

Japan Labor Review

Volume 6, Number 1, Winter 2009

Special Edition

The Gender Gap in the Japanese Labor Market

Articles

Labor Market Segmentation and the Gender Wage Gap

Haruhiko Hori

Occupational Sex Segregation and the Japanese Employment Model: Case Studies of the Railway and Automobile Industries

Wakana Shuto

Testing the Taste-Based Discrimination Hypothesis: Evidence from Data on Japanese Listed Firms

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Corporate Governance by Investors and the Role of Women

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Article Based on Research Reports

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JILPT Research Activities



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EDITORIAL OFFICE

The Japan Institute for Labour Policy and Training

International Affairs Department

8-23, Kamishakujii 4-chome, Nerima-ku, Tokyo 177-8502 Japan

TEL: +81-3-5903-6315 FAX: +81-3-3594-1113

Email: jlr@jil.go.jp

Homepage: <http://www.jil.go.jp/english/index.html>

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Introduction

The Gender Gap in the Japanese Labor Market

Among the labor economists who pay careful attention to international comparisons of labor market outcomes, the gender wage gap of Japan, as well as that of Korea, is known to be the largest among OECD countries.¹ The hourly wage in Japan of permanent and regular female workers relative to male workers, which is not adjusted for the observed characteristics of workers, was 59.1 in 1990, while the corresponding figure for 2000 was 66.0; this indicates that there has been only a 6.9 percentage point gender wage convergence in this 10-year period. This wage convergence, however, may have been caused by the convergence of the characteristics of workers across genders. Indeed, Akira Kawaguchi reports that 60% of unadjusted wage convergence between 1990 and 2000 is explained by the convergence of the observed characteristics of workers across genders, based on a large sample from the Basic Survey of Wage Structure.² He pointed out that in particular the convergence of years of job tenure explained the gender wage convergence.³

With this persistent gender wage gap as a background, this special issue of the Japan Labor Review aims at explaining the mechanisms behind the gender wage gap in Japan. To this end, this issue contains five papers that are largely classified into two categories. In the first category are two papers that attempt to explain the gender wage gap by occupational segregation. The second category consists of three papers that examine the relationship between female employment and the performance of firms.

Recent studies in the US have pointed out that occupation-establishment segregation explains a large fraction of gender wage gap in the US.⁴ The first paper by Haruhiko Hori reports that occupational segregation measured by the Duncan index based on the Population Census was almost constant between 1980 and 2000. He then goes on to estimate the wage regression model using the proportion of females in a given occupation as an additional explanatory variable based on the Basic Survey of Wage Structure. Through this, Hori finds that both males and females receive a lower level of compensation if they are engaged in

¹ Francine Blau and Lawrence Kahn, "Understanding International Differences in the Gender Pay Gap," *Journal of Labor Economics* 21, no. 1 (2003): 106-44.

² Akira Kawaguchi, "1990 Nendai ni okeru Danjokan Chingin Kakusa no Shukusho [Changes in the Japanese gender wage gap in the 1990s]," *The Economic Analysis*, no. 175 (2005): 51-80.

³ Geraint Johnes and Yasuhide Tanaka report that the wage convergence in Japan between 1993 and 2000 is almost completely explained by the changes in the Mincerian wage regression coefficients ("Changes in Gender Wage Discrimination in the 1990s: A Tale of Three Very Different Economies," *Japan and the World Economy* 20, no. 1 [2008]: 97-113). However, the result is based on 400 to 500 observations of International Social Survey Programs that do not include years of job tenure, which is a critical explanatory variable in Kawaguchi (2005).

⁴ For example, Trond Petersen and Laurie A. Morgan, "Separate and Unequal: Occupation-Establishment Sex Segregation and the Gender Wage Gap," *American Journal of Sociology* 101, no. 2 (1995): 329-65; Kimberly Bayard, Judith Hellerstein, David Neumark and Kenneth Troske, "New Evidence on Sex Segregation and Sex Differences in Wages from Matched Employee-Employer Data," *Journal of Labor Economics* 21, no. 4 (2003): 887-922.

occupations with a high proportion of female workers. However, the combination of occupational segregation and wage penalties for female-dominated jobs can only explain 5 percent of the gender wage gap in Japan; this figure is much smaller than those found in the US. As is clearly cautioned in the text, readers should recognize that this analysis is mainly limited to blue collar jobs; the majority of white collar jobs are excluded from the analysis as occupational information on white collar jobs are rarely recorded in the Basic Survey of Wage Structure. As such, further research based on a dataset that covers a wider range of occupations is warranted.

The second paper by Wakana Shuto shed light on the facts behind statistical figures reported in the first paper. It reports on cases of occupational segregation in the railway and automobile industries, which are traditionally considered as male-dominated jobs. Based on interviews with managers, trade union leaders, supervisors and workers themselves, Shuto describes how female workers enter those so-called male jobs and the problems that arise in the process. She reports that technological progress in the railway industry largely eliminated the physical handicap of females, but that this is not necessarily the case for the automobile industry. This finding implies that gender differences in physical strength are still a cause of occupational segregation. However, her additional finding challenges the commonly held belief that blue collar jobs are less suitable for females who are trying to strike a balance between work and family commitments, due to the irregular work shifts of such jobs. This interview-based report indicates that blue-collar jobs are even suitable for the purpose of work-life balance, because unscheduled overtime work is less frequent in blue-collar jobs than in white-collar jobs. In addition, Shuto points out that gender segregation is occurring even within occupations, as employers who expect short-term job tenure among female workers tend to design jobs for female workers as “dead-end” jobs with a small amount of training invested in them. These findings perhaps suggest the statistical analyses that capture heterogeneity in the dynamic aspects of job careers across genders give rise to meaningful implications.

The remaining three papers belong to the second category, which examines the relationship between female employment and the performance of firms. A testable implication of Becker’s original model of the taste-based discrimination of employers is that the discriminatory employer sacrifices his or her profit to indulge their own tastes. Judith K. Hellerstein, David Neumark and Kenneth R. Troske first examined this testable implication based on US data, and found that firms with a higher proportion of female workers earn higher profits, which is consistent with Becker’s prediction.⁵ Shinpei Sano implements a similar test based on the firm-level data of Japanese publicly traded companies, and finds that those firms with a higher proportion of full-time female workers earn higher profits once firm-level fixed effects are controlled for. In addition, he reveals that a positive correlation between the proportion of female workers and the profit of firms is observed in industries where the concentration is high; this observation is also consistent with Becker’s prediction,

⁵ Judith K. Hellerstein, David Neumark and Kenneth R. Troske, “Market Forces and Sex Discrimination,” *The Journal of Human Resources* 37, no. 2 (2002): 353-80.

because only employers in non-competitive industries can indulge their discriminatory tastes at the expense of profits. These findings coincide with the results of Daiji Kawaguchi based on the Basic Survey of Japanese Business Structure and Activities.⁶

Naomi Kodama, Kazuhiko Odaki and Yoko Takahashi point out that firms which hire more women record higher returns on assets in cross-sectional estimations; however, this correlation disappears once firm-level fixed effects are allowed for. They then investigate what are the fixed effects that create a positive correlation between the proportion of female workers and return on assets. They match information of positive human resource management strategies for female workers, taken from a guidebook for job hunting for female students, with the financial information of the firm. In their data set human resource management practices are measured by the gender gap of average job tenures, the proportion of female workers in management positions, and the existence of a re-employment system for job interruption due to family reasons. These variables are found to be positively correlated with the proportion of female workers and the performance of firms. Based on these findings, they claim that a human resource management style that fully utilizes the female labor force produces results.

The last paper by Akira Kawaguchi posits a hypothesis that employers without strict corporate governance are likely to indulge their taste of discrimination at the expense of shareholders. He examines this hypothesis by examining the relationship between the corporate finance structure of the firm/activity on the investor's relationship, the proportion of female workers among managers, and other indexes of human resource strategies for utilizing female workers. The analysis based on original survey data finds that firms under the stronger control of stockholders are more likely to adopt human resource management strategies that attempt to fully utilize the female labor force. We should admit here a possible endogeneity issue caused by an unobserved factor that determines both corporate governance structures and human resource management strategies; however, the idea by Kawaguchi to examine the relationship between corporate governance structures and gender issues is very novel and important. This idea may well explain why Becker's long-term prediction that competitive pressure in markets eventually purges discrimination does not seem to hold in the real world. Further research based on this original idea seems promising.

Overall, the papers in this special issue suggest the importance of social institutions, such as occupational segregation or practices of human resource management, as an explanation for the persistent gender wage gap in Japan. Conscious reforms of these institutions and the competitive pressure of markets seem to be important factors in narrowing the gender wage gap.

Daiji Kawaguchi
Hitotsubashi University

⁶ Daiji Kawaguchi, "A Market Test for Sex Discrimination: Evidence from Japanese Firm-Level Panel Data," *International Journal of Industrial Organization* 25, no. 3 (2007): 441-60.

Labor Market Segmentation and the Gender Wage Gap

Haruhiko Hori

The Japan Institute for Labour Policy and Training

Differences in the occupations in which men and women are employed—i.e., occupational segregation—have been identified as a major cause of the gender wage gap. In this paper, we examine the impact of the gender difference in occupational distribution on the gender wage gap focusing on occupations.

The extent of occupational segregation was measured using the Duncan index, which was found to have exceeded 50 over the past 20 years. This indicates that there is considerable occupational segregation, and in addition that the extent of this occupational segregation has changed little.

In order to then examine the nature of the impact of occupational segregation on the gender wage gap, the wage function was measured including the female share of employment using individual data from the 2000 Basic Survey on Wage Structure. The analysis confirmed that wages in an occupation tend to decline as the share of female employment increases in the case of both the male and female wage functions. The impact of occupational segregation on the gender wage gap was also investigated, but it was found that only around 5% of the overall gender wage gap estimated using the means can be explained by occupational segregation.

I. Introduction

One factor identified as a major cause of the gender wage gap is the difference in occupations in which men and women are employed—i.e., occupational segregation—the argument being that as the two sexes are employed in quite different occupations and large numbers of women are employed in “female-dominated occupations” on relatively low wages, there arises, on average, a large wage gap between men and women.

In this paper, we examine the impact of the male-female difference in occupational distribution on the gender wage gap. The paper consists as follows. Section II examines the state of the female shares of employment in each occupation based on the results of the 2000 Population Census. This is followed in section III by an investigation of the extent of the difference in men’s and women’s occupational distributions using the Duncan index. In section IV, we analyze the extent to which occupational segregation explains the gender wage gap. Finally, section V briefly summarizes the findings.

II. Female Shares of Employment by Occupation and Industry

We begin by examining the extent to which the proportions of employment of men and women in each occupation differ using the results of the 2000 Population Census. Appendix I gives the female shares of employment in each occupation at the division and major group levels of occupational classification (Hereinafter referred to as one-digit occupa-

tions and two-digit occupations, respectively. The proportions at the group level [three-digit occupations], were omitted due to constraints of space).

Appended Table 1 shows the female shares of employment in each occupational division in descending order. “Total” indicates the total number of employed men and women combined, “females” indicates the number of female employed, and “female share of employment” is “females” divided by “total.” It may be observed from this table that the female share of employment is highest among “service workers” (64.8%), followed by “clerical and related workers” (62.0%). In both these categories, the female shares of employment exceed 50%. Among “workers in transport and communications occupations” (4.7%) and “protective service workers” (5.0%), on the other hand, the female shares of employment are only in the single digits, and the proportion is also low among “managers and officials” (11.1%).

The female shares of employment in the two-digit occupations are shown in Appended Table 2, again in descending order. The occupations with the highest proportions of females are “family-life supporting service workers” (96.3%), “social and welfare workers” (85.8%), “clothing and textile products workers” (80.4%), “other service workers” (74.3%), “public health and medical workers” (73.4%), “serving workers” (72.5%), “office equipment operators” (70.1%), “personal sanitary service workers” (66.4%), “musicians and stage artists” (65.5%), and “out-door clerical workers” (65.4%).¹ The female shares of employment are high in occupations such as “service workers,” “clerical and related workers,” and “professional and technical workers.”

Occupations in which there are low proportions of women, on the other hand, include, in ascending order of share, “train drivers” (0.1%), “stationary engine, machinery and construction machinery operators” (0.7%), “workers operating marine and air transport” (0.8%), “electrical workers” (1.7%), “automobile drivers” (2.7%), “mining workers” (2.8%), “transportation equipment assembling and repairing workers” (3.1%), and “construction workers” (3.7%).² It can be seen that the female shares of employment are low in occupations such as “workers in transport and communications occupations” and “production process workers and labourers.”

¹ “Family-life supporting service workers” includes “housekeepers and maids,” “home helpers,” and “babysitters,” etc. “Social and welfare workers” includes “child counselors,” “nursery workers,” and “caregivers.” “Other service workers” includes “tour conductors,” “travel attendants,” “fashion models,” and “undertakers and crematory workers,” etc. “Personal sanitary service workers” includes “barbers,” “beauticians,” and “aestheticians,” etc. “Out-door clerical workers” includes “bill and account collectors” and “meter readers,” etc.

² “Stationary engine, machinery and construction machinery operators” includes “boiler operators” and “crane and winch operators,” etc. “Electrical workers” includes “electrical equipment fitters” and “line builders,” etc.

Table 1. Trends in Duncan Index (Occupations)

	1980	1985	1990	1995	2000
One-digit occupations	26.8	24.6	25.9	27.6	27.9
Two-digit occupations	43.9	44.4	40.6	40.9	40.8
Three-digit occupations	50.4	51.2	51.6	52.3	51.1

Source: Ministry of Public Management, Home Affairs, Posts and Telecommunications, *Heisei 12-nen Kokusei Chosa* (2000 Population Census of Japan).

III. Examination of Difference in Shares of Employment Using Duncan Index

In the preceding section, we looked at the female shares of employment in individual occupations. However, it is not possible to discover the extent of the male and female shares of employment in occupations as a whole simply by looking at the proportions of women in individual occupations. Below, therefore, we examine the degree of divergence in men's and women's occupational distributions using the Duncan index. The Duncan index is an index that is expressed follows:

$$S_t = \frac{1}{2} \sum_i \left| m_{it} - f_{it} \right| \quad (1)$$

where m_{it} is the proportion of males employed in occupation i at time t to males employed in all occupations at time t multiplied by 100, and f_{it} is the proportion of females employed in occupation i at time t to females employed in all occupations at time t multiplied by 100.³ If men's and women's occupational distributions were to exactly coincide, the Duncan index would be zero, and if their occupational distributions were to be completely segmented, the Duncan index would be 100. The Duncan index is a figure that indicates the percentage of men (or women) that would have to change occupations in order for the male and female occupational distributions to coincide.

Table 1 shows the results of calculation of the Duncan index for occupations based on equation (1) in one-digit occupations, two-digit occupations and three-digit occupations of the Population Census occupational classification. If we look at 2000, we see that the Duncan index was 27.9 at the one-digit level, 40.8 at the two-digit level, and 51.1 at the three-digit level. Taking the three-digit level as an example, what these values mean is that men's and women's occupational distributions would not be the same unless 51.1% of men (or women) changed occupation.

Tracing the Duncan index over time, it can be seen that, although the trend varies somewhat, the index does not as a rule change substantially regardless of the level of classification used.

³ In this paper, we obtain the Duncan index using the number of employed. However, the trend remains unchanged even when the index is calculated using the number of employees, though the index is larger in the later case.

IV. Relationship between Female Shares of Employment in Occupations and Wages

1. Explanation of the Crowding Hypothesis

As we have seen, women's and men's occupational distributions differ considerably. Next, we examine the nature of the relationship between the female share of employment in an occupation and wages as a preliminary to examining the relationship between male-female occupational segregation and the gender wage gap.

One theory for explaining the link between occupational segregation by sex and the gender wage gap is the crowding hypothesis put forward by Bergmann (1974). This hypothesis is premised upon the existence of a mixture of female-dominated occupations and male-dominated occupations in the labor market. According to the hypothesis, women are shut out of male-dominated professions and flood into female-dominated occupations for which there are limited employment opportunities. The relative wage of female-dominated occupations consequently falls, giving rise to a gender wage gap.

Below, we briefly explain the crowding hypothesis with reference to Figure 1. Let us suppose that there are presently only two occupations in society: occupation F and occupation M. Both women and men are similarly hired in occupation F and occupation M, and employers allocate the optimal human resources to jobs regardless of sex. If a higher wage is paid in occupation M than occupation F, there will occur a movement from occupation F to occupation M. As a result, the equilibrium wage for both occupation F and occupation M will settle at W_0 . Here, 25% of the labor force is employed in occupation F and 75% in occupation M. In terms of the left-hand diagram (occupation F), the volume of employment between the origin (where the vertical and horizontal axes intersect) and L_{f0} is equivalent to 25% of the labor force, while in the case of the right-hand diagram (occupation M), the volume of employment between the origin and L_{m0} is equivalent to 75% of the labor force. Naturally, both men and women are employed in occupations M and F.

If, as a result of discrimination, social conventions, and similar factors, women's access to occupation M is restricted, however, the labor supply curve for occupation M will shift upwards from S_{m0} to S_{md} , wages will consequently increase from W_0 to W_{md} , and the volume of employment will decline from L_{m0} (75% of the labor force) to L_{md} (60% of the labor force). As a result of being shut out of occupation M, these women would enter occupation F, and the labor supply curve for occupation F would shift downwards (from S_{f0} to S_{fd}). As a result, wages in occupation F would fall to W_{fd} , and the volume of employment would increase from L_{f0} (25% of the labor force) to L_{fd} (40% of the labor force). Thus would arise a wage gap between occupation M and occupation F.

As described above, the decline in wages in occupations in which women concentrate is due to the concentration of women in certain occupations due to their exclusion from certain others, and the decline of wages in these occupations. Working on the basis of the crowding hypothesis, relative wages end up lower in "female-dominated occupations," in

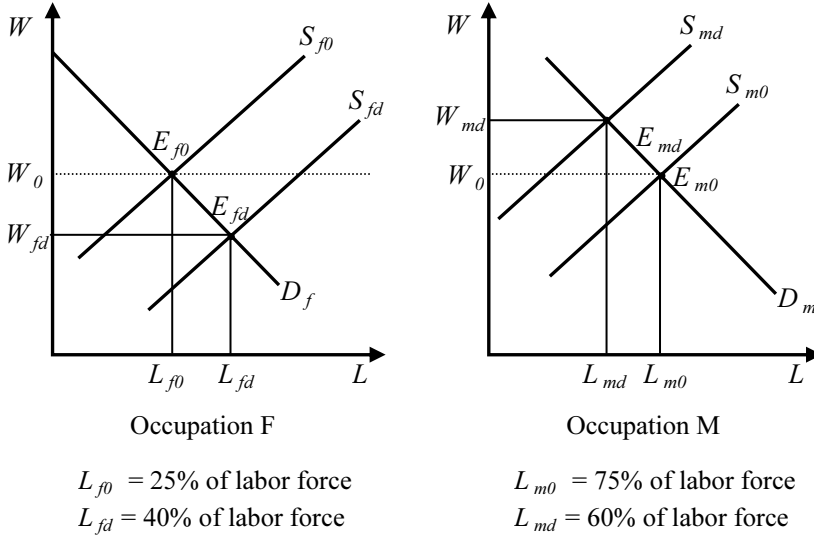


Figure 1. The Crowding Model Illustrated

Source: Blau, Ferber, and Winkler (1998), figure 7.2.

which a high proportion of women are employed, and conversely relative wages are higher in “male-dominated occupations” in which low proportions of women are employed.⁴

2. Results of Past Analyses Regarding Female Shares of Employment and Wages

Based on the crowding hypothesis explained above, wages in an occupation should decline as the female share of employment increases. This relationship is confirmed by the following equation

$$\ln W = F\beta_g + \mathbf{X}\Gamma_g + u \quad (2)$$

$g = \text{females or males}$

where W is wages, F is the female share of employment in each occupation, $\mathbf{X}$ is the vector of control variables indicating age, education, and so on, and β and Γ are each coefficients.

⁴ For the sake of simplicity, we do not here clearly distinguish between the female and male supply and demand structures in occupation F and occupation M. As we shall see later, however, the crowding effect has strikingly different results according to sex even in the case of employment in occupations with the same proportions of females. From the point of view of the theoretical schematic of the crowding hypothesis, this indicates that differing supply and demand curves are encountered in occupations with a relatively high proportion of males and occupations with a relatively high proportion of females. One study that explains the crowding hypothesis by developing a more detailed model that incorporates the differences between the female and male supply and demand structures is that by Altonji and Blank (1999), who explain the crowding hypothesis introducing Johnson and Stafford’s (1998) model.

u is the error term.

If the crowding hypothesis is valid, then a negative relation should be observed between F , indicating the female employment rate, and wage $\ln W$. In other words, if the female share of employment increases, female or male wages should fall. As a result, the value of β , which is the coefficient value of F , is expected to take a negative value.

Analysis based on equation (2) have produced numerous findings that give a negative value to β . Bayard, Hellerstein, Neumark, and Troske (2003) used matching data on employees and employers to examine to what extent the gender wage gap could be explained by not only the female share of employment in occupations in the labor market as a whole, but also the female shares of employment in industries, at business establishments, and in occupations within business establishments. Their estimates, calculated similarly to equation (2) above, showed the coefficient values of the females shares of employment in occupations in the labor market as a whole, industries, business establishments, and occupations in business establishments to each be negative, showing that wages are relatively lower in occupations, industries, and business establishments with high female shares of employment. They additionally found that the above four shares together explain around half of the gender wage gap.

Blau and Beller (1988) used data from 1971 to 1981 to show that the value of β is negative for both men and women. Sorensen (1990) also argues that β exhibits a negative effect, and that 15%-30% of the gender wage gap is explained by this variable.

Johnson and Solon (1986) and Macpherson and Hirsch (1995) obtained the following results:

- (i) Male and female wages each tend to decrease as the female share of employment in an occupation increases.
- (ii) The extent of this decrease is greater for males than for females.

3. Results of Measurements Using Data for Japan

According to the crowding hypothesis explained above, wages in an occupation should decline as the proportion of women increases relatively. This relationship is confirmed by the previously explained equation (2).

If the crowding hypothesis is valid, there should be observed a negative relation between F , indicating the female employment ratio, and wages $\ln W$. Here, therefore, we estimate the relationship between the female share of employment by occupation and the gender wage gap in Japan according to equation (2). In the case of Japan, however, analysis of the impact of the female share of employment on male or female wages using individual data is severely hampered by the limitations of the data available. The Population Census used so far to measure the Duncan index is fine from the point of view of occupational categories, but it provides no information at all on wages. *Chingin Kozo Kihon Tokei Chosa* (Basic Survey on Wage Structure), referred to below as the "Wage Census," does provide wage data, but covers only a low proportion of occupations, and no occupation or job grade

is given for over half of employees in the data for 2000.

In the absence of suitable data linking occupations and wages, we adopt a second-best strategy in this paper of analyzing the occupations covered by the Wage Census by looking at the relationship between men's and women's wages and female shares of employment in occupations. In specific terms, we measure the following wage functions for men and women respectively using individual data from the 2000 Wage Census. As the inclusion of part-time workers would result in insufficient information being available on education, we analyze ordinary workers in the present paper.

$$\ln W = \alpha + \beta_1 \times AGE + \beta_2 \times AGE^2 + \beta_3 \times TEN + \beta_4 \times TEN^2 + \beta_5 \times \Sigma SCH_i + \beta_6 \times \Sigma FS_i + \beta_7 \times \Sigma IND_i + \beta_8 \times F + \varepsilon \quad (3)$$

where W is wages, AGE is age, TEN is length of continuous employment by an employer years, SCH is the educational background dummy (base = junior/senior high school graduate), FS is the enterprise size dummy (base = fewer than 10 employees), IND is the industry dummy indicating industry in the one-digit occupations (base = manufacturing), and F is the female share of employment in an occupation. ε is the error term.

The main object of interest is the value of the coefficient β_8 indicating the relation between F , which indicates the female share of employment in an occupation, and wage W . If coefficient β_8 is negative, this indicates that men's or women's wages will fall if the proportion of females in an occupation increases.

The education dummy variables are introduced to measure how much higher technical college, junior college, and four-year college graduates' wages are compared with the base junior/senior high school graduate category. Similarly, the enterprise size dummy variables measure the extent of the increase in wages of persons employed at enterprises with 10-99 employees, 100-999 employees, and 1,000 or more employees compared with a base of persons employed at enterprises with fewer than 10 employees. The dummy industry variables also measure the extent of the increase or decrease in wages of employees employed in industries other than the base (manufacturing) at the one-digit level of classification.

For wages W , we use the result of dividing scheduled cash earnings by contract working hours. The sample used for the purpose of estimating equation (3) covers persons whose scheduled cash earnings are not zero, and persons whose contract working hours are not zero. As previously noted, the analysis concerns ordinary workers.

The square term of age and square term of length of continuous employment are introduced to express the relationship between age or length of continuous employment and wages as quadratic functions. For the actual calculations, however, we used the value obtained by dividing the square term of age or the square term of length of continuous employment each by 100.

Estimates were calculated by the least squares method using sampling weights. Estimates were calculated for male and female ordinary workers separately in accordance with

equation (3).

Based on equation (3), the results of the estimates of wage functions for men and women are as shown in Table 4 and Table 5. Table 2 and Table 3 show the descriptive statistics for men and women respectively. Looking at the estimated wage function for women shown in Table 4, it can be seen that the values for all except mining are significant at the 1% level, and the signs, too, largely satisfy the theoretical conditions. The value of F , which is the main interest, is negative and statistically significant. This finding indicates that women's wages decline as the female share of employment in an occupation increases. Results that support the crowding hypothesis described above can be detected in the wage functions for women.

The estimates of men's wage function, on the other hand, are shown in Table 5. All the variables are statistically significant at the 1% level, and, as with women's wage function, the signs are positive and negative as expected. The value of F is negative in the case of men, too, and is in addition statistically significant. These results indicate that, like women's, men's wages decrease as the female share of employment in an occupation increases.

A comparison of the female F and male F coefficients reveals that the absolute value is larger in the case of men (-0.110) than women (-0.046). This finding resembles those of Johnson and Solon (1986) and Macpherson and Hirsch (1995), and indicates that men experience a larger decline in wages as a result of being in a female-dominated occupation.

The albeit quite limited data thus show there to be a negative relation between the female share of employment and wages, as explained by the crowding hypothesis, in Japan too.

4. How Much of the Gender Wage Gap is Explained by Occupational Segregation?

Having shown that there is a negative relation between female share of employment in an occupation on the one hand and women's or men's wages on the other, we consider next the extent of the impact of occupational segregation on the gender wage gap. Below, we investigate the impact on the gender wage gap of occupational segregation based on the estimates shown in Table 4 and Table 5.

It must be noted at this point that, as the results in Table 4 and Table 5 indicate, the coefficient of determinations for both the female wage function and the male wage function are below 0.4, which does not fit the model closely. In other words, the proportion of the variation in women's wages and the variation in men's wages that is explained by the explanatory variables shown in Table 4 or Table 5 (age [age^2], length of continuous employment [$\text{length of continuous employment}^2$], education, size of employer, industry, and female share of employment in occupation) is less than 40%. To put it the other way around, over 60% of the determinants affecting female wages and male wages remain to be explained, and in some cases the coefficient for the female share of employment F could become negative due to the effect of these statistically unobserved factors. Bearing this point in mind, the correlations between F and the other explanatory variables and the residual term were

Table 2. Descriptive Statistics (Females: Ordinary Workers)

	No. of ob- servation	Minimum	Maximum	Mean	Standard deviation
F	89,767	0	1	0.68	0.29
4-year college graduate	89,767	0	1	0.08	0.28
Junior/technical college graduate	89,767	0	1	0.31	0.46
Enterprise size: 10-99 persons	89,767	0	1	0.37	0.48
Enterprise size: 100-999 persons	89,767	0	1	0.34	0.47
Enterprise size: 1,000 or more persons	89,767	0	1	0.25	0.43
Mining	89,767	0	1	0.00	0.02
Construction	89,767	0	1	0.00	0.06
Electricity, gas, heat supply and water	89,767	0	1	0.00	0.02
Transport, information and communications	89,767	0	1	0.03	0.16
Wholesale and retail trade, eating and drinking places	89,767	0	1	0.14	0.35
Finance and insurance	89,767	0	1	0.08	0.27
Real estate	89,767	0	1	0.00	0.06
Services	89,767	0	1	0.54	0.50
Age	89,767	15	79	38.12	13.22
Age ²	89,767	2.25	62.41	16.28	10.72
Length of continuous employment	89,767	0	62	7.86	7.78
Length of continuous employment ²	89,767	0	38.44	1.22	2.22
lnW	89,767	3.95	12.25	7.11	0.40

Table 3. Descriptive Statistics (Males: Ordinary Workers)

	No. of ob- servation	Minimum	Maximum	Mean	Standard deviation
F	179,154	0	1	0.16	0.20
4-year college graduate	179,154	0	1	0.16	0.37
Junior/technical college graduate	179,154	0	1	0.09	0.29
Enterprise size: 10-99 persons	179,154	0	1	0.39	0.49
Enterprise size: 100-999 persons	179,154	0	1	0.32	0.47
Enterprise size: 1,000 or more persons	179,154	0	1	0.24	0.43
Mining	179,154	0	1	0.01	0.07
Construction	179,154	0	1	0.03	0.18
Electricity, gas, heat supply and water	179,154	0	1	0.01	0.10
Transport, information and communications	179,154	0	1	0.20	0.40
Wholesale and retail trade, eating and drinking places	179,154	0	1	0.11	0.31
Finance and insurance	179,154	0	1	0.01	0.08
Real estate	179,154	0	1	0.00	0.05
Services	179,154	0	1	0.28	0.45
Age	179,154	15	79	39.88	12.70
Age ²	179,154	2.25	62.41	17.51	10.62
Length of continuous employment	179,154	0	64	11.10	10.13
Length of continuous employment ²	179,154	0	40.96	2.26	3.51
lnW	179,154	4.39	11.89	7.36	0.41

Table 4. Estimates of Wage Function (Females: Ordinary Workers)

	β	t-value
(Constant)	5.971	497.746
Age	0.032	54.657
Age ²	-0.040	-56.548
Length of continuous employment	0.021	50.678
Length of continuous employment ²	-0.009	-6.321
Junior/technical college	0.164	62.171
4-year college	0.368	87.918
Enterprise size: 10-99 persons	0.086	17.828
Enterprise size: 100-999 persons	0.186	39.156
Enterprise size: 1,000 or more persons	0.282	53.895
Mining	0.193	1.544
Construction	0.166	7.491
Electricity, gas, heat supply and water	0.304	2.724
Transport, information and communications	0.326	41.699
Wholesale and retail trade, eating and drinking places	0.189	49.126
Finance and insurance	0.230	40.603
Real estate	0.153	5.278
Services	0.332	96.334
F	-0.046	-10.299
Sample size	89,767	
Adj R ²	0.376	

Table 5. Estimates of Wage Function (Males: Ordinary Workers)

	β	t-value
(Constant)	6.058	626.591
Age	0.051	106.373
Age ²	-0.057	-102.810
Length of continuous employment	0.020	72.274
Length of continuous employment ²	-0.016	-20.727
Junior/technical college	0.077	27.078
4-year college	0.298	127.772
Enterprise size: 10-99 persons	0.049	13.439
Enterprise size: 100-999 persons	0.053	14.202
Enterprise size: 1,000 or more persons	0.173	44.843
Mining	-0.063	-2.613
Construction	0.083	17.436
Electricity, gas, heat supply and water	0.175	10.016
Transport, information and communications	-0.081	-35.582
Wholesale and retail trade, eating and drinking places	-0.027	-10.048
Finance and insurance	0.097	8.920
Real estate	0.093	4.392
Services	0.074	31.087
F	-0.110	-25.261
Sample size	179,154	
Adj R ²	0.350	

examined, but no explanatory variables were found to be significantly correlated with the residual term. Regarding in particular the relation between the female share of employment F and the residual term, the respective results shown for men and women were also investigated, but no clear relation between the size of the female share of employment and the residual term was observed. In view of these results, it can be seen that the coefficient for F does not take a negative value in response to the effect of unobserved factors.

Despite the poor fit of the coefficient of determinations, the quite large scale of the survey, which covered 179,154 men and 89,767 women, makes it, in a sense, unavoidable that the coefficient of determinations will be small. In fact, the results of estimates for Europe and North America also produce values for the coefficient of determinations that resemble the results described here. In this paper, therefore, we analyze the impact of occupational segregation on the gender wage gap based on the results in Table 4 and Table 5.

We consider the impact of occupational segregation on the gender wage gap using the same method as that employed by, among others, Sorensen (1990) and Johnson and Solon (1986). Reproducing equation (2) for men and women separately gives us

$$\ln W_f = F\beta_f + X_f\Gamma_f + u_f \quad (4)$$

$$\ln W_m = F\beta_m + X_m\Gamma_m + u_m \quad (5)$$

where W is wages, F is the female share of employment in each occupation, X is the control variable indicating age and length of continuous employment, etc., and β and Γ are the respective coefficients. u is the error term. The subscripted f and m each indicate female and male. Here, evaluating equation (4) and (5) using the means eliminates the error term, resulting in equations (4)' and (5)'.

$$\underline{\ln W_f} = \underline{F_f}\beta_f + \underline{X_f}\Gamma_f \quad (4)'$$

$$\underline{\ln W_m} = \underline{F_m}\beta_m + \underline{X_m}\Gamma_m \quad (5)'$$

Further resolving equations (4)' and (5)' gives equation (6).

$$\begin{aligned} \underline{\ln W_m} - \underline{\ln W_f} &= \underline{F_m}\beta_m + \underline{X_m}\Gamma_m - \underline{F_f}\beta_f - \underline{X_f}\Gamma_f \\ &= \underline{F_m}\beta_m - \underline{F_f}\beta_f + \underline{X_m}\Gamma_m - \underline{X_f}\Gamma_f \end{aligned} \quad (6)$$

The first and second terms on the right side of equation (6)—i.e., $\underline{F_m}\beta_m - \underline{F_f}\beta_f$ —are the parts that evaluate the gender difference in the female share of employment in an occupation, and they reflect the impact of occupational segregation. Accordingly, the degree of the impact of occupational segregation on the gender wage gap evaluated using the means is obtained by the following equation:

$$\frac{E_m\beta_m - E_f\beta_f}{(\ln W_m - \ln W_f)} \quad (7)$$

Calculating the values of equation (7) using the values from Tables 2 through 5 gives the following:

$$\begin{aligned} & \frac{E_m\beta_m - E_f\beta_f}{(\ln W_m - \ln W_f)} \\ &= (-0.110 \times 0.162 - (-0.046) \times 0.676) / (7.364 - 7.106) \\ &= 0.0132 / 0.258 \\ &= 0.0512 \end{aligned}$$

From the result, it can be seen that only 5.1% of the entire gender wage gap evaluated using the means is explained by occupational segregation. It may be concluded from the present findings that occupational segregation is not a powerful explanatory factor in the gender wage gap. Sorensen (1990) shows in an analysis of the situation in the United States that occupational segregation explains 15-30% of the gender wage gap evaluated using means, in comparison with which the results presented here for Japan have conspicuously less explanatory power.

V. Conclusion

In this paper, we analyzed segmentation in the labor market focusing on occupation. The extent of occupational segregation was measured using the Duncan index, which it was found has exceeded 50 over the past 20 years at the three-digit level of classification. This indicates that there is considerable occupational segregation, and that the extent of this occupational segregation has changed little. In order to then investigate the nature of the impact of occupational segregation on the gender wage gap, the female share of employment was added to the wage function for measurement. As a result, it was found that the coefficient of the female share of employment exhibits a negative value in the case of both the female wage function and the male wage function. This indicates that both women's and men's wages decline as the female share of employment in an occupation increases. Based on these estimates, the extent to which the gender wage gap can be explained by occupational segregation was estimated, and it was found that only 5.1% of the gender wage gap estimated based on the means was explained by occupational segregation. Insofar as can be determined from the present findings, occupational segregation cannot be said to have a major impact on the gender wage gap. As noted earlier, however, there is a shortage of data linking occupations and wages in Japan, and the Wage Census used here too suffers from a bias toward blue collar jobs in its occupational makeup, resulting in a significant lack of data on occupations corresponding to clerical white collar positions. The impact of occupational segregation on the gender wage gap therefore needs to be reinvestigated after further

refinement of the data sources available.

However, the crowding hypothesis is not the only hypothesis to explain the negative relation between the female share of employment and wages. For instance, the compensated wage differential hypothesis also explains this relationship. According to the compensated wage differential hypothesis, workers choose wages and non-wage work attributes as a package. It is therefore possible to choose working conditions as a package. One might, for example, choose a job that offers a low wage but that also enables one to work one's preferred working hours, commute a shorter distance, and perform less onerous duties. Conversely, a package may consist of a high wage, heavy responsibility, and restrictive working hours. If many women choose occupations associated with the former kind of package and many men choose the latter, the female share of employment and women's or men's wages may consequently be negatively related.

The crowding hypothesis is thus not the only explanation provided by economic theory for the negative relation between the female share of employment and wages. Moreover, the policy implications differ according to whether it is the crowding hypothesis or the compensated wage differential hypothesis that is the more valid. In the case of the crowding hypothesis, women's lower wages are a result of their being excluded from certain occupations by institutional factors, such as employers' prejudices. In order to eliminate the gender wage gap, therefore, these conditions need to be eliminated in order to make certain occupations more accessible to women. In the case of the compensated wage differential hypothesis, on the other hand, women's low wages are a result of the individual's selection of a package of wage and non-wage elements according to his or her own tastes, leading in turn to a gender wage gap. According to this hypothesis, therefore, there is basically no longer any scope for policy intervention to eliminate the gender wage gap. If the compensated wage differential hypothesis does hold, however, then one would expect there to be many cases of women choosing to work as non-regular employees, and as part-time workers in particular. According to the compensated wage differential hypothesis, women constrained by the demands of home, such as housework, child care, or caring for an elderly relative, may choose non-regular employment allowing them greater flexibility of working hours, albeit at a lower wage. The findings in this paper are the results of an analysis of only ordinary workers, who correspond to regular workers. From the finding based on results concerning only ordinary workers that there exists a negative relation between the female share of employment and women's or men's wages, the present findings suggest that the crowding hypothesis is highly likely to be valid.

Appendix: Female Shares of Employment by Occupation

Appended Table 1. Female Shares of Employment in the One-Digit Occupations of the Population Census

One-digit occupations	Total	Females	Female share of employment (%)
Service workers	5,619,616	3,639,208	64.8
Clerical and related workers	12,295,848	7,624,294	62.0
Workers not classifiable by occupation	741,810	325,036	43.8
Professional and technical workers	8,567,691	3,719,132	43.4
Agricultural, forestry and fisheries workers	3,174,286	1,359,265	42.8
Sales workers	9,398,137	3,406,700	36.2
Production process workers and labourers	18,059,022	5,320,527	29.5
Managers and officials	1,856,978	205,857	11.1
Protective service workers	1,013,920	51,177	5.0
Workers in transport and communications occupations	2,304,963	108,929	4.7

Source: Ministry of Public Management, Home Affairs, Posts and Telecommunications, Statistics Bureau, *Heisei 12-nen Kokusei Chosa* (2000 Population Census).

Appended Table 2. Female Shares of Employment in the Two-Digit Occupations of the Population Census

Two-digit occupations	Total	Females	Female share of employment (%)
Family-life supporting service workers	179,190	172,584	96.3
Social and welfare workers	573,925	492,470	85.8
Clothing and textile products workers	628,534	505,419	80.4
Other service workers	705,354	524,247	74.3
Public health and medical workers	2,394,017	1,757,312	73.4
Serving workers	1,666,551	1,208,723	72.5
Office equipment operators	374,657	262,679	70.1
Personal sanitary service workers	866,325	574,845	66.4
Musicians and stage artists	197,559	129,422	65.5
Out-door clerical workers	92,674	60,651	65.4
General clerical workers	11,520,415	7,204,009	62.5
Food manufacturing workers	1,295,259	788,545	60.9
Other labourers	1,732,610	1,008,496	58.2
Food and beverages preparing workers	1,949,255	1,066,326	54.7
Textile workers	218,240	109,966	50.4
Other professional and technical workers	629,447	313,591	49.8
Professors and teachers	1,403,545	656,128	46.7
Agricultural workers	2,866,662	1,295,657	45.2
Leather and leather products workers	48,933	22,015	45.0
Workers not classifiable by occupation	741,810	325,036	43.8

Appended Table 2 (*Continued*)

Two-digit occupations	Total	Females	Female share of employment (%)
Other manufacturers	1,591,119	672,447	42.3
General machine assembling and repairing workers	1,364,992	561,331	41.1
Measuring and optical instrument assembling and repairing workers	157,176	62,216	39.6
Sales workers of commodities	7,083,938	2,751,327	38.8
Rubber and plastic products workers	470,874	178,954	38.0
Superintendents of residences and buildings	252,941	92,483	36.6
Fine artists, photographers and designers	265,908	96,821	36.4
Pulp, paper and paper products workers	188,602	67,145	35.6
Authors, reporters and editors	129,499	41,812	32.3
Carrying labourers	1,499,731	482,083	32.1
Clerical workers in transportation and communication	308,102	96,955	31.5
Beverage and tobacco manufacturing workers	57,274	16,831	29.4
Printing and book-binding workers	374,707	109,922	29.3
Sales related workers	2,314,199	655,373	28.3
Communication workers	164,250	38,517	23.5
Fisheries workers	240,066	55,602	23.2
Chemical products workers	280,812	64,219	22.9
Ceramic, clay and stone products workers	298,235	66,370	22.3
Wood, bamboo, grass and vine products workers	323,852	67,120	20.7
Religious workers	115,496	18,484	16.0
Metal processing workers	1,632,546	250,601	15.4
Scientific researchers	159,430	22,598	14.2
Judicial workers	55,947	7,896	14.1
Directors of companies and corporations	1,263,168	177,098	14.0
General machine assembling and repairing workers	1,020,880	127,384	12.5
Forestry workers	67,558	8,006	11.9
Other workers operating transport	158,447	18,131	11.4
Management professionals	119,033	11,664	9.8
Metal material workers	209,989	16,449	7.8
Engineers and technicians	2,523,885	170,934	6.8
Government officials	118,790	6,263	5.3
Protective service workers	1,013,920	51,177	5.0
Other managers and administrators	475,020	22,496	4.7
Construction workers	2,880,632	105,396	3.7
Transportation equipment assembling and repairing workers	730,761	22,974	3.1
Mining workers	39,541	1,113	2.8
Automobile drivers	1,897,114	51,894	2.7
Electrical workers	639,566	10,860	1.7
Workers operating marine and air transport	43,571	338	0.8
Stationary engine, machinery and construction machinery operators	374,157	2,671	0.7
Train drivers	41,581	49	0.1

Source: Ministry of Public Management, Home Affairs, Posts and Telecommunications, Statistics Bureau, *Heisei 12-nen Kokusei Chosa* (2000 Population Census).

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Occupational Sex Segregation and the Japanese Employment Model: Case Studies of the Railway and Automobile Industries

Wakana Shuto

Japan Women's University

The aim of this paper is to illustrate empirically, through the use of prominent examples, the degree of occupational sex segregation in Japan and the impact that the decline in such segregation has had on Japanese industrial relations.

The employment model of Japan is characterized by a flexible labor structure featuring broadly-skilled workers who are supported by a seniority-based pay system and demonstrate a high level of labor productivity. However, this Japanese pattern of employment is only the norm for male workers and does not necessarily apply to female workers. Women are generally employed in different occupations, and even when they do perform the same work as men, in most instances they are placed on different career tracks. This occupational and career differentiation is termed as “occupational sex segregation,” and this division by sex has long underpinned Japan’s employment model.

However, recent years have chipped away at the wall of separation, and since the 1990s women have begun to enter occupations previously exclusive to men. This paper will present six case studies and analyze this new phenomenon focusing on the automobile and railway industries, seen as strongholds of Japanese industrial relations.

I. Introduction

1. The Japanese Industrial Relations Model

The Japanese industrial relations model has been commonly characterized by “three pillars,” which consist of lifetime employment, seniority pay systems, and enterprise unionism (OECD 1973). In Japan, employers commonly promise lifetime employment in order to bolster worker morale, and the phenomenon of lifetime employment is generally understood to eventually lead to higher worker productivity and enterprise loyalty. Thus, employees under a lifetime employment system work for the same firm from the start of their working lives to their retirement. Stable employment enables employers to invest in their employees from a long-term perspective, where managers can expect to recoup the consequent higher cost of employee training and resultant wage scales. Such firms offer employees long-term, enterprise-based job training, and so employees are able to muster a broader range of knowledge and skills than many of their counterparts in other industrialized nations. The high level of worker skills and promise of long-term employment also makes Japanese employees amenable to job duty flexibility, a necessary prerequisite to the lifetime employment system. For employees, job security and a regular income are considerable reassurance that they will be able to live a stable life, even without the assurance that they will perform one particular job for the duration of their employment with the company.

In return for lifetime employment, workers make a considerable commitment to the

firm, of which the best evidence is the long hours on the job that most Japanese employees commonly devote to their work. Wage and promotion systems in Japan are also strongly tied to the lifetime employment system. Employees are promoted internally, and their wages rise based on a seniority scale that measures the length of their service within the same firm. It is commonly thought by management and employees alike that seniority reflects job knowledge and skills. Nevertheless, pay is not strictly based on seniority (though seniority is an especially strong element in compensatory evaluation for non-executive workers), but also to some degree on merit.

In addition, many companies have also expanded the private welfare benefits they provide for employees in order to strengthen their commitment to the firm. Large-sized firms usually offer ample welfare benefits to employees such as pension plus retirement benefits, as well as a good accommodation system. This is known as “welfare corporatism” (Dore 1973). Importantly, worker benefits are offered not only for white-collar but also for blue-collar workers. As the latter improve their abilities, blue-collar workers also tend to agree to job flexibility and seniority based wages: a scheme generally known in Japan as the “white-collarization of blue-collar workers” (Koike 1996).

2. Occupational Sex Segregation

The lesser-known reality is that this employment model, while significant, is the norm only for men. Women workers in Japan are marked by short-term employment and fewer job skills; moreover, Japan has the largest gender wage gap of all the developed countries. Indeed, there is a tremendous amount of “occupational sex segregation” in the workplace. Although such employment patterns were made illegal by the Equal Employment Opportunity Act (EEOA) in 1985, occupational sex segregation continues to be the norm today.

What is meant here by “occupational sex segregation” is a combination of “job segregation” and “career segregation.”¹ The type of work performed by men and women tends to be defined by their sex. According to government data, more than 50% of all occupations consist mostly of one sex or the other (Management and Coordination Agency 2000).

Even when male and female employees are working on the same job, there are generally different career tracks for men and women. In Europe and the United States, career segregation is observed when women working at the same job as men are rarely promoted (Wirth 2001). This is known as the “glass ceiling.” Although Japan shares the phenomenon, this is not the main issue for the kind of sex segregation experienced by women. Instead, it is very common for there to be several career courses within each occupation. One path for a particular career usually involves employees experiencing a variety of jobs as part of their

¹ Occupational sex segregation is generally characterized by the phenomenon of “horizontal segregation” and “vertical segregation” (Hakim 1992). Occupational segregation in Japan, however, is not fully explained by these characteristics, as the Japanese workforce has a unique occupational structure best understood by its “institutional division of career tracks.” Hence, this paper defines occupational sex segregation as both “job segregation” and “career segregation.”

promotion track training programs, whereas another career path involves a very limited amount of the kinds of job training experiences that in the majority of cases lead to promotion. While the former type of career is almost always populated by men, the latter is, in practice, reserved for women.

For example, there are both men and women working as clerks in all offices; however, many male workers are usually promoted to upper-managerial status while many female workers remain in their clerical jobs until retirement. According to one government report of 2001, in companies that had introduced several career courses, 98% of clerical workers on an executive career track were male (Ministry of Health, Labour and Welfare 2001). It is generally well known that Japanese firms do not recruit employees for a particular job but rather for a career, and employees work toward that career, not any particular job. Therefore, in Japan, career segregation has two implications; one is that career segregation is tantamount to the creation of a “glass ceiling” for women, and the other is the implicit difference in career tracks. The latter is the more critical issue, one which leads to a severe gender gap in job skills and wage scales.

The Japanese employment model is based on precisely this division of labor. Indeed, occupational sex segregation is co-dependent with the Japanese model. While men are generally trained for a broader range of skills, women do mostly auxiliary work. Men generally commit themselves fully to the firm, while women are usually expected to make primary their domestic roles as “housewives.” Lower wages for women enables higher wages for men. Private welfare, generally provided by the employers, is based on a so-called breadwinner family model where firms grant generous allowances for (male) employees with dependent family members. Labor unions also contribute to this system, and call for wages for men that are enough to support a wife and children. Indeed, “welfare corporatism” is built on this kind of “familialism” (Esping-Andersen 1990).

3. Subject, Theories and Hypothesis

The proclivity toward gender segregation in the Japanese workplace has recently begun to change. In the 1990s, female workers began to enter into occupations that were previously only held by males. This trend is best observed in industries that form the lynchpin of the Japanese Employment Model. If gender segregation were an indispensable factor to the continuation of the Japanese Model, a decline in workplace gender segregation would have strong implications for the Japanese Employment Model. Therefore, this article addresses the issue whether the model for Japanese employment needs to be reconfigured to conform with other models, or whether it is possible to maintain the principle elements of the Japanese Model in the increasingly likelihood of an end to gender segregation in the workplace. This study is constructed around three questions:

- a. Why have women sought work in industries previously dominated by men?
- b. How is it that occupational sex segregation has decreased?
- c. How do these changes affect our understanding of the Japanese Employment Model?

These research questions were addressed through a variety of case studies carried out in Japan, and the author is especially concerned here with cases of the railway and automobile industries. Employees in both industries are exemplary of the effects of the Japanese Model for being uniquely multi-skilled and flexible workers. Moreover, these industries have in the past wholly consisted of men; however, from the early 1990s the number of women working in both industries has been on the rise.

It must be noted that until the recent past, women had not been allowed to take up particular occupations in Japan. Indeed, until 1999 the Labor Standards Act in Japan even prohibited women from working at night. While the EEOA was enacted in 1985, companies still continued to not recruit women in places that required night duties, and until the change in the Labor Standards Act in 1999, women did not have an equal chance in the workplace.

In addition to legal discrimination, men are generally considered physically stronger than women. Indeed, on average a woman's bicep strength is only 50-60% of that of a man's (Ministry of Education, Culture, Sports, Science and Technology 2002). According to government data, one quarter of companies in the manufacturing sector only allocate certain jobs to women, or they do not even recruit women, based on the government finding that "women do not have enough muscular strength to do certain jobs" (Ministry of Labour 1998). This thinking might appear to be from the Stone Age, and needless to say, muscular strength does differ between individuals; however, muscle mass does not have an effect on the recruitment process in other developed countries. Yet in Japan it is generally believed that women could not possibly take on heavy physical jobs, and this bias is used as an obstacle in the employment of women. Both factors impede equal opportunities and create job segregation in Japan.

Moreover, the main characteristic of employment for males is lifetime employment, which is implemented by continuous training and retraining of workers throughout their career. Companies usually exclude women from the training process, as managers believe it would be difficult for the company to recoup their investment costs in a female employee who is customarily expected to make her domestic duties primary. This is explained by the statistical discrimination theory (Phelps 1972). Since Japan has a longer term training system for male workers compared with other countries, career segregation is a correspondingly more significant factor for Japanese women.

At the same time, this theory tends to not just exclude but also necessitate the participation of female workers. Japanese managers prefer that not all employees stay with the company long-term on the grounds that they must consider the negative effect on employees who cannot be promoted, and the increase in personnel costs based on seniority basic wages. As a result, rather than just hiring long-term employees, managers occasionally prefer to hire a small percentage of short-term employees who perform duties similar to long-term employees but without the associated long-term costs. Such labor management policies form the core of occupational sex segregation in Japan. According to previous research, Japan's job segregation is surprisingly lower than in other developed countries de-

spite the large gap in wages between men and women (Anker 1998; Blau, Ferber, and Winkler 1998; Hakim 1992; Nishikawa 1997; OECD 1985, 1988; Roos 1985). The contradiction is the result of greater career segregation, and as a result occupational sex segregation in Japan is characterized by a lower rate of job segregation and higher rate of career segregation.

The analysis of occupational sex segregation in this study is framed by three hypotheses: Regulations Restricting Night Shifts for Women, Differences in Physical and Muscular Strength, Theory of Statistical Discrimination.

II. The Railway Industry

The author considered six case studies in which women in recent years have increasingly been employed in traditionally male jobs, e.g. train drivers, conductors, and automobile assemblers. These case studies consist of interviews with managers, labor union leaders, supervisors, and workers themselves. The interviews principally focus on the railway (company A, B and C) and automobile (company D, E and F) shop floor as typical of the Japanese model. The author analyzes the way each subject overcame gender segregation, and how some work rules were changed with the integration of women onto the shop floor.

1. Entrance of Female Workers

The typical shop floor within the railway industry is reserved for full-time, male high school graduates. Generally thought to have lifetime employment, on average, these workers keep their jobs longer than their counterparts in other industries. There are three primary types of job duties: station attendants, conductors, and drivers. Railway employees are usually recruited as “transportation workers,” and are generally expected to undertake all three job categories over the course of their careers. Their general promotion system is as follows: new recruits spend between 2 to 3 years on station duty, then 7 to 8 years as train conductors and after their tenth year or later they are promoted to be drivers. Job relocation within the railway system leads to an increase in wages, and the speed of promotion differs from person to person; theoretically though, almost every employee could eventually be promoted to driver. There are additional rare cases of promotions up to the level of station master, but it is nevertheless typical of the Japanese model to promote an employee based on their having performed a wide variety of job duties during different stages of the employees career with the company.

In 1985, company A built a new type of train targeting tourists, and first began hiring women to serve as on-board crew members.² Then in 1992, several firms began to recruit

² Serve-on-board crew members do all the work that male conductors do, but they do not handle train door controls. It is generally believed that these female employees are obviously different from male conductors; that they are on board only to perform passenger services and not for the operation of trains. Consequently, working conditions and job prospects, such as the wage and career system, are completely different for the two positions. Needless to say, the former job is meant only for

women as drivers. Company B built the newest airport express train in 1994, and started employing women as conductors. Likewise, company C established “clerical work” within its categorized station duties, and began hiring women as well. Since the late 1980s, all three companies had been discussing how to address an anticipated labor shortage. Under this situation managers thought to begin employing women, which they also considered would generate good publicity for the company’s new line of trains.³ The integration of women into the workforce, however, was strongly opposed by their male employees, who gave voice to their opposition through their representative labor unions.

Women were employed in the same jobs as those offered to men, but companies made special accommodations for women in terms of work schedule, job training, and promotion. New work shifts without night duty were created and reserved for women, as it was thought that the rate of female employees was limited to approximately 10%. Women’s job duties were very restricted: their job training and skills were limited and new women employees had little experience in related fields. In company A for instance, from the outset women were groomed as drivers. Yet, it took men at least 10 years of station and conductors’ duties before they could be promoted to the position of “driver.” The company, however, applied a system in which women workers would take on driving duties after only 2 years experience, as it was thought that women were likely to quit sooner than men.⁴ Nevertheless, managers expected women drivers to remain in the firm for at least 10 years on the grounds that they needed to return their investment cost and gain the public trust. Likewise, in company B, women conductors were promoted sooner than men, and with earlier job transfers, women began receiving comparatively higher wages under the extant wage system. Therefore, in company B, women conductors received 10 to 20% higher wages than the male conductors of the same age, and 30% higher than women of the same age holding clerical jobs.

Most women in integrated jobs remained in the same firm, and therefore managers made sure that women could stay with their jobs for at least the minimum length of time expected. In 1999, protective legislation restricting employment for women was revised, which included the abolition of the legal proscription against late-shift night work for women. After revision of the law, companies passed many jobs usually reserved for men on to women, and newly hired men and women were both employed for “transportation work.” Indeed, companies generated an entirely new policy of introducing all new hires, male and female, to the same promotion system. To the present day, companies B and C have been

women and latter job is strictly reserved for men.

³ These companies then recruited women from junior colleges and men from high schools. Due to the overwhelming disproportionate numbers of women attending junior colleges, recruiting junior college graduates meant recruiting women. In fact, 88% of junior college graduates are women (Ministry of Education, Culture, Sports, Science and Technology 2003). In effect, it was easier to strengthen sex segregation in the workplace by implementing academic qualifications.

⁴ Indeed, men would remain for almost 20 years in their duties as conductors, drivers and operators in order to work their way up from the regular trains to express trains. For greater publicity, women were assigned to ride on express trains from the very beginning.

hiring between 20 to 40% of women for transportation work, and presently the rate is still on the increase. Company A, on the other hand, has stopped recruiting women entirely, the occurrence of which will subsequently be examined in a later study.

2. Three Factor Changes in the Railway Industry

Occupational sex segregation in the railway industry has progressed to a period of occupational integration for both men and women. Three factors that historically contributed to sex-segregated occupations have changed: legal and corporate systems, attitudes towards physical strength as a job prerequisite, and statistical conditions that contribute to occupational segregation.

After the legal review imposed by the EEOA, two out of three companies chose to implement systems requiring the same duties and careers be assigned to both sexes, and the number of women in the workplace subsequently increased. The legal prohibition of night duties for women had created not only a sex-based working shift differential in both industries, but was fundamental to the divisions in hiring by gender, training, and promotion.

Thanks to technological improvements, sex-difference in physical strength is no longer a significant factor in an employee's ability to perform regular job duties. The majority of technological changes came with electrification in the 1970s, but the systematic sex-segregation that had developed in the previous decades remained as a matter of customary employment practice. When women were first recruited, managers did not feel comfortable with their assessment of the physical strength of women employees. Managers, union leaders, and shop foremen discussed women's job capabilities (i.e. whether they could easily manipulate train controls in an emergency, how fast they could react in case of accidents, etc.) when railway managers introduced the so-called "special care" for women, and managers required lengthier training for women than for men. However, once women took regular duties in the 1990s, managers and employees both recognized that gender did not affect job duties when augmented by technological improvements. Recently, women employees themselves, union leaders, managers, and shop foremen have come to realize that there are no duties that only men are physically capable of accomplishing, and the employment of women has lead to a reassessment of women's job capabilities.

When the subject companies began employing women, each introduced specific career courses that would be reserved for women. Managers thought it would be sufficient that women took on single jobs, while men would continue to be trained as multi-skilled workers. Case studies show that this type of career segregation was premised on the considerable difference in the human capital invested in men, who were expected to devote their entire working lives to the company, and women who were expected to quit much sooner. While women were put on a "fast-track" promotion system in the 1990s, women's career limitations nevertheless remained.

At the same time, these cases are obviously different from traditional career segregation for the following reasons:

- (i) Women in integrated jobs gain higher skills and wages than women in segregated jobs.
- (ii) Women's length of service is on the increase in integrated jobs.
- (iii) Career integration has progressed since the legal review imposed by the EEOA.

(1) Women's Higher Skills and Wages

The first point is exemplified when women in integrated jobs were required to work much longer terms than in women segregated jobs. Women's employment at that stage differed from male long-term employment, in which it is presumed that managerial work is the employee's next step; however, it was never the same for the short-term employment occupation in which women were generally employed, and it was assumed that skill development would soon be interrupted or terminated. The fast track became a certain level in human investment that allowed women to improve their skills. This article refers to this style of employment as "medium-term employment," in the sense of hitting the ceiling for promotions at a certain level (Figure 1). Medium-term employment thus refers not only to the number of years of employment, but also to the skill building and wage structures associated with it. In other words, the character of women's employment has transcended from traditional career segregation, which consisted of long-term male employment and short-term female employment, to long-term male employment and medium-term female employment.

(2) Lengthening Years of Service

The turnover rate for women is clearly lower in integrated than in segregated jobs. In company A and C for instance, women drivers keep on working between 7 and 8 years. Moreover, in company B there is no gap of the length of service between women and men in integrated jobs. In these companies there is a clear difference in the length of service despite the fact that women have the same academic background as their male counterparts.⁵ While there is the possibility that job assignments and skill development will affect the length of service, it is estimated that there are three factors supporting women so as to keep them working: higher wages, *esprit de corps* (job pride), and work schedule. The latter being that in the railway industry, the shop floor has little overtime work as long as trains run on time, while on the other hand, office workers often have unexpected overtime that women find objectionable and consequently causes them to leave the firm. It appears that owing to shift work, transportation workers find it much harder to manage work and family life than clerical workers, which is in fact not the case. The main issue for women to voluntarily separate from their employment is the issue of overtime work rather than their actual work shift schedule. Consequently, medium-term employment functioned more successfully.

⁵ Most women in segregated jobs, for example, quit in their third or fourth year with the company.

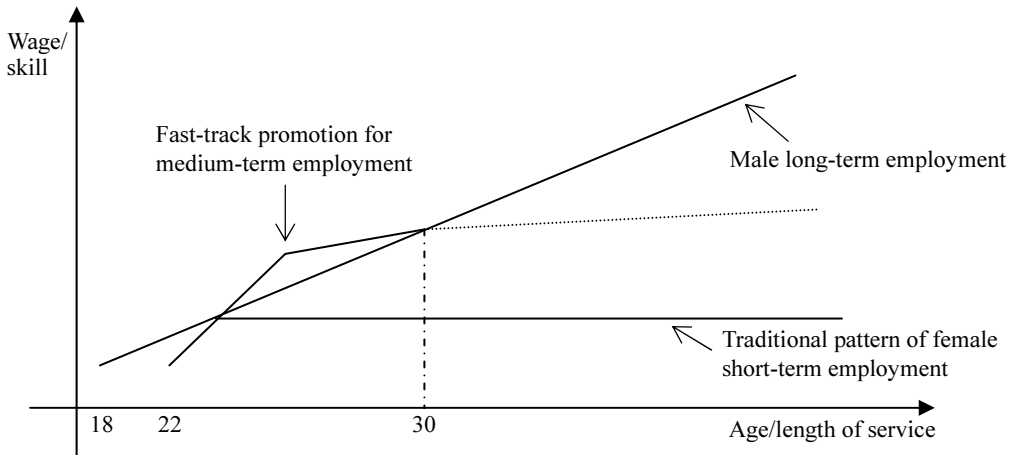


Figure 1. Wage Curve and Training for Fast-Track Promotion in Medium-Term Employment

(3) Reviewing Lifetime Employment and Integrating Careers

The principle reason was that managers for Company A wanted to avoid hiring women after the EEOA review. Company A had streamlined its management since 1999, and by 2001 a quarter of its employees had accepted “voluntary retirement.” Under such conditions, the company realized that it could not afford to employ workers who needed special terms such as lifetime employment.

In contrast, financial conditions in companies B and C remained quite stable and their management teams willingly continued to recruit women. However, these companies began reforming their career and wage systems, thus becoming more flexible in their ability to promote and dismiss their employees. Company B for instance, introduced a new system in 2000. In its previous system, transportation workers at company B had promoted job rotations from station duties to conductors and drivers in turn. In the new system, these duties became equal at all levels. Wages based on merit and post were reinforced, and instances of wages based on seniority declined. The basic pay scale on average became rather flat. Nevertheless, total lifetime earnings did not make any difference because of the union’s bargaining.⁶ Briefly, they still keep multi-skilled training and promotion systems, but managers have introduced flexibility in career and merit based wages. The cause in statistical discrimination weakened, if the training based on long-term and seniority payment were to be diminished. In medium-term employment, women had no career prospects even after a substantial time of employment. Companies B and C reduced the barriers to integrate the ca-

⁶ In the new wage system, employees receive 15% higher wages in their thirties and 15% lower wages in their late forties compared with the previous wage system, which was based on minimum basic wages without any increase in pay except the regular rise. So, the total wage gains and losses were offset. Moreover, employees between 40 and 50 are guaranteed their previous wages.

reer system by reviewing terms of long-term employment. The integration between men and women has continued to progress.

III. The Automobile Industry

1. Entrance of Female Workers

Previously the assembly line of the automobile industry, like the railway industry, was an all-male workplace. The automobile industry, however, had male contract employees who were used to being adjusted at employment levels. In general, the rate of non-regular workers was from 20 to 30%, and generally only full-time employees were trained as multi-skilled workers. Consequently, a hierarchical male labor structure formed out of regular and non-regular employees.

According to Koike, Chuma, and Ota (2001), assembler's skills are categorized into four levels:

- Level 1: Workers are on a specific job. This is for non-regular workers.
- Level 2: Workers gradually given all (approx. 15) jobs on the line, which can also be focused on 3 to 5 jobs as well as detecting and adjusting for their failures. These are usually young, regular workers.
- Level 3: Workers on this level take on all jobs and investigate the cause of their failures. These workers are considered the backbone of the company.
- Level 4: Workers who could be instructors at overseas factories and participate in redesigning job allocations.

These levels are for non-executive workers only. Such skill development is thought to be one of the features of Japanese workers, and the reason for their high labor productivity.

The automobile industry started to hire women in the early 1990s. As the labor market tightened during the good years of the late 1980s, companies believed they must hire women to make up for what they expected to become a shortage of young workers sometime in the near future.

Company D started business in 1992 as the experimental subsidiary of company F, and from inception management had planned to bring in female workers. To do so, the company made many technological changes to its manufacturing process, so as to create an assembly line that eliminated the need to move heavy objects and thus create a work environment by technological innovation where men and women could perform the same duties. At company E, which primarily made trucks, women began to be hired for the assembly line in 1992. At major manufacturer F, the results of female employment at its subsidiary D had a good affect; in 1998, the year before the abolition of the protective regulations for women, it also began hiring women.

Both companies started employing women as full-time workers and gave them the same jobs and career courses as men. Each worked under the same working conditions with the exception of differences in working patterns. Employees worked two shifts, and the

second shift included some night duties. On the night shift, women would come to work two hours earlier and stop work at 22:30, about two hours before the end of the shift. After women workers stopped work, the male squad leaders and leaders responsible for out-of-line labor would substitute for them. Therefore, in terms of labor organization the proportion of women could not exceed that of squad leaders, and stayed at about 5%.

After the April 1999 elimination of the protective regulations for women, male and female work patterns became exactly the same, and the percentage of women rose rapidly. For instance, in 1999 company D hired 42 men and 56 women, and in 2000 it hired 25 men and 26 women.

2. Factors Contributing to the Maintenance of Sex-Segregation of Occupations

Like the railway industry, the EEOA eliminated one factor for sex-segregated occupations in the automobile industry; however, differences in the two other factors remain. There is a limit on the work that many women can actually do. Even at company D, where the latest equipment is installed, women are only able to do on average about 80% of the tasks appointed to them. Therefore, it is considered difficult for a station chief to treat women entirely equal to men, and this factor impedes the continued development of women's job skills.

Another point that should be considered here is that many tasks generally require muscular strength, and socially perceived notions of differences impede an objective assessment of an employee's strength. In these case studies, when women were first hired they were presented with standards that limited their activities; however, once the company had experienced mixed workplaces the socially perceived differences in physical strength eventually died out.

Women's attrition rates are higher in the automobile industry. In company D for instance, women's length of service is on average between 3 and 4 years. Although some women continue working after 5 years, even those women quit their jobs when they get married. In other words, the turnover rate is not significantly different from that of women who in the past engaged only in short-term employment. Many women blame physical limitations (muscle strength) for their decision to quit, and one can suppose that the influence of perceived as well as real differences in muscular strength, which had been eliminated in the railway industry, have not been eliminated in the automobile industry—a fact which is reflected in employment attrition rates.

Nevertheless, in all case studies, many companies are aggressively recruiting women employees, and it is apparent that the workplace has not refrained from training people who might quit. In fact, women's turnover rate has not affected their access to educational training or skill building, which indicates the other side of statistical discrimination. Managers seem to prefer that women leave their companies sooner rather than later. In the automobile industry, some male workers quit faster than women, but recently the male length of service has increased due to the economic recession. Therefore, there is a possibility that automobile companies have adjusted to the decreased rate of male resignations by using short-term

women employees.

Consequently, the gap of the skill level between men and women still exists. The skill level of most women is in level 1, with the exception of some in level 2, based on the definition of Koike, Chuma, and Ota (2001). Nevertheless, there is a notable quality difference from customary gender segregation. Women are provided with the same career courses as men, and they are also trained as multi-skilled workers. In this context, continuous female employment is practically assured. Compared with the simple single-skill work that was typical of women's employment in the past, women are receiving much more training than previously.

IV. Conclusion

1. The Incentive for Employing Women

There were two factors necessary for managers to initiate hiring women in the early 1990s. First was the labor market. This was by no means due to a shortage of labor during a time of transient economic change. Instead, the move signified a general preparation for future shortages that stemmed from the low birth rate. Second, the change was a final result of the EEOA enacted in 1985. While the EEOA had, to date, not actually been enforced (because it only required employers to "make an effort"), by the 1990s companies were obliged to make some institutional moves against sex discrimination in the workplace. Similarly, several companies were of the idea that employing women would be good for public relations. Indeed, the hiring of women as train conductors and drivers was greatly celebrated by the Japanese media.

Union leaders followed the lead of managers by also recruiting women. In the workplace, female workers were not always welcomed, and managers and union leaders received strong complaints from some male workers: "This job is definitely not for women" was a common refrain. The reason of this resistance was to protect their territory, plus strongly held beliefs regarding women's abilities and the social need to protect their reproductive health. However, men's opposition dwindled with the gradual increase in the number of women. Recently, labor unions have also begun to recruit as many women as men.

2. The Three Factors Which Formed the Occupational Sex Segregation

(1) Revision of the Law

The legal prohibition of night work for women was eliminated after the Labor Standard Act was reviewed in 1999. Thereafter, the number of newly recruited female workers multiplied rapidly in many firms. A number of published case studies improved the situation, and this legal review had a significant impact on the decline in workplace segregation.

The new legal framework, however, did not necessarily improve or change the actual work rules found in a variety of companies. A few case studies, which have not been mentioned due to space constraints, indicate that some companies have maintained work rules

that encourage sex segregation. In most cases, the maintenance of sex-biased work rules was the result of demands by the labor unions aiming to protect women. Whether the representative unions emphasize protection or equality, the differences are reflected in the union's particular history of organizing women. Unions that have historically organized women and men tend to be against rule changes, even if they would open up new opportunities for women. This is because protectionist work rules regulating women's employment were the result of organizing drives led by that union in the past. Ironically, those workplaces with a long history of men and women working together were inclined to be much slower in occupational desegregation.

(2) Differences in Muscle Strength

In the railway industry, technical innovations have proven women capable of taking on almost every job, but in the automobile industry, there are a few jobs women are still unable to undertake. In all cases, managers, union leaders, and workplace supervisors are greatly concerned with women's abilities when they first start their new duties; however, managers are put at ease after they observe women actually working on the job. Briefly, the importance of muscle strength is much smaller than one would think. Also, even if women's jobs were rather limited in the automobile industry, managers, union leaders and many women workers believe it is possible that men and women could still participate together in the same system for promotion and status. In fact, physical limitations do not appear to be the major problem once envisioned.

(3) Theory in Statistical Discrimination

There are two points that can be concluded from the phenomena of career segregation in Japan. As a general trend, when firms began employing women they introduced several career courses divided by gender. Therefore, occupational sex segregation still remains widespread. Although integrated career courses do exist for both sexes, the gap in career development remains in workplaces because women consistently leave their jobs after a short period. Secondly, in 50% of the cases examined (Company B, C and E), women were generally able to continue in a particular career course. At the same time, it must be noted that these women were not always provided with the choices found in the male-centered career system. In some cases, career integration is enabled by the introduction of a new career system for both sexes. Under the new system, women receive job skill training and are paid higher wages compared with women in the historically sex-segregated system. On the other hand, the range of skill development and wage scales for men appears to narrow, as can be seen from examples in company B. That is, careers for both sexes are integrated from either side and an increase in demand for women's wages and skills appears to necessitate a decrease in men's wages and required job skills.

Additionally, there is the possibility that the integration of women is being used as an excuse to implement significant restructuring of employment patterns. In the railway indus-

try, it was thought that drivers required a high level of job skills, whereas technological innovation had decreased the level of skills necessary to perform job duties. However, the company had found that its unions opposed any modification of the career and wage system. Also, it may have found the need for gender integration provided the political leverage necessary to restructure job and skill categories. Indeed, after the integration of women, many men, on their own and through the voice of their union leaders, complained by saying “anybody can do our jobs from now on” or “our jobs are diminishing.” Still, the unions had little choice but to eventually accept the systemic changes. It is not clear what managers meant, but it is clear that the integration of women triggered a restructuring of the employment pattern.

3. Impact on the Japanese Model

The progression of de-segregation demanded revision of the Japanese model. In the customary Japanese model, firms manage homogeneous labor resources so that their human resource management relies one-sidedly on an inflexible long-term training and promotion system. Workers not suited for this system were generally excluded from the employment framework. This article clearly shows that, at present, some companies face a non-conventional challenge to integrate heterogeneous laborers. And yet, such companies seem to be developing new systems for improving workers abilities based on flexible long-term employment; such experiments have so far brought positive results.

Furthermore, a closer examination confirms that enterprise-based training and multi-skilled work still remains the norm, and most employees are expected to work for many years for the same firm. This means that elements in the Japanese employment model are still being retained even after the acceptance of women into the workforce. Thus, we can conclude that certain elements of the Japanese model can exist in an employment environment characterized by declining gender segregation.

This article introduces only six case studies; however, the employment experiments investigated have been performed within most industries. The trend is inevitable, and indeed irreversible. The Japanese government, for instance, initiated a redesigning of its social welfare policies, historically based on a model premised on one male wage earner per family, into a system where both men and women are assumed to be engaged in waged work. Japan has only begun investigating employment models in which men and women work together, and the model proposed in this article might well become one of those used to represent the Japanese case.

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Testing the Taste-Based Discrimination Hypothesis: Evidence from Data on Japanese Listed Firms*

Shinpei Sano

Kobe University

Using the “market test” methodology, we examine the employer discrimination theory. We use a set of data on Japanese listed firms which has detailed employee information. The “market test” is the methodology to demonstrate the causes of the differential wages, verifying the significance of the correlative profit and the number of female employee added. Existing literature does not control the factors which affect firms’ profits, such as employees’ age distribution and the share of married female employees. Unique Japanese firm-level panel data enable us to estimate a more efficient estimator than the previous research. We find that (i) estimation results indicate that an increase in the proportion of female workers increases the profit; (ii) a high proportion of female workers has a strong effect in concentrated industries. These results support the employer discrimination hypothesis. Next, we examine how firms with a high female proportion grow faster in more competitive industries. This is the long-run implication of the employer discrimination theory. As a result, adding a larger number of female employees does not seem to contribute to growth of companies in a competitive market environment.

I. Introduction

The wage gap between female and male workers can be observed in many countries. For example, on average, female workers earn less than 66% of the male workers’ wage in Japan, about 81% in the U.S. and about 83% in the U.K.¹ The gender wage gap has been closing in recent years in Japan, but the gap is still larger than in other advanced countries.

Economic theory explains the existence of the gender wage gap. Becker’s (1971) taste-based discrimination theory and Phelps’s (1972) statistical discrimination theory explain the gender wage gap through the labor demand side. Taste-based discrimination theory assumes there are employers who discriminate against women. Discriminatory employers hire fewer women at the sacrifice of profit. Although the productivity of female workers is the same as that of male worker, there is the gender gap in the labor market. Statistical discrimination theory suggests that the gender wage gap reflects the gender productivity gap due to asymmetric information between firms and worker. Employers do not know when workers will leave their firms and employers give training opportunities to those workers with a lower probability of quitting. In general, the quitting rate of female workers is higher than male workers. As a result, on average the female wage is lower than the male

* This article is based on Sano (2005), with substantial editions and revisions.

¹ These figures are based on *Heisei 18-nen Chingin Kozo Kihon Chosa* (Basic Survey on Wage Structure) (Ministry of Health, Labour and Welfare 2006) for Japan, *Yearbook of Labour Statistics* (ILO 2006) for the U.S., and *Yearbook of Labour Statistics* (ILO 2003) for the U.K.

wage due to low productivity.²

To identify the reason for the gender wage differences, researchers often implement the wage regression method. To examine how the gender wage gap is due to the productivity gap, researchers estimate the wage equation by including proxy variables of productivity. However, it is difficult to justify the proxy variables for productivity (Neumark 1988, 1999; Altonji and Blank 2003). In Japan, in particular, the wage regression method using proxy variables is not available to us due to a lack of micro data. An alternative way to identify the productivity gap is the “market test” method as suggested by Hellerstein, Neumark, and Troske (2002). The market test is methodology to demonstrate the causes of the differential wages, verifying the significance of the correlative profit and the number of female employees added. If the female-male wage gap is due to employer discrimination, then non-discriminatory employers earn higher profits by hiring more women. On the other hand, if the gender wage gap is due to their productivity gap, then there is no correlation between the proportion of female workers and the firms’ profit.

Hellerstein, Neumark, and Troske (2002) showed that an increase in the female proportion increased profits by using U.S. cross-sectional data. This result is consistent with Becker’s employer discrimination hypothesis. However, an established fixed effect which is positively correlated with female proportion may have a positive effect on profit. Kawaguchi (2007) implements market tests using level panel data from Japanese firms to eliminate the fixed effect. Kawaguchi (2007) showed how a rise in female employment increased firms’ profits. He also showed how the largest portion of gender gaps came from their productivity gap. Kodama, Odaki, and Takahashi (2005) examined the relationship between the proportion of female workers and the firms’ profits using level panel data from Japanese firms. They found that additional employment of female workers increased firms’ profits by the pooled OLS, but this relationship was eliminated by the fixed effect model. They insisted that the positive relationship between firms’ profits and the proportion of female workers in cross-section analysis is spurious, but rather firms’ management strategy truly affects firms’ profits. The previous research does not control the factors such as employee characteristics directly related to firms’ profits. For example, the age distribution of employees may affect both the firms’ profits and hiring strategies.³ If these variables are omitted, then the estimation result has an omitted-variable bias. To avoid this omitted-variable bias, we supplement financial data with survey data containing details about employees. A unique data set enables us to control these variables. By adding to these variables, we can test the taste-based discrimination hypothesis.

We find that (i) estimation results indicate that an increase in the proportion of female workers increases profits; (ii) a high proportion of female workers has a strong effect on concentrated industries. These results support employer discrimination hypothesis. Next,

² Kawaguchi (2008) explains other theory of the cause of wage gap.

³ Nakamura (1988) points out that firms which allocated women to important positions increased their profit in the retail industry in Japan.

we examine how the firms with a high female proportion grow faster in a more competitive industry. This is the long-run implication of the employer discrimination theory. As a result, employing a larger number of females does not seem to contribute to the growth of the companies in a competitive market environment.

The remainder of this paper is organized as follows: First, we present the theoretical background. Second, we explain the data. Third, we discuss the empirical model and some potential bias. Fourth, we summarize the estimation results and discuss their implications. Finally, we provide some concluding remarks.

II. Theoretical Background

Employer taste discrimination implies that if the female-male wage gap is due to taste discrimination, then non-discriminatory employers earn higher profits by hiring more women. Here we summarize Becker's classical theory of employer taste discrimination: Suppose employers obtain their utility from their firms' profit and from the number of male employees. Employers maximize their utility. For simplicity, the only input is labor and the price of the product is normalized to the unity. Under this assumption, the utility function of employers and profits are expressed by the following equations.

$$U(\pi, L_M, L_F) \quad (1)$$

$$\pi = f(L) - w_M L_M - w_F L_F \quad (2)$$

where $L = L_M + L_F$. Utility function is strictly concave and $f(\bullet)$ is strictly concave and increasing.

Using first order condition for utility maximization,

$$U_\pi(f_{LM} - w_M) + U_M = 0 \quad (3)$$

$$U_\pi(f_{LF} - w_F) + U_F = 0 \quad (4)$$

f_i denotes marginal productivity of each employee. The discrimination coefficient is defined as $d_M = -U_M/U_\pi$, $d_F = -U_F/U_\pi$ and varies across employers. To solve equations (3) and (4), we can derive the following equations:

$$f_{LM} = w_M + d_M \quad (5)$$

$$f_{LF} = w_F + d_F \quad (6)$$

Firms which face a competitive market decide to hire each labor unit by filling these conditions.

In the static situation, if the female-male wage differential is due to employer discrimination in the labor market, the relative wage to men of women should be less than that of the relative productivity. In this case, non-discriminatory employers could gain more

profit through increasing the additional number of female employees. On the other hand, if the wage differential is due to statistical discrimination, the proportion of female workers should not be correlated with the profits of the firms.

In the long run, if the market is competitive, less discriminatory employers go into the market because they make more profit by increasing the number of female workers. As a result, discriminatory employers lose their market share and exit the market. In other words, less discriminatory employers earn higher profits and grow faster than discriminatory ones.

To sum up, the static Becker hypothesis is as follows: Employers who discriminate less against women hire female worker through earning higher profits. So, non-discriminatory employers earn higher profits by hiring more female workers. The dynamic Becker hypothesis implies that less discriminatory employers experience faster growth than the more discriminatory ones.

III. Data

We used the *NIKKEI-NEEDS* (hereafter *NEEDS*), which is financial data based on marketable securities reports about listed companies on the exchange markets. *NEEDS* contains all financial statements, including total sales and numbers of asset holdings. *NEEDS* covers almost all the listed companies in Japan and makes use of panel data.

However, *NEEDS* has limited details on employees, such as the total number of employees. We supplement details on employees with *Shushoku Shikiho Joshi Gakusei Ban* [Quaternary company handbook for female students] (hereafter *Shikiho*). *Shikiho* is a basic survey of firms' activities collected by the publisher, *Toyo Keizai Shinposha* containing financial data and details about the firms' and employees' characteristics. These include such details as the number of full-time employees by sex, average age of employees, average years of employment, the number of female managers, and the number of married female employees.⁴

NEEDS and *Shikiho* use the same stock ID, so we can combine the two data sets and make use of the panel data. The available data cover 10 years (1992-2001), and the sample size is about 550 for each year. There were originally about 5500 observations in the 10 years of data, but after excluding observations with missing values, there remained 3664 observations.

IV. Econometric Specification

1. Static Analysis

Similar to Hellerstein, Neumark, and Troske (2002) and Kawaguchi (2007), we use the following equation to test the static Becker hypothesis—whether non-discriminatory

⁴ Abe and Ouchi (1998) used *Shikiho* to identify the problem of the dual career ladder system.

employers earn higher profits by hiring more female workers.

$$profit_{it} = \beta_0 + \beta_1 \frac{L_F}{L}_{it} + \beta_2 capital_{it} + \beta_3 Debt_{it} + \beta_4 age_firm_i + industry_i \beta_5 + time_t \beta_6 + \beta_7 age_labor_{it} + \beta_8 tenure_labor_{it} + \beta_9 KATSUYO_{it} + c_i + \varepsilon_{it} \quad (7)$$

where subscript i and t are indexes for firm and year, respectively, c_i is unobserved heterogeneity, and ε_{it} is idiosyncratic error.

Profit is a firm's operating profits⁵ defined as “(total sales minus cost)/total sales.”⁶ L_F/L is the proportion of full-time female workers to the total number of employees.⁷ If there is discrimination against women, a higher proportion of women increases the firm's profits: β_1 is positive. If no discrimination against women exists, the null hypothesis $\beta_1 = 0$ is not rejected.

To control other factors relating to a firm's profits, we include variables which are characteristics of the firms and the employees in the equation. *Capital* represents “fixed asset/ total sales.” This variable captures the differences in accounting and economics cost. *Debt* is “debt/total sales.” This variable captures the firms' behavior against the negative macro shock. If firms face negative macro shock, they react by increasing their borrowing. *Age_firm* is the years of operation of each firm. This variable captures the firms' brand effects on the profits.⁸ Firms with longer operating year face higher capital replacement cost because of holding obsolete capital. It is important to include *age_firm* variable in the regression model. To control the industry and year specific effect, we include industry and year dummies in the regression model.

Employees' characteristics may affect firms' profits. *Age_labor* is the average age of full-time workers within firms, and *tenure_labor* is the average years of employment of full-time workers at the firms. These variables capture the intra firm demographic effect on the profit. For example, higher levels of human capital increase firms' profits. Higher levels of average age and years of employment within firms represent higher human capital level. Alternatively, firms which hire older workers pay more in wages than those hiring younger workers.

We add the *KATSUYO* variables to the estimation model in order to control the effect of the degree of gender equality on the firms' profits. The proportion of female managers to female workers and the proportion of married women to female workers are proxy variables for the degree of gender equality within firms. For example, firms obtain an advantage because they actively promote women to executive jobs, or firms provide working conditions that encourage the employment of married women. Women can continue working without depleting their accumulated human capital. The *KATUSYO* may be positively correlated

⁵ We also estimated using current profit and found no significant difference from the results.

⁶ *Shikiho* reports non-consolidation information. Therefore, we used the non-consolidation statement from NEEDS instead of the consolidation statement.

⁷ The number of part time workers is not available due to limited data.

⁸ *Age_firm* may capture the proxy of human capital accumulation (Brown and Meddof 2003).

with operating profit. Otherwise, firms need to improve the working environment for women for social requirement. The set up cost for the working conditions may exceed the benefit for hiring more women. In this case, the *KATUYO* is negatively correlated with profit. It is important to control these variables in order to avoid omitted variable bias.

2. Dynamic Analysis

To test the idea that non-discriminatory firms grow fast, which is an implication of the employer discrimination hypothesis, we regress the following equation.

$$growth_{i1992} = \delta_0 + \delta_1 \frac{L_F}{L_{i1992}} + \delta_2 age_firm_{i1992} + industry_i \delta_3 + \delta_4 age_labor_{i1992} + \delta_5 tenure_labor_{i1992} + \delta_6 KATSUYO_{i1992} + \epsilon_{i1992} \quad (8)$$

Where $growth_{i1992}$ is defined as $(sales_{i2001} - sales_{i1992})/sales_{i1992}$.⁹

The dynamic Becker hypothesis implies that less discriminatory employers grow faster than more discriminatory ones. If the dynamic Becker hypothesis is true, then the coefficient of L_F/L is positive, holding other factors fixed. We add firm's age, industry dummy, employees' characteristics variables and *KATSUYO* variables in the estimation model to control other factors about profit.

3. Potential Bias and Its Solutions

(1) Outliers

Several extreme cases can be observed from the financial data. Figure 1 shows the box plot for operating and current profit in our data set. Figure 1 illustrates the existence of outliers, especially above the 99th quartile. These outliers are due to the firms' unobserved heterogeneity.

The OLS estimator will be influenced by outlier data. Dropping these observations leads to two possible problems (Wooldridge 2008): First, estimation result may suffer from a small sample bias because there are many extreme observations in our data set. Second, outlying observations may provide important information about population data. To avoid these biases, we apply LAD method evaluated for the sample median. The LAD estimator minimizes the sum of the absolute deviations of residuals, instead of the sum of squared residuals. In other words, the LAD estimates the effect of explanatory variables on the conditional median of dependent variables, rather than conditional mean. LAD is robust estimator against the extreme observations.¹⁰

⁹ Our measure of sales growth is limited through not including firms which ceased business in 2001. Alternative measures of sales growth can be defined as $(sales_{i2001} - sales_{i1992})/[sales_{i2001} + sales_{i1992}]/2$, thus enabling those closed firms to be included (Genda 2004).

¹⁰ For details, see Buchinsky (1998) or Koenker (2005).

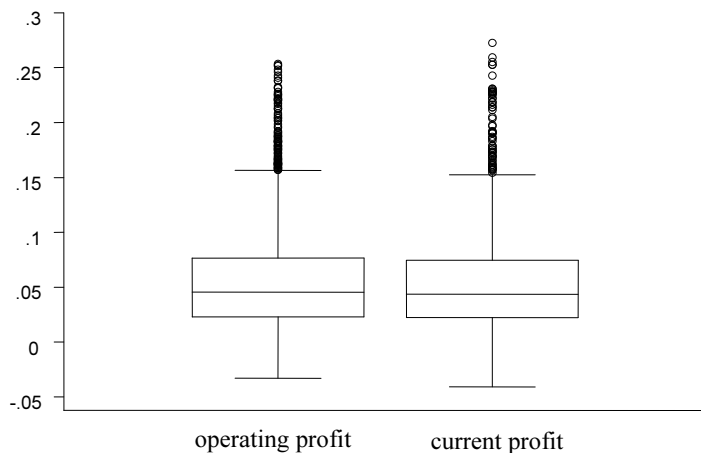


Figure 1. Box Plot (Operating Profit and Current Profit)

(2) Unobserved Heterogeneity

The firm's unobserved heterogeneity (c_i) may be correlated with L_F/L . Suppose that c_i captured idiosyncratic demand shock and production shock to a specific firm. If firms face new technological progress, and they hire more male workers who are able to adapt to new technology, then c_i and L_F/L are negatively correlated and the OLS estimator of β_1 is downward biased. Other interpretation of unobserved heterogeneity is that it represents firms' hiring or management strategy. Firms' unobserved strategy may affect profit. Fixed Effect estimation allowed us to eliminate unobserved heterogeneity and to obtain the consistent estimator of β_1 under the strict exogeneity assumption.¹¹

(3) Sample Selection

Our data set covered only listed companies in Japan. Therefore, it is not population data about all firms existing in Japan. Although our data set is not free from sample selection problems, our data is representative of Japanese companies. Our result indicates *BIG* company behavior.

Sikiho is based on survey data. Respondents fail to answer certain questions, such as average age of full time workers or the number of female managers, leading to missing data for the independent variables. The direction of bias is not obvious. Firms which intend to hire more women tend to answer the questionnaire. Alternatively, firms answered the questionnaire due to their positive performances. On the other hand, the firms with poor performances use *Sikiho* as an employment advertisement. Due to the sample selection problem, the effects of proportion of female worker on profits are overestimated. We need exclusive variables to collect sample selection bias, but it is not available. Thus our result has sample selection bias.

¹¹ Strict exogeneity assumption means $E(\varepsilon_{it} | c_i, x_{i1} \dots x_{iT}) = 0 \quad t = 1, \dots, T$.

Table 1. Descriptive Statistics

	Number of observations	Mean	Standard deviation	Min.	Max.
Operating profit	3664	0.050	0.054	-0.231	0.430
Proportion of full-time female workers	3664	0.220	0.130	0.014	0.862
Fixed asset/total sales	3664	0.587	0.560	0.025	5.126
Debt/total sales	3664	0.558	0.203	0.053	2.456
Firm age	3664	50.831	19.027	3	116
Average age of employees	3664	35.871	3.784	21.2	46.2
Average years of employment	3664	12.799	4.469	1.2	24.6
Proportion of female managers to full-time female workers	3664	0.053	0.090	0	0.811
Proportion of married female workers to full-time female workers	3664	0.201	0.141	0	0.885
Sales growth	397	0.083	0.540	-0.849	4.925

(4) Violation of Strict Exogeneity Assumption

The fixed effect model assumes a strict exogeneity assumption, which is error term ε_{it} and is uncorrelated with any independent variables. But this strict exogeneity assumption may be violated by simultaneously problem. Firms fire female workers due to bad performance, or good performance leads to more hiring of women. If these situations are true, our estimation result suffers from simultaneous bias. In this case, we need instrumental variables which correlate with hiring decisions but which do not correlate with profit. Unfortunately, potential instrumental variables are unavailable for our data.

V. Results

1. Static Analysis

We test the static Becker hypothesis based on equation (7). The descriptive statistics of the analysis sample for the test of static Becker hypothesis are shown in Table 1.

Table 2 shows the estimation results concerning the determination of firms' operating profit using panel data. In Table 2, column (1) presents the benchmark OLS estimates of equation (7) which exclude employees' characteristics. The coefficient for proportion of female workers is negative but is not significant. Other control variables are significant at the 1% level. *Capital* is positively correlated with firm's profit at the 1% significant level. And *Debt* is negatively correlated with firms' profits at the 1 % significant level. These results are consistent with theoretical prediction. Firms with longer operating year earn less profit.

Table 2, column (2) presents the OLS result, adding in the employees' characteristics variables. Holding the characteristics of firms and employees, the proportion of female worker is negatively correlated with profit. The magnitude of the coefficient implies that a

Table 2. The Determination of Operating Profit 1992-2001

	Dependent variable: Operating profit					
	(1) OLS	(2) OLS	(3) LAD	(4) LAD	(5) FE	(6) FE
Proportion of full-time female workers	-0.0049 (0.0073)	-0.0154 ** (0.0073)	0.0118 *** (0.0044)	0.0066 (0.0045)	0.0261 * (0.0158)	0.0364 ** (0.0169)
Fixed asset/total sales	0.0315 *** (0.0022)	0.0320 *** (0.0023)	0.0313 *** (0.0010)	0.0311 *** (0.0010)	-0.0440 *** (0.0029)	-0.0441 *** (0.0029)
Debt/total sales	-0.0873 *** (0.0065)	-0.0770 *** (0.0065)	-0.0581 *** (0.0026)	-0.0528 *** (0.0029)	-0.0201 ** (0.0094)	-0.0205 ** (0.0094)
Firm age	-0.0004 *** (0.0000)	-0.0002 *** (0.0000)	-0.0003 *** (0.0000)	-0.0002 *** (0.0000)		
Average age of employees		0.0017 *** (0.0006)		0.0013 *** (0.0004)		0.0006 (0.0007)
Average years of employment		-0.0033 *** (0.0005)		-0.0021 *** (0.0003)		-0.0010 (0.0008)
Proportion of female managers		-0.0247 *** (0.0073)		-0.0080 (0.0056)		0.0144 (0.0102)
Proportion of married female workers		-0.0021 (0.0067)		-0.0081 ** (0.0041)		0.0263 *** (0.0085)
Constant	0.1107 *** (0.0153)	0.0785 *** (0.0189)	0.0717 *** (0.0089)	0.0474 *** (0.0129)	0.0875 *** (0.0069)	0.0712 *** (0.0205)
Number of observations	3664	3664	3664	3664	3664	3664
Number of firms					811	811
(Pseudo) R ²	0.31	0.33	0.23	0.24	0.11	0.12
Year effect	yes	yes	yes	yes	yes	yes
Industry effect	yes	yes	yes	yes	-	-

Note: Standard errors are in parentheses. ***, ** and * are significant at the 1% level, the 5% level, and the 10% level, respectively. OLS stands for Ordinary Least Square, LAD indicates median regression, and FE indicates the fixed effect model.

10% increase in the proportion of female workers decreases the profits by about 0.15% point. The Firms' characteristics significantly affect their profit. A higher average age of full-time workers earns more profit. Average years of employment of full-time workers are negatively correlated with profit at the 1% significant level. Increasing the share of female managers decreases a firm's profit. The percentage of married female employees has no correlation with profit.

The OLS estimator is affected by the existence of outliers. Heterogeneity, which is unobserved by researcher may be a source of variation between firms' profits. The LAD estimator evaluated at sample median is resilient to the extreme observations. Table 2, column (3) shows the LAD results without controlling the employees' characteristics variables. Now, the most interesting coefficient for female workers is positive and significant at the 1% level. The magnitude of the coefficient implies that a 10% increase in the proportion of female workers decreases profits by about 0.1% point. Other variables affecting profit are the same as the OLS result. After controlling employees' characteristics variables (Table 2,

column [4]), the coefficient for the proportion of female workers becomes insignificant but the sign of the coefficient is positive. The effect of other variables on profit is the same as the OLS result without the significance of *KATUSYO* variables.

The differences between OLS and LAD results indicate that firm's unobserved heterogeneity is correlated with both the share of female workers and profit variables. Fixed effect estimation allowed us to eliminate unobserved heterogeneity, even if that is the case. Table 2, column (5) is the FE result without controlling employees' characteristics variables.¹² The share of female worker is positively correlated with profit at the 10% level. Capital and debt are also statistically significant. Adding employees' characteristics (Table 2 column [6]), the proportion of female workers and the firms' profit is positively correlated at the 5% level. In other words, firms increase profit about 0.36% with a 10% increase in the proportion of female workers. This estimation result is consistent with the static Becker hypothesis.

When compared with each estimation result, the coefficient of the share of female workers estimated by LAD and FE is larger than the OLS result. This indicates that the firms' unobserved heterogeneity is positively correlated with the proportion of female workers, and that the OLS estimate has a downward bias. This is consistent with theoretical prediction.

The average age of employees indicates a proxy variable for human capital. Our result finds that higher levels of human capital contribute to firms' profits. Otherwise, average length of employment is negatively correlated with profit. Conditions of the average level of human capital, such as longer years of employment which means higher hiring cost, for wages, may decrease profit.

KATUSYO variables have a negative effect on profit by OLS and LAD estimation. Otherwise, FE indicates that the proportion of married female employees has a positive effect on profit. Firms' unobserved heterogeneity is correlated with the working conditions for married woman and women who hold management posts. Thus, the OLS or LAD estimator has a downward bias.

Our data set covers only listed companies and full-time workers. Kawaguchi (2007) uses population data reports with a positive correlation share for female worker and operating profit. Hellerstein, Neumark, and Troske (2002) showed similar results. Kodama, Odaki and Takahashi (2005) found that the positive correlation between the proportion of females and profit is seemingly due firms' working conditions. Using working conditions such as the employees' age distribution and the degree of gender equity within firms directly, the firms obtain profits by increasing the proportion of female workers. Our result is consistent with Hellerstein, Neumark, and Troske (2002) and Kawaguchi (2007).

¹² Hausman test rejected the null hypothesis about no correlation with unobserved heterogeneity and explanatory variables at the 1% level. (Hausman statistics is 43.58: P-Value<0.00)

Table 3. The Determination of Operating Profit 1992-2001 by Degree of Concentration

	Dependent variable: Operating profit			
	(1) Bottom 25th quartile	(2) 25th to median	(3) Median to 75th quartile	(4) Above 75th quartile
Proportion of full-time female workers	0.0006 (0.0254)	0.0271 (0.0799)	0.0065 (0.0162)	0.0938 * (0.0562)
Fixed asset/sales	-0.0364 *** (0.0057)	-0.0854 *** (0.0085)	-0.0160 *** (0.0028)	-0.0502 *** (0.0075)
Debt/total sales	-0.0926 *** (0.0184)	0.0193 (0.0208)	-0.0158 (0.0106)	0.0092 (0.0247)
Average age of employees	0.0003 (0.0014)	-0.0011 (0.0017)	0.0006 (0.0006)	0.0023 (0.0023)
Average years of employment	-0.0031 ** (0.0014)	0.0009 (0.0018)	-0.0007 (0.0008)	0.0012 (0.0022)
Proportion of female managers	0.0082 (0.0193)	0.0165 (0.0282)	0.0244 ** (0.0098)	0.0192 (0.0257)
Proportion of married female workers	-0.0136 (0.0178)	0.0411 ** (0.0179)	0.0185 ** (0.0094)	0.0044 (0.0241)
Constant	0.1684 *** (0.0418)	0.1165 ** (0.0528)	0.0355 * (0.0194)	-0.0140 (0.0632)
Number of observations	1049	994	1040	581
Number of firms	245	216	217	133
(Pseudo) R ²	0.19	0.17	0.13	0.19
Year effect	yes	yes	yes	yes

Note: Standard errors are in parentheses. ***, ** and * are significant at the 1% level, the 5% level, and the 10% level, respectively. All specifications are estimated by FE. Degree of concentration is calculated by Herfindahl Index at 1991 (source: Japan Fair Trade Commission). Above quartiles indicate is more concentrated industry.

2. By Market Competition

Market competition conditions are a key feature of taste-based discrimination theory. Firms in the competitive market have no room for discrimination against woman. Conversely, firms that discriminate against woman do so because of lack of market competition. Hellerstein, Neumark, and Troske (2002) used fourth quartile product share variables proxy for market competition. They found that firms which have a large share of product market earn more profit by increasing the proportion of female workers. Kawaguchi (2007) used the Herfindahl-Hirschman Index (hereafter HHI) proxy for market competition. He found that the HHI and the female proportion are negatively correlated. To test Becker's prediction, we regress by the degree of market competition.

HHI measures the degree of market concentration. HHI is calculated by squaring the market share for each firm's product shipment and totaling within the industry. A large value of HHI means a more concentrated market. We use proxy variable for market concentration by dividing by the fourth quartile dummy variables. To avoid correlation between HHI and

Table 4. The Determination of Sales Growth 1991-2001

	Dependent variable: Sales growth			
	(1) OLS	(2) OLS	(3) LAD	(4) LAD
Proportion of full-time female workers	-0.3876 *	-0.8059 ***	-0.4716 **	-0.5698 ***
	(0.2142)	(0.2432)	(0.2136)	(0.1926)
Firm age	-0.0069 ***	-0.0025 *	-0.0028 **	0.0008
	(0.0016)	(0.0013)	(0.0013)	(0.0013)
Average age of employees		-0.0282		-0.0213
		(0.0186)		(0.0151)
Average years of employment		-0.0201		-0.0133
		(0.0153)		(0.0132)
Proportion of female managers		0.8617 *		-0.0613
		(0.5095)		(0.2998)
Proportion of married female workers		0.1892		0.1219
		(0.2193)		(0.1598)
Constant	0.1040 ***	1.6520 ***	0.3035	1.1094 ***
	(0.0263)	(0.4818)	(0.2339)	(0.4072)
Number of observations	397	397	397	397
(Pseudo) R ²	0.15	0.22	0.09	0.14

Note: Standard errors are in parentheses. ***, ** and * are significant at the 1% level, the 5% level, and the 10% level, respectively. OLS stands for Ordinary Least Square and LAD indicates median regression. Industry dummies are included.

demand shock, we used the indicator for 1991.¹³

Table 3 shows fixed effect estimation results divided by the degree of concentration. The bottom 25th quartile represents the most competitive market and the top 75th quartile represents the most concentrated market. The coefficient of the female proportion is positive for all groups, but is statistically significant for only the top 75th quartile group. The magnitude of the coefficient implies that a 10% increase within the proportion of female workers increases the profit by about 0.94% of a point. This result is consistent with Becker's prediction.

3. Dynamic Analysis

The dynamic Becker hypothesis implies that less discriminatory employers grow faster than more discriminatory ones. We implement growth regression based on equation (8) to examine this prediction.

Table 4 is the estimation result for growth regression between 1992 and 2001. According to Table 4, column (1), the female proportion evaluated for 1992 is negatively correlated with firms' sales growth at the 10% level. Holding the effect of employees' characteristics, the female proportion evaluated for 1992 is negatively correlated with firms' sales growth at the 1% level (Table 4, column [2]). We cannot confirm Becker's dynamic prediction by

¹³ We obtain HHI from Japan Fair Trade Commission's *Monthly Report of Fair Trade Commission*.

Table 5. The Determination of Sales Growth

	Growth (1993-2001)	Growth (1994-2001)	Growth (1995-2001)	Growth (1996-2001)
Proportion of full-time female workers	-0.5951 *** (0.1909)	-0.4910 *** (0.1840)	-0.3985 ** (0.1710)	-0.2256 * (0.1268)
Number of observations	392	372	346	364
R ²	0.27	0.27	0.23	0.24

Note: All specifications include firm age, average age of employees, average years of employment, proportion of female managers and married female workers, and industry dummies. Standard errors are in parentheses. ***, ** and * are significant at the 1% level, the 5% level, and the 10% level, respectively. All specifications are estimated by OLS.

Table 6. The Determination of Sales Growth by the Degree of Concentration

	Dependent variable: Sales growth			
	(1) Bottom 25th quartile	(2) 25th to median	(3) Median to 75th quartile	(4) Above 75th quartile
Proportion of full-time females workers	-1.1803 * (0.6347)	3.9235 ** (1.6865)	-25.2735 * (14.7549)	-4.2442 * (2.1315)
Number of observations	117	114	105	61
R ²	0.09	0.08	0.09	0.22

Note: All specifications include firm age, average age of employees, average years of employment, proportion of female managers and married female workers and industry dummies. Standard errors are in parentheses. ***, ** and * are significant at the 1% level, the 5% level, and the 10% level, respectively. All specifications are estimated by OLS. Degree of concentration is calculated by Herfindahl Index at 1991. Above quartile is more concentrated industry.

this result.

Indicator of sales growth may be affected by “outliers” in the same way as for operating profit. Extreme observations lead to this result. To examine this possibility, we implement the LAD estimation evaluated by sample median. The results by the LAD method are the same as the OLS result (Table 4, column [3]) and [4]).

Table 5 is growth regressions which change over time intervals. The initial value of the female proportion has a negative effect on profit at all specifications. We cannot confirm Becker’s dynamic prediction by this result.

Similar to the static prediction, the degree of market competition is crucial for the dynamic model. Table 6 shows the estimation results by the degree of concentration using HHI. The female proportion is negatively correlated with sales growth for the bottom 25th quartile which means more competition (Table 6, column [1]). A mildly competitive market (bottom 25th quartile to median Table 6, column [2]) indicates that the female proportion accelerates sales. The female proportion is negatively correlated with sales growth at more concentrated and at the most concentrated market sections (Table 6, column [3] and [4]).

The dynamic Becker hypothesis predicts that firms which face more competitive mar-

kets grow faster. Our results indicate that firms do not grow fast in competitive markets and are similar to the results obtained by Hellerstein, Neumark, and Troske (2002) and Kawaguchi (2007). This implies that the Japanese market is not competitive enough to eliminate taste-based discrimination.

VI. Concluding Remarks

This paper examines the taste-based discrimination theory with a set of Japanese firm level panel data using the market test methodology. Market test is the methodology to demonstrate the causes of the differential wages, verifying the significance of the correlative profit and the number of female employees added. Existing literature does not control the factors which have an effect on firms' profit, such as employees' age distribution and the share of married female employees. Our data enables us to estimate a more estimator than the previous research. We find that (i) estimation results indicate that an increase in the proportion of female workers increases the profits; (ii) a high proportion of female workers has a strong effect in concentrated industries. These results support the employer discrimination hypothesis. Next, we examine how firms with a high female proportion grow faster in more competitive industries. This is the long-run implication of the employer discrimination theory. As a result, adding a larger proportion of female employees does not seem to contribute to growth of the company in a more competitive market environment.

Our paper had the following limitations: First, our estimation result may harm bias simultaneously. Firms fire female workers due to bad performance, or good performance leads to more hiring of women. We need instrumental variables to correct the bias. However, it is difficult to find suitable instruments. Second, our data set covers only listed companies. Estimation results are suitable for large and well-known companies in Japan but unsuitable for other companies due to the sample selection problem. To solve these problems, it is necessary to build a suitable data set.

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Why Does Employing More Females Increase Corporate Profits?: Evidence from Japanese Panel Data*

Naomi Kodama

Ministry of Economy, Trade and Industry

Kazuhiko Odaki

Ministry of Economy, Trade and Industry

Yoko Takahashi

Japan Society for the Promotion of Science

From the point of view of both the significance of women's participation in society and also corporate business strategy and social responsibility, it is important to know the effects of female employment on the corporate profits and the mechanism that links the proportion of female workers and corporate performance. The empirical results show a positive correlation between the proportion of female workers and corporate profits using firm-level cross-section data, and no correlation according to fixed-effect estimation using panel data. These findings are not consistent with the "discrimination hypothesis" that female workers are discriminated against in the labor market, the "amenity hypothesis" that firms that perform well employ more females for the amenity of male employees, and the "negative shock hypothesis" that firms that encounter a negative shock and experience a deterioration in performance limit hiring. The results suggest that firm-specific factors may increase female employment and also raise corporate performance. An investigation of these firm-specific factors indicates that human resource management (HRM) measures intended to enable equal opportunities and treatment between male and female workers raise both the proportion of female workers and corporate performance. As gender-equality HRM coincides with the profit motive, therefore, it is important to disseminate appropriate information on the HRM advantage. Family-friendly measures, by contrast, should preferably be pursued at public expense by society as a whole in order to avoid unfairness among the firms that comes from external economy effect the measures have.

I. Introduction

From firms' point of view, are female workers a target of discrimination whose employment is something to be avoided if possible, a burden that should be employed as a social obligation to contribute to society insofar as this does not harm performance, or a resource to be actively used to contribute to performance? If employment of female workers and corporate performance are related, then this is an important question from the point of

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view of both the significance of women's participation in society and also corporate business strategy and social responsibility. The labor demand adjustment since the 1990s, a considerable number of firms have actually positively sought to recruit and promote women. Among their motivations for employing women are improving management efficiency, boosting competitiveness, and gaining access to high-caliber human resources.¹ It is not clear, however, whether the performance of such firms actually increases, and, if so, to what extent active use of women is responsible for this.

One traditional hypothesis concerning the relationship between corporate performance and female employment is the "employer-discrimination hypothesis" proposed by Becker (1971). This holds that if many firms discriminate against female workers and are reluctant to hire them, demand for female labor in the labor market is inhibited and the wages and other treatment that they receive is lower than their productivity and contributions. As a result, firms that do not have discriminatory tastes can turn the gap between their productivity and the market wage rate into profit by employing more women. Underlying the persuasiveness of this hypothesis applied to Japan are circumstances including the large gender wage gap compared with other developed countries, the low female participation rate, and the low participation rate of highly educated women whose retained value of human capital is particularly high.²

If it can be confirmed that profitability tends to be higher at firms that have a higher proportion of female workers, Becker's hypothesis may hold. The few studies so far conducted indicate that firms with a higher proportion of female workers tend to have higher profit on sales. Using cross-section data on approximately 3,000 firms and establishments in manufacturing industry in the United States, Hellerstein, Neumark, and Troske (2002) find that, after controlling for age of firm, composition (race and age) of workforce, and other such factors, plants with a high proportion of women are more profitable, and this tendency appears to be stronger at plants with high levels of product market power. In Japan, Sano (2005) uses panel data on listed firms to demonstrate that as the proportion of women rises, so too does profit on sales. Employing data from the Ministry of Economy, Trade and Industry's (METI) *Kigyo Katsudo Kihon Chosa* (Basic Survey of Japanese Business Structure and Activities), Kawaguchi (2007) discovers that the higher the proportion of women, the higher the profit on sales. The findings are thus consistent with Becker's hypothesis.

This paper examines several other hypotheses, in addition to Becker's, that allow for a positive correlation between the proportion of female workers and corporate performance,

¹ According to the 2006 *Josei Koyo Kanri Kihon Chosa* [Basic survey on woman's employment management], the main reasons given for needing to pursue positive action, in terms of the proportion of firms citing them, are "to improve management efficiency by effectively utilizing women's abilities" (65.3%), "to translate male and female employees' abilities into improvements in productivity and greater competitiveness" (56.2%), and "to secure good human resources and be recognized as an firm that is worker friendly and has a fair reputation" (53.9%).

² According to Higuchi, Abe, and Waldfogel (1997), the labor force participation rate increases with length of education in all developed countries except Japan.

and sheds light on the mechanism that links the proportion of female workers and corporate performance.

This paper is composed as follows. We begin in section II by presenting the hypotheses regarding the relationship between the proportion of female workers and corporate performance, before proceeding to explain the data used in this paper in section III. Section IV describes the estimation methodology and results. Section V discusses the effects of HRM on female employment and corporate profits, and section VI discusses the implication of this paper and unresolved issues for future research.

II. Hypotheses Concerning Female Employment and Profits

A correlation of greater profitability at firms with high proportions of female workers, or employment of greater numbers of women at firms with high profitability, has been confirmed by Hellerstein, Neumark, and Troske (2002), Sano (2005), and Kawaguchi (2007). If wages in the labor market are equal to individual workers' marginal productivity, the gender wage gap is commensurate with the actual difference in productivity, and so the profitability of firms that employ more women instead of men is not necessarily higher.³ If there is a positive correlation between the proportion of female workers and profitability, what is the mechanism behind it? Let us therefore examine four hypotheses concerning the relationship between the proportion of female workers and firms' profitability.

The first is the "discrimination hypothesis." According to Becker's taste model, introduced in the preceding section, the objective function of employers and executives reflects not only firm profits but also personal discriminatory tastes.

Thus, for example, given

$$(1) \quad U = \pi - aL_f$$

a disutility equal to coefficient a is incurred when female workers L_f is increased by one unit. When there are many such discriminatory firms on the labor demand side and they are the leading actors in making offers of limited labor demand, the female market wage rate will be precisely a lower than the marginal productivity.⁴ While aware that women have higher marginal productivity than their wages, discriminatory firms will thus not seek to employ many women. In contrast, firms that are not discriminatory will be able to reap the differ-

³ Firms maximize profit π given production function F as a function of capital K , male workers L_m , female workers L_f , and intermediate inputs M , real capital price r , male and female real wages W_m and W_f , and real intermediate inputs price P_M .

$$\pi = F(K, L_m, L_f, M) - rK - W_m L_m - W_f L_f - P_M M$$

Male and female wages in the labor market at this time reflect the respective productivities of male and female workers; in other words, they reflect differences in the human capital of men and women.

⁴ In the optimization of the objective function of discriminatory employers, (female marginal productivity) $- a =$ (female labor wage rate).

ence between female worker productivity and the market wage as profit by employing large numbers of women. According to the “discriminatory hypothesis,” then, corporate performance increases as more women are employed.

The second hypothesis posits that firms that perform well employ more women for the amenity of (male) employees. Firms that perform well employ many women, and employ more as performance increases. This line of thinking we call the “amenity hypothesis.” This hypothesis envisages a reverse causal relationship to the preceding discriminatory hypothesis.

Third is the “negative shock hypothesis.” Individual firms are exposed to shocks (such as productivity shocks and demand shocks) at the macro level, industry level, and firm level. When a negative shock is encountered and performance deteriorates, firms in many cases limit hiring.⁵ Even if the numbers of male and female hires are similarly restricted at such time, the job separation rate is constantly higher among female workers than males, leading to a decline in the proportion of female workers.⁶ Lower proportions of women are consequently observed at firms with poorer performance. When performance recovers, on the other hand, the proportion of female workers recovers as a firm fills its vacancies. It is thus thought that as negative shocks inhibit hiring, which in turn causes the proportion of female workers to fall due to differences in the job separation rates for men and women, there consequently arises a positive correlation between corporate performance and the proportion of female workers.

The fourth hypothesis holds that the proportion of women does not raise corporate performance, nor vice versa, and that seemingly correlated due to the existence of a background “true cause” that affects both the proportion of female workers and corporate performance. There is a possibility that there exist “firm-specific factors” in firms that raise both the proportion of women and profitability, and HRM is one particularly likely candidate. Firms that are superior in terms of this firm-specific factor have both a high proportion of female workers and high profitability, but, as long as there is no change in the firm-specific factor, there is no change in profitability at a firm if it simply raises the proportion of women.

In this paper, we proceed with our analysis using the above discrimination, amenity, negative shock, and firm-specific factor hypotheses as our working hypotheses.

⁵ Japanese firms exhibit a strong tendency to respond to negative shocks by first limiting hiring rather than dismissing workers.

⁶ According to the Ministry of Health, Labour and Welfare’s *Koyo Doko Chosa* (Survey on Employment Trends), the job separation rate in 2003 was 13.7% for males and 20.9% for females. Women are 16.5% points more likely than men to leave their jobs for “personal reasons (marriage, childbirth, child care, nursing of relative, etc.)” (56.7% for men compared with 73.2% for women), and so the female job separation rate is always high.

III. Data

1. Summary of *Kigyo Katsudo Kihon Chosa* (Basic Survey of Japanese Business Structure and Activities) Data

The analysis in this paper uses individual firm data for a total of eight years from the Basic Survey of Japanese Business Structure and Activities (*BSJBSA*) conducted by METI in 1992 and 1995-2001. This is a survey of all companies in the mining, manufacturing, wholesale/retail, and eating and drinking establishment divisions of the Japan Standard Industrial Classification (excluding other eating and drinking establishments) that have at least 50 workers and initial capital of at least ¥30 million. The sample size each year is around 20,000, and consisted of 25,826 firms in 2000.

The advantage of this data source is that corporate performance and numbers of employees by sex are surveyed, and it is possible to calculate estimates broken down into permanent employees (full-time workers) and part-time workers.⁷ It is also possible to concatenate cross-section data to create panel data for up to a maximum of eight surveys (covering a time span of 10 years including the two years during which surveys were not conducted).⁸ Descriptive statistics are shown in Table 1.

2. Summary of *Shushoku Shikiho Joshi Gakusei Ban* [Quarterly Company Handbook for Female Students] Data

In order to examine the firm-specific factor hypothesis, which is one of the above hypotheses concerning the relationship between the proportion of female workers and corporate performance, we need variables for HRM, which is a likely candidate as a firm-specific factor, and especially variables concerning women's employment management. This paper examines the relationship between the proportion of female workers and corporate performance using HRM-related variables for the first time, and so incorporating these variables in the analysis is extremely significant.

In this paper, therefore, we obtain variables concerning HRM, including systems used by women such as child care leave systems and flextime systems, from Toyo Keizai Shinposha's *Quarterly Company Handbook for Female Students (QCHFS)* (1993, 1998, 2003).

⁷ In the *BSJBSA*, the term "full-time worker" refers to paid directors and full-time employees (workers employed under contracts for a term of more than 1 month and persons employed for 18 or more days in each of the last 2 months of the fiscal year concerned, regardless of whether they are called permanent employees, semi-permanent employees, or *arubaito* (temporary workers), etc.). "Part-time workers" are workers who work shorter scheduled working hours than the general employees among full-time workers, regardless of whether they are called permanent employees, semi-permanent employees, or *arubaito*, etc. These definitions are largely the same as the definitions of full-time workers and part-time workers used for *Maigetsu Kinro Tokei* [Monthly labour survey] produced by MHLW.

⁸ As no breakdown of workers by sex was obtainable from the *BSJBSA*, 2001 data from this survey were used only for the analysis allowing for time lag.

Table 1. Descriptive Statistics

Variable name	Sample size	Mean	Standard deviation
Ratio of operating income to total assets	180294	0.028	0.147
Proportion of females (including part-timers)	180294	0.322	0.202
Ratio of female permanent employees	180294	0.229	0.157
Ratio of male permanent employees	180294	0.660	0.213
Ratio of female part-time workers	180294	0.093	0.153
Ratio of male part-time workers	180294	0.018	0.054
Log of regular workers	180294	5.017	0.967
Rate of foreign ownership	180294	0.013	0.097
Year of establishment	180294	1961	14.94
Listed firm (listed dummy)	180294	0.088	
Gender difference in length of service	1097	7.120	3.969
Existence of reemployment system	838	0.331	
Ratio of female managers	256	0.046	0.103
Proportion of women among main career track hires	245	0.212	0.210
Better than statutorily required child care leave system	1128	0.262	
Log total male/female overtime	182	2.660	0.628
Flextime system	869	0.358	
Possibility of women's internal transfer	834	0.836	
Promotion equality	249	0.203	0.710
Percentage of child care leave taken	235	0.028	0.028
Ratio of married female employees	802	0.200	0.148

The numbers of firms covered by the report are 1,123 in 1993, 834 in 1998, and 863 in 2003. From this, 11 variables, including “gender difference in length of service,” “reemployment system,” and “ratio of female managers,” were created according to the purpose of the present analysis.⁹

In order to use these HRM variables to analyze the relationship between the proportion of female employees and corporate performance, data from the above the *BSJBSA* were matched with data at the individual firm level to obtain a data set consisting of a total sam-

⁹ The 11 HRM variables prepared were as follows: “gender difference in length of service” (= men’s mean length of service in years – women’s mean length of service in years), “reemployment system” (= existence of reemployment scheme for workers retiring before mandatory retirement age due to marriage or childbirth, etc.), “ratio of female managers” (= proportion of all managerial positions that are filled by women), “proportion of women among main career track hires,” “better than statutorily required child care leave system” (= existence of child care system in 1991, existence of system allowing child care leave in excess of 1 year in 1996 and 2001 after entry into effect of Child Care Leave Act in April 1992), “overtime,” “flextime system,” “possibility of women’s internal transfer,” “promotion equality” (= ratio of female managers/ratio of female employees), “percentage of child care leave taken” (number of people taking child care or nursing care leave/female employees), and “ratio of married female employees.”

ple of 1,763 for three years. The descriptive statistics are shown in Table 1.

The mean ROA (Return on Assets)¹⁰ is 2.8%, and the proportion of women among the total number of workers calculated by adding together full-time workers and part-time workers is 32.2% (22.9% female permanent employees and 9.3% female part-time workers), the mean number of regular employed persons is 151 (= exp [5.017]), mean rate of foreign ownership is 1.3%, mean year of establishment is 1961, and listed firms account for 8.8% of the total. According to data from the *QCHFS*, the gender difference in length of service is 7.12 years, the proportion of firms that have reemployment systems for workers who retire before mandatory retirement age due to marriage or childbirth, etc. is 33.1%, the ratio of female managers is 4.6%, the proportion of women among main career track in dual career ladder system hires is 21.2%, the proportion of firms with better than statutorily required child care leave systems is 26.2%, mean overtime is 14.3 hours (= exp [2.660]), the proportion of firms with flextime systems is 35.8%, the proportion of firms at which internal transfers of female workers is possible is 83.6%, mean promotion equality is 0.20, the mean percentage of child care leave taken is 2.8%, and the mean ratio of married female employees is 20.0%.

IV. Estimation Methodology and Results

1. Regression Analysis of Pooled Data

(1) Estimation Methodology

In order to confirm whether there is a correlation between the proportion of female workers and corporate performance, cross-section data for each year from 1992 to 2001 were pooled and a regression analysis performed. ROA was used for profitability as the productivity of capital K.¹¹ For the explanatory variables other than the proportion of female workers, we used firm size, listed dummy, industry dummies, rate of foreign ownership, and year of establishment.

¹⁰ Ratio of operating income to total assets

¹¹ While return on equity (ROE) is an indicator of the efficiency of capital attributable to shareholders, the ratio of operating income to total assets (ROA) shows the efficiency of total assets including that portion corresponding to borrowing (= capital + liabilities), and is widely used to examine the management efficiency of an firm. The return on sales used in past research is given as a proportion of capital cost, worker wages, and cost of intermediate goods, which are all the constituents of sales (capital cost's share of the sum of the three), and so there is a high probability of its serving as a proxy for the input ratio of production factors rather than corporate performance. Thus if the proportion of female workers is assumed to be correlated with the proportion of production activity that is performed internally, there is a possibility that firms that have a low proportion of female workers may, like electrical manufacturers that spin off their plants as subsidiaries, outsource production, as a result of which most of their sales will take the form of payments for the supply of intermediate goods and their return on sales will be low.

Table 2. Correlation between Profitability and Proportion of Female Workers

Dependent variable: Profitability

	(1)		(2)		(3)		(4)	
	OLS		OLS		Fixed effect		Fixed effect	
	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.
Proportion of females	0.015	0.003			-0.003	0.008		
Ratio of female permanent employees			0.012	0.005			-0.022	0.009
Ratio of female part-time workers			0.019	0.005			0.013	0.008
Ratio of male part-time workers			0.007	0.009			-0.012	0.012
Log of regular workers	0.003	0.000	0.004	0.000	0.005	0.002	0.009	0.002
Listed dummy	0.010	0.001	0.010	0.001				
Rate of foreign ownership	0.033	0.007	0.034	0.007	-0.006	0.007	-0.007	0.007
Year of establishment	0.298	0.033	0.299	0.033				
Constant	-0.578	0.067	-0.580	0.067	-0.002	0.010	-0.016	0.010
<i>N</i>	180294		180294		180294		180294	
Number of firms	37343		37343		37343		37343	
<i>R</i> ²	0.009		0.009		0.007		0.007	

Notes: 1. (1) and (2) show the results of the OLS estimations (panel clustering robust standard error), and (3) and (4) show the results of fixed effect estimation.

2. The proportion of female workers indicates the proportion of female workers among all employees (including part-time workers).

3. The denominator for calculating the ratio of male permanent employees, ratio of female part-time workers, and ratio of male part-time workers is the total number of employees in specification (2) and (4).

4. All specifications are controlled by year dummies.

5. Specification (1) and (2) are controlled by industry dummies.

6. The coefficient for year of establishment is multiplied by 1,000.

(2) Estimation Results

Column 1 in Table 2 shows the results of estimation by the least squares method (clustering robust standard error). The coefficient for the proportion of females including part-time workers is 0.015, which is significantly positive.¹² The estimate that profitability is 0.15% higher at firms where the proportion of females is 10% higher is quite considerable considering that mean profitability is 2.80% (see Table 1 Descriptive Statistics).

The number of female workers includes part-time workers. If the part-time workers' wages are lower than their productivity, there is a possibility that the lowness of personnel expenditures on them may have a positive effect on corporate performance. In addition to using the ratio of female part-time workers among all employees and ratio of male part-time workers among all employees as explanatory variables, therefore, estimates were calculated

¹² The trend remains unchanged even when estimates are performed using ordinary profit, business income, and operating income as the numerators for calculating ROA. Even the dependent variable is the ratio of Earnings Before Interest and Taxes (EBIT) to total assets, a similarly significant positive relationship to that with ROA is confirmed (results table omitted).

changing the proportion of female workers to the ratio of female permanent employees among all employees. It was found as a result that the coefficient for the ratio of female permanent employees is 0.012, which is significantly positive (column 2 in Table 2), indicating that the proportion of female workers raises corporate performance even allowing for the effect of part-time workers.¹³

Regression analysis of pooled data thus confirms that there is a positive relationship between the proportion of female workers and profitability. This result is consistent with the findings of previous studies, and appears to support the discrimination hypothesis that holds that women who are discriminated against receive wages that are below their productivity.

2. Fixed Effect Estimation

(1) Estimation Methodology

Estimates calculated using pooled data do not take account of the possibility that the heterogeneities of each sample may be lumped together under the error term unobservable to the explanatory variables. As the unit of investigation employed by the *BSJBSA* is the firm, there are considerable unobservable heterogeneities specific to firms, and it is highly likely that these are correlated with the explanatory variables. In order to treat these firm characteristics as firm-specific factors and eliminate them, fixed effect estimates were determined using panel data.

(2) Estimation Results

Columns 3 and 4 of Table 2 show profitability regressed by the proportion of female workers after adjusting for the impact of the business cycle by adding year dummies using panel data created from the *BSJBSA* in 1992 and 2001. The coefficient on proportion of female workers is not significant (column 3 of Table 2). By adding the ratio of female part-time workers to all employees, the ratio of male part-time workers to all employees, and the ratio of female permanent employees to all employees to the explanatory variables, the coefficient for the ratio of female permanent employees becomes significantly negative (column 4 of Table 2). This suggests that firms may regard female permanent employees as a future resource and so, though they may have a negative effect on earnings at present, employ them as a form of anticipatory investment.

If the firm-specific factors is eliminated by means of fixed effect estimation, the results indicate that the proportion of females does not have an impact on profitability. This is not consistent with the discrimination hypothesis, according to which there exists a gap between women's wages and their productivity.¹⁴ This also does not tally with the amenity or negative

¹³ It was also confirmed by least squares estimation using pooled data that personnel costs per person are not correlated with profitability. There is a strong possibility that rather than profits being earning by firms by not paying the wages prevailing in a competitive labor market, profits are distributed to both labor and capital.

¹⁴ Estimating profitability by the instrumental variables method using the existence of a better

shock hypotheses, which predict a positive correlation between the proportion of women and profitability (irrespective of the direction of the causal relationship).

3. Estimation Allowing for Time Lag

(1) Method of Estimation

Based on the results of the above fixed effect analysis alone, there is still scope to refute the negation of the discrimination hypothesis. There is a possibility that there exists a time lag between an increase in the proportion of female workers and their actually contributing to corporate performance due to the time required for training and so on, as a result of which no correlation between the proportion of female workers and corporate performance can be detected when estimating them at the same point in time. As the amenity hypothesis posits the employment of women as a result of good corporate performance, moreover, there may be a lag in corporate performance's raising the proportion of women under this hypothesis too. The same applies in the case of the negative shock hypothesis. We therefore reexamine the existence and direction of the causal relationship by calculating estimates allowing for the following time lag after simplifying the estimation model:

$$(2) \quad Y_{it+m} - Y_{it} = \alpha + \beta(X_{it} - X_{it-1}) + \gamma Z_{it-1} + \varepsilon_{it-1}$$

$$(3) \quad X_{it+m} - X_{it} = \mu + \phi(Y_{it} - Y_{it-1}) + \xi Z_{it-1} + \eta_{it-1}$$

where Y_{it} is profitability in period t at firm i , X_{it} is the proportion of female workers, and Z_{it} is the firm attributes, such as industry and so on. Formula (2) looks at the impact of a change in the proportion of females from period $t-1$ to t on the change in profitability in the period (year) m from t to $t+m$. The purpose of this is to confirm the relationship between the proportion of female workers and corporate performance taking into consideration the lag until the actual application of the abilities of the increased number of female workers. Formula (3) reexamines the discrimination hypothesis, amenity hypothesis, and negative hypothesis by looking at the impact of changes in profitability from $t-1$ to t on changes in the proportion of females from t to $t+m$. Whereas the independent variables shows the change in one year, the dependent variable represents the change during year m ($m = 1 - 6$).

(2) Estimation Results

Table 3 and Table 4 show the results of the time lag estimates. Neither the impact of

than statutorily required child care leave system as the identification variable, it was found that the coefficient for the proportion of females is not significant (results table omitted). This would suggest that the correlation between the proportion of female workers and profitability is a spurious one.

Table 3. Change in Proportion of Females and Change in Profitability
(Δ proportion of females $\rightarrow \Delta$ profitability)

	1-year lag		2-year lag		3-year lag		4-year lag		5-year lag		6-year lag	
	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.
Change in proportion of females	0.002	0.009	0.011	0.011	-0.001	0.012	0.026	0.015	-0.020	0.017	-0.098	0.066
Constant	0.004	0.001	0.013	0.001	0.004	0.001	-0.001	0.001	0.001	0.001	0.001	0.003
<i>N</i>	124457		97717		73822		52381		32395		14751	
Prob > F	0		0		0		0		0		0.018	
<i>R</i> ²	0.002		0.003		0.001		0.001		0.001		0.001	

- Notes: 1. The proportion of females is the proportion of women, including part-time workers, among all employees (including part-time workers).
2. The explanatory variable is the change in the proportion of females from (*t*-1) to year *t*, and the dependent variable is the change in profitability from *t* to (*t*+*m*).
3. Controlled by industry dummies and year dummies at time (*t*-1).

Table 4. Change in Profitability and Change in Proportion of Females
(Δ profitability $\rightarrow \Delta$ proportion of females)

	1-year lag		2-year lag		3-year lag		4-year lag		5-year lag	
	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.
Change in profitability	0.002	0.001	-0.001	0.002	0.002	0.002	-0.001	0.003	-0.006	0.007
Constant	-0.003	0.000	-0.006	0.001	-0.008	0.001	-0.008	0.001	-0.011	0.001
<i>N</i>	85064		77977		55080		34154		15647	
Prob > F	0		0		0		0		0	
<i>R</i> ²	0.0011		0.0023		0.0029		0.0039		0.0058	

- Notes: 1. The proportion of females is the proportion of women, including part-time workers, among all employees (including part-time workers).
2. The explanatory variable is the change in profitability from (*t*-1) to year *t*, and the dependent variable is the change in the proportion of females from *t* to (*t*+*m*).
3. Controlled by industry dummies and year dummies at time (*t*-1).

change in profitability on change in the proportion of female workers nor the impact of the change in the proportion of female workers to the change in profitability is significant. The absence of a correlation between the two according to this estimation allowing for a lag in the relationship between the proportion of female workers and ROA, as well as the panel fixed effect estimation, means that there is hardly any possibility that the discrimination, amenity, or negative shock hypotheses hold true in Japan.

4. Search for Firm-Specific Factors

(1) Estimation Methodology

The findings that profitability and the ratio of female workers are positively correlated according to least squares estimation using pooled data and that there is no correlation according to fixed effect analysis and estimation allowing for a time lag are consistent with the firm-specific factor hypothesis. In other words, the correlation between profitability and the proportion of female workers indicated by the results of estimates by the least squares method using pooled data is a spurious one, and there may in fact be firm-specific factors that raise both corporate performance and the proportion of female workers. Below, therefore, we search for these firm-specific factors, or “true causes.”

In this paper, we assume that firms’ HRM measures are potential firm-specific factors, and we look for those correlated with both profitability and the proportion of female workers.

We begin with an overview of the literature analyzing the relationship between HRM measures and the proportion of female workers and corporate performance. Regarding HRM measures and the proportion of female workers, Kawaguchi (2002) demonstrates using data from a questionnaire survey conducted in the Kansai region in 2000 that HRM measures do not affect women’s employment. Wakisaka (2001) examines child care leave systems and the proportion of females using data from *Joshi (Josei) Koyo Kanri Kihon Chosa* [Basic survey on woman’s employment management] for 1995, 1996, and 1997. At small establishments (with 30 or fewer workers), the cost of child care leave systems is excessive and hiring of women is limited, and so the effect on the proportion of female workers is negative. At large firms, conversely, the proportion of female workers is significantly increased and the effect on length of women’s service is positive. Regarding child care leave systems, Morita and Kaneko (1998) also verify, using data from *Josei no Shugyo Ishiki to Shugyo Kodo ni Kansuru Chosa* [Survey of women’s attitudes to work and work behavior] conducted by the Japan Institute of Labour in 1996, that child care leave systems increase women’s length of service. Employing individual data from *Shohi Seikatsu ni Kansuru Paneru Chosa* [Japanese Panel survey of Consumers] (the Institute for Research on Household Economics) Shigeno and Okusa (1998) similarly suggest that child care leave systems have the effect of encouraging continuation in employment.

Regarding the relationship between HRM measures and corporate performance, Perry-Smith and Blum (2000) demonstrate that firms that implement multiple, rather than individual, family-friendly measures in combination exhibit both higher proportions of female

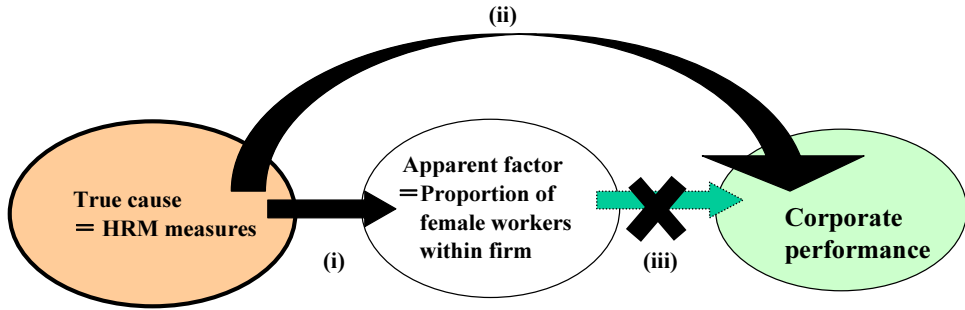


Figure 1. Relationship between Corporate Performance and Proportion of Females

workers and higher corporate performance (in terms of growth in sales). In addition, Konrad and Mangel (2000) show that the proportion of specialist personnel, proportion of female workers, and cross term of the composite work-life index (WLI) have a positive effect on corporate performance (sales per person). In Japan, Sakazume (2002) estimated the relationship between family-friendly measures and the rate of change in ordinary profit using data from a survey of firms conducted by the Japan Productivity Center for Socio-Economic Development in 2001 and data on employees from respondent firms, confirming that there is no significant relationship.¹⁵ Abe and Kurosawa (2006) have also demonstrated, using data from *Shigoto to Seikatsu no Ryoritsu Shien Saku to Kigyo Gyoseki ni Kansuru Chosa* [Survey of measures to assist the balancing of work and family and corporate performance] conducted in 2005 by the NLI Research Institute, that firms with better child care leave systems that exceed statutory requirements and arrangements for working shorter hours to care for a relative exhibit higher performance (in terms of the rate of change in value of sales and ordinary profit).

The specific approach by which we search for the “true factors” affecting both the proportion of female workers and corporate performance is shown in Figure 1. The first step is to select those HRM measures that raise both the proportion of females (i) and profitability (ii). Next, each of the HRM measures survived as the result of (i) (ii) estimation and the proportion of females are added to the explanatory variables in the estimate equation for profitability again. (the same number of regressions as there are measures is per-

¹⁵ Clifton and Shepard (2004) have demonstrated that work-family support programs raise productivity. Arthur (2003) and Arthur and Cook (2004) examine the impact on share prices of family-friendly initiatives reported in *The Wall Street Journal* using the event study approach, and find that there is a positive correlation between family friendly measures and share price. Kawaguchi and Nagae (2005) likewise use the event study approach to examine the impact of the Company Award for the Promotion of Gender Equality and Family-Friendly Company Award on award winners' share prices. Their findings show that while the Family-Friendly company Award boost the share price of award winners in the short term, the effect is the reverse in the case of firms whose profits are falling, and the Company Award for the Promotion of Gender Equality depresses the share price of award winners in the short term. Roehling, Roehling, and Moen (2001), meanwhile, explain how worker loyalty is positively correlated with flextime and the informal support of superiors and coworkers.

formed.) If, in the course of regressing profitability, one of the subsequently added HRM variables is found to be significant while the coefficient for the proportion of females ceases to be significant, or the absolute value of the coefficient shrinks, then it may be surmised that that HRM variable is the true cause raising both the proportion of female workers and corporate performance, and the apparent explanatory force of the proportion of female workers in relation to profitability is removed (iii).

As these calculations depend on a sample of data created by matching data from the *BSJBSA* with data from the *QCHFS*, which covers firms that are popular as sources of employment among female students, there is a possibility of the estimates being affected by selection bias due to the correlation of the error term and explanatory variables such as the proportion of female workers and HRM variables. We therefore checked and controlled for this bias by following Heckman's (1979) two-stage estimation procedure.

(2) Estimation Results

Table 5 shows the results of estimation of whether HRM-related variables affect the proportion of female workers.¹⁶ Eight of the 11 HRM variables have a significant effect on the proportion of females. It was also estimated whether personnel and labor-related variables affect profitability. Three measures—"small gender difference in length of service," "high proportion of female managers," and "existence of reemployment systems"—were found to have a significant effect on profitability (results table omitted). From these two results, it can be seen that the above three measures have a significant effect on both the proportion of female workers and profitability.

In order to confirm whether these three HRM-related variables are firm-specific factors that raise the proportion of female workers and also raise profitability, we next examine whether the proportion of female workers loses its explanatory power in the estimation equation adopting profitability as the dependent variable by controlling for these HRM variables.

Columns 1 and 2 of Table 6 show the results of estimates regarding the relationship between profitability and the proportion of female workers, corrected for the sample selection bias and calculated using matchable data from the *QCHFS* and the *BSJBSA*. Column 1 shows the results of estimates calculated without employing an identification variable removed at the second stage of the two-stage Heckman procedure, and identification relies on the nonlinearity of the inverse Mill's ratio. Here, the coefficient for the log number of regular employees is not significant, and so in column 2 the accuracy of identification is ensured

¹⁶ In this search, too, we correct for sample selection bias having controlled for industry and ratio of foreign ownership, etc. As most HRM measures mainly apply only to permanent employees, the proportion of female workers used here is the ratio of female permanent employees excluding part-time workers. Even if we use the proportion of females including part-time workers, however, the results are the same except for the effect of overtime and possibility of internal transfers by women, which cease to be significant.

Table 5. Relationship between Proportion of Female Workers and HRM Measures

Dependent variable: Ratio of female permanent employees	(1)		(2)		(3)		(4)		(5)		(6)		(7)		(8)	
	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.
Gender difference in length of service	-0.003	0.001														
Reemployment system			0.018	0.010												
Ratio of female managers					0.588	0.080										
Proportion of women among main career track hires							0.359	0.054								
Better than statutorily required child care leave system									0.026	0.010						
Log of overtime											-0.042	0.015				
Existence of flextime system													-0.034	0.010		
Possibility of women's internal transfer															-0.025	0.012
Ratio of foreign ownership	-0.049	0.047	-0.204	0.062	-0.180	0.098	-0.271	0.105	-0.126	0.046	-0.130	0.126	-0.166	0.059	-0.201	0.062
Year of establishment	-0.136	0.278	1.062	0.323	0.034	0.425	0.378	0.473	0.766	0.262	0.402	0.555	1.096	0.310	1.144	0.325
Constant	0.458	0.541	0.256	0.014	0.245	0.810	-0.437	0.898	-1.253	0.507	-0.324	1.049	-1.860	0.600	-1.940	0.631
Inverse Mill's ratio	0.028	0.009	-0.022	0.010	-0.070	0.029	-0.091	0.033	-0.024	0.009	-0.074	0.047	-0.028	0.009	-0.029	0.010
<i>N</i>	66634		66634		66634		66634		66634		66634		66634		66634	
Select number	1097		838		256		245		66634		182		869		834	
ρ	0.225		-0.173		-0.535		-0.624		-0.188		-0.523		-0.228		-0.231	

Notes: 1. Heckman two-stage estimation. A first-stage probit analysis was performed using the ratio of foreign ownership, log of regular employment, listed status, and year of establishment.

2. Year dummies and 3-digit industry dummies are included (not reported).

3. The coefficient for year of establishment is multiplied by 1,000.

Table 6. Relationship between Profitability and HRM Measures

Dependent variable: Profitability	(1)		(2)		(3)		(4)		(5)		(6)	
	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.	Coef.	Std. Err.
Gender difference in length of service												
Reemployment system					-0.002	0.000					-0.002	0.000
Ratio of female managers	0.016	0.009	0.020	0.008	0.005	0.005	0.005	0.003	0.057	0.032	0.005	0.003
Ratio of female permanent employees	0.055	0.012	0.057	0.012	0.049	0.014	0.005	0.011	0.050	0.025	-0.006	0.010
Ratio of foreign ownership	0.484	0.067	0.483	0.067	0.350	0.084	0.035	0.019	0.164	0.040	0.042	0.018
Year of establishment	-0.003	0.003			0.067	0.067	0.493	0.099	0.539	0.158	0.257	0.101
Log of regular employment												
Constant	-0.885	0.132	-0.908	0.129	-0.626	0.164	0.031	0.005	-1.103	0.301	-0.449	0.197
Inverse Mill's ratio	0.005	0.007	0.011	0.002	0.010	0.003	0.005	0.003	0.052	0.012	0.005	0.003
<i>N</i>	66634		66634		66634		66634		66634		66634	
Select number	1763		1763		1097		838		256		826	
ρ	0.125		0.269		0.253		0.146		0.828		0.135	

Notes: 1. Heckmann two-stage estimation. A first-stage probit analysis was performed using the proportion of female workers, ratio of foreign ownership, year of establishment, log of regular employment, and listed status.

2. Year dummies and 3-digit industry dummies are included (not reported).

3. The coefficient for year of establishment is multiplied by 1,000.

by removing this log number of regular employees as an identification variable. The coefficients between the proportion of females and profitability are consistent with the results of the cross-section analysis described previously, and are positively significant (coefficient = 0.016, 0.020).

Columns 3-5 of Table 6 show the results for profitability using the HRM variables and proportion of female workers as the explanatory variables. “Gender difference in length of service” and “reemployment system” have a significant impact on profitability, and the proportion of female workers is not significant. On the other hand, although the coefficient between “ratio of female managers” and profitability is positive at the 10% significance level (coefficient = 0.057), the coefficient for the proportion of female workers is also positive at the 10% level, as well as being larger (coefficient = 0.050), and so the condition for being a “true cause” is not satisfied. From this, it would appear that the two variables “gender difference in length of service” and “reemployment system” raise both profitability and the proportion of female workers, and are the “true causes” in the background that create the spurious correlation between profitability and the proportion of female workers. Column 6 of Table 6 shows the results of estimates using “gender difference in length of service,” “reemployment system,” and the proportion of female workers simultaneously as explanatory variables. The coefficients for the two variables are significant, and the coefficient for proportion of females is not significant, which confirms that “gender difference in length of service” and “reemployment system” are highly likely to be “true causes.”

V. Types of HRM Measure and Impact on Female Employment and Corporate Profits

1. Gender-Equality Measures and Family-Friendly Measures

The estimates in the preceding section employed numerous HRM variables, and examining their effect in view of their individual purposes and characters should be highly significant from the point of view of research on HRM.

Regarding internal HRM initiatives affecting female employment, Wakisaka (2001) divides them into two types: gender-equality measures and family-friendly measures. Gender-equality measures consist of measures designed to eliminate as far as possible the gap between men and women in hiring, job content, training, pay and other treatment. Family-friendly measures, on the other hand, are regarded as having the effect of promoting the hiring and retention of high-caliber employees (especially women) through the provision of corporate support to enable employees to fulfill their family responsibilities.¹⁷

¹⁷ This may involve, for example, allowing longer child care leave than required by law, reducing overtime, not relocating women to other operations, and creating an environment that makes it easier to take child care leave and raising the proportion of workers that take child care leave.

Table 7. Relationship between Proportion of Female Workers and Profitability

		Proportion of females	
		Positive correlation with proportion of females	No correlation with proportion of females
Profitability	Positive correlation with profitability	Small gender difference in length of service Existence of reemployment system High ratio of female managers	
	No correlation with profitability	High proportion of women among main career track hires Better than statutorily required child care leave system Short overtime No flextime system No possibility of women's internal transfer	High equality of promotion High percentage of child care leave taken High ratio of married employees

2. Relationship between Type of Measure and Female Employment/Corporate Profits

The results of our estimates of the impact on the proportion of female workers and profitability of the 11 HRM-related variables analyzed here are summarized in Table 7. Three are correlated with both the proportion of female workers and profitability, and these are strongly bound up with equality in that they are designed to enable equal use of human resources regardless of sex. For example, the existence of a small “gender difference in length of service” is suggestive of an environment in which women can remain at a firm for a long time and the importance of mechanisms for rewarding employees according to ability and performance irrespective of sex. While having a “reemployment system” tends at first sight to be classified as family friendly, the possibility of reemployment is determined by a firm on the basis of individual workers’ performance before retirement. Consequently, reemployment systems have a powerful management effect on women who have marriage and childbirth in mind, and so may also be interpreted as equality measures that raise female workers’ motivation.¹⁸

Next, four of the five HRM variables that raise the proportion of female workers but do not affect corporate performance appear to be family-friendly measures (the exception being “proportion of women among main career track hires,” which is an equality measure). These are: “(short) overtime,” “better than statutorily required child care leave system,” “flextime system,” and “no possibility of women’s internal transfer.”¹⁹ Dividing HRM-related

¹⁸ It is possible that “reemployment systems” may have lost most of their actual significance since 1992, when legislation on child care leave was enacted. Possible reasons for this variable nevertheless being an important explanatory variable are that women leave their jobs due to circumstances not covered by child care leave systems and the proxy variable that women were employed from before the entry into effect of the Child Care Leave Act.

¹⁹ The correlation coefficient between flextime systems and proportion of female workers is negative. This is thought to be due to the fact that, as Wakisaka (2002) observes, flextime is not in practice

variables into gender-equality measures and family-friendly measures according to how they function, then, we find in general that whereas equality measures raise the proportion of female workers and also raise corporate performance, family-friendly measures raise the proportion of female workers but do not affect corporate performance.

VI. Discussion

Regression analysis of cross-section data shows there to be a significant and quite large positive correlation between the proportion of female workers and profitability. This appears to support the discrimination hypothesis that holds that women are underpaid for their contributions due to discrimination, and that firms that employ more women consequently have higher profitability. When firm-specific factors are eliminated by fixed effect estimation using panel data, however, no correlation is found between the proportion of female workers and profitability, and it is not possible to discern a correlation even when allowing for a time lag. The findings consequently contradict not only the discrimination hypothesis, but also the amenity hypothesis and the negative shock hypothesis. The results of our estimates are consistent with the firm-specific factor hypothesis that holds that an apparent correlation arises as a result of the existence of firm-specific factors that raise both profits and the proportion of female workers.

When HRM-related variables are added and correction is made for selection bias, it is confirmed that two variables—"small gender difference in length of service" and "existence of reemployment system"—are "true causes" that raise the proportion of female workers and profitability. It was also discovered that whereas these are proxy variables for gender-equality HRM measures intended to enable active and equal use to be made of men and women, family-friendly HRM measures mostly increase the proportion of female workers but do not affect profitability.

Equality measures increase the proportion of female workers and also improve business performance. Interviews with firms conducted by the METI Gender Equality Panel (2003) also suggest that firms that treat their employees as individuals, regardless of sex, also make more use of women and exhibit better performance. If the correct recognition that equality measures have a positive effect on corporate performance grows more widespread, therefore, firms whose aim is to increase profits will naturally adopt and expand their use of equality measures and use of women will develop further. Firms that do not take such action will, in the long term, be weeded out, provided that the markets in which they do business are competitive. As for policy implications, the coincidence of equality HRM measures with the profit motive means that the appropriate role of government may be to provide information by developing statistics and undertaking research studies, rather

always family friendly because flextime workers have to work considerably longer overtime than workers that work regular hours.

than by regulation and coercion through, for example, the establishment of numerical targets for hiring of women.

Family-friendly measures, on the other hand, do not increase a corporation's profits even when enhanced. What is more, there arises the problem of externalities in that the merits of introducing such measures are enjoyed by its employees' spouses and the firms that employ these spouses and are not family friendly. For example, if the employer of a woman caring for a child were to reduce overtime as a part of its family-friendly measures, the woman's husband working at another company would then be free to work more overtime. If family-friendly measures are to be enhanced through policy means, therefore, this should be pursued by society as a whole at public expense. Policies that are likely to be effective include the various costs of child care being borne by society as a whole rather than the firm, and accelerated development of public infrastructure such as day nursery. It is also important that society as a whole rethink how men as well as women work by, for example, reducing overtime.

Certain limitations of this paper should be kept in mind when discussing the implication of these results. Firstly, as the discrimination hypothesis rejected here concerns only discrimination by management, no examination has been made of the effects of other mechanisms of discrimination, such as statistical discrimination and discrimination by customers. It should also be borne in mind that the search for possible firm-specific factors raising both the proportion of female workers and profitability was restricted to HRM-related variables. Although there are other variables that should be investigated as firm-specific factors affecting both the proportion of females and profitability, such as production technology, regulations, corporate attributes and policies, and regional structure of labor supply and demand, these were not analyzed in this paper due mainly to data constraints. Furthermore, while we also attempted an analysis of the impact on profitability and the proportion of female workers of multiple HRM-related variables in combination, the lack of a sufficient theoretical framework meant that conclusions could not be drawn in this paper. These remain as areas for further research.

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Corporate Governance by Investors and the Role of Women*

Akira Kawaguchi

Doshisha University

The paper examines the hypothesis that “The disciplining of management by investor governance of corporations promotes an active role for women in the corporation. The variables used to measure “active role” for women are three: the proportion of women among regular employees, the proportion of managers who are women and the number of positive action policies. The four used as measures of investor governance are: managers answering that investors’ word carried more weight than that of their banks (a dummy variable counted as 1), the number of investor relations (IR) measures, the number of measures to reform shareholders general meeting procedures and the number of measures to reform board structures.

The results show that there is a significant positive correlation between the proportion of women in management and the existence of positive action policies on the one hand and the strength of investor governance. This means that where investors’ influence is strong, many positive action measures are taken, resulting in a higher proportion of female managers, the hypothesis thereby being supported. Thus it becomes apparent that the disciplining of managers by investors creates an environment in which it is easier for women to be active, and thereby produces more women managers.

I. Introduction

The gender gap is greater in Japan than in any other advanced industrial country whether it be measured in terms of wages, participation or form of employment. One thesis holds that this gender gap is a function of individual worker choice, an alternative argues that it is caused by discrimination in the treatment of women on the part of corporations. The two theses are not mutually incompatible. The latter one can be subdivided into two: the arguments respectively from what might be called statistical discrimination and that from irrational discrimination.

The former, statistical discrimination, arises when, given imperfect information about a particular worker’s ability or propensity to give up a job, people use a person’s sex or race as a means of giving a best estimate of those characteristics. In other words firms behave in such a way as to maximize profit, given the information available.¹ Early studies of the

* The paper is a comprehensive revision of Chapter 9, “Are Women Active in Progressive Firms?: Corporate Governance and Management Reform and the Role of Women” in Kawaguchi (2008). The paper on which it is based was previously presented at the West Japan Labour Study Group (*Kansai Rodo Kenkyukai* in Osaka) and at the 2008 meeting of the International Association for Feminist Economics (Turin University, Italy). I would like to acknowledge the helpful comments received from participants on those occasions and also the many ideas gained from discussions with Daiji Kawaguchi. The responsibility for errors which remain is mine.

¹ However, when discrimination influences the worker’s investment in human capital there is a possibility of two equilibria, one in which the firm discriminates and one in which it does not, with profit being greater in the latter case (Coate and Loury 1993).

wage effects of statistical discrimination are those of Phelps (1972), Arrow (1973), and of statistical discrimination in recruitment and promotion, those of Doeringer and Piore (1971), Thurow (1975).

By contrast, the “irrational discrimination” hypothesis assumes firm behavior which is inefficient and not conducive to maximizing profits. Becker (1957) showed theoretically the possibility that employers could, if they had discriminating tastes, discriminate against women and blacks, even at the cost of diminishing profits. Kawaguchi (2008) responded to that by differentiating six different sources of discrimination besides an inherent taste for it: fixed stereotyped ideas, biased perceptions, sexual harassment, inadequate work-life balance policies, and inadequate information concerning worker characteristics.

In this paper we shall use the term “irrational discrimination” to mean discrimination which sacrifices profits.

The purpose of the present paper is to argue that discrimination against women is irrational from the point of view of corporate governance. If gender discrimination is irrational, in firms where investors exercise firm discipline over managers, those managers ought not to be allowed to discriminate against women. This leads to the hypothesis that “Where management is disciplined by investor governance, women are enabled to play a more active role.”

There are many existing field studies of gender discrimination, but none which deal with it from the viewpoint of corporate governance. The hypotheses tested in previous studies have been the following:

- (i) Firms with a high proportion of female employees have higher profits.
- (ii) Firms with a high proportion of female employees have a higher growth rate.
- (iii) Firms producing for highly competitive markets have a higher proportion of female employees.
- (iv) Firms producing for highly competitive markets have a lower gender wage gap.

Examples of the first type of study are: Sano (2005), Kodama, Odaki, and Takahashi (2005) and Kawaguchi (2007). Sano (2005) used the Nikkei Economic Electronic Databank System (hereafter NEEDS) and *Shushoku shikiho*, *Joseiban* [Quarterly company handbook for female students] published by Toyo Keizai, Inc. to look for a correlation between the female proportion in the labor force and the sales margin (profit/sales). Sano found that there was a negative correlation when estimated by the ordinary least squares (hereafter OLS) method, but a positive correlation when the estimation was by the median regression or by the fixed effect model method.

Kodama, Odaki, and Takahashi (2005) used the same *Quarterly Company Handbook* and *Kigyo Katsudo Kihon Chosa* (Basic Survey of Japanese Business Structure and Activities) for the years 1992 to 2000 to correlate the proportion of female employees with returns to capital employed (ordinary profit/capital employed). They found a significantly positive correlation using the least squares method, but no significant positive correlation using the fixed effect model, in fact a significant negative correlation with some model variations.

Kawaguchi (2007) used the Basic Survey of Japanese Business Structure and Activities for 1992 and for the years 1995 to 1999 to look for a relation between the proportion of female employees and operating profit on sales. Kawaguchi found a positive correlation both by the least squares, and by the fixed effect model methods.

Thus, looking for a relation between female employment and profit, all three studies using data obtained in Japan showed a tendency for there to be a positive correlation, but with differences according to the method used: Sano finding a negative and Kodama, Odaki and Takahashi, and Kawaguchi a negative correlation using least squares, while with the fixed effect model, Sano and Kawaguchi found a positive correlation but Kodama, Odaki and Takahashi a non-significant one.²

As for studies in other countries, Hellerstein, Neumark, and Troske (2002) used American cross-sectional data for the 1980s to estimate the relation between the proportion of female employees and operating profit on sales. They found positive relations both at the factory and at the corporate level.³

Studies of the second type, investigating the relationship between the proportion of female employees and corporate growth include the above mentioned study of Sano (2005) and Kawaguchi (2007). Sano found a negative correlation between the proportion of women employees in 1992 and growth in sales from 1992 to 2001. Kawaguchi found that the higher a firm's female employment in 1992, the lower was its growth in both output and employment, 1992-1999. Both studies contradict the irrational discrimination hypothesis.

Foreign studies include that of Hellerstein, Neumark, and Troske (2002) who compared 1990 factory-level data for the proportion of female employees with, for the period 1990 to 1995, growth in sales, growth in employment and whether or not there had been a change of factory ownership, the latter being included on the assumption that discriminating against women would cause low profitability and hence make a change of ownership more likely. They found no correlation of any of the variables with female employment. As with studies in Japan, while not actually finding negative correlations, they found nothing to support the irrational discrimination hypothesis.

The third type of study is exemplified in Kawaguchi (2007). He found that the higher the level of concentration in an industrial sector, the lower was the proportion of female employment.

As for overseas studies, Ashenfelter and Hannan (1986) compared 1976 data on banks

² Kodama, Odaki, and Takahashi (2005) conclude that the "taste discrimination" hypothesis is not supported and that there must be a third factor which affects both the proportion of female employees and profits. They suggest that this factor is the system of re-employing women who return to work after raising a family.

³ Corporate work-life-balance (hereafter WLB) policies are expected both to promote the role of women and increase corporate results, and analyses of the relationship have been conducted by Wakisaka (2006a, 2006b, 2007), and Abe and Kurosawa (2006). They both find a positive correlation. For a survey of the foreign literature on the effects of WLB policies and corporate results, see Matsubara and Wakisaka (2005a, 2005b, 2006).

in the two states of Pennsylvania and New Jersey. He also found a negative correlation between the level of concentration in an industry and the proportion of female employees. These studies go to confirm the irrational discrimination hypothesis.

Black and Strahan (2001) is representative of the fourth type of study. They analysed American bank data, looking for the effect on gender wage differentials of deregulation. They discovered that whereas deregulation led to a 12% reduction in male wages, the reduction for women was only 3%. This suggests that intensified competition had the effect of forcing bank managements into more egalitarian policies.

Again, Black and Brainerd (2004) used American data from 1976 to 1993 to estimate the effect on gender wage differentials of the increase in imports resulting from globalization. They found that in industries with a high degree of concentration, the differential decreased the higher the proportion of imports in consumption became. Their interpretation was that the level of concentration correlated with the level of oligopoly rent. That rent had been distributed with priority to male employees. Increased competition with imports reduced that rent and made it less possible to discriminatingly privilege men, i.e. discriminate against women. This study, therefore, supports the irrational discrimination hypothesis.

The present paper differs from existing studies in the following two respects. First, it examines the irrationality or otherwise of management discrimination against women, by looking at the hypothesis that institutional and foreign investors, pressing for more efficient management should make it difficult for managers to continue to discriminate^{4, 5}. In this paper the strength of investor pressure on managers is measured by the perceptions of managers themselves, as well as by reforms designed to favor investors, in, for instance, board structure, the handling of shareholders general meetings and investor relations.

The second difference is that existing studies have generally used the proportion of female employment as their measure of discrimination against women (or its obverse, the degree to which women have an active role). In this paper, we use as additional measures,

⁴ There is an alternative to the hypothesis that an increasing strength of shareholder voice enforces more efficient management, namely that firms with more efficient management are likely to reduce the proportion of their shares held by “stable shareholders” and as a consequence the weight of foreign shareholding increases. Miyajima, Haramura, and Enami (2003) have shown that in the latter half of the 1990s, the pattern of shareholding in firms with a high level of earning power showed an increase foreign ownership and a reduction in the holdings of banks and insurance companies. They explain this as resulting from the facts that the banks and insurance companies had disposed of their more valuable shares first in order to maximize the receipts, while the more profitable firms, becoming less dependent on the banks, were more inclined to sell the reciprocal holdings they had in the banks.

⁵ Yonezawa and Miyazaki (1996) showed that the higher a firm’s proportion of foreign ownership, the higher the productivity, and Miyajima et al. (2002) showed that the rate of productivity growth was also higher. Again, Horiuchi and Hanazaki (2004) showed that the same relationship applied when comparing industrial sectors, and Miyajima and Kuroki (2004) found that firms with a high proportion of ownership by foreign shareholders and by domestic institutional investors had a higher return on capital employed and a higher Tobin’s q.

the proportion of women in management and positive action policies.⁶ The use of the single measure of proportion in total employment is dangerous since it is possible for firms to discriminate against women in job postings, training, assessment and promotion, even when they have high proportions of female employees.

If one uses the model of Becker (1957) the above problem does not arise, at least theoretically, because all workers are considered as equal in ability and lacking in human capital investment, thus making a gender disproportion in recruitment in itself a sign of discrimination. But there are obviously many other ways to discriminate besides in recruitment, so multiple measures are necessary.

The structure of this paper is as follows. Section II looks at the relationship between corporate governance and an active role for women in historical perspective, and explains the logic underlying the hypothesis that subjecting managers to investor discipline will promote the role of women. Section III introduces the data used for the study and Section IV explains the variables used in the model. Section V discusses the results of the estimation and Section VI offers conclusions.

II. Corporate Governance in Japan and the Role of Women

Here we establish the historical facts of the relation between corporate governance and an active role for women, and explain the logic underlying the hypothesis that subjecting managers to investor discipline will promote the role of women.⁷

Firms mobilized their capital in post-war Japan primarily by indirect finance. As a result, the main-bank system functioned as the mechanism for disciplining management. Generally, a firm's main bank was the bank which provided the highest proportion of the firm's bank finance, and usually held the highest proportion of the firm's shares. It would interfere very little with management in normal times, but when the firm faced a crisis, would send executives into the firm to rescue it. The relation is described by Aoki (1994) as "contingent governance."

Traditional Japanese firms, in order to avoid having investors interfere in management, promoted reciprocal cross-holdings. In this way they minimized the proportion of their shares which were bought and sold in the market, and were able to prevent institutional investors and foreign investors from getting large shareholdings.

This uniquely Japanese system of corporate governance had the advantage that it allowed managers to concentrate on long-term objectives without bothering too much about profit levels in the short term. It is what made possible the long-term development of human capital through the strategy of lifetime employment.

⁶ We use the term to refer to policies planning deliberate action to promote an active role for women, what is known in America as affirmative action.

⁷ For further elaboration of the argument, see Kawaguchi (2008, chap. 6).

That employment system of building human capital for the long term through lifetime employment was a system which excluded women. In return for offering workers stable employment prospects, the firms required of their workers a flexible pattern of working. In a Japanese firm which frequently required overtime working, weekend working, trips, and postings away from home, it was hard to be a fully functioning employee without the backing of a full-time housewife. Work conditions in Japanese firms did not allow women to go on working after marriage and having children. Most women would leave their jobs when they married and had children. And since it would not be rational for the firm to offer the same training and job allocation as they gave men to women who had a high separation rate, women received less advantageous treatment in recruitment, training, posting and promotion.

However, recent changes in the socio-economic environment have raised the productive potential of women. In the first place there has been a notable increase in female educational levels. The proportion of female age groups going to university in 1990 was 15.2%, but in 2007 had risen to 40.6%—a higher rise than that for men which was from 33.4% to 53.5%.⁸ This increase in female university enrolments meant, not only an increase in the potential work ability of women, but also a stronger propensity to seek employment.

A second change is the development of governmental policies to make working compatible with running a family. Successive measures have been taken to deal with the decline in the birth rate. Listed in the order of enactment or adoption, the Parental Leave Act (1991), the Basic Direction for Future Child Rearing Support Measures (the Angel Plan) (1994), the New Angel Plan (1999), the Measures to Facilitate the Rearing of the Next Generation (2003) and the Basic Law for Social Measures to Counter the Declining Birthrate (2003). These measures have been designed to make working more compatible with family responsibilities, by improving child care services, creating parental leave systems, and flexible working systems. The measures to counter the declining birth rate have the possibility of facilitating the employment of women and reducing the likelihood that pregnancy and childbirth will mean that women leave their jobs.

Again, the decline in the birth rate means smaller numbers of young workers coming into the labor market. Firms will become increasingly unable to recruit enough good workers if they continue to concentrate on recruiting men.

Thus, the need to increase the scope of women's work activity is obviously there, but unless firms change their established employment practices it is not going to happen. In order to deploy female labor effectively, in the first place they have to introduce employment practices which make the combination of working and enjoying family life possible for women; they need, for instance, to reduce endemic overtime working, reduce the length of the working day, make it easier to take time off for childbirth and child care, and take fam-

⁸ From the annual statistical compilations of the Ministry of Education, Culture, Sports, Science and Technology, *Gakko Kihon Chosa* (Basic Survey on Schools). http://www.mext.go.jp/b_menu/toukei/001/07073002/007/ssh26.xls, (accessed November 16, 2007).

ily circumstances and spouse's job into account when planning job transfers.

They need, also, to treat men and women equally, in respect to recruitment, job posting, training and personnel assessment. Hitherto these are matters in which the gender criterion has been regularly used. This is part of the firm culture; gender bias is built into the employee mentality and firms' personnel practices. Equal treatment for both sexes requires a reconstruction of that employee mentality, in particular of the mentality of management. It requires a revolutionary change to expose the gender bias in personnel policies and establish conventions of equality.

Such a revolution might become possible if there is powerful governance by investors. For the following reasons, First, investors, as compared with main banks, are pursuing profit in the short term. And they are constantly demanding that managers manage efficiently, in sharp contrast to main banks which in normal times rarely interfered. Pressed by investors to manage efficiently, managers should seek positively to exploit female labor with its potentially enhanced productivity.

Secondly, in order to promote an active role for women, there is a need for a considerable revolution in employment practices in Japanese firms and it is reasonable to suppose that such a revolution would be more easily accomplished in those firms where the composition of the stakeholders has been substantially changed from banks to institutional investors, including foreigners. Where governance systems have not changed, firms are more likely to be hidebound in existing practices, making reform difficult to accomplish.

Thirdly, foreign investors do frequently take up the question of expanding the role of women as part of their demands for the improvement of management practices. They see the fact that women managers and directors are so extremely rare in Japan as an indication of the general insiderist exclusiveness and inefficiency of Japanese firms, and this also means that increased power to the foreign investors serves to promote the role of women.

III. The Data

The data used for this research are drawn from the Research Report on Corporate Governance, Social Responsibility and Human Resources Strategies carried out by the Japan Institute for Labor Policy and Training. This was a questionnaire survey addressed to 2531 firms (quoted on both the first and second stock markets of Tokyo, Osaka and Nagoya) between the 6th and the 21st of October, 2005. Schedules were sent and received by post and the response rate was 17.8%.

The questionnaire was divided into three parts, the first dealing with the general managerial stance, corporate social responsibility, investor relations, etc., the second with personnel policies for regular workers, and the third, "About your firm," asking about numbers of employees, their length of tenure and general business performance. The first section was to be answered by a corporate planning manager, and the others by a human resources manager.

Table 1. Descriptive Statistics

Variable	Number of observations	Mean	Standard deviation	Minimum	Maximum
Proportion of women among regular employees	376	0.266	0.234	0	1
Proportion of women among managers	361	0.016	0.031	0	0.25
Number of positive action policies	334	2.695	2.718	0	10
Measures to promote the taking of annual paid holidays	429	1.655	1.339	0	7
Measures to improve the regulation of work hours	402	4.609	2.530	0	12
Stakeholders with hitherto an important influence					
Banks' voice stronger than investors'	425	0.369	0.483	0	1
Investors' voice stronger than banks'	425	0.355	0.479	0	1
Voice of both weak	425	0.275	0.447	0	1
Number of IR measures	433	3.624	2.212	0	9
Number of measures to reform shareholders general meeting procedures	450	2.351	1.493	0	7
Number of measures to reform board structures	441	1.397	1.037	0	1
Number of employees					
1-99	450	0.044	0.206	0	1
100-299	450	0.124	0.330	0	1
300-499	450	0.118	0.323	0	1
500-999	450	0.216	0.412	0	1
1000-1999	450	0.160	0.367	0	1
2000-4999	450	0.200	0.400	0	1
More than 5000	450	0.138	0.345	0	1
Industry					
Constsruction	450	0.089	0.285	0	1
Food products	450	0.049	0.216	0	1
Textiles	450	0.038	0.191	0	1
Chemicals	450	0.067	0.250	0	1
Pharmaceuticals	450	0.031	0.174	0	1
Glass and ceramics	450	0.027	0.161	0	1
Metal	450	0.058	0.234	0	1
Machinery	450	0.073	0.261	0	1
Electrical equipment	450	0.076	0.265	0	1
Transport equipment	450	0.051	0.220	0	1
Precision machinery	450	0.013	0.115	0	1
Other products	450	0.040	0.196	0	1
Electricity, gas	450	0.022	0.148	0	1
Transport	450	0.031	0.174	0	1
Information, communications	450	0.062	0.242	0	1
Retail trade	450	0.100	0.300	0	1
Wholesale trade	450	0.033	0.180	0	1
Finance	450	0.069	0.254	0	1
Services	450	0.071	0.257	0	1
Has union	442	0.722	0.449	0	1

These data were integrated with data from NEEDS. In this paper we have not used any business indicators, but the industrial sector divisions are taken from NEEDS.

Table 1 shows descriptive statistics. For the detailed questions and cross-tabulations, please see JILPT (2007).

IV. Experimental Models

The purpose of the analysis was to test the hypothesis that “the greater the say investors had in the management of the firm, the more active would be the role of women” and the hypothesis that “the greater the say investors had in the management of the firm, the more earnestly the firm would pursue WLB policies.” Such policies are a prerequisite for women to play an active role.

The dependent variables were three proxies for feminine activity, and the two variables for WLB promotion. The independent variables were the four which were used as proxies for “investor say,” the power of investors to influence managers. We explain below how those variables were constructed.

1. Proxies for Feminine Activity

We used three dummy variables to indicate feminine activity:

- ❖ The proportion of women among regular employees
- ❖ The proportion of women in the ranks of management
- ❖ The number of positive action policies.

Table 1 shows that while the mean proportion of women among employees is 26.6%, among managerial staff (section chief and above) it is a mere 1.6%.

Strictly speaking, the questions about positive action policies were not concerned with actual levels of feminine activity, but rather with whether or not the company is creating the conditions which would enable women to play a greater role in the future. “Number of positive action policies” was measured by the number of “yes” answers to the following questions.

Does your company carry out positive action policies? Would you please check the relevant item for each of the following (a) to (f).

- (a) Establishing a section or appointment of a particular manager specifically responsible for positive action programs (promotion infrastructure)*
- (b) Carrying out surveys and analysis of problems arising*
- (c) Making plans to utilize women's abilities*
- (d) Seeking actively to recruit and promote women*
- (e) Education and training designed to make it possible to employ women in sections where they are in a tiny minority*
- (f) Providing a consultation and advice service specifically for women*

- (g) *Adoption of regulations to curb sexual harassment*
- (h) *Establishing programs to make it easier to combine work and family life (over and above legal requirements).*
- (i) *Propaganda work among men*
- (j) *Improving the work environment and atmosphere*

The average number of policies ticked was 2.7. For firms which ticked any of them the average was 3.8. The most commonly chosen policy was rules to prevent sexual harassment, followed by positive attempts to recruit and promote women.

2. Variables Relating to Policies for Improving the Work-Life Balance

We measured the approach to WLB with the following two variables:

- ❖ The number of policies directed at persuading employees to take their paid holidays
- ❖ The number of policies designed to regulate working hours.

For the former we used the following question.

Does your firm pursue any of the following policies designed to promote the actual taking of paid holidays? Please tick those which you are following.

1. *Encouraging taking the holiday in a single continuous span of days*
2. *Instituting the practice of shutting the firm down for a period*
3. *Planning the incidence of individual holidays*
4. *Forward planning of the work load and ways of getting through it*
5. *Reviewing the designation of key essential personnel and making sure that they have substitutes*
6. *Insisting that the taking of holidays is never reflected in performance assessments*
7. *Making the handling of their subordinates' holiday arrangements an element in the performance assessment of managers.*
8. *No particular measures*

As Table 1 shows, the average score was 1.7, the most frequent choice being “encouraging the taking of continuous holidays” followed by “forward planning of the work load and ways of getting through it.”

The question for “better regulation of working hours” was as follows.

Has your company adopted policies to improve the regulation of working hours? Please tick the policies which you have adopted.

1. *Introduction of the check system (using time card, IC card, record of computer booting, etc.)*
2. *Making overtime dependent on prior instruction from superior*

3. *Setting days for leaving work at a fixed time (No overtime days, etc.)*
4. *Regular workshop/office patrols to check on overtime*
5. *Increasing the numbers on flextime or discretionary work hours*
6. *Encouraging the taking of alternative holidays*
7. *Establishing an advice center in the firm*
8. *Special health checks for workers doing a particularly large amount of overtime*
9. *Educational and diffusion work regarding appropriate work hours*
10. *Surveys of the actual state of overtime working*
11. *Establishing a special committee or working party to regulate work hours*
12. *Making a formal agreement on working hour control within the Management-Labor Committee framework*

As Table 1 shows, firms' average implementation score was 4.6. The most frequent choice was "educational and diffusion work regarding appropriate work hours," followed by "making overtime dependent on prior instruction from superior" and "surveys of the actual state of overtime working."

3. Variables Designed to Measure Strength of Investor Role in Corporate Governance

The relative power of stakeholders has a great influence on corporate governance. In the case of the typical Japanese firm, banks were strong and investors were weak. Banks interfered in management very little as long as things went well. The main bank would intervene to rebuild management structures when the firm suffered a crisis. By contrast, investors, since they place considerable importance on short-term profits, constantly demand the improvement of managerial efficiency. Hence, the relative power of banks and investors greatly influences the character of management. We used three dummy variables to indicate this:

- ❖ Banks' voice more powerful than that of investors
- ❖ Investors' voice more powerful than that of banks
- ❖ Voice of both investor and bank weak

We determined the assignment of those variables in the light of answers to the following question.

About your firm's stakeholders:

1. *Omitted.*
2. *Would you please choose, from among the following eight alternatives, the three whose influence on your management has in the past been greatest and is likely in future to be greatest, and number them 1 to 3 according to the strength of that influence.*
 1. *Customers (consumers)*
 2. *Employees*
 3. *Suppliers*
 4. *Local community*
 5. *The bank(s) you deal with*
 6. *The firm(s) you deal with*
 7. *Other firms in the industry*
 8. *Other*

- | | |
|----------------------------|----------------------------|
| 3. Individual investors | 7. Group firms |
| 4. Institutional investors | 8. Others (please specify) |

For the first dummy variable, firms scored 1 if they put “the bank(s) we deal with” ahead of individual or institutional investors. For the second, if they put either individual or institutional shareholders ahead of the bank, and for the third, if they included none of the three (banks, individual or institutional investors) in their first three.⁹

Where investors’ influence is great we would expect their pressure for management efficiency to reduce the degree of irrational female discrimination. Hence one would expect the “investors’ voice stronger than banks” dummy to correlate positively with an enhanced role for women and WLB policies.

Next, in order to measure the extent to which management gave weight to investors’ interests we used the following proxy measures:

- ❖ The number of investor relations (IR) measures
- ❖ The number of measures to reform shareholders general meeting procedures
- ❖ The number of measures to reform board structures

The question we used to make up the IR measure was:

What investor-relations programs does your firm currently carry out? Please tick those which apply.

- (a) *Making information pamphlets such as Annual Securities Reports available at all the firm’s facilities.*
- (b) *Putting your annual report up on your home page as investor information*
- (c) *Holding regular meetings with analysts within Japan*
- (d) *Holding regular meetings with analysts overseas*
- (e) *Hiring investor-relations consultants*
- (f) *Establishing an investor-relations section within the firm with a team specialized in providing information to analysts and investors*
- (g) *Creating an information disclosure document in English*
- (h) *Holding discussion meetings for investors apart from the shareholders general meeting*
- (i) *Giving shareholders special privileges*

As Table 1 shows, the average number of items ticked was 3.6. The most frequently chosen items were meetings with analysts within Japan, the establishment of an IR section, and making the Annual Securities Reports available.

For reform of the shareholders general meeting, the question was as follows:

⁹ In including individual as well as institutional investors in the “investors’ voice stronger than banks” dummy we had in mind, not minor or floating shareholders, but individual shareholders whose opinion firms’ take account of, and they also are likely to press managers to be more efficient.

We would like to ask about how you handle your annual general meetings of shareholders. Would you please tick the items which describe your practice.

- (a) We try to avoid the favorite days when all other firms have their meetings*
- (b) We schedule meetings for Saturdays and Sundays*
- (c) We give early notice of the date of the shareholders general meeting*
- (d) We disclose the names of those proposed for directorships before the meeting*
- (e) We provide simultaneous translation into English at the shareholders general meeting*
- (f) We don't try to get the meeting over quickly; we encourage lively discussion*
- (g) We send out notice of the meeting by electronic mail*
- (h) We allow voting on shareholders general meeting resolutions by electronic mail*

As Table 1 shows, the average number of items ticked was 2.4. The most frequently chosen items were: advance disclosure of candidate directors, followed by encouraging lively discussion.

Next, the questions for obtaining the number of measures to reform board structures were as follows.

Has your firm carried out any of the following measures to reform the board of directors? Please tick the items which apply.

- (a) Transfer to the legal category of "Company with Committees"*
- (b) Introduction of the Executive Officer system*
- (c) Appointment of external directors*
- (d) Introduction of a stock option system*
- (e) Made disclosure of individual directors' emoluments*

As Table 1 shows, the average number of ticked items was 1.4 with the adoption of the executive officer system and appointment of external directors being the items most frequently chosen.

V. Estimation Results

1. Influence of Investors and Management Reform

First we wanted to test whether the three objective measures of investor influence which we had chosen—number of IR measures, number of measures to reform shareholders general meeting procedures and number of measures to reform board structures—were appropriate as measures of investor influence. Accordingly we used the OLS method to see how, as dependent variables, these were predicted by the dummies for “investors’ voice stronger than banks’,” “voice of both weak,” employee numbers, union presence and industrial sector.

Table 2. Strength of Investor Influence and Management Reform

Independent variables	Number of IR measures (1)	Number of measures to reform shareholders general meeting procedures (2)	Number of measures to reform board structures (3)
Investors' voice stronger than banks'	1.150*** (0.236)	0.714*** (0.168)	0.269** (0.127)
Voice of both weak	0.481* (0.248)	0.537*** (0.177)	0.299** (0.133)
R ²	0.341	0.230	0.121
Number of observations	405	419	413

Notes: 1. All models use as independent variables, in addition to the one specified, dummies for the number of employees, the presence or absence of a union, and industry.

2. The figure in brackets is the standard error.

3. The level of significance is shown as *=10%, **=5% and ***=1%.

If these three objective indicators are valid, there should be a positive correlation with “investors’ voice stronger than banks’.” The results are shown in Table 2.

Table 2 shows that firms in which the investors’ voice is stronger than banks’ score 1.15 points more on number of IR measures, 0.71 points more on number of measures to reform shareholders general meeting procedures and 0.27 points more on number of measures to reform board structures than the firms where the banks’ voice is stronger than investors’. And even those firms which say that the voice of both investor and bank is weak have higher scores on numbers of those measures of reforms than those in which the banks’ voice is stronger than investors’. One may hypothesize that this is because they are anticipating the day when they will be seeking to mobilize capital from the market.

These results suggest that it is indeed appropriate to use the numbers of policies for promoting investor relations, reforms of shareholders general meeting and board reforms as proxy measures for the influence of investors.

2. Investor Governance and an Active Role for Women

Table 3 examines the relation between investor governance and the role of women. Unexpectedly when we estimate the relation between the strength of investor governance and the proportion of women in the regular labor force (models [1] to [4]) we find not a single significant coefficient. However, with the exception of model (1) the signs are all in the expected direction.

Let us look next at the relation of the strength of investor governance to the proportion of women in management (models [5] to [8]). Here all the coefficients not only have the expected sign, but are also significant at the five percent level; there is a higher proportion of female managers the stronger the influence of investors.

The same applies to positive action policies (models [9] to [12]), though the relation

Table 3. Strength of Investor Governance and Extent of Feminine Activity (OLS)

Model number	Independent variable (X)	X coefficient	Standard error	R ²	Number of observations
Dependent variable: Proportion of women among regular employees					
(1)	Investors' voice stronger than banks'	-0.027	0.029	0.222	357
(2)	Number of IR measures	0.008	0.006	0.236	361
(3)	Number of measures to reform shareholders general meeting procedures	0.006	0.008	0.214	372
(4)	Number of measures to reform board structures	0.003	0.012	0.209	366
Dependent variable: Proportion of women among managers					
(5)	Investors' voice stronger than banks'	0.014	0.004 ***	0.301	341
(6)	Number of IR measures	0.002	0.001 ***	0.296	347
(7)	Number of measures to reform shareholders general meeting procedures	0.002	0.001 **	0.275	358
(8)	Number of measures to reform board structures	0.005	0.001 ***	0.288	352
Dependent variable: Number of positive action policies					
(9)	Investors' voice stronger than banks'	0.701	0.367 *	0.219	311
(10)	Number of IR measures	0.303	0.074 ***	0.265	320
(11)	Number of measures to reform shareholders general meeting procedures	0.507	0.101 ***	0.265	329
(12)	Number of measures to reform board structures	0.316	0.135 ***	0.211	325

Notes: 1. In all models, in addition to the independent variable tested (X), dummy independent variables were used for number of employees, industry and presence or absence of unions. In models (1), (5) and (9), the "voice of both weak" dummy was also added as the independent variable.
2. The level of significance is shown as *=10%, **=5%, ***=1%.

to the "investors' voice stronger than banks'" dummy fails to reach the five percent significance level.

It is clear from the above that the results are rather different depending on whether one uses the proportion of women in the total regular labor force or the proportion of women in management or the number of positive action policies as the index of an active role for women. Strong investor governance does not make for a high proportion of women in the labor force, but it does bring the enthusiastic promotion of positive action and the promotion of women to the ranks of management.

This result can be interpreted as follows. There are multiple ways in which female labor can be utilized. Becker (1957) envisaged the situation in which firms take advantage of lower female wage rates to hire a larger proportion of women and thereby increase profits. But a different way of utilizing female labor power is to invest in their human capital, place them in important posts, and promote them in the same way as men, in other words to treat them as part of the firm's core labor force. It seems that in firms with strong investor influence, women are not employed chiefly as cheap labor, but are treated as part of the core labor force.

Table 4. Strength of Investor Governance and WLB Policies (OLS)

Independent variable (X)	X coefficient	Standard error	R ²	Number of observations
Dependent variable: Number of measures to encourage taking annual paid holidays				
(1) Investor voice stronger than banks'	0.274	0.154 *	0.214	404
(2) Number of IR measures	0.023	0.032	0.247	409
(3) Number of measures to reform shareholders general meeting procedures	0.180	0.044 ***	0.258	424
(4) Number of measures to reform board structures	0.061	0.061	0.232	417
Dependent variable: Number of measures to regulate work hours				
(5) Investor voice stronger than banks'	0.066	0.292	0.262	378
(6) Number of IR measures	0.200	0.059 ***	0.329	384
(7) Number of measures to reform shareholders general meeting procedures	0.382	0.082 ***	0.325	397
(8) Number of measures to reform board structures	0.394	0.112 ***	0.301	393

Notes: 1. In all models, in addition to the independent variable tested (X), dummy independent variables were used for number of employees, industry and presence or absence of unions. In models (1) and (5), the "voice of both weak" dummy was also added as the independent variable.

2. The level of significance is shown as *=10%, **=5%, ***=1%.

3. Investor Governance and the Work-Life Balance

Finally, we looked at the relationship between investor-dominated corporate governance and the number of WLB measures. If investor governance promotes an active role for women, in firms where investors have great influence there should be more WLB policies designed to make it easier for women to play an active role.

Table 4 shows results generally in line with the hypothesis. The measures of the relation to the strength of investor governance all show a positive coefficient. However, the only coefficient which reaches the one percent level of significance is that between the number of measures to promote the taking of annual paid holidays as the dependent variable with reform of shareholders general meeting procedures as the independent. If measures to regulate work hours be taken as the dependent variable, all the coefficients are positive at the one percent level with the exception of the "investors' voice stronger than banks" dummy.

VI. Conclusion

This study has used the Research Report on Corporate Governance, Social Responsibility and Human Resources Strategies (Japan Institute for Labor Policy and Training 2005) to test the hypothesis that the disciplining of management by investors serves to promote an active role for women in the enterprise. The variables used to measure "active role" for women are three: the proportion of women among regular employees, the proportion of managers who are women and the number of positive action policies. As measures of investor governance we had both subjective measures of managers' perceptions and objective

measures. The subjective measure was a dummy variable counted as 1 if managers said that investors' word carried more weight than that of their banks. And as objective measures we constructed three variables from the number of investor relations measures, the number of measures to reform shareholders general meeting procedures, and the number of measures to reform board structures.

The results of our estimation showed that the proportion of women in management and the number of positive action policies had a significantly positive relation with investor governance. This indicates that where investor influence is strong, positive action policies are adopted and female managers are common, thus confirming the hypothesis.

Finally, in order to confirm the truth of the hypothesis from another angle we analyzed the relation between investor governance and policies to promote work-life balance, assuming that if investor influence were strong, WLB policies would be promoted in order to give a more active role for women. The estimation produced the expected results. Where investor influence is strong there are more efforts to ensure that annual paid holidays are taken and that work hours are made more appropriate.

Thus it is clear that the disciplining of management by investors creates a work environment in which it is easier for women to play an active role and breeds a larger number of female executives.

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Changes in the Transition from High School to Work: Focus on High School Career Guidance

Yukie Hori

The Japan Institute for Labour Policy and Training

This paper discusses the situation and issues concerning the distinctively Japanese school graduates employment system that has underpinned the stable transition of high school graduates from education to work in Japanese society using data from an interview survey conducted by the Japan Institute for Labour Policy and Training (JILPT) in 2007 and the Japan Education Longitudinal Study (JELS), and focuses in particular on vocational counseling for high school graduates.

It was found that although the ongoing relations between high schools and enterprises that are the linchpin of the Japanese school graduates employment system are less continuous than they were in the 1980s, the change according to the present survey is not as great as that observed during the early 1990s. The system changed structurally in the early 1990s, since when it may be regarded as being maintained as it is. It was also found that the scale of the change in the system tends to vary according to region. While policies suited to each region are required, the JELS data indicate that social class has a particularly major impact on female high school graduates in the provinces, placing them in a socially disadvantageous position. What is needed is the social development of means of facilitating the movement of young people in the provinces from school into work to ensure social equity in order to ensure that opportunities in life do not depend on social attributes.

I. Purpose of Study and Outline of Data Sources

1. Purpose of Study

The purpose of this paper is to examine present developments in the distinctively Japanese high school graduates employment system that has underpinned the stable movement of high school graduates into employment in Japanese society, focusing in particular on high school career guidance.

The transition from school to work of young people who do not enter higher education became a serious social problem in developed countries from the late 1970s, when there began to occur a shift in industrial structure from secondary industry centered on manufacturing to tertiary industry. Only in Japan and Germany, which had mechanisms enabling young people who leave education at an early stage to move from school to work, was the problem of youth unemployment long avoided.¹

In Japan, this role was played by good rule-based relations between public employment

¹ At the “Transition Support Policy for Young People with Low Educational Background—2007 JILPT International Workshop” held by JILPT in 2007, the difficulty encountered by young people who do not proceed to higher education in making the transition to work was discussed as a challenge faced by all developed countries.

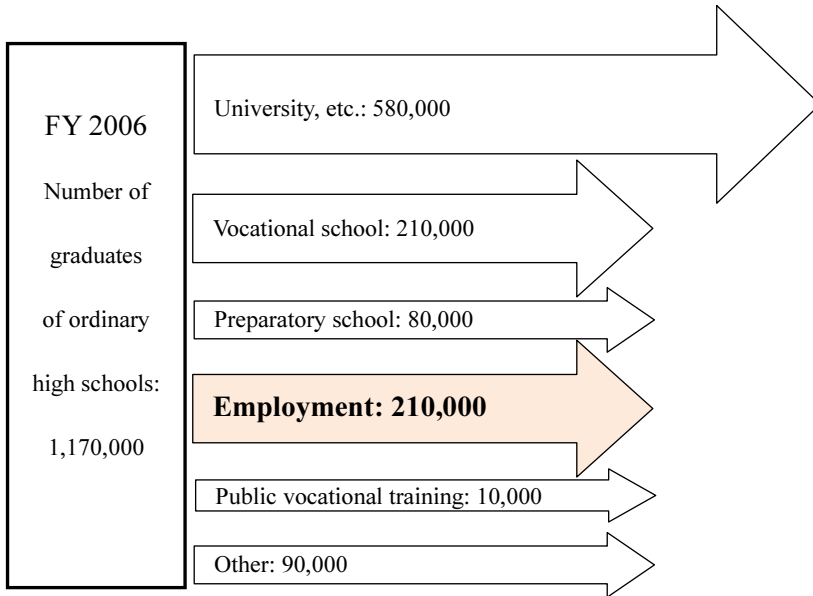


Figure 1. Post-School Paths of Ordinary High School Graduates (Graduating March 2007)

Source: Compiled from Ministry of Education, Culture, Sports, Science and Technology of Japan (MEXT), *Gakko Kihon Chosa* (Basic Survey on Schools).

Note: Percentage of students enrolling in ordinary high school: approx. 97%.

security offices, high schools, and companies. Despite considerable regional variation, these relations are known to be characterized by the development of the high school graduate labor market by the labor authorities and relations between high schools and companies, and a particularly important role is considered to have been played in Japan in facilitating the movement of high school graduates from school to work by ongoing “proven” relations between high schools and companies (Kariya 1991). In this paper, we define the system by which students decide on their jobs in an environment of ongoing, stable relations between schools and companies based on the practices of “referral by designated schools” and “one application per student” as comprising the Japanese high school graduates employment system.

From the mid-1990s, however, the career paths of high school students underwent a major transformation. The proportion of high school graduates entering employment fell from 40% to just 20%, and the proportion enrolling in universities rose sharply. The high school graduate labor market was also hit by the recession, causing major changes in both the quantity and quality of job openings for high school graduates, and the result was that out-of-work school graduates who neither enrolled in higher education nor entered employment after high school became a social problem. It was at this time that there began to emerge a strong recognition that the formerly healthy Japanese high school graduates em

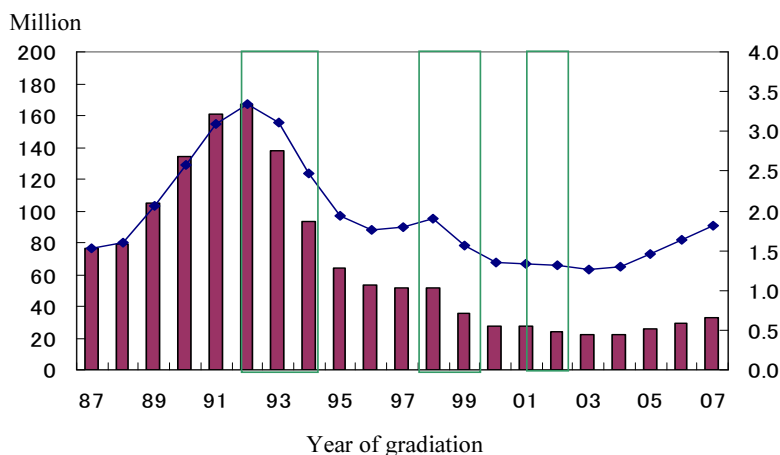


Figure 2. Number of Job Openings for Prospective New High School Graduates and Ratio of Job Openings to Applicants

Source: Annual editions of Ministry of Health, Labour and Welfare of Japan (MHLW), Employment Security Bureau, *Shinki Gakusotsusha (Koko/Chu-gaku) no Shokugyo Shokai Jokyo* [Employment referrals for new junior and senior high school graduates].

Note: Final estimates for June following graduation. As recruiting activity occurs before graduation, there is an approximately six-month lag before the effects of the economic downturn become apparent.

ployment system was ceasing to function properly.

Figure 2 depicts the number of job openings and the ratio of job openings to job applicants for prospective new high school graduates. From this it can be seen that, despite recent indications of an economic downturn, job openings for high school graduates are recovering following a period of recession in the late 1990s. However, the true picture of employment of high school graduates in knowledge society where over 70% of high school graduates is unclear, and it may safely be said that the general economic recovery has not necessarily led to an improvement in employment conditions in all regions.

Using data from past and present interview surveys, this paper therefore examines the present state of the Japanese high school graduates employment system focusing on an analysis of regional variables, and it concludes with a tentative analysis of young people's employment choices in the provinces.

As variables of regional employment conditions, we use types of high school graduate labor market. Labor markets are classified into three types based on labor force mobility, the state of supply and demand, and the category of job openings for high school graduates (Table 1). In this paper, we perform our analysis using these three types as variables.

This paper is composed as follows. In the following section, I confirm the data, and in section II I review the shrinkage of the high school labor market and the mechanisms by which high school graduates find employment. In section III, I review the literature and

Table 1. Types of High School Graduate Labor Market

Type	Labor mobility	State of supply and demand	Category of job openings	Regions covered
Type 1	Inflow	Good/intermediate	Services/ distribution	Tokyo, Saitama, Osaka
Type 2	Balance	Good/intermediate	Manufacturing	Nagano, Niigata
Type 3-i	Outflow/balance	Shortage	Services/ distribution	Aomori, Kochi, Hokkaido
Type 3-ii	Outflow	Good/intermediate	Manufacturing	Shimane, Oita, Akita

analyze school-employer relations. In section IV, I present four types of high school career guidance, and in section V I present an overview of the employment choices of young people in the provinces. In the closing section, I expand on the implications of the findings.

2. Outline of Data Sources

The data sources used were “Kosotsu shushoku shien chosa” [Survey of employment support for high school graduates] conducted by the Japan Institute for Labour Policy and Training (referred to below as the JILPT Survey) and a survey of third-year high school students in AREA-Y of the Japan Education Longitudinal Study (JELS) conducted in autumn 2004 by Ochanomizu University COE.

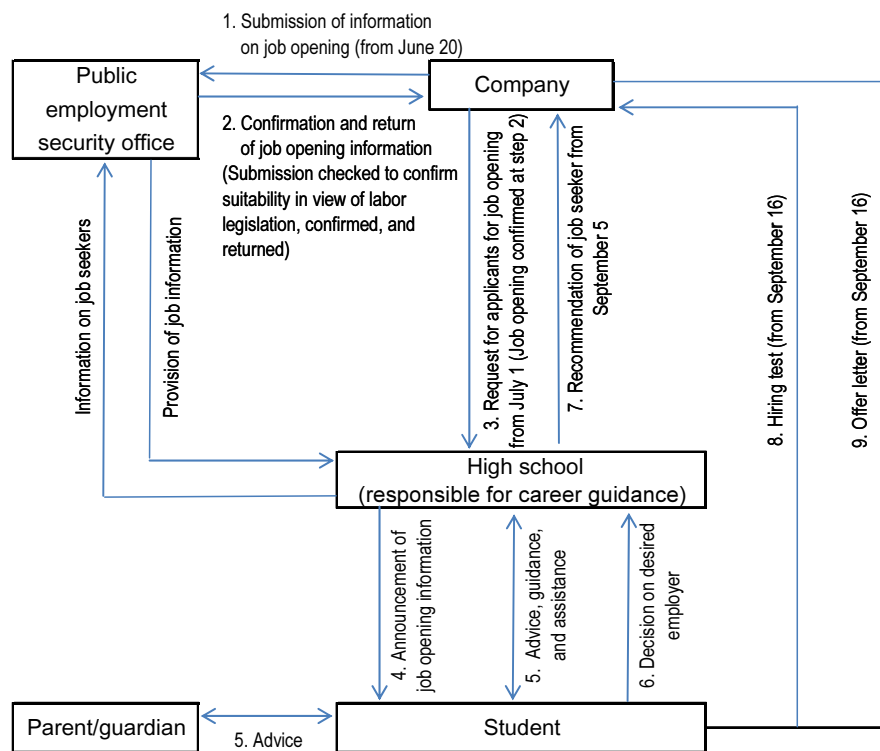
The former is a survey of 11 public employment security offices, 24 high schools, and 23 companies. The geographical scope of the survey is shown in Table 1. Some high schools surveyed in 1997 were included, and eight schools were used for a longitudinal comparison based on Table 3.

High schools were selected with the assistance of the public employment security offices in each region. As a rule, the high schools with most students who found employment in each office’s area were chosen, as a consequence of which the vocational schools selected tended to consist of the more prestigious schools in the region. The JELS survey covered 947 persons, and the survey method and sample are described below.

II. Shrinkage of High School Graduate Labor Market and Mechanisms of Employment of High School Graduates

Before proceeding to the analysis, I first describe the present state of the high school graduate labor market in Japan as a whole and the mechanisms of employment of high school graduates.

From the late 1990s, the 18-year-old population decreased and three changes in the career choices of high school students were observed (Hori 2007). Firstly, there was a rise in the proportion of students enrolling in higher education. Due to the change in direction in



Dates of commencement of recruitment screening, etc.

1. Commencement of acceptance of requests for applicants for job openings by public employment security offices (June 20)

3. Commencement of requests for applicants for job openings and visits to schools (July 1)

7. Commencement of submission of student application documents to companies (September 5)

8 & 9. Commencement of screening and offers (September 16)

Figure 3. Framework for Employment of New High School Graduates through High Schools

Source: Reproduced from the final report of *Kosotsusha no Shokugyo Seikatsu no Iko ni kansuru Kenkyu* [Research on transition of high school students to working life] (MEXT/MHLW 2002).

higher education policy and the decline in the size of the 18-year-old population, there occurred an increase in the proportion of students entering university. Secondly, there was a rise in the proportion of high school graduates who neither enrolled in higher education nor found employment. This proportion rose until 2002, and then began to decline from 2003. Thirdly, the proportion of job finders declined. The number exceeded 600,000 in the 1980s and fell sharply in the 1990s, but since around 2003 has remained at around 210,000. The number of job openings for high school graduates similarly declined rapidly following the collapse of the economic bubble, though it has followed a recovery trend since 2003. While demand at large manufacturers is presently temporarily high, the scale of employers of high school graduates is declining overall, and openings are mainly for factory manual workers.

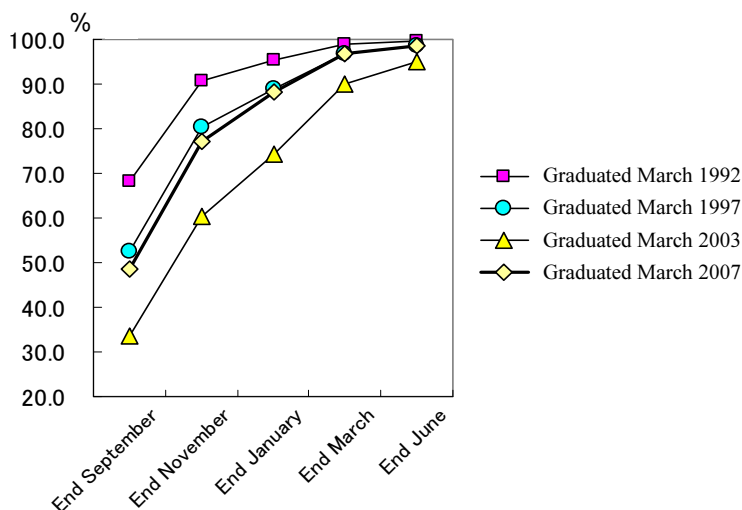


Figure 4. Change in Timing of Offers

Source: The Japan Institute for Labour Policy and Training (2008).

(Further data on this are omitted due to constraints of space).

As Figure 3 shows, moreover, the employment of high school graduates is prescribed by institutional arrangements.

Firstly, companies are unable to have direct contact with high school students, who instead seek employment through public employment security offices or high schools. Secondly, the timing of disclosure of job openings is governed by recruitment agreements. Job openings are disclosed to high schools on July 1 and selections made by September 16. In the 1980s, over 600,000 high school students decided which companies they wanted to apply to and over half decided on their jobs during this short period. Thirdly, students can only apply to one company at a time, a practice that is regarded as being intended to enable as many students as possible to be interviewed by their first-choice employer.

Out of this institutional environment there developed the practice among companies of designating particular high schools to recommend students for job openings. There thus formed ongoing transactional relations between specified schools and companies.

In order to maintain their status as designated schools under this system, high schools seek to recommend the students that companies want. Before sending students to companies, therefore, they screen them internally based on their grades. If there are more students than job openings, the number is whittled down by internal screening, and no recommendation is made if students' ability is not up to the level required by a company. In order to continue to be supplied by high schools with good students, companies hire the students recommended to them by high schools without performing further screening themselves.

Now, however, more job information is shared via a system run by public employment security offices that provides online access in high schools to a database of informa

Table 2. Timing of Receipt of Information on Job Openings and Number Received (by Prefecture)

	March 2007 graduates			March 2003 graduates			2003-2007
	Number of job openings at end March	Number received end July or later	Proportion of late job openings	Number of job openings at end March	Number received end July or later	Proportion of late job openings	Change in proportion of late job openings
Osaka	23,580	3,945	16.7%	14,173	4,214	29.7%	-13.0%
Tokyo	44,861	10,897	24.3%	29,632	11,963	40.4%	-16.1%
Saitama	12,227	2,591	21.2%	7,041	2,238	31.8%	-10.6%
Niigata	6,932	2,221	32.0%	4,298	2,636	61.3%	-29.3%
Nagano	4,553	1,126	24.7%	3,761	1,741	46.3%	-21.6%
Hokkaido	10,054	6,901	68.6%	10,477	7,872	75.1%	-6.5%
Kochi	761	392	51.5%	637	391	61.4%	-9.9%
Oita	4,804	1,293	26.9%	2,805	1,606	57.3%	-30.3%
Aomori	2,460	1,614	65.6%	2,365	1,817	76.8%	-11.2%
Akita	2,532	1,375	54.3%	2,521	1,703	67.6%	-13.2%
Shimane	1,507	604	40.1%	1,234	680	55.1%	-15.0%

Source: The Japan Institute for Labour Policy and Training (2008).

tion on job openings for high school graduates received by these offices. The date from which job openings can be advertised also varies according to region and, although it has become institutionally possible for students to make multiple applications, the “one application per student” approach still predominates.

One further change is the increasing variation in the timing of offers. At the beginning of the 1990s, 70% of students decided their jobs at the end of September (when the results of applications to companies made soon after openings could be advertised and presumably the companies whose hiring tests were taken first). By 2003, by contrast, this proportion had fallen to 33%. Despite returning to 48% in 2007, it is no longer the case that everyone finds jobs at the same time.

The change in the timing of offers is dictated by companies’ recruitment activities, and an examination of the timing of receipts of information on job openings shows that the proportion of job openings appearing in July differs considerably according to prefecture. According to JILPT (2008), while there are large proportions of early job openings in areas of high demand such as Tokyo and Osaka, the proportion of “late job openings” appearing latter than July exceeded one half in Aomori (65.6%) and Hokkaido (68.6%) (both sets of figures are for March 2007). In regions where employment conditions are poor, it is not unusual for job openings to appear toward the end of the year or later. When economic conditions worsen, job openings appear later. The difference in timing of recruitment activity is due to the fact that while large companies in areas of high demand can engage in periodic hiring, most companies in the provinces are small businesses that rely mainly on recruiting workers as and when needed.

From the above, it may be concluded that the tendency for jobs to be found during the same short period of time is weakening, as up to the first half of the 1990s, and that the timing has grown especially more diverse in regions where demand is weak.

III. Review of Literature and Current State of School-Employer Relations

Career guidance for high school graduates has to date been regarded as centering on “*jisseki-kankei* (proven relations)” in the sense of ongoing trust-based transactional relations between high schools and companies. These proven relations are “networks that help to stabilize employment, recruiting, and job placement through the exchange of highly definite information based on trust in the context of an ongoing transactional relationship, and are associated with the norm of one party’s actions being controlled by others against the backdrop of the continuity of relations” (Kariya 1991). “Proven relations” in the form of ongoing relations founded on trust between high schools and companies are an effective means of enabling the smooth transition of high school students from school into jobs, and are considered to have operated in unison with the spread of meritocracy through internal screening by schools based on grades.

The Japan Institute of Labor (JIL) (1998) astutely observes, however, that the identification of such “proven relations” depends solely on the perceptions of high school teachers, and their existence has not been properly demonstrated from objective data. There thus arises a need to investigate relations between schools and companies based on actual data on job finders, and analysis has demonstrated that such relations are not as strong as had previously been assumed. Terada (2004) did an analysis of several vocational high schools in Aichi Prefecture, where school-employer relations are considered strong, and he found that the number of companies with which schools had proven relations was extremely small, accounting for only around 30% of the number of school graduates who found employment. He concludes that proven relations “could not be described as a decisive mechanism of employment of high school graduates in Japan.”

So are school-employer relations, which weakened in the 1990s, weakening further? This analysis employs the same methodology used by JIL (1998); that is to say, school-employer relations are measured based on actual data on jobs found, rather than teachers’ impressions of proven relations. As data for the same observation period as last time could not be obtained, however, comparisons should be treated with caution.

Companies that recruited only once during the observation period were defined as “single hirers,” a lower proportion of which (calculated by dividing the number of such companies by the number of companies at which jobs were found) was interpreted as indicating a greater continuity in the school-employer relationship. “*jisseki kigyo* (Proven hirers)” were defined as companies that hired continuously for five or more years. “*keizoku kigyo* (Ongoing hirers)” were defined as companies that hired for at least half of the years during the observation period.

Table 3. Proportion of Single Hirers

	% of single hirers in 1997 survey		% of single hirers in 2007 survey	1997 observation period	2007 observation period
<i>Tokyo</i>					
High school A	78.8	↑	98.5	11 years (1986-1996)	11 years (1996-2006)
<i>Saitama</i>					
High school D	70.4	↑	83.6	10 years (1987-1996)	10 years (1997-2006)
Vocational high school E	77.3	↓	76.8	5 years (1992-1996)	5 years (2002-2006)
Vocational high school F	43.2	↑	66.2	15 years (1981-1996)	11 years (1996-2006)
<i>Nagano</i>					
High school K	84.9	↑	93.7	10 years (1986-1996; 1990×)	8 years (1996-2006; 2001-2003×)
High school L	63.5	↑	73.2	12 years (1985-1996)	11 years (1996-2006)
Vocational high school N	49.1	↑	65.1	11 years (1985-1995)	11 years (1996-2006)
<i>Shimane</i>					
Vocational high school R	55.9	↑	66.2	8 years (1989-1996)	8 years (1999-2006)

Note: × denotes years for which no data were obtainable.

The results are summarized in Table 3. Although the proportion of single hirers tends to be slightly higher than on the last occasion, the change is not as great as that observed in the 1997 survey, and the scale of the change varies, moreover, according to high school. The large structural change in relations between high schools and companies occurred in the early 1990s, and there appears to have been no substantial change since then to the present.

From the above, it is evident that while school-employer relations have weakened slightly overall, ongoing relations are being maintained by some. Avoiding simple generalizations, therefore, the next task is to identify patterns.

IV. Four Types of High School Career Guidance

The analysis up to the preceding section employed as a data source information from high schools. In this section, we consider regional differences in high school career guidance using data from interviews with teachers responsible for providing such guidance. High school career guidance varies depending on the number of job finders and employment conditions, and patterns in this variation can be identified tracing along the two axes of employment conditions and number of job finders (Figure 5).

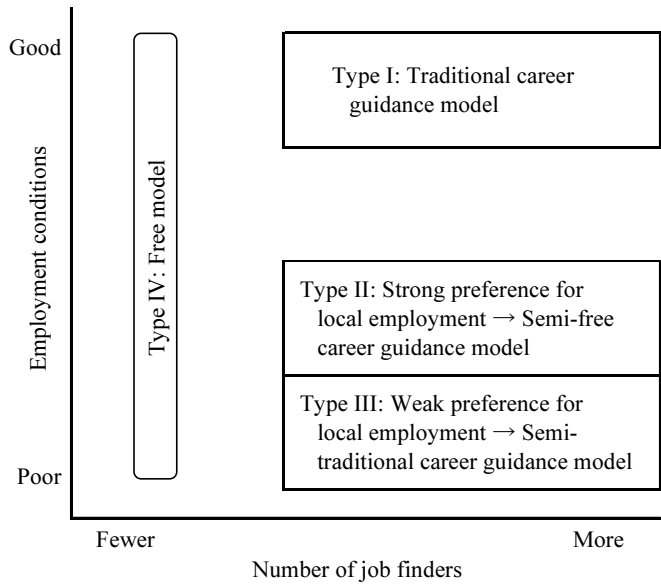


Figure 5. Four Types of High School Career Guidance

Type I is the so-called Japanese high school graduates employment system centered on stable, trusting relations between schools and companies, and this can still be found at vocational schools in regions where the job market is still buoyant (Tokyo, Saitama, and Nagano).

Type II is the model of career guidance observed at schools with comparatively large numbers of job finders that are located in regions where employment conditions are poor and there is a quite strong preference for working locally. Although in prefectures such as Hokkaido and Akita, for example, teachers described not screening internally for job openings in the prefecture due to the small number involved, the likelihood of traditional career guidance being maintained falls as the desire of students to remain in regions where employment conditions are poor increases, resulting in a “freer” career guidance model in comparison with traditional career guidance prescribed by practices to date.

Type III is the model of career guidance observed at schools where job finders are comparatively numerous in regions where employment conditions are poor and the preference for local employment is relatively weak (as in prefectures such as Shimane and Kochi). As the local orientation is not that strong, students at such high schools can be sent out to regions where employment conditions are better, making it easier to maintain traditional career guidance.

Type IV is found principally at general schools with extremely few job finders. It may be classed as a “free career guidance model” in the sense that hardly any features of traditional career guidance are apparent regardless of whether employment conditions are good or bad.

Table 4. Grades and Career Plans: Area-X

Grade	Em- ploy- ment	Voca- tional school	Junior college	Univer- sity	Freeter	Don't know	Others	No answer	N
Male									
Good	15.4	8.1	2.1	72.6	0.4	0.0	0.9	0.4	234
Middle	22.1	18.2	2.6	53.9	0.0	0.6	0.6	1.9	154
Not good	22.9	14.3	1.2	53.9	1.6	1.2	3.7	1.2	245
Total	19.9	13.0	1.9	60.8	0.8	0.6	1.9	1.1	633
Female									
Good	10.4	18.0	14.7	55.4	0.0		1.1	0.4	278
Middle	14.0	27.0	16.3	38.8	2.2		0.6	1.1	178
Not good	23.0	30.9	8.6	29.7	3.1		2.0	2.7	256
Total	15.9	24.9	12.9	42.0	1.7		1.3	1.4	712

Table 5. Grades and Career Plans: Area-Y

Grade	Em- ploy- ment	Voca- tional school	Junior college	Univer- sity	Freeter	Don't know	Others	No answer	N
Male									
Good	26.5	6.2	1.9	63.6	0.0	0.0	1.2	0.6	162
Middle	36.1	9.3	1.9	48.1	0.9	0.0	1.9	1.9	108
Not good	40.9	13.6	2.8	36.4	0.6	1.1	2.3	2.3	176
Total	34.5	9.9	2.2	49.1	0.4	0.4	1.8	1.6	446
Female									
Good	27.6	11.8	11.8	48.8		0.0	0.0		170
Middle	23.8	23.8	8.5	42.3		0.0	1.5		130
Not good	30.3	21.1	7.4	39.4		0.6	1.1		175
Total	27.6	18.5	9.3	43.6		0.2	0.8		475

V. Who Gets a Job after High School Now in Japan?

While differences can thus be observed in career guidance for high school graduates according to region, can regional variation in the career choices of high school students also be detected? We turn to the survey of third-year high school students in AREA-X and Y for the Japan Education Longitudinal Study (JELS) conducted in autumn 2004 by Ochanomizu University COE in order to attempt a tentative analysis.

We begin with the relationship between academic performance and the types of careers chosen in Area-X (Table4). According to our analysis, those high-school graduates who enroll in university obtain higher academic grades, and those who seek for jobs have poorer grades.

We next turn to Area-Y. We make two observations here. First, the ratio of employment in Area-Y is higher than Area-X. Second, while male students exhibit the same feature as that we observed in Area-X, we find that female students in Area-Y behave differently

Table 6. Grades and Career Plans and Father's Education: Area-X

Grade	Father's education	Em- ploy- ment	Voca- tional school	Junior college	Uni- versity	Freeter	Don't know	Others	No answer	N
Male										
Good	Junior/high school	18.8	12.5	0.0	67.7	1.0		0.0		96
	Univ./junior/vocational school	6.9	5.0	2.0	84.2	0.0		2.0		101
	Total	12.7	8.6	1.0	76.1	0.5		1.0		197
Middle	Junior/high school	34.4	19.7	1.6	42.6		1.6		0.0	61
	Univ./junior/vocational school	7.5	9.0	1.5	80.6		0.0		1.5	67
	Total	20.3	14.1	1.6	62.5		0.8		0.8	128
Not good	Junior/high school	30.8	13.2	0.0	47.3	2.2		5.5	1.1	91
	Univ./junior/vocational school	10.6	11.5	2.9	72.1	0.0		1.9	1.0	104
	Total	20.0	12.3	1.5	60.5	1.0		3.6	1.0	195
Female										
Good	Junior/high school	15.3	18.4	22.4	42.9			1.0		98
	Univ./junior/vocational school	5.8	14.4	9.4	69.8			0.7		139
	Total	9.7	16.0	14.8	58.6			0.8		237
Middle	Junior/high school	20.3	31.3	14.1	29.7	1.6		1.6	1.6	64
	Univ./junior/vocational school	3.8	21.8	14.1	60.3	0.0		0.0	0.0	78
	Total	11.3	26.1	14.1	46.5	0.7		0.7	0.7	142
Not good	Junior/high school	33.9	29.4	8.3	16.5	4.6		3.7	3.7	109
	Univ./junior/vocational school	8.2	30.6	6.1	52.0	2.0		0.0	1.0	98
	Total	21.7	30.0	7.2	33.3	3.4		1.9	2.4	207

Table 7. Grades and Career Plans and Father's Education: Area-Y

Grade	Father's education	Employ- ment	Voca- tional school	Junior college	Univer- sity	Don't know	Others	N
Male								
Good	Junior/high school	25.6	5.8	3.5	64.0		1.2	86
	Univ./junior/vocational school	20.0	2.2	0.0	77.8		0.0	45
	Total	23.7	4.6	2.3	68.7		0.8	131
Middle	Junior/high school	46.0	8.0	0.0	46.0		0.0	50
	Univ./junior/vocational school	15.2	12.1	3.0	66.7		3.0	33
	Total	33.7	9.6	1.2	54.2		1.2	83
Not good	Junior/high school	42.9	15.4	3.3	35.2	1.1	2.2	91
	Univ./junior/vocational school	36.2	8.5	2.1	48.9	0.0	4.3	47
	Total	40.6	13.0	2.9	39.9	0.7	2.9	138
Female								
Good	Junior/high school	37.6	10.6	10.6	41.2			85
	Univ./junior/vocational school	15.4	7.7	13.8	63.1			65
	Total	28.0	9.3	12.0	50.7			150
Middle	Junior/high school	30.6	27.4	4.8	37.1		0.0	62
	Univ./junior/vocational school	12.8	14.9	10.6	59.6		2.1	47
	Total	22.9	22.0	7.3	46.8		0.9	109
Not good	Junior/high school	35.9	21.4	9.7	33.0	0.0		103
	Univ./junior/vocational school	12.5	14.6	6.3	64.6	2.1		48
	Total	28.5	19.2	8.6	43.0	0.7		151

for those achieve the “middle” academic performance; those female students tend to go for vocational school

We next consider the relationship between student’s carrier path and his/her father’s education in both areas. Overall, we find that students with good academic performance proceed to university; however, we find the following two differences between Area-X and Y.

- (i) The ratio of going to university in Area-X is higher than in Area-Y.
- (ii) In Area-X, both female and male students have gap on father’s education with same grade. In Area-Y, father’s education seems to play more important role in on the carrier choice made by female rather than male. Only 25.6% of female student with good grade and low social background enter the labor market after high school, while 37.6% of female students with good grade and low social background enter the labor market after high-school graduation.

From our analysis, (i) social background better explains the high-school graduates’ carrier choices in Area-X, rather than Area-Y; (ii) gender gap in Area-Y is larger than that in Area-X.

VI. Conclusion

The school-company relations that are the linchpin of the Japanese high school graduates employment system are weaker now than during the 1980s, but have changed little since weakening in the first half of the 1990s. In an examination of “regional migration” in the employment of high school graduates from a geographical perspective, Tani (2000) argues that there occurred structural change in the regional migration of high school graduate job finders in the early 1970s and early 1990s. Although this paper does not analyze regional migration, this identification of a structural change in the employment of high school graduates in the early 1990s coincides with the findings described here.

A further finding of this paper is that forms of employment of high school graduates in Japanese society are diversifying, and there is some variation in the extent of changes in the Japanese high school graduates employment system. While this paper mainly concerned high school graduate vocational guidance for school graduates, it is known from surveys of companies conducted simultaneously that ways of responding also differ according to size of companies (JILPT 2008). Though being maintained overall, the Japanese high school graduates employment system is beginning to exhibit increasing diversity.

While policies need to be tailored to suit individual regions, it is especially important to focus on support for young people in the provinces. According to the findings of this paper, an examination of the career choices of young people in a certain region in Area-Y shows that women’s choices are particularly affected by social class, restricting their chances of advancing to higher education. In addition, job openings for high school graduates consist increasingly of factory manual worker, and there is little demand for female graduates.

Accordingly, female high school graduates in the provinces may be described as being in a socially disadvantageous position. Support for high school graduates in the provinces is therefore also important from the point of view of social equity in order to ensure that opportunities in life do not depend on social attributes.

In Japanese society, it is impossible for everyone to advance to higher education. There remains a certain proportion of school graduates who go straight into work after leaving high school, and they are especially concentrated in the provinces. What is needed is the societal development of means of guiding young people in the provinces to ensure a smooth transition from school to work.

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JILPT Research Activities

Research Report

The findings of research undertaken by the Japan Institute for Labour Policy and Training (JILPT) are published in Japanese as research reports. Below is a list of the reports published from August 2008 to November 2008. The complete text in Japanese of these reports can be accessed from the JILPT website,* and we are currently working on uploading English abstracts of these reports as well.

Research Reports

No. 104 *Career Support and Career Development of School-Age Youngsters: Toward Coordination with Career Education* (October 2008)

Research Series

No. 51 *Survey of Employee Attitudes and Issues in Human Resource Management* (September 2008)

No. 50 *Survey of the State of Corporate Teleworking* (September 2008)

Research Material Series

No. 48 *Newly Revised Index of Occupational Titles* (September 2008)

No. 47 *Report on 8th Korea-Japan Workshop: Regional Employment Development in Korea and Japan* (September 2008)

* JILPT website: URL: <http://www.jil.go.jp/english/index.html>

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