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Industrial Concentration and Employee Compensation: Some Evidence from Japan

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Abstract

This paper examines the effects of industrial concentration on employee compensation including fringe benefits, using data of Japanese manufacturing industry. The primary findings are; (1) concentration has a positive and significant effect on direct wages and on total compensation, but is not significantly related to fringe benefits per workers; (2) firm size has a positive and significant impact on wages, total compensation and fringe benefits, particularly so on fringe benefits; (3) unionization is positively and significantly associated with total compensation and fringe benefits. The analysis has ascertained the effects of Japan's employment/compensation structure, as well.

Industrial Concentration and Employee Compensation:
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Noriyuki Doi *

I. Introduction

The influence of product market monopoly power on employee compensation has interested economists for decades because it may include "X-inefficiency." Stigler suggests that "the magnitude of monopoly elements in wages, executive compensation, royalties, and rents is possibly quite large."¹⁾ If concentrated industries pay their employees more than the opportunity costs, then the misallocation of resources due to market power is probably larger than when measured by profits.²⁾ Also, market power may be concerned with the equity problem, by triggering the rising wage-differentials among employees. Recently this problem is receiving increased attention, but whether such differentials pose significant equity problems is arguable. Furthermore employee compensation is examined from the viewpoint of the effect of market power on "worker satisfaction" -- one of the "social performances."

As industrial concentration increases, firms receive monopoly gains, which in turn will be distributed into profits, increasing wages and other discretionary expenses. Then, it is an important problem to examine the monopoly gains' distribution into employee compensation. There are some reasons for which industries or firms with market power are willing to share the fruits of their market power with their employees, even though

an association between concentration and employee compensation does not derive definitely from the theory of a firm. First, firms may pay a higher wage to establish or maintain a good reputation among employees, or a good relationship with unions. The separation of control and management may promote such behavior. This tendency is also probably larger under the "firm union" system than under the "industrial union" system. Second, they may pay more to attract a higher quality of workers, in particular under the "firm union" system.

Third, an increased productivity is more likely to be passed on in higher wages in more concentrated than in less concentrated industries, because price reduction is likely to upset the oligopolistic cooperation. Also, oligopolists may reduce exceptionally high profits by increasing employee compensation.

Finally unionization is easier in concentrated industries because of the small number of firms, and/or because those industries consist of large firms. Higher unionization is inclined to reflect larger union strength. But the relationship may be restricted under the "firm union" system, since unions vary in strength and attitude or ideology in an industry.

Thus, concentration or market power is expected to have a positive influence on employee wages or compensation. It is important to disentangle the effect into the two parts: monopoly rent and the possible effects of firm size, unionization and employee quality, since the concentration effect is likely to reflect the combined effects of these factors, as suggested above.

There is an increasing number of empirical studies on concentration and employee compensation.³⁾ The evidence is mixed. Weiss concludes, using a sample of observations of individual employees, that while concentrated industries pay higher wage rates, they also hire "superior" personnel whose incomes contain few monopoly rents.⁴⁾ Master's and Haworth and Rasmussen's studies imply that concentration doesn't have a significant influence on wages at an inter-industry level.⁵⁾ On the other hand, Philips, Dalton and Ford, Haworth and Reuther, Jenny, Kwoka, Pugel, and Caves, et al. reveal that concentrated industries seem to pay the monopoly wages.⁶⁾

Wage supplements or fringe benefits have increased the importance in total employee compensation, especially after the World War II.⁷⁾ But those empirical studies make no mention of the composition of employee compensation, or of fringe benefits. The payment of fringe benefits also may be the "voluntary employer action", which in turn may be influenced by market structure elements such as concentration and firm size. Oligopolists may pay more in fringe benefits, instead of paying exceptional wages, since they take into consideration the "spillover" impact of their firms' wages on wages of other industries. It may be also because the payment policy is likely to be conducive to longer service of employees and their loyalty to their firms. Furthermore, top management has higher utility from providing larger benefits for their employees. Then the influence of market power is likely to be more definite for total employee compensation

including various fringe benefits than for direct wages. This relationship is supported by the findings of Alpert, that concentration is positively and significantly related to the share of fringe benefits in total employee compensation (hereafter denoted as fringe benefits share) in the U.S.A..⁸⁾ The findings suggest that as concentration increases, fringe benefits go up more than direct wages do. Therefore the composition of employee compensation should be taken into account in the study of the relationship between market power and employee compensation.

The aim of the present paper is to consider the "monopoly compensation" hypotheses, using data of industry level employee compensation from the Japanese manufacturing sector. The test includes two hypotheses; concentration has a positive effect on employee compensation and the concentration effect is stronger for total compensation than for wages. It is organized as follows: Section 2 refers to the model, the data and the definitions used; Section 3 presents the major empirical results; Section 4 describes some basic conclusions, with suggestions for future work.

II. Research Design

The statistical analysis in this paper consists of a series of multiple regression equations relating the dependent variables, four definitions of employee compensation, to concentration and other control variables. Then before testing the "monopoly compensation" hypothesis, the "managerial discretion" is additionally examined by regressing manager compensation on some factors,

since it is likely to be a factor favorable to the concentration - employee compensation relationship, as was alluded to earlier. The data are derived from a sample of 46 six-digit Input-Output Table industries in 1970, which are comparable to 4-digit SIC classification. The year is from an expansionary period.

The Statistical Model

The general structure of the model used is the following:

$$(1) \quad \log MC = \alpha_0 + \alpha_1(CR) + \alpha_2(FS) + \alpha_3(IG) + \gamma$$

$$(2) \quad \log EC = \beta_0 + \beta_1(CR) + \beta_2(FS) + \beta_3(RE) + \beta_4(ME) +$$

$$\beta_5(WE) + \beta_6(IG) + \beta_7(US) + \beta_8(KL) + \mu$$

where MC denotes manager compensation, EC employee compensation, CR industry concentration, FS firm size, RE regular or permanent employee ratio, ME male employee ratio, WE white collar employee ratio, IG industry growth, US unionization ratio, KL capital-labor ratio, α_i ($i = 0, \dots, 3$) and β_j ($j = 0, \dots, 8$) parameters to be estimated and γ and μ the residual element, respectively.

Equation (1) is for the test of the "managerial discretion."

In other words, the hypothesis is tested that the more concentrated the industry is, the greater the scope for managerial discretion is, since it is assumed that the manager compensation is correlated with the opportunity for the managerial discretion.⁹⁾

Equation (2) is devoted to the test of the "monopoly compensation hypothesis."

Fringe benefits make up a very important part of the compensation of most Japanese workers and include such pecuniary benefits as housing subsidies, transportation allowances, family allowances, children allowances and retirement funds. And they also include such non-pecuniary benefits as recreational, educational, and medical facilities and housing. Therefore the total money equivalent values for those non-pecuniary benefits provided workers should be calculated and then added to pecuniary compensation. The data of those fringe benefits at four-digit SIC level are available in the Input-Output Table.¹⁰⁾

Four definitions of per capita annual employee compensation were utilized here. They are:

$$(1) EC(1) = W/Nr$$

$$(2) EC(2) = (W + Fp)/(Nr + Nt)$$

$$(3) EC(3) = (W + Fp + Fw)/(Nr + Nt)$$

$$(4) EC(4) = (Fp + Fw)/(Nr + Nt)$$

where W stands for direct wages, Fp pecuniary fringe benefits, Fw welfare expenses, Nr regular employees and Nt temporary employees. The pecuniary fringe benefits include retirement allowances, payments of employers to social security fund, payments in kind, and costs to employers of housing. The welfare expenses virtually correspond to expenses related to the recreational, educational and medical services, not the total money equivalent values. The assumption has been made that the operating expenses are highly correlated with the total money equivalent values.

Wages and pecuniary fringe benefits are in character compensations paid to individual employees, while the "welfare expenses" are primarily benefits which all employees of a firm enjoy jointly. The natural logarithms of those compensations (in terms of thousand yen) were taken. The data of the number of employees are available in the Input-Output Table.

Manager compensation (MC) is per capita compensation of paid board-of-directors personnel which doesn't include the "manager bonus," a dividend of the final accounting profits. The data also are from the Input-Output Table.

The estimated regression equations include combinations of eight independent variables. The theoretical rationale for these variables has been amply covered in earlier literature. Accordingly only brief mention is made regarding the theoretical justification for their inclusion in our model, referring to some Japan-specific characteristics of labor and management system.¹¹⁾

Concentration

Concentration ratio (CR) may be a reflection of the intensity of market power. Then the higher the concentration ratio is, the more the firms in concentrated industries pay their employees, because of those reasons noted earlier. It also is expected to have a positive effect of the manager compensation. Four firm production concentration ratio as a surrogate for market power is used from Japan, Fair Trade Commission's (JFTC) data.¹²⁾ Although the measure used here (and in virtually all

studies) is not always the best indicator of market power, it was used here for two reasons: first, it is available in JFTC's data; second, it has been found to have significant results in market structure-performance analysis, at least for Japanese industry.

Other Control Variables

If employees of an industry are divided into two subgroups based on some factors such as firm size and sex, then per capita compensation used here of an industry is represented in the following equation:

$$\frac{W_0}{N_0} = \frac{N_1}{N_0} \left(\frac{W_1}{N_1} - \frac{W_2}{N_2} \right) + \frac{W_2}{N_2}$$

where W stands for compensation ($W_0 = W_1 + W_2$), N number of employees ($N_0 = N_1 + N_2$), subscript 0 industry, and subscripts 1 and 2 the subgroups, respectively. If compensation differentials are found, i.e., $W_1/N_1 > W_2/N_2$, then the relative weight of a subgroup, N_1/N_0 , is positively associated with W_0/N_0 , which is equivalent to the compensation measures used here. Among the factors relevant to the compensation differentials are unionizations, firm size, sex, age and length of service, the percentages of regular employees and of white-collar employees. Capital-labor ratio and industry growth also may be factors relevant to inter-industry differentials in employee compensation.

First, oligopolistic firms or industries may be subject to larger pressure for higher wages or compensation from their

unions, as suggested earlier. But, firms usually have "firm union" in the industrial sector of Japan, which is remarkably different from the "industrial union" system in other Western Countries. Some firms have a cooperative or friendly relationship with their unions, while others have an antagonistic relationship with their unions. Therefore it may be difficult to predict a priori union strength at the industry level, or to capture it fully by the measurable variables such as unionization ratio.

The ratio of union members to total industry employees (unionization ratio) is a proxy for union strength. But the disaggregated ratio is not available. Instead, the same 2-digit level unionization ratio, which is available in the Ministry of Labor's data,¹³⁾ was applied to all of the industries which were classified as the same 2-digit industry.

Second, one of the characteristics of Japan's labor market is the relatively large wage differentials by firm size, which are frequently called the "dual structure."¹⁴⁾ In general, wages are higher in larger firms than in smaller firms, since large firms have higher productivity and/or greater market power than small firms. Also, workers of small firms are in most cases not unionized. Thus a firm size variable, large firm ratio (FS), was added to our model. The ratio was defined as the percentage of employees in firms with over 100 million yen of equity capital. The ratio also may serve as a proxy for industry unionization, since most large firms have unions, while small-to-medium-sized

firms frequently have no union. This variable may have a positive impact on manager compensation, as well, since the separation of control and management is usually found in large firms, and large firms have greater "ability to pay" than small firms, due to their market power and/or high productivity.

Third, not all employees are hired for life under the two Japan-specific systems; the "lifetime employment" and the "seniority" system.¹⁵⁾ There are two distinct categories of employees in most firms; regular or permanent employees and temporary employees. Few temporary employees are subject to the seniority-based wage system. Temporary employees are paid at a lower scale than regular employees. And they may exert a restrictive pressure on compensation of regular employees, including fringe benefits. Thus, in general, the regular employee ratio (RE) is likely to have a positive influence on employee compensation. The measure is regular employees/total employees.

Fourth, there are remarkable wage differentials between male and female employees; male workers tend to receive higher compensation than female workers of similar age and educational level.¹⁶⁾ The lifetime employment and seniority systems virtually mean "a pay/promotion escalator system for male employees." Not only are women often hired as temporary employees, but also they usually withdraw from the work force at an earlier age because of marriage or childbirth and care. Thus the effect of male employee ratio (ME), of which the measure is male employees/total employees, is expected to be positive. The ratio is also likely to be a

proxy for age and length of service, which are expected to have a positive effect, under the two systems noted earlier.¹⁷⁾

Fifth, in general, white-collar employees are inclined to enjoy higher compensation, as compared with blue-collar employees. The hypothesis was tested by including white-collar employee ratio (WE). The measure is white-collar employees/total employees.

Sixth, labor productivity is likely to have a definite effect on employee compensation.¹⁸⁾ The variable used to control for it is capital-labor ratio (KL), which is measured by the gross book value of fixed assets/total employees.

Finally, industry growth (IG) has a positive and significant effect on profitability. The higher growth industries or firms then have the greater "ability to pay." Sales growth especially may exercise a great influence on the "bonuses" employees receive. Thus industry growth may be positively associated with employee compensation. It is the 1970 value of shipments/1965 value of shipments.

The source of RE is the Input-Output Table and the data of FS, ME, WE, KL, and IG are available in MITI, Census of Manufactures: 1970.

III. The Estimated Results

First, consider the concentration-manager compensation relationship. The result (t-ratios in parentheses) for the sample in 1970 is:

$$\log MC = 3.040 + 0.048(CR) + 0.078(FS) + 0.016 \times 10^{-2}(IG) \quad \bar{R}^2 = 0.381$$

(2.462) (2.003) (2.162) N = 46

The concentration ratio, firm size and industry growth are expectedly all of a positive sign and statistically significant, although concentration is correlated with firm size, with r of 0.411. This result implies that corporate managers have discretionary power, ¹⁹⁾ and also receive benefits accruing from market power. Thus there seems to be high likelihood of a significant effect of market power on employee compensation in Japan.

We turn now to our central problem. Table I and II show the estimated equations. ²⁰⁾

Effect of Concentration

The concentration ratio is, as expected, of a positive sign and statistically significant in EC(1)-, EC(2)- and EC(3)-equations, supporting the "monopoly compensation hypothesis." The concentration effect has some interesting implications. First, the reduced effect of concentration for EC(3) is against our a priori expectation that the concentration effect is likely to be more definite for the compensation including various fringe benefits than for direct wages. The results may suggest that fringe benefits such as the "welfare expenses" are less likely to be influenced by concentration. In fact, for EC(4) the concentration ratio is not statistically significant.

This result is not in conflict with the existing studies in support of the "monopoly compensation" hypothesis. But it suggests a more accurate picture about the relationship; the positive association between concentration and employee compensation is likely

to reflect the possibility that concentration has a positive effect on direct wages, but has no definite effect on fringe benefits. This finding implies that as concentration increases, fringe benefits share doesn't go up. Therefore it doesn't lend support to Alpert's conclusion. Also, this result has an interesting suggestion: market power may not be related to the "non-wages" worker satisfaction. But the vigorous examination of the suggestion is beyond the direct scope of our objective here.

Second, the significant effects of concentration on wages and total compensation don't provide support for the hypothesis argued by Haworth and Reuther, that the concentration's effect on compensation disappears in an expansionary period, since the year selected, 1970, was in an expansionary period.

Effects on Other Control Variables

First, unionization ratio has the expected sign, but is significant for EC(2) and EC(3), while insignificant for EC(1). An explanation of the results concerns the possibility that unions have stronger influence on fringe benefits than on direct wages. This explanation may be consistent with the finding that unionization ratio has a positive and significant effect on EC(4). Thus, the fringe benefits are influenced by union bargaining. These results reveal the impact of unionization on the distribution between direct wages and fringe benefits; Unionization is positively related to the fringe benefits share. This prediction is consistent with the empirical results of Freeman and Alpert.²¹⁾

Table I Regression Results: EC(1) and EC(2) (N = 46)

Const.	CR	WE	RE	IG	FS	KL	ME	US	R ²
<u>EC(1) - Equation</u>									
2.3593	0.1263 (2.430)	0.2790 (1.860)	0.3619 (1.175)	0.0490 (2.274)	0.0857 (2.019)				0.414
2.4502	0.1588 (3.452)	0.1588 (1.171)	0.2842 (0.951)	0.0477 (2.301)		0.7530 (2.699)			0.453
2.4027	0.1021 (3.049)	0.0782 (0.789)	0.2235 (1.095)				0.3725 (8.467)		0.735
2.7050	0.1420 (2.958)	0.0837 (0.540)		0.0522 (2.602)		0.7704 (2.781)		0.0770 (1.089)	0.457
<u>EC(2) - Equation</u>									
2.0087	0.1235 (2.374)	0.3230 (2.168)	0.7717 (2.522)	0.0450 (2.101)	0.0912 (2.160)				0.473
2.1026	0.1584 (3.443)	0.2003 (1.451)	0.6918 (2.329)	0.0439 (2.130)		0.7768 (2.794)			0.507
2.0581	0.1019 (3.087)	0.1162 (1.198)	0.6241 (3.075)				0.3687 (8.574)		0.760
2.7245	0.1277 (2.607)	0.0563 (0.359)		0.0550 (2.693)		0.8254 (2.927)		0.1172 (1.921)	0.489

Note: coefficients for CR, WE, RE, KL, ME, and US are in terms of 10^2 ; coefficients for FS are in terms of 10^4 ; R^2 = coefficient of determination adjusted for degrees of freedom; t-ratios are in parentheses.

Table II Regression Results: EC(3) and EC(4) (N = 46)

Const.	CR	WE	RE	IG	FS	KL	ME	US	R ²
<u>EC(3) - Equation</u>									
1.196	0.1055 (1.918)	0.3823 (2.451)	0.8713 (2.723)	0.0470 (2.093)	0.1132 (2.561)				0.487
2.0581	0.1456 (3.308)	0.2220 (1.669)	0.7503 (2.614)	0.0430 (2.160)		1.1626 (4.338)			0.594
1.9678	0.0933 (2.522)	0.1498 (1.375)	0.7268 (3.188)				0.3836 (7.828)		0.732
2.7336	0.1139 (2.373)	0.0732 (0.479)		0.0550 (2.762)		1.2163 (4.423)		0.1207 (2.045)	0.569
<u>EC(4) - Equation</u>									
0.5183	0.0025 (0.027)	0.9882 (3.786)	1.2867 (2.401)	0.0660 (1.757)	0.2249 (3.040)				0.447
0.7778	0.0845 (1.158)	0.6755 (3.071)	1.0627 (2.242)	0.0601 (1.828)		2.1614 (4.879)			0.573
0.5333	0.0449 (0.528)	0.6385 (2.564)	1.2089 (2.320)				0.4423 (3.985)		0.464
1.7358	0.0597 (0.756)	0.3856 (1.518)		0.0753 (2.271)		2.0861 (4.525)		0.2100 (2.143)	0.546

Note: coefficients for CR, WE, RE, KL, ME, and US are in terms of 10^2 ; coefficients for US X RE in terms of 10^4 ; R² = coefficient of determination adjusted for degree of freedom; t-ratios are in parentheses.

Second, firm size has a positive and significant influence on the level of all the definitions of employee compensation. This result is collateral evidence in support of the "dual structure" hypothesis. It is worth noting that the strength of the firm size effect is $EC(3) > EC(2) > EC(1)$. The results imply that inter-firm size differentials are greater in fringe benefits than in wages, consistent with the relationship found in the aggregate level. The finding that the firm size effect surpasses the concentration effect when compensation includes fringe benefits, is important as well. Thus these results show that firm size plays an important role in the determination of fringe benefits. This possibility is supported by the result for EC(4).

Third, regular employee ratio is of a positive sign in all equations, but is statistically significant in EC(2)-, to EC(4)-equations, while not significant in EC(1)-equation. The insignificance in EC(1)-equation is a little puzzling. This result may be because Japan's labor market is divided into two submarkets which are noncompetitive with each other; markets for regular and temporary employees. But the ratio's significance in EC(2)- and EC(3)-equations implies that fringe benefits increase as the regular employee ratio does. This explanation is ascertained by the effect for EC(4).

Fourth, male employee ratio is, as expected, the most important determinant of inter-industry compensation differentials. This result may suggest, as noted, that the ratio is a comprehensive variable which captures the combined effects of sex and age or length of service, which are the primary factors in Japan's pay schedules.

Fifth, white-collar employee ratio is positively signed, but is generally not significant except for some cases in which it is seemingly significant due to its negative correlation with the large firm ratio. This result is a little perplexing. The evidence is likely to suggest that the shortage of blue-collar workers with greater mobility which occurred due to high economic growth, might induce declining wage differentials between white-collar and blue-collar employees. On the other hand, the ratio is generally significantly and positively related to fringe benefits, in contrast with direct wages and total compensation, though in some cases the high collinearity with US overpowers the expected effects of the ratio.

Sixth, capital-labor ratio is positively and significantly related to employee compensation, in particular strongly related to fringe benefits, supporting our a priori expectation.²²⁾ Thus, higher labor productivity is passed on in higher employee compensation.

Finally, industry growth has the expected effect. The evidence indicates that higher growth industries tend to pay more, because of the greater ability to pay. But employment growth which is defined as 1970 employees/1965 employees ratio, doesn't have a definite effect (not shown here), which is different from findings reported for the U.S.. This result may be due to the labor practices of the "lifetime employment" and "seniority" systems. In other words, under such systems employment pressure may have greater influence on the "starting wages" of new workers, but usually has less connection to compensations of "already employed workers."

IV. Conclusion

The main objective of this paper has been to examine the influence of concentration on employee compensation at an inter-industry model. The results show that concentrated industries do pay their employees more in direct wages. This evidence may demonstrate that firms with market power are likely to share, at least some of the fruits of market power with their employees. Thus, in Japan, welfare losses due to market power seem to be larger than when measured by profits. This possibility is strengthened further by the positive effect of concentration on manager compensation.

In addition, it is worth noting that concentration doesn't have a definite impact on fringe benefits. Therefore concentration doesn't have a positive influence on the share of fringe benefits in total employee compensation.

Needless to say, our results must be viewed as tentative. Among the conceivable shortcomings of this paper are a limited sample and neglect of other relevant determinants, which are both due to the lack of consistent data. The solution of these problems is left for future analysis. And, the related problems for future study are the impacts of concentration on change in employee compensation and on the share of employee compensation in the monopoly gains.

NOTES

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- (1) G.J. Stigler, "The Statistics of Monopoly and Merger," Journal of Political Economy, Vol. 64. No. 1 (February, 1956), pp. 33-40; quotation, p. 35.
- (2) For the influence of monopoly wage or X-inefficiency on welfare losses, see W.S. Comanor and H. Leibenstein, "Allocative Efficiency, X-Efficiency and the Measurement of Welfare Losses," Economica, Vol. 36, No. 3 (August, 1969), pp. 304-309, and F.W. Bell, "The Effect of Monopoly Profits and Wages on Prices and Consumers' Surplus in U.S. Manufacturing," Western Economic Journal, Vol. 6, No. 3 (June, 1968), pp. 223-241.
- (3) For a survey of existing studies, see F.M. Scherer, Industrial Market Structure and Economic Performance, 2nd edition, pp.358-362, (Boston: Houghton Mifflin, 1980),

and R. Smiley, "Firm Size, Market Power and the Distribution of Income and Wealth: A Survey," In J.J. Siegfried (ed.), The Economics of Firm Size, Market Structure and Social Performance, (Washington, D.C.: U.S. Government Printing Office, 1980,) pp. 90-103.

- (4) L.W. Weiss, "Concentration and Labor Earnings," American Economic Review, Vol. 56, No. 1 (March, 1966), pp. 96-117.
- (5) S.H. Masters, "Wages and Plant Size: An Inter-Industry Analysis," Review of Economics and Statistics, Vol. 51, No. 3 (August, 1969), pp. 341-345; and C.J. Haworth and D.W. Rasmussen, "Human Capital and Inter-Industry Wage in Manufacturing," Review of Economics and Statistics, Vol. 53, No. 4 (November, 1971) pp. 376-380.
- (6) L. Philips, Effects of Industrial Concentration, (Amsterdam: North Holland, 1971), Chapter 4, pp. 89-117. J.A. Dalton and E.J. Ford, "Concentration and Labor Earnings in Manufacturing and Utilities," Industrial and Labor Relation Review, Vol. 31, No. 1 (October, 1977), pp. 45-58. C.T. Haworth and C.J. Reuther, "Industrial Concentration and Interindustry Wage Determination," Review of Economics and Statistics, Vol. 60, No. 1 (February, 1978), pp. 85-95.
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R.E. Caves, M.E. Porter and A.M. Spence, Competition in the Open Economy (Cambridge: Harvard University Press., 1980), pp. 247-253.

- (7) The fringe benefits or welfare systems in Japanese private firms are receiving more interest as one of the "Japanese style of management." Therefore, the determinants of fringe benefits are an important problem. See for example, S.H. Paine, "Wage Differentials in the Japanese Manufacturing Sector," Oxford Economic Papers, Vol. 23, No. 1 (July, 1971), pp. 212-238.
- (8) W.T. Alpert, "Unions and Private Wage Settlements," Journal of Labor Research, Vol. 3, No. 2 (Spring 1982), pp. 179-199.
- (9) O.E. Williamson, "Managerial Discretion and Business Behavior," American Economic Review, Vol. 53, No. 5 (December, 1963), pp. 1032-1057; especially pp. 1042-1047.

- (10) Government of Japan, Input-Output Table: 1960-1965-1970, (Tokyo: Government Printing Office, 1975).
- (11) For survey of Japan's labor system, see, for example, W. Galenson, "The Japanese Labor Market," in H. Patrick and H. Rosovsky (eds.), Asia's New Giant: How the Japanese Economy Works, (Washington, D.C.: The Brookings Institution, 1976), pp. 587-671.
- (12) Japan, Fair Trade Commission, The Trends of Production Concentration Ratio and Herfindhal Index in Main Industries: 1965-1976, (Tokyo: Fair Trade Association, 1979).
- (13) Japan, Ministry of Labor, Report on Survey of Trade Unions: 1971. (Tokyo: Government Printing Office, 1972), Table I, pp. 26-27.
- (14) For example, in manufacturing, if the base level of wage of 100 is wage of regular employees in firms with over 500 employees, then wage indexes of firms with 100-499, 30-99, and 5-29 employees are 81.4, 69.6, and 61.8 respectively (1970). For the details, see for example, Japan, Ministry of Labor, Statistical Abstract of Labor: 1972 (Tokyo: Government printing Office, 1972), Table 90, p. 113.

- (15) The lifetime employment system is confined primarily to large firms. But workers of small-to-medium sized firms also think that their long services at the same companies are desirable. In this way, the system covers a great number of firms, consistent with lesser mobility of workers. Therefore it may have some influence on employment/compensation structure in Japan, at least before the "Oil Shock."
- (16) In manufacturing, compensation of women employees is 48.9% and 46.8% of compensation of male employees for blue-collar and white-collar jobs respectively (1970). See Japan, Ministry of Labor, op. cit. Table 105, pp. 136-137.
- (17) In Japan's firms, the length of employee's service, which is also parallel with age, is the primary factor of the pay schedule, and is followed by status.
- (18) The importance of productivity in the wage determination is emphasized by Brozen. See, Y. Brozen, Concentration, Mergers, and Public Policy (New York: Macmillan, 1982), pp. 60-74.
- (19) The present result supports Caves and Uekusa's conclusion that "in large Japanese companies the scope for management to act on motives other than profit maximization is rather

great, although there is not much evidence on what those other motives are," (p.12). R.E. Caves and M. Uekusa, Industrial Organization in Japan (Washington D.C.: The Brookings Institution, 1976).

- (20) There were significant multicollinearity problems in our model. Therefore some variations of the equation were applied.
- (21) In this connection, we estimated the effect of unionization on fringe benefits' share in total compensation for the same sample. The result shows that unionization ratio has a positive and strong influence on fringe benefits' share. The same result was presented in the U.S. by Alpert (ref. 8) and also by Freeman. See R.B. Freeman, "The Effect of Unionization on Fringe Benefits," Industrial and Labor Relations Review, Vol. 34, No. 4 (July, 1981), pp. 489-509.
- (22) Sometimes output-labor ratio has been used instead of the capital-labor ratio. But the two variables are highly correlated. Therefore the output-labor ratio used (value added/employees) has not altered our conclusion derived from the use of capital-labor ratio (not shown here).