

Effects of Workplace Composition on Annual Wage of the Standard Employees in Japan

Yumiko Murao

Toyo University

1. Introduction

1.1 Previous research

In the labour market, various kinds of social resources - typically wage, job training opportunities and 'inner rewards'- are allocated to the participants. Many researchers who specialized in the study of social stratification or social inequality have focused on such social resource allocation processes.

It has been said that individual characteristics and job characteristics are important factors determining the quality and the quantity of social resources that are allocated in the workplace. Additionally, some researchers showed evidence that workplace composition also affect these social resource allocation processes. For example, Tomaskovic-Devey (1993) demonstrated that gender and racial composition had an impact on internal reward determination. In Japan, Aiba (1998) clarified that gender composition in the workplace partly controlled internal reward distributions by using Tomaskovic-Devey's analytical framework. Murao (2000, 2001, 2003) also revealed that the decision-making capacity and the advancement opportunities in Japan were affected by the gender relations in the workplace.

As for wages, there is substantial accumulation of studies on the gender composition in the workplace. Many earlier works showed that there has been significant occupational

gender composition effects on wages even though the individual characteristics and job characteristics have been controlled. This result was construed as evidence of the existence of gender discrimination on wages.

On the contrary, Tam (1997) insisted that occupational gender composition does not influence wages in the US. Instead of the ‘devaluation hypothesis’, which states that women’s wage is devalued when compared with men’s, Tam propose the ‘specialized human capital hypothesis’. This hypothesis states that “the occupational differences in the investment cost of specialized human capital explain the apparent sex [gender] composition effects on wages” (Tam 1997:1658). Through statistical analysis, he demonstrated that gender composition effects on wages can be attributed to the wage effect of specialized human capital.

Thomaskovic-Devy and Skaggs (2002) revisited Tam’s findings by using a new analytical model. Their model is characterized by the following two points: (1) using a measure indicating %female in the respondent’s job instead of the respondent’s occupation, (2) taking into consideration social closure process –the process that “more powerful actors excluding status inferiors in order to monopolize desired jobs” (Thomaskovic-Devy and Skaggs 2002:104). As a result, they find that gender composition has an effect on wages indirectly. Gender composition affects training time, and then in turn, training time affects on wages.

In this study I discuss whether gender compositions of workplaces have significant effects on wages.

1.2 Japanese situation

Since 1986, the year that Equal Employment Opportunity Law between Men and Women was enforced, gender wage gap in Japan has been improving, but its pace has been very slow. In 1986, female full-time workers got paid 59.7% of their male counterparts. 17 years

later, in 2003, the index rose to 66.8%. Such degree of gender wage gap in Japan is relatively high when compared internationally. According to labour statistics, the indexes were as follows: the US 79.4 % (2003), Britain 80.6 % (1999), France 74.1 % (2002)¹.

It is said that one of the main reasons of gender wage gap is horizontal gender segregation. That is, the wages of men and women are different because their occupations are separated. On this basis, the degree of horizontal gender segregation in Japan should be high. However, in reality, the degree of gender segregation on an occupational level is relatively low in Japan. That is why many researchers have pointed out that vertical gender segregation is especially important to explain gender inequality in the Japanese labour market (cf. Anker 1998, Blackburn et al. 2000). This fact gives suggestions that Japan could give a good data for testing the effect of gender composition of workplaces on wages.

Strong gender system is one of the important features of Japanese labour market. Another prominent feature of recent Japanese labour market is the rapid expansion of non-standardization of employment. In January 2007, non-standard workers make up about one-third of all employees. This means that more and more standard employees are working with non-standard employees. Therefore, when we analyze the standard employee's wage allocation process, one should consider not only the gender composition but also the composition of the employment status.

The main hypotheses of this study are as follows:

- Low wage hypothesis: the greater the numbers of the non-standard or female employees, the less the standard employees get paid, because such works are regarded as unauthoritative.

¹ Sources: Ministry of Health, Labour and Welfare, 2003, *Basic Survey on Wage Structure* (Japan), Ministry of Labour, 2002, *Employment and Earnings* (the US), ILO, 2002, *Yearbook of Labour Statistics* (Britain, France).

- High wage hypothesis: the greater the numbers of standard or female employees, the more the standard employees get paid, because the standard employees' status become relatively improved in such a situation.
- No effect hypothesis: workplace compositions do not affect wages.

2. Data and methodology

2.1 Data

The data comes from 'Trade Union and Gender' Survey conducted in 2004 by the 21st Century COE Program "Frontiers of Gender Studies", Ochanomizu University, Japan. Questionnaires are distributed through local organizations of the Japanese Trade Union Confederation (*Rengo*).

2.2 Models

For this study I use 814 samples of those who were working as standard employees and conduct multiple regression analysis. It is conventional to use the individual hourly wage as the measure of earnings in wage determination studies, however, in this study last year's annual wage with tax is used as the dependent variable. This is because our data does not contain last year's working hours.

As to independent variables concerned with individual characteristics, 3 factors are listed: gender, years of education and years of tenure are used. To control the effect of work characteristics, industry (manufacture / non-manufacture / public service), occupation (clerical and sales / professional and technical / skilled and service), firm size (less than 300 / 300 or more) and job title are entered into the regression model. In regard to workplace composition, I

use four variables. These are as follows: (1) non-standard employee ratio in workplace, (2) female ratio in workplace, (3) non-standard employee ratio of colleagues whose principal tasks are the same as that of a respondent, (4) female ratio of colleagues whose principal tasks are the same as that of a respondent.

2.3 Data description

Table 1 and Table 2 present descriptive statistics for variables of the models. This data is characterized by a far greater portion of large firm workers. According to Employment Status Survey conducted in 2002, the percentage of those who working at the firm of 300 or more employees was 54.1%. In Japan, the wages is different depending on the size of the firm. Therefore the respondents of ‘Trade Union and Gender’ Survey are biased toward relatively well situated employees.

Table 1: Descriptives of the data

		all standard employees	standard women employees	standard male employees	male-female difference
last year's annual wage with tax (10 thousands yen)	mean	503.03	406.59	545.78	139.19 ***
	std. dev.	169.99	158.78	156.90	
	median	499.14	399.08	522.70	
years of education	mean	13.75	13.80	13.73	-0.07
	std. dev.	2.02	1.86	2.08	
	median	13.48	13.59	13.42	
years of tenure	mean	15.04	12.49	16.16	3.67 ***
	std. dev.	8.18	6.95	8.43	
	median	13.57	12.38	14.58	
female ratio in workplace (%)	mean	26.21	40.92	19.69	-21.24 ***
	std. dev.	24.88	25.93	21.39	
	median	20.35	35.71	14.24	
non-standard employee ratio in workplace (%)	mean	16.59	19.76	15.18	-4.58 **
	std. dev.	21.02	21.71	20.57	
	median	9.60	14.90	7.31	
female ratio of colleagues whose principal tasks are the same as respondent(%)	mean	29.16	64.60	13.45	-51.16 ***
	std. dev.	35.84	34.80	22.68	
	median	10.85	68.65	0.44	
non-standard employee ratio of colleague: whose principal tasks are the same as respondent (%)	mean	11.35	14.96	9.74	-5.22 ***
	std. dev.	20.82	23.24	19.46	
	median	1.08	2.56	0.97	
N		814	250	564	

Table 1: Percentage table of the data

		all standard employees	standard women employees	standard male employees	chi-square statistic
industry	manufacture	46.4	42.8	48.0	1.920
	non-manufacture	34.5	36.8	33.5	
	public service	19.0	20.4	18.4	
		100.0	100.0	100.0	
occupation	clerical and sales workers	30.1	19.2	34.9	50.171 ***
	professional and technical workers	24.4	16.8	27.8	
	skilled and service workers	45.5	64.0	37.2	
		100.0	100.0	100.0	
firm size	under 300	11.3	9.6	12.1	1.043
	300 and more	88.7	90.4	87.9	
		100.0	100.0	100.0	
job title	no job title	52.5	72.4	43.6	57.541 ***
	having job title	47.5	27.6	56.4	
		100.0	100.0	100.0	
N		814	250	564	

3. Results of analysis

Table 3 shows the results of stratified multiple regressions. Model 1 consists of variables of the individual and job characteristic. In model 2, two variables of workplace composition were added, that is, female ratio and non-standard employee ratio in the workplace. Model 3 is the full model. It additionally contains other workplace composition variables: female ratio and non-standard ratio of colleagues whose principal tasks are the same as that of respondent. As is evident from table 1, among all standard employees and among standard male employees, tacking on workplace composition variables to model 1 significantly increases the model's power of explanation. By contrast, among standard female employees, there is no significant change between the models. This means that workplace composition affects only men's earnings.

Table 3: Results of stratified multiple regressions

		all standard employees			standard female employees			standard male employees		
		B	std. error	beta	B	std. error	beta	B	std. error	beta
model 1	gender (women = 0)	90.79	10.47	0.25 ***	-	-	-	-	-	-
	years of education	19.99	2.61	0.24 ***	20.55	5.03	0.24 ***	19.90	3.04	0.26 ***
	years of tenure	11.03	0.70	0.53 ***	11.80	1.45	0.52 ***	10.83	0.80	0.58 ***
	industry (manufacture = 0)	-	-	-	-	-	-	-	-	-
	non-manufacture	10.07	10.86	0.03	31.47	19.87	0.10	1.18	13.06	0.00
	public service	18.23	13.26	0.04	56.46	23.54	0.14 *	-4.89	16.50	-0.01
	occupation (clerical and sales workers = 0)	-	-	-	-	-	-	-	-	-
	professional and technical workers	2.46	11.84	0.01	33.67	22.29	0.08	-11.92	14.42	-0.04
	skilled and service workers	-16.23	11.95	-0.04	-60.59	22.97	-0.14 **	-10.76	14.44	-0.03
	firm size (less than 300 = 0)	78.74	14.23	0.15 ***	56.08	27.83	0.10 *	85.46	16.52	0.18 ***
job title (no job title = 0)	46.14	10.26	0.14 ***	61.06	21.02	0.17 **	38.49	11.89	0.12 **	
constant	-96.11	44.19	*	-111.25	84.00	-	8.23	52.95	-	
model 2	gender (women = 0)	89.59	11.34	0.24 ***	-	-	-	-	-	-
	years of education	19.94	2.61	0.24 ***	20.62	5.08	0.24 ***	20.01	3.06	0.27 ***
	years of tenure	10.92	0.70	0.53 ***	11.80	1.46	0.52 ***	10.68	0.79	0.57 ***
	industry (manufacture = 0)	-	-	-	-	-	-	-	-	-
	non-manufacture	11.18	10.84	0.03	31.53	19.96	0.10	2.31	13.01	0.01
	public service	19.99	13.25	0.05	56.26	23.66	0.14 *	-2.49	16.43	-0.01
	occupation (clerical and sales workers = 0)	-	-	-	-	-	-	-	-	-
	professional and technical workers	3.40	11.89	0.01	34.04	22.45	0.08	-12.05	14.53	-0.04
	skilled and service workers	-9.16	12.26	-0.02	-59.21	24.60	-0.14 *	-4.92	14.73	-0.01
	firm size (less than 300 = 0)	79.67	14.28	0.15 ***	57.20	28.46	0.11 *	86.24	16.48	0.18 ***
job title (no job title = 0)	48.67	10.35	0.14 ***	60.89	21.66	0.17 **	40.91	11.89	0.13 **	
female ratio in workplace	0.14	0.23	0.02	0.09	0.40	0.01	0.08	0.29	0.01	
non-standard employee ratio in workplace	-0.65	0.25	-0.08 *	-0.11	0.49	-0.01	-0.78	0.29	-0.10 **	
constant	-90.57	44.57	*	-115.01	87.98	-	15.00	52.72	-	
model 3	gender (women = 0)	66.58	13.23	0.18 ***	-	-	-	-	-	-
	years of education	19.65	2.59	0.23 ***	19.98	5.13	0.23 ***	20.33	3.04	0.27 ***
	years of tenure	10.98	0.70	0.53 ***	11.92	1.48	0.52 ***	10.76	0.79	0.58 ***
	industry (manufacture = 0)	-	-	-	-	-	-	-	-	-
	non-manufacture	7.96	10.86	0.02	25.28	20.51	0.08	3.32	12.94	0.01
	public service	16.90	13.26	0.04	49.15	24.31	0.12 *	1.07	16.41	0.00
	occupation (clerical and sales workers = 0)	-	-	-	-	-	-	-	-	-
	professional and technical workers	-0.69	11.92	0.00	29.39	22.76	0.07	-13.46	14.47	-0.04
	skilled and service workers	-11.37	12.22	-0.03	-60.22	24.68	-0.14 *	-5.56	14.64	-0.02
	firm size (less than 300 = 0)	81.13	14.21	0.15 ***	60.27	28.59	0.11 *	85.82	16.40	0.18 ***
job title (no job title = 0)	43.96	10.38	0.13 ***	58.36	21.76	0.16 **	36.60	11.92	0.12 **	
female ratio in workplace	0.58	0.27	0.09 *	0.33	0.44	0.05	0.64	0.37	0.09 +	
non-standard employee ratio in workplace	-0.57	0.31	-0.07 +	-0.25	0.56	-0.03	-0.65	0.37	-0.08 +	
female ratio of colleagues whose principal tasks are the same as respondent	-0.67	0.21	-0.14 **	-0.37	0.28	-0.08	-0.85	0.33	-0.12 *	
non-standard employee ratio of colleagues who principal tasks are the same as respondent	-0.12	0.28	-0.01	0.19	0.45	0.03	-0.18	0.38	-0.02	
constant	-59.38	45.21	-	-91.23	90.39	-	11.99	52.46	-	
model 1: adi. R ² (F value)	0.438	(71.479) ***		0.351	(17.800) ***		0.353	(39.407) ***		
model 2: adi. R ² (F value)	0.442	(59.503) ***		0.345	(14.132) ***		0.360	(32.673) ***		
model 3: adi. R ² (F value)	0.449	(51.899) ***		0.345	(11.917) ***		0.368	(28.329) ***		
change of F value: model 1 to model 2	3.562 *			0.031			4.023 *			
change of F value: model 2 to model 3	5.999 **			0.902			4.526 *			
N	814			250			564			

+ p<0.1, * p<0.05, ** p<0.01, *** p<0.001

As can be seen the results of all standard employees, gender has a strong significant effect on wages. In model 1, being a man improves his wage 25% higher. This effect is reduced to 18% in model 3, where we take into consideration the full variables of workplace composition.

On the whole, variables of individual characteristics strongly affect wages: the most powerful variable is years of tenure. This fact is probably the reflection of Japanese seniority-based wage system, which is well developed among large firms. Years of education also have a significant effect on wages. On the contrary, variables of job characteristics have rather limited effects on wages. The effects of industry and occupation are insignificant except

among standard female employees. However, firm size and job title has consistently significant effects on standard employee's wages. Working at a large firm and having job title consistently improves one's wages

As for workplace composition variables, a interesting result is shown. Most of the workplace composition variables have significant effects on wages only among all standard employees and among standard male employees. This means that only men are affected by workplace composition. Although working with women increases standard male employee's wages, doing same principal tasks of female colleagues decreases his wages. Such effect cannot be seen among standard female employees. Therefore the effect of gender composition and non-standard employee composition bring about wage hierarchy among men.

4. Conclusions

The results were as follows:

First, every individual characteristic variable has a positive significant effect on wages.

Secondly, work characteristic variables also have positive effects on wages. Among all employees and among just male employees, working at a large firm and having a job title improve their wages. Among female employees, working in public service sector has positive significant effect. The effect of being a skilled and service worker has a negative significant effect.

Thirdly, workplace composition has a significant effect on the annual wage of the standard employee. However the power of the workplace compositions is only valid among all employees and among male employees. In contrast, no work composition variable has a

significant effect among female employees.

Fourthly, among all employees and also among male employees, the effect of non-standard employee ratio in the workplace is negative. The female ratio of colleagues whose principal tasks are the same as that of respondent also has a negative effect. This means that male standard employee's annual wage is discounted by the existence of female or non-standard employees.

Fifthly, high female ratio in the workplace increases the annual wage of male standard employee. This means that male standard employees enjoy a unilateral benefit from the existence of female employees in their workplaces.

References:

- Aiba, K., 1998, "Gender Gap in Internal Rewards and Reward Structure: Analyses in the Japanese Workplace", The Japanese Association of Labor Sociology, *Annual Review of Labor Sociology*, 9:127-149. [Japanese]
- Anker, Richard, 1998, *Gender and Jobs: Sex Segregation of Occupation in the World*, Geneva, International Labour Office.
- Blackburn, Robert M., Jennifer Jarman, Bradly Brooks, 2000, The Puzzle of Gender Segregation and Inequality: A Cross-National Analysis, *European Sociological Review*, 16(2):119-135.
- Murao, Y., 2000, "Gender Effects on the Distribution of Decision-Making Capacity in the Workplace", The Japanese Association of Labor Sociology, *Annual Review of Labor Sociology*, 11:143-169. [Japanese]
- Murao, Y., 2001, "Status-Attainment in Labor Market and Job Segregation: Event- History Analysis on the Job Title Attainment Process of Male Employee in Japan", Ochanomizu University

Graduate School of Humanities and Sciences, *Journal of the Graduate School of Humanities and Sciences*, 3:77-86. [Japanese]

Murao, Y., 2003, *Labor Market and Gender*, Toyokan Shuppansha. [Japanese]

Tomaskovic-Devy, D., 1993, *Gender & Racial Inequality at Work: The Sources & Consequences of Job Segregation*, ILR Press.

Tomaskovic-Devy, D., and S. Skaggs, 2002, "Sex Segregation, Labor Process Organization, and Gender Earnings Inequality", *American Journal of Sociology*, 108:102-128.

Tam, T., 1997, "Sex Segregation and Occupational Gender Inequality in the United States: Devaluation or Specialized Training?", *American Journal of Sociology*, 102:1652-1692.