō with Mitsubishi Shōji. Medium and small millers are carrying marketing through wholesalers and trading firms, which are, however, inferior in power to those of big millers. Herein lies the difference of competitive power between bigs and smaller.

(b) The intense sales competition and the difference of sales potentiality are reflected in the difference in price. Products of big plants are sold at higher prices than those of smaller firms. Particularly noticeable are the relatively low prices for the plants of 100- to 200-ton class (daily output).

The actual picture of sales competition may be outlined as below: ① Big firms have network of sole agents comprising the most powerful wholesalers all over the country, assigning the latter certain monthly norm based on their own sales programs. ② The main tactics for medium-small millers are to increase wholesalers' margin and to accept trade credit bills on longer term. ③ If a miller conducts price cutting even slightly to adjust his stock, it is exaggeratedly circulated among the circle. ④ When customers of a firm are pulled out by some others' price cutting, the firm at once takes countermeasures by price cutting or

bill acceptance on longer term. Thus it has been a repeated case that only a little price cutting causes wide-spread price cutting and bill acceptance on longer term.

⑤ Not only smaller millers but also big ones conduct price cutting now and then. ⑥ Rebates to users, a popular practice in trade, provide a means of competition.

The fundamental cause of crucial competition lies in the stagnant business and excessive capacity, which lead to struggles for acquiring users (counting 24,000 in the country), resulting in buyer's market. In addition, since competition takes place in the situation of the established linkage of miller-wholesaler-user, it necessarily takes form of price-cut competition.

2. "Aligning the flour users" and "small customers"

(a) Bread, noodles and cake account for 86 per cent of all uses of flour. Table 5 exhibits changes in the composition of output by plant (firm) scales and uses. Demand stagnation for noodles and steady growth for bread can be observed.

Big millers' position is superior in bread and cake-biscuit while medium-small millers are still strong in noodles. The position of medium millers in bread is slowly rising. It is said that their efforts of expanding their share in bread-flour is giving a spur to price-cut competition.

(b) Changes on the side of users. The most fierce point in the sales competition between big and medium-small firms now is that, corresponding to the concentration and advances to bigger scales of production, alignment or linkage—a kind of vertical integration—between millers and users is in progress.

① There have been many cases that millers or wholesalers help users to invest necessary money for enlarging plant or expanding production (typical is bakery). Users change their suppliers of flour to those millers who provide them various favorite conditions (e.g. credit, help for finance, capital participation, etc.).

② Miller firms themselves, however, have not sufficient capital power or financial ability to satisfy users' demands fully, so there appears intervention by large trading firms. These traders, in exchange for financing to flour users, ask for purchasing of flour from big millers with whom they have the relation of sole agent. Moreover, as in the case of *instant rāmen* (China-style noodles readily cookable), traders often come into omarketing the users' products.

③ This alignment is a way of competition being actively employed among big and medium millers. This move is remarkable not only for bread and cake makers but also for noodle makers today who have been the principal customers of small millers.

(c) A kind of differentiation, so to say, is being intensified in the market competition between the core and fringe. That is to say, because of the alignment between big millers and major users, it is very difficult for medium-small firms to make inroads into the market of leading firms. On the other hand, the

Table 5. Changes in Wheat Flour Production by Types of Flour (1,000 tons, %)

	Firm Size	Bread-Flour			Noodle-Flour			Cake-Flour			Total		
		Production	Ratio	Change over 1966	Production	Ratio	Change over 1966	Production	Ratio	Change over 1966	Production	Ratio	Change over 1966
1971	Big 4 total	753	68	10.9	672	57	- 4.1	319	69	6.3	2,133	67	10.5
	Above 100 tons total (ex. big 4)	314	28	35.9	432	37	37.1	124	27	17.0	904	28	22.5
	Below 100 tons total	38	4	-49.3	76	6	-56.1	17	4	-60.5	152	5	-53.5
	National total	1,105	100	12.2	1,180	100	- 0.8	460	100	2.4	3,182	100	6.2
	(Ratio)		(34.7)		(37.1)		(14.5)		(100.0)				
1966	Big 4 total	679	69	30.8	701	59	23.9	300	67	33.3	1,930	64	32.8
	Above 100 tons total (ex. big 4)	231	23	50.0	315	26	42.5	106	23	58.2	738	25	47.0
	Below 100 tons total	75	8	11.9	173	15	-10.4	43	10	2.4	327	11	- 3.5
	National total	985	100	33.1	1,189	100	21.3	449	100	34.3	2,995	100	30.5
	(Ratio)		(32.9)		(39.7)		(15.0)		(100.0)				
1961	Big 4 total	519	70	-	566	57	-	225	67	-	1,453	63	-
	Above 100 tons total (ex. big 4)	154	21	-	221	23	-	67	20	-	493	22	-
	Below 100 tons total	67	9	-	193	20	-	42	13	-	339	15	-
	National total	740	100	-	980	100	-	334	100	-	2,295	100	-
	(Ratio)		(32.2)		(42.7)		(14.6)		(100.0)				

Note: Total production includes produce for industrial, home and miscellaneous uses.
 Source: Food Agency, annual survey of milling plants.

latter could deprive the former out of the markets still further. Thus the competition between the core and fringe is "one-way traffic" and a "competitive cleavage" is obviously seen.

The field where the core-fringe competition is most intense is on the fringe of market, that is "small customers." This means those sectors of small users or particular areas where alignment is not yet formed.

(d) Amid the stagnant or slowly-growing demand for flour, the managerial efforts of miller firms have been directed to diversification of operations.

The product lines of the big four are as follows. For Shōwa the percentage of flour milling is traditionally small, main efforts being made on oil-fat and feed. In Nippun and Nittō the weight of milling is still large (about 80 per cent). Nisshin, while maintaining its position as the largest miller, has gradually lowered the weight of flour (67.7 per cent in 1964, 49 per cent in 1973) with expanding feed rapidly. Medium and small firms are also striving for diversification yet the weight of flour is still large. Thus again, as for diversification the difference between the core and fringe is wide.

Even with the competitiveness being maintained to an appreciable extent, differentiation of competition and inter-firm differences have become clear, which in turn are producing grounds for industry stabilization.

IV Coordinative Aspects of Core and Frings

1. Coordination and splits

(a) While displaying intense competition, the flour milling industry is on the other hand pursuing industry stabilization and coordinative behavior under the initiative of the core. Such coordination, however, has been accompanied by occasional splits, causing many cases of conflicts in the industry.

As one of the most important coordinative actions, we shall examine in the next section "price leadership in partial oligopoly." Here we take up several points which make the bases of coordination. To summarize beforehand, in the process of confining the competitive fringe members to the limited share of market, the coordination has grown stronger, hence maturing to a unique oligopolistic industry.

(b) Basic interest, the core and fringe have in common, is the governmental control on wheat and its sales price. Especially as to the request for lowering the sales price of wheat (when it was higher than the international price) concerted actions were always shown by the two sectors. As regards the control itself, although arguments for liberalization were active sometimes, the circles as the whole made no appeal for its removal. Thus the interests of both have been common on the control in general, yet the two are divergent concerning concrete control measures (quantity of quota, method of allocation, etc.).

Split on the alteration of allocation method: Big and medium firms, intending share increasing, advocated that only actual performances of production be

the base of quota and they were successful in realizing this, but smaller millers insisted on capacity base. They wished to keep the "vested rights" to receive wheat quota by the fact that they have capacity (equipment) even if production performances might decline. Also as to the charge of freight of wheat the big accepted bearing it, but the small moved to keep the charge on government because of its location. Being surrounded by these alterations of the allocation method, small mills fortified their consolidation.

Split on the total quantity of government's sale of wheat: The big, expecting share enlargement, wanted expansion of the total volume of government's sale. The smaller, holding that the cause of business instability lay in the excessively large amount of total sales, demanded its curtailment.

(c) One of the largest fruits of coordinative actions was the mass weeding of petty plants by the application of the SEMP Act mentioned above. The core and fringe fully cooperated in shaking off by a political measure the marginal fringe firms which had been an actual and potential market-disturbing factor, and this was accomplished by the Food Management System.

2. Organization and behavior of trade associations

The conducts of the core and fringe, both coordinative and disruptive, were represented as moves by group types.

(a) Flour Millers' Association: This may be said the trade association of millers composing the core and the fringe A. Its members in 1966 were 52 firms, 84 plants. The aggregate daily capacity was said 70 per cent of total industry capacity; the share in the actual purchase of wheat 87 per cent. The member firms at the latest time count 37, comprising the big four and medium firms. The principal tasks are adjustment of wheat quota and connection with government agencies. Insofar as purchasing of wheat is concerned, the top four and other members are united, but on other matters there is a split between them. The latter group felt it necessary to take independent actions and started another organization while remaining in the Association.

(b) National Council of Flour Millers: This may be regarded as the organization of the fringe B. The members—medium and small millers—numbered 162 firms at its highest in 1966, but then have decreased to 84 at the present due to shutdown and other causes. This is also a wheat organization, acting as the channel of wheat quota allocation and thereby purporting to protect the interests of smaller millers. For these aims they hold such programs as adjustment of the quota bases, preferred acquisition of domestic wheat, avoidance of excessive competition, stability of flour price, lowering of wheat price, prevention of slanderious propaganda on small millers, measures for export, etc. Yet there are small millers who do not join even this organization, remaining as outsiders.

(c) Milling Industry Development Foundation

When the SEMP Act of 1966 was applied to this industry, this Foundation was set up as the organ for accumulating funds for modernization. Its main

task is promotion of modernization, especially the delivery of solatium for plant closure, and additionally popularization of wheat flour products, improvement of technology, management, and research are involved. It is not a wheat association but an organ for adjustment around modernization for the circles.

On the base of the above-explained split-involving coordination, there appears the "partial oligopoly price leadership" as the behavior among the opposing groups and organizations.

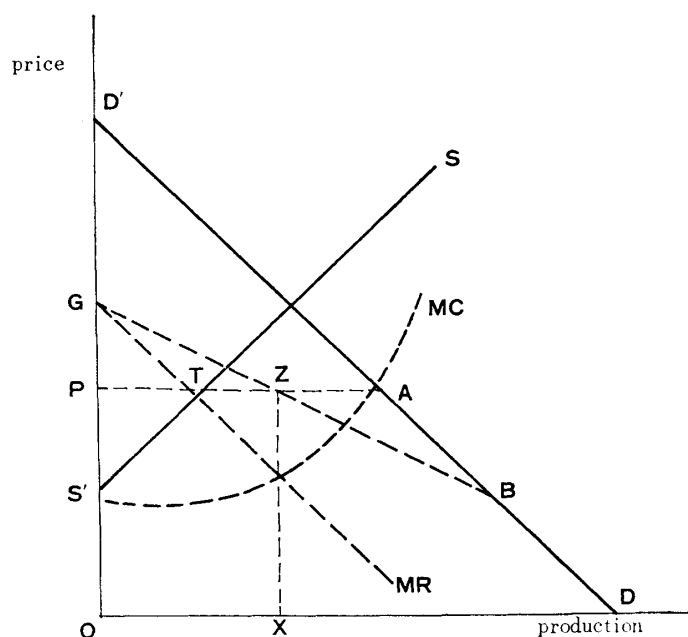
V A Model of Price Leadership in Partial Oligopoly

1. Price and output determination by core and fringe

(a) In the market structure consisting of core and fringe, the equilibrium solution of the price and output determination of the two can be obtained by transforming the explanation of the so-called "dominant firm price-leadership." That is to say, assuming presence of solid coordination within partial oligopoly, let a single dominant firm represent this partial oligopoly group. Other fringe firms are taken as a group. It is presumed that between the two groups lies a certain amount of difference of average cost level, in which the dominant firm (oligopoly group) is lower than the other group (fringe firm group). And since an equilibrium solution is concerned, the price levels of the two are assumed to be equal. This model may be explained in various ways but we shall use a graph of the simplest form.

(b) In Figure 3, $D'D$ represents the overall market demand curve, and

Figure 3. Equilibrium under Dominant Firm Price Leadership



F. M. Scherer, *Industrial Market Structure and Economic Performance*, 1970, p. 165.

S'S the supply curve for all members of the competitive fringe (the total of each fringe producer's marginal cost curve).

At price OS' the competitive fringe cannot supply; at price OG they provide all the output. Actually the price will be settled between OS' and OG, and the fringe supply will be determined in accord with it. So the dominant firm's effective demand curve becomes the kinked curve GBD, subtracting the amount supplied by the competitive fringe from the total demand at a given price.

Given GB, the dominant firm derives its marginal revenue function MR. It can maximize its profits by producing the output OX where its MC curve equals MR, and at the corresponding price XZ (where OX equals CB) = OP.

As the result of the determination of OX and OP by the dominant firm, the demand curve facing the fringe group is supposed to be the horizontal line (PTZA). Assigning T for the intersecting point of this horizontal line and the supply curve S'S, PT shows the fringe's supply.

Since the dominant firm supplies at price OP, at which total supply and demand keep equilibrium (OX = PZ), the residual ZA (subtracting PZ from PA) will be the supply of the fringe group. Hence, the above-said PT equals to ZA.

Thus the dominant firm determines the price OP and the supply OX = PZ, and the fringe group provides ZA = PT. The supply and demand in the market attain equilibrium at PA.

(c) This solution stands on the following assumptions.

① The dominant firm pursues profit maximization with a given demand function and a cost function of its own.

② The dominant firm can measure the supply curve of the fringe group, and the demand function and cost function of its own.

③ At the same price, both the dominant and the fringe produce homogeneous products.

④ With the price determined by the dominant firm as given, the fringe group expands output until its short-run marginal cost equals to the price.

(d) Next, we shall examine the possibility of split between core and fringe, confining our aspect to the relation with the model of the dominant firm price-leadership.

① There is no possibility that the fringe group may sell at a price above the level determined by the dominant firm, losing its market.

② It is quite possible that the fringe may sell at a price below the level determined by the core. If the core judges that such lower price sales by the fringe may lead to the fringe's share expansion, the core group will take retaliative measures at once. For the core it is possible to lower its price below the fringe's cost level and thus to expel the fringe. The latter, for fear of various destructive means the dominant would take, usually follow the price setting of the latter.

③ However, in such case as the market share is already established between

core and fringe, and consequently there is born a kind of product differentiation or a cleavage in competition, the core will allow the fringe's lower-price sales unless it causes redistribution of market shares. In this case crucial price-cut competition becomes inevitable among the fringe firms. To those firms that can barely obtain "normal profits" even at the price level determined by the dominant firm, such destructive price cutting would mean suicide. All in all, there will be generated a sort of harmonization within the fringe, judging that it is the better way to follow the dominant.

④ In periods of business stagnation or recession, the fringe group will want to sustain operation at the highest level of capacity by means of price cutting. The dominant firm will be inclined to follow suit also. In the case of prolonged stagnation, since the price-cut competition between core and fringe may worsen the whole industry business conditions, price raising under the core's leadership will be desired sooner or later. By such requirement, coordination by the two should be accelerated.

⑤ When the market is rather dull and production costs are increasing (incl. miscellaneous expenses) the fringe firms are particularly pressed to the need of price raising. However, since they cannot take initiative in such move, the core's leadership will be wanted. In this case if overall coordination is lacking among the fringe group, and some firms do not agree price raising, confusions will arise inside the group (or sometimes in the whole industry including the core). Then again stability and coordination will be required sooner or later.

To the milling industry the last-mentioned case seems most probable. Indeed in this industry there have been exhibited many plays (or dramas) of price amendment or raise one after another on account of cost increases, while room for productivity improvement being narrow.

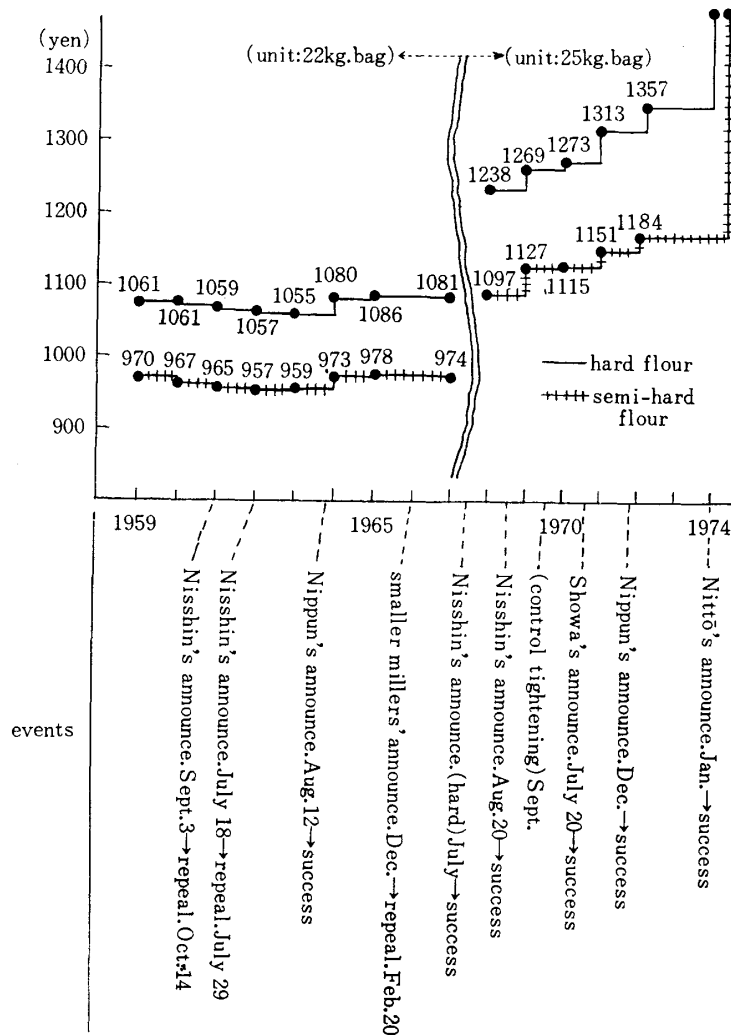
2. The price amendment drama

Figure 4 presents the moves and amendments of flour price in the past. Below we shall review the outline.

(a) The price raise movement of 1960-61 was fired at its fuse by Nisshin, which, however, was repealed sooner than a month on the request of the Head of Economic Planning Agency. In August 1963 Nippun started a move, other firms followed it, and the price raise was accomplished (raise of 30 yen per bag, 2.2 kilograms).

(b) The amendment conducted between the end of 1965 and the beginning of next year was a little more complex. In November 1965 the National Council of Flour Millers (association of smaller millers) announced a raise of 35 yen per bag. Big millers did not follow it at once but took the same step in January and February next year. However, since the Prime Minister had stressed price stabilization as his preferred policy on the Diet, this raise was obliged to be withdrawn on the strong request of the Administration. This event produced the following by-products.

Figure 4. Shipping Price of Wheat Flour



Source: Prices by Food Agency,
Shokuryō Kanri Tōkei Nenpō

① The big millers' hesitation to follow the fuse-firing by medium-small millers produced bad faith among the latter.

② As a compensation to the repeal of price raise the SEMP Act was exceptionally applied to this industry as mentioned already.

(c) The 1968 price raise succeeded. In July Tokyo Seifun (a medium scale producer) announced a raise of 50 year (per bag, 25 kilograms), and in the next month Nisshin raised by 2.5 per cent on average, being followed by Nippun, Nittō and Shōwa. As the reasons for this raise Nisshin explained as follows. "① The price has been substantially pegged since 1963. ② Business efforts to absorb cost increases for production and distribution have reached a limit. ③ Despite our request of lowering the wheat price, the government raised it this year in succession to the previous year. ④ Since flour consumption is stagnant since 1966, absorption of deficits by sales increase is impossible."

The responses of flour users and wholesalers to this price raise are interesting. We can read following words in a business paper of the industry. "Some makers say, 'please purchase our products since we do not raise.' So the said business crisis is groundless. Such divergence in flour prices may result in wider confusion among users. Opportunist millers are troublemakers."

(d) The raise of 1970 also had a success. Firstly Shōwa announced it, Nippun and Nittō followed next day and Nisshin three days later. Later on smaller millers over the country followed. This time the complicated expression appeared. The announcement of Shōwa was "a raise of 3-odd per cent for business use (49 yen per bag)," which did not include the increase in wholesale costs. So, for users purchasing through wholesalers the raise contains the announced rate plus increase of wholesale costs. As a business paper wrote, "This is an epoch-making event in that there were no oppressions by the government, and in addition wholesalers resolved to secure their increments in costs concurrently with millers. Supposedly it was rendered possible by *the sympathetic understanding* of the Food Agency. The new raise has permeated into the miller circles exceptionally speedily, which may have been derived from its merits to wholesalers and the earnestness of smaller millers. This seems to tell the standstill in their business."

(e) The noticeable points shown in the above-described price-raise dramas may be summarized as below:

- ① Price amendment is affected by the intervention of governmental policies.
- ② Sympathetic understanding of the Food Agency is necessary.
- ③ Amendment may fail if beforehand lobbying is insufficient.
- ④ As a general view of the circles, Nisshin's cooperation is the most essential.
- ⑤ Through the several experiences, actings for amendment made progresses, for instance, from the formula of "per bag" to "percentage on average," or separation of wholesalers' costs.
- ⑥ Typical actings of price leadership were seen in that, while obviously having tacit agreement, the circles selected a suitable fuse-firer according to circumstances, to whom they followed soon.
- ⑦ Even if some organization of medium-small firms or its members started the play, the result would be a failure unless major firms follow it.
- ⑧ Barometric price leader, so to speak, is practically one of the top four.
- ⑨ Price amendment concerns "list price." It is another story whether actual selling prices are the same with it.
- ⑩ To speak generally, the width of price raise is narrow but its frequency is increasing.

(f) Actual situations after the amendments are hard to grasp precisely. It seems, however, that in a few months after the price changes collapse arises. Complaints emerge among millers, wholesalers, and users about confusions of price, and then the opinion leader of the circles takes part of persuasion. This is called "tightening the control over market price." The relation between price

raise and such tightening is delicate. The case of 1969 is a typical one. Nittō informed to its sole agents that the falling selling price be pulled up to the announced list price, and this was followed by Nippun and Shōwa on the next day and later by Nisshin. This step of tightening, instead of raising, was taken because a further raise on the stage of falling price was expected to invite a price rise in processed goods and to give a spur to the dullness of demand.

3. Results of the partial oligopoly price leadership

(a) The mode of coordination, repulsion and adjustment exhibited in the price amendment dramas is just the phenomenal pattern of competition and coordination by "core and fringe." And the success in the price amendment suggests the intensifying aspect of coordination.

Under such conditions of flour milling as the determination of wheat price by the government, slow growth, low ratio of value added, keen competition, buyer's market and scanty room for productivity improvement, industry performance has been worsened by increases in labor and other costs for both big and smaller firms. Obviously such hardship is stronger on medium-small millers (due to higher costs). However, it is desperate to realize price raising by this group alone. So, leadership by big millers is expected.

(b) Price raises inevitably produce confusions. Yet a raise would enable marginal firms to cover rising costs for a while. By it big firms can operate relatively more favorably (higher profits may become obtainable, if not excess profits). Insofar as the benefits of price raising are common to both groups, coordination can be successful. And without it, fringe (= marginal) firms cannot sustain themselves.

(c) Price raising refers to the list price of big millers, to which firms of smaller scale follow. Confusions arise by intense competition, and so tightening of control becomes necessary. These practices differ from price agreements involving penalty, and also from tacit agreements between a small number of oligopolistic concerns. They are a kind of agreement in that negotiation on the back-stage (comprehension of users, sympathetic understanding of the Administration or approval of various forces of the circles) is presupposed, but they do not amount to a solid agreement because of the side-by-side existence of core and fringe.

On the other hand, that confusions can be settled, by control tightening, tells growing consciousness on the common interests of the circles, and it may be said that the "tacit agreement" is yielding actual fruits. The price leadership and price raising in such form are difficult to be regulated by the Anti-monopoly Act (Act concerning Prohibition of Private Monopoly and Maintenance of Fair Competition) because evidence of "agreement" is slender. There is a fact, however, that in August 1956 the Fair Trade Commission gave a warning that the list-price raise in spring of that year was suspected to be a violation of the Act.

(d) By contrasting the actual state of the price leadership in the milling industry with the above-explained model, the following points may be mentioned. ① The price elasticity of demand is small. ② Since the wheat price of the same brand is uniform being subject to government's control (though with difference of freight) and the output and capacity of each plant are known, cost functions are easy to measure empirically. ③ The quota system of wheat defines the share between core and fringe. ④ Between core and fringe firms, and within each group, differences of costs and managerial ability are large. ⑤ Although wheat flour is a homogeneous product, in Japan particularly a kind of product differentiation is working due to famous brands, marketing routes and alignment, and hence price differences are growing between big and smaller firms. This does not imply that the fringe members do not follow the price level set forth by the core, but do so keeping the price somewhat below that level. ⑥ Since demand is in a state of plateau, the price (list price) raised by coordination is always exposed to disturbance. Especially the fringe firms, desiring expansion of production and sales to the full extent of capacity, are apt to run into price cutting. ⑦ The mass-weeding of tiny plants in recent years suggests that the structure of "two-pole coexistence" is still on the way to completion.

(e) The price leadership shown in the price-raising dramas is not a natural phenomenon. It is a condensed phenomenon of competition and coordination within the market structure of milling.

However, it is not correct to assume "oligopolistic excess profits" *a priori* from the evidence on interdependent market conducts. True as the multiplied effect of many factors (such as stagnant demand, competition by a multitude of enterprises, indirect control on flour price by direct control on wheat), on one hand interdependency is intensifying, but on the other competitive price setting and low profits are being resulted.

At the same time we must not overlook the fact of oligopolistic market domination, being dazzled by the existence of numerous fringe firms and sharp competition. The coexistence of core and fringe is made possible only because the latter lies under the umbrella of the former, and is woven into the domination by the core. The wheat control system is making the ground to support the coexistence, though as a result.

VI Conclusion

From the above observations on the flour milling industry, typical form of oligopoly and non-oligopoly within a sector, we should like to make some tentative summarization along the theory of "peaceful coexistence of core and fringe" mentioned at the beginning of this paper.

(a) As a matter of course, the absolute number of enterprises is directly proportionate to competitiveness and inversely proportionate to coordinativeness. When seller concentration to big firms advances under stagnant markets and

dull growth, marginal firms are shaken off. Such weeding by the normal competition process is difficult, due to the control in this industry, so it has been performed under the name of modernization. The result is, letting alone the improvement of efficiency of the industry as a whole, reorganization of the coexistence of core and fringe.

(b) Even if diminishing of firms has been attained by mass-weeding, competitiveness and confusion are not excluded. In this industry the weighty upper pole, with the share of core reaching 70 per cent, tells that the condition is fulfilled for the core to bring about stability to it.

(c) Product differentiation does hardly arise for such commodity as flour which is homogeneous and almost wholly used as intermediary goods. (Actually there are some problems concerning differentiation as mentioned already). In milling there is little room for specialization by technological speciality. (Some special flour is produced but now negligible under the mass-production of final products). In an industry with negligible product differentiation competitiveness is intense over the whole industry including core and fringe. Price competition is dominant.

(d) In the back-scene of coordination in milling, there is the lack of new entry in a large scale due to the dull growth of demand and the established oligopoly. In those industries rapidly expanding production, competitiveness would work far more intensively inside both its core and fringe and between the two.

(e) Milling lies under a particular condition that its raw material, wheat, is subject to control. This condition has affected rather on the side of the fringe, but the control has brought success to modernization—mass weeding. It seems that in an industry free from such special condition, the logic of oligopoly of today would be more clear.

(f) Lastly, J. S. Bain has said about the American milling industry that nothing much about performance could be inferred *a priori* from the evidence on conduct alone. In other words, he mentions milling as an example of competitive pricing and of low profits due to the low seller concentration, whatever the market behavior might be.

Indeed as for Japan's flour milling also this aspect is observable as a result, but the particular factor of indirect regulation of flour price through direct control on wheat (both quantity and price) should not be overlooked. Of course the stagnation of demand and competition among numerous firms are factors common with U.S.A. If such factors were absent and closer coordination existed between core and fringe, it would be a stronger oligopoly industry with the fringe.

(g) From the relation between oligopolistic core and competitive fringe in the same sector, milling industry, we can observe the advancement toward the coexisting system of core and fringe, containing various conflicting phenomena.

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