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SIZE DISTRIBUTION OF SHAREHOLDINGS AND MANAGERIAL BEHAVIOR IN GROUP OF FIRMS

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This paper aims to examine a relationship between ownership of a firm and business behavior of it, especially between cross-tie ownership by a group of firms and goal of such firms. It is supposed that as for firms characterized by owner control¹⁾ which I will call owner-control firms they run the business in an effort to maximize dividends of shareholders with a profit-maximizing motivation as a precondition of their behavior, and that as for firms characterized by management control which I will call management-control firms they try to realize a variety of objects, getting rid of intervention by owners of the firms as well as dealing with constraints by shareholders.

Groupings of firms are dividend into two types. The one is called large six groups, namely Mitsui Group, Mitsubishi Group, Sumitomo Group, Fuyō Group (or Fuji Group), Sanwa Group, and Dai-Ichi Kangin Group, while the other is called independent groups, including Shin Nittetsu Group, Toyota Group and Hitachi Group. The former is characterized by cross-tie ownership; in other words, fairly large parts of shares of each group member firm are mutually held by other firms belonging to the same group. Meanwhile, the latter is the pyramidal type group in the sense that large parts of shares of a firm of a group are held by the giant firm of the group at the top of a pyramid; therefore, we can say that members of independent groups are owner-control firms.

Each of the large six groups has a presidents' club as the decision-making body. In many cases most of large shareholders of a member firm are other firms belonging to the same group. Accordingly, representatives of this firm are at the same time these large shareholders. Namely, the president's club represents virtually the largest shareholder. If the management of this firm is influenced by the will of the president's club, this firm may be called owner-control firm. If a dividend-maximization policy is required of the firm manager by the presidents' club in the capacity of a

¹⁾ A. A. Berle and G. C. Means classified the control of companies in five types, namely, management control, legal device, minority control, majority ownership and private ownership. I will simply classify ownership types into two ones namely, management-control which corresponds to the definition of Berle & Means and owner-control.

See A. A. Berle and G. C. Means, *The Modern Corporation and Private Property*, 1932, p. 94.

shareholder, the member firms may mutually share maximum dividends. On the contrary, if a firm is a management-control one, it is likely that its manager can behave more freely from constraints imposed by shareholders' requirements than managers of owner-control firms.

Special attention is called to clarification of what effects cross-tie ownership of shares within a group bring about on each member. If the ownership is based on the motivation of dividend maximization, the cross-tie ownership has an effect of keeping profits within the group. On the other hand, if the ownership is based on the motivation of strengthening combination among member firms, the manager of each member firm may be discretionally able to pursue his project freely from constraints by shareholders who are outside of the group, since large parts of shares are occupied by shareholders who are inside the group, namely group members.

Yarrow showed that manager's capability of discretionary decision-making depends on size distribution of large shareholders and on costs required for the manager to enforce dividend maximization.²⁾ If the size distribution influences the capability of discretion, it is interesting to analyse a relationship between behavior of the manager and ownership characterized by size distribution, using Yarrow's model.

At first, Yarrow's argument is briefly explained. Secondly, Japanese data are applied to Yarrow's model for examination of the character of ownership of the basis of size of a firm as well as the fact whether the firm belongs to a group or not. Thirdly, examination is made of a relationship between size distribution of shareholders and dividend policy.

1. MANAGER'S BEHAVIOR AND CONSTRAINTS

The criterion to classify ownership types depends on the situation, namely, how many shares a specific shareholder owns. If large parts of shares are owned singly, the firm may be called owner-control. In a management-control firm, the manager is not always fully able to behave independently from the will of shareholders, but he is constrained in some degree by them. If constraints are rigorous for him, the firm would be rather called owner-control than management-control. Yarrow says as follows: "The ability of managers to increase their own utility at the expense of shareholders is limited by two factors: the wealth-maximizing activities of shareholders and the danger of an involuntary take-over by a rival firm".³⁾

Marris emphasizes the latter,⁴⁾ but Yarrow insists that the former is a

²⁾ G. K. Yarrow, "On the Prediction of Managerial Theories of the Firm", *The Journal of Industrial Economics*, June 1976.

³⁾ *ibid.* p. 268.

⁴⁾ R. Marris, *The Economic Theory of Managerial Capitalism*, 1964.

more important limitation on managerial discretion. He shows the form of constraints on managerial discretion imposed by the wealth-maximizing activities of shareholders. Let the actual market value of shares be v and let the maximum potential market value of the firm's ordinary shares be v^* , which may be interpreted as the maximum value of shares the firm can gain if the firm maximizes profits.

Yarrow considers such a case in which largest shareholders combine with each other to enforce policies which maximize share prices. Denoting the number of largest shareholders by n and the vector of parameters which express size distribution of shareholdings by α , Yarrow says, "The proportions of the firm's ordinary shares held by the coalition (p) can be expressed as a function of the size of the coalition (n) and the vector parameters of the size distribution of shareholdings (α). That is, $p = P(n, \alpha)$, where $\partial p / \partial n > 0$. The opportunity cost to the coalition of the utility-maximizing behavior of managers is $P(n, \alpha)(v^* - v)$, since this would be the magnitude of the former's gain in the event that share-price-maximizing policies become operative".⁵⁾

A cost is needed, however, for the largest shareholders to enforce share-price-maximization policies. It can be called the cost of intervention. Let the cost of intervention of $f(n, \beta)$, where β can be interpreted as a factor such as adjustment costs arising from changing of manager's team, $\partial f / \partial n > 0$ and $f(0, \beta) > 0$. It is implied by $\partial f / \partial n > 0$ that the larger is the number of shareholders involved, the more expensive is the collusion of them. Let the net benefit of an intervention to the coalition of n largest shareholders be B . Then,

$$B = P(n, \alpha)(v^* - v) - f(n, \beta)$$

It is a difference between the benefit arising from share-price-maximizing policies and the cost of intervention. In detail, it depends on $(v^* - v)$, which is a difference between the maximum potential price of shares and the actual market price of shares, the number of the largest shareholders n , size distribution of shareholdings α and adjustment cost needed for intervention β . If $(v^* - v)$ becomes larger, the coalition of the largest shareholders is induced, since B increases.

Now, let $(v^* - v)$ be given by the manager's decision. It depends on n , α , β whether the decision is obliged to alter or not. In reality, α is expressed variously. In general, the more biased is the size distribution of shareholdings, the larger is the benefit of coalition of the largest shareholders. We can use such indexes as concentration ratio of shares by the largest shareholders or Herfindahl Index as a proxy.

⁵⁾ Yarrow, op. cit. p. 269.

In the case of a group, we may consider n largest shareholders are the same as the president's club so that the cost required to co-organize may be small and adjustment cost β may also be small. Therefore, we can say that $f(n, \beta)$ is small for firms of large six groups compared to other firms. If $P(n, \alpha)$ is the same as other firms, B is larger for the firms of large six groups on such an assumption that other things are equal, so that large shareholders may easily enforce the manager to undertake dividend maximization policies; in other words, they may easily enforce policies which maximize share prices. But, is the cross-tie ownership based on the motivation of dividend maximization? If so, it will keep some parts of dividends within the group, which must reduce the amount of dividends which go to outside shareholders. If not, it will mitigate constraints by the wealth maximization behavior of outside shareholders; it also brings about such an effect that may enable managers to get rid of a risk of take-over by rival firms.

Which effect does the cross-tied group of firms have? To clarify this question, we will examine relationship between the size distribution of shareholdings α and dividend policies in this country.

2. SIZE DISTRIBUTION OF SHAREHOLDINGS IN JAPAN

As an index of size distribution of shareholdings we can adopt concentration ratio of shareholdings by largest shareholders. The higher the ratio becomes, the more the collusion of largest shareholders will be strengthened and the more the discretion of the manager will be weakened. It is problematic to specify the number of shareholders who are taken into account as n largest shareholders. Because of limited data available, we may choose ten (or twenty) largest ones to specify n so that we may take into account concentration ratios of shareholdings by the top one, three, five and ten largest shareholders. Moreover, it is useful for our purpose of analysis to draw on an index, for example, Gini's concentration ratio or Herfindahl Index, which expresses the degree of inequality of distribution. The latter is adopted in this paper.

Table 1 shows the average concentration ratios of shareholdings by the top one, three, five and ten largest shareholders of (1) firms listed up in the First Section in the Tokyo, Osaka and Nagoya Stock Exchanges, (2) firms in the Second Section of the same exchanges, and (3) firms which are members of presidents' clubs of the big three former Zaibatsu groups of firms, the last one being further broken down by groups. The concentration ratio is the ratio of the number of shares issued by a firm, which the top largest shareholders own, to the total number of shares issued. As you find from the table, the average concentration ratios of the top largest

TABLE 1 AVERAGE CONCENTRATION RATIOS OF TOP 1, 3, 5
AND 10 LARGE SHAREHOLDERS

	Number of Firms	Cumulated Concentration Ratio of Shareholdings			
		Top 1 (%)	Top 3 (%)	Top 5 (%)	Top 10 (%)
Firms Listed up in the First Section of Tokyo, Osaka and Nagoya Stock Exchanges	980	14.98	26.31	33.25	43.61
Firms Listed up in the Second Section of Tokyo, Osaka and Nagoya Stock Exchanges	706	23.56	37.62	44.42	53.67
Firms which Are Members of Presidents' Club of Big 3 Groups of Firms	64	10.02	20.70	27.70	38.49
Mitsui Group	22	8.14	18.70	25.54	36.01
Mitsubishi Group	23	11.00	21.32	28.45	39.42
Sumitomo Group	19	11.02	22.25	29.29	40.22

Source: Tōyō Keizai, Kigyo Keiretsu Sōran, 1978.

shareholder of a firm listed up in the First and Second Sections are 14.98 per cent and 23.56 per cent respectively. In the case of member firms of the big three groups of firms, it is as small as 10.02 per cent. Of course, the number of firms listed up in the First Section is larger than that of those firms in the Second Section. And almost all of the firms which are members of the presidents' clubs are included in the list of the First Section, their size being larger than the size of other firms in the same list. We can thus conclude that the larger the size of firms becomes, the more the concentration ratio of shareholdings by the top largest shareholder reduces. This tendency can also be found in the cases of the top three, five and ten largest shareholders. For further examination of a relationship between size of firms and concentration ratio of shareholdings, we classify the firms listed up in the First and Second Sections according to the size in terms of capital.

Table 2 shows the concentration ratios of shareholdings by the largest shareholders in each size of firms in the First and Second Sections.

Let us analyze, moreover, a relationship between size of firms and size distribution of shareholdings, using Herfindahl Index. Table 3 indicates the size distribution of shareholdings expressed by this index in each size of firms. It follows from a comparison of this index with the concentration ratio of shareholdings that the difference in indexes among varying size becomes more clearly.

Next, let us examine the size distribution of shareholdings in the case of the independent groups, in which the feature of ownership differs from

TABLE 2 AVERAGE CONCENTRATION RATIOS OF SHAREHOLDINGS
BY LARGEST SHAREHOLDERS IN EACH SIZE OF CAPITAL

First Section of Tokyo, Osaka and Nagoya Stock Exchange

Size of Capital (in billion yen)	Number of Firms	Cumulative Concentration Ratio of Shareholdings			
		Top 1 (%)	Top 3 (%)	Top 5 (%)	Top 10 (%)
1~ 5	602	17.72	29.77	36.92	47.33
5~ 10	175	12.56	23.43	30.46	41.07
10~ 20	98	11.07	21.50	28.16	38.59
20~ 50	69	7.51	16.73	22.66	32.34
50~100	24	6.14	14.40	20.24	29.57
100~	12	5.36	13.13	18.51	27.70

Second Section of Tokyo, Osaka and Nagoya Stock Exchange

Size of Capital (in billion yen)	Number of Firms	Cumulative Concentration Ratio of Shareholdings			
		Top 1 (%)	Top 3 (%)	Top 5 (%)	Top 10 (%)
0.2~0.5	203	25.94	40.91	47.74	56.86
0.5~1	345	21.02	34.37	41.34	51.01
1 ~2	131	26.34	40.95	47.49	56.02
2 ~5	19	30.62	44.71	50.23	57.90
5 ~	8	10.50	22.94	29.19	38.28

Source: Tōyō Keizai, Kigyo Keiretsu Sōran, 1978.

TABLE 3 AVERAGE HERFINDAHL INDEX IN EACH
SIZE OF FIRMS

Size of Capital (in billion yen)	Number of Firms	Herfindahl Index
1~ 5	557	0.06829514
5~ 10	165	0.04422338
10~ 20	91	0.03423956
20~ 50	64	0.02060075
50~100	23	0.01348118
100~	12	0.01057270
First Section of Stock Exchange Total	912	0.05505311

Source: Tōyō Keizai, Kigyo Keiretsu Sōran, 1978.

TABLE 4 CONCENTRATION RATIOS OF SHAREHOLDINGS BY LARGEST SHAREHOLDERS IN INDEPENDENT GROUPS

Firms	Cumulative Concentration Ratio of Shareholdings			
	Top 1 (%)	Top 3 (%)	Top 5 (%)	Top 10 (%)
Shin Nittetsu Group				
Shin Nittetsu	2.99	7.84	11.69	19.83
Nisshin Steel Co., Ltd.	12.45	19.87	25.80	34.88
Daido Steel Co., Ltd.	13.09	23.74	29.99	40.02
Nittetsu Mining Co., Ltd.	30.00	44.72	55.07	65.23
Hitachi Group				
Hitachi, Ltd.	4.23	9.46	13.95	22.61
Hitachi Cable, Ltd.	59.13	65.62	71.40	80.08
Hitachi Metals, Ltd.	54.17	60.13	64.10	69.44
Shin Meiwa Industrial Co., Ltd.	30.13	55.73	59.73	63.96
Matsushita Group				
Matsushita Electric Industrial Co., Ltd.	5.46	13.71	20.72	31.14
Matsushita Electric Works, Ltd.	26.96	37.43	42.19	50.49
Victor Company of Japan, Ltd.	50.47	64.20	71.34	79.76
Matsushita Reiki Co., Ltd.	53.11	62.27	67.01	74.21
Toyota Group				
Toyota Motor Co., Ltd.	5.04	14.67	22.59	35.96
Toyota Motor Sales Co., Ltd.	38.40	49.77	55.39	64.64
Nippon Denso Co., Ltd.	22.66	39.73	49.91	64.31
Toyoda Automatic Loom Works, Ltd.	19.18	28.27	35.20	49.70

Source: Tōyō Keizai, Kigyo Keiretsu Sōran, 1978.

one another between the top giant firm and other member firms. Table 4 indicates the concentration ratios of shareholdings of some firms belonging to the independent groups. The firms placed first in each group is the top giant firm, namely Shin Nittetsu, Hitachi, Matsushita Electric Industrial and Toyota Motor. As you see, while other firms have larger concentration ratios, the top giant firms have very small ratios. Most of the member firms shows such a feature as is characteristic of the ownercontrol firm. The foregoing means that pyramidal control of share ownership prevails in the independent groups.

We can accordingly conclude as follows:

(1) The larger the size of a firm becomes, the more the size distribution of shareholdings is equalized and the more the feature of the management-control firm is displayed.

(2) In the big six groups of firms, especially in the three Zaibatsu groups, namely, Mitsui, Mitsubishi and Sumitomo, the size distribution of shareholdings are barely equalized, compared with other large firms. Therefore, we cannot look on them as owner-control. We must note, however, the fact that the president's club in each of these groups provides at the same time larger shareholders with a place of meeting for discussion and decision on the business of member firms so that they are closely related with each other.

(3) In the case of the independent groups, top giant firms which are placed at the top of the pyramid show that the size distribution of shareholdings is most equalized so that they cannot be owner-control. On the contrary, the highly concentrated shareholdings are shown by member firms in the independent groups other than those at the top, each of which is the largest shareholder of an individual firm of the group.

3. OWNERSHIP AND DIVIDEND POLICY

On the assumption that owner-control firms tend to pursue a dividend maximization policy, a question arises concerning a feature of a dividend policy followed by such a group of firms as are characterized by cross-tie ownership and concerning a possibility of using the result of investigation of this feature in finding out any effects the cross-tie ownership brings about on the group, for example, an effect of exploitation of dividends by many small shareholders or an effect weakening constraints imposed by outside shareholders. It calls for clarification of three points as follows:

(1) The first point is whether or not dividend policies vary with the character of ownership; in other words, whether or not an owner-control firm tends to maintain the dividend rate high, while a management-control firm tends to do it low, freely, to some extent, from constraints due to shareholders' demand for a high rate.

(2) The second point is whether or not the big six groups of firms characterized by cross-tie ownership tend to keep such dividends within the groups that are sustained at a high rate.

(3) The third point is concerned with the independent groups; namely, while the concentration ratio of shareholdings by the top giant firm is very high, the question is about any effects it brings about on group members as to their policy toward the rate of dividend.

At first, let us examine a relationship between ownership and rate of dividend. Table 5 indicates a relationship between concentration ratio of shareholdings and rate of dividend as to 539 firms in 1976, which are grouped by every 10 per cent in the concentration ratio of shareholdings by top three largest shareholders. This table does not show any significant rela-

TABLE 5 AVERAGE RATE OF DIVIDEND

Concentration Ratio of Shareholdings by Top Three Largest Shareholders (%)	Number of Firms	Average Rate of Dividend (%)
1~9	11	10.36
10~19	199	11.37
20~29	166	11.42
30~39	54	10.85
40~49	44	9.86
50~59	43	10.35
60~69	17	13.65
70~79	4	16.25
80~89	1	12.00
Total	539	11.21

Source: Tōyō Keizai, Kigyo Keiretsu Sōran, 1978.

TABLE 6 AVERAGE RATE OF DIVIDEND

	Average Rate of Dividend (%)
Mitsui Group	9.81
Mitsubishi Group	9.06
Sumitomo Group	8.00
Average Rate of Big Three Groups	8.98
Sanwa Group	10.37
Fuyō Group	11.32
Dai-Ichi Kangin Group	9.61
Average Rate of Big Six Groups	9.82
Shin Nittetsu Group	6.89
Toyota Group	12.15
Matsushita Group	16.79
Hitachi Group	13.53
Nissan Group	12.00
Average Rate of Independent Groups	12.10

Source: Tōyō Keizai, Kigyo Keiretsu Sōran, 1978.

tionships between ownership and rate of dividend. A relationship may be found, however, between the rate of dividend of the big six groups of firms and that of the independent groups, as is shown in Table 6 in which the rate of dividend is averaged. The average rate of dividend of the big three groups (Mitsui, Mitsubishi and Sumitomo) is 8.98 per cent, lower than that of all the firms, namely 11.21 per cent, whereas that of the big six groups (Fuji, Sanwa, Dai-Ichi Kangin in addition to the big three) is 9.82 per cent, also lower than that of all the firms.

On the contrary, the average rate of dividend of the independent groups is 12.10 per cent, higher than that of all the firms. That of Shin Nittetsu Group is as low as 6.89 per cent, though it is higher than that of other firms in the iron and steel industry. Nissan, Toyota and Hitachi Groups have the higher rate, while Matsushita Group has the highest rate of dividend.

We can thus conclude as follows:

(1) We cannot find any significant relationship between ownership and dividend policy upon examination of a relationship between concentration ratio of shareholdings and rate of dividend, except that the independent groups having an owner-control feature pursue evidently a policy of keeping a high rate of dividend.

(2) We cannot always say that the big six groups of firms characterized by cross-tie ownership adopt a policy of seeking a higher rate of dividend. Therefore, it is difficult to insist that objects of cross-tie ownership are to keep more dividends within the groups. We would rather say that it brings about such an effect that weakens constraints by outside shareholders.

(3) The top giant firms of the independent groups having a owner-control feature show a policy of keeping higher rates of dividend, from which it follows that firms which show apparently an owner-control feature adopt a wealth maximizing behavior.