JOB TURNOVER AND WAGE CHANGE: AN EMPIRICAL ANALYSIS

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Ⅰ. Introduction

Under the influence of the prolonged economic slowdown since the 1990s, the long-term employment practices as one of the salient characteristics of the Japanese labor market have been going through profound changes. The unemployment rate has been renewing its highest peak since 1991, and its influence is now reaching to the middle aged to older workers with a longer tenure in the previous job as well as to younger workers. (see Fig.1) [1].

One of the main reasons for the rise in the unemployment rate is the drastic increase of the number of displaced workers. When looking at changes in the number of the unemployed by reasons for job separation from the previous job, the number of the voluntary unemployed in 2003 has remained 2.2 times of the number in 1993, compared to the number of involuntary unemployed which increased to 5.6 times during the same period. Reversing the previous trend, the number of involuntary unemployed started exceeding the number of voluntary unemployed since 2001. The number of involuntary unemployed due to personnel reduction, dissolution or bankruptcy of company has drastically increased in recent years (see Fig.2).

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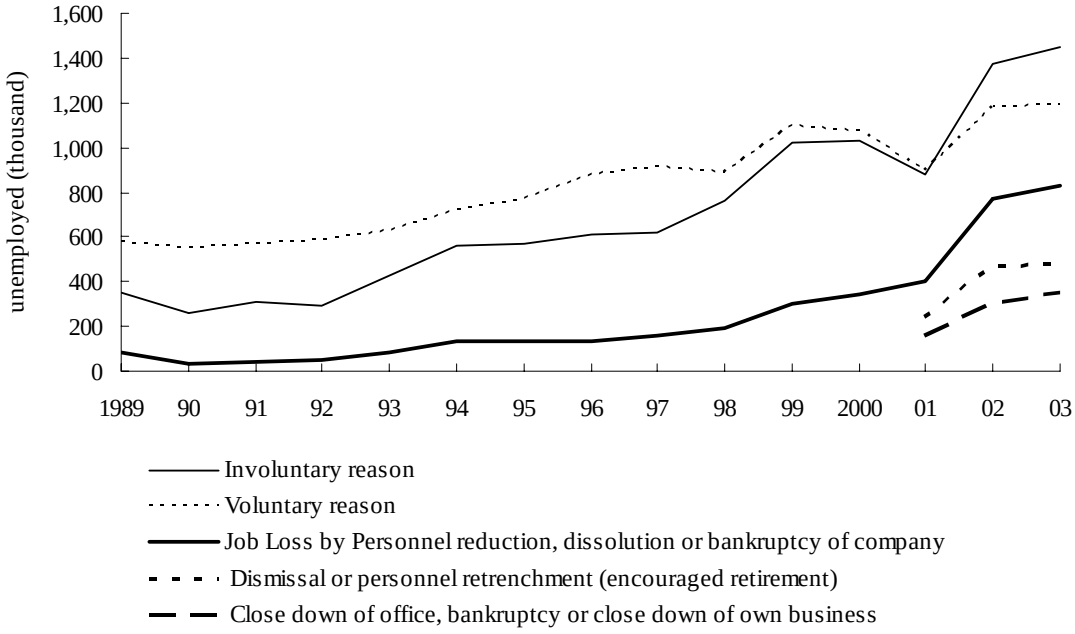
Figure 1
Unemployment rate by age: 1968-2002

Note: Unemployment rate is shown as the monthly average of the year.
Source: Statistics Bureau, *The Labour Force Survey* , 1968-2002.

Figure 2
Unemployed Person by Reason for Job Loss



Source: Statistics Bureau, *Special Survey of the Labour Force Survey* , Feburary 1989-2001, and *Detailed Tabulation* Jan.-March 2002- 2003.

Table 1

Characteristics of Unemployed by reason, Employed, and Not in Labour Force, 2003 (Jan.- March)

	Unemployed						
		Close down of office, bankruptcy or close down of own business	*Dismissal or personnel retrenchment (encouraged retirement)*	*Other Involuntary Reason (Mandatory Retirement etc.)*	*Voluntary Reason*	*Employed*	*Not in Labour Force*
Total (thousand) 1)	2,720	350	480	620	1,190	62,090	27,480
Female	33.8%	34.3%	31.3%	21.0%	42.9%	40.8%	67.5%
Head of Household	32.7%	34.3%	37.5%	54.8%	20.2%	40.9%	26.5%
Age							
15-24years	13.2%	8.6%	6.3%	6.5%	18.5%	9.2%	3.5%
25-34	27.6%	22.9%	20.8%	17.7%	36.1%	23.0%	10.6%
35-44	16.9%	17.1%	16.7%	11.3%	19.3%	20.2%	9.3%
45-54	18.0%	31.4%	27.1%	11.3%	14.3%	23.5%	9.0%
55-64	20.6%	17.1%	29.2%	38.7%	9.2%	16.6%	15.9%
65-	4.0%	2.9%	0.0%	11.3%	1.7%	7.5%	51.8%
Employee (thousand) 2)	2,360	300	430	520	1,110	52,610	3,860
Industry 3)							
Mining	0.0%	-	-	0.0%	0.0%	0.1%	0.0%
Construction	11.8%	16.7%	11.6%	13.5%	9.9%	9.4%	5.7%
Manufacuturing	23.6%	30.0%	37.2%	26.9%	14.4%	21.3%	18.3%
Electricity, Gas, Water Service, and Heat Supply	0.4%	-	-	0.0%	0.0%	0.6%	0.3%
Transport, Communications, and Utilities	8.4%	6.7%	11.7%	11.5%	8.1%	8.4%	6.5%
Wholesale and Retail Trade	20.7%	26.7%	16.3%	15.4%	25.2%	18.4%	20.9%
Finance, Insurance, and Real Estate	4.3%	3.3%	4.6%	5.7%	5.4%	4.0%	4.1%
Educational and Health Services	7.2%	0.0%	2.3%	3.8%	9.9%	13.7%	13.9%
Accommodation and Food Services	6.3%	3.3%	4.7%	1.9%	9.9%	4.9%	10.9%
Other Services	14.4%	10.0%	16.3%	15.4%	15.3%	15.2%	15.8%
Public Administration	0.4%	-	-	0.0%	0.9%	3.7%	2.6%
Other Industry	2.1%	0.0%	2.3%	1.9%	1.8%	0.3%	1.3%
Occupation 3)							
Professional and Technical Occupation	6.8%	3.3%	4.7%	5.8%	8.1%	15.0%	11.6%
Administrative and Managerial Occupation	1.3%	3.3%	2.3%	1.9%	0.0%	3.5%	1.6%
Administrative Support	19.4%	16.7%	20.9%	17.3%	21.6%	22.5%	26.6%
Sales	18.1%	20.0%	16.3%	15.4%	19.8%	14.5%	15.0%
Service	12.2%	6.7%	9.3%	7.7%	15.3%	10.9%	14.5%
Transportation	3.8%	6.7%	4.7%	5.8%	3.6%	3.8%	2.6%
Production, Operators, and Construction Labourers	29.1%	36.7%	34.9%	34.6%	22.5%	23.2%	17.6%
Other Labourers	7.6%	6.7%	7.0%	7.7%	7.2%	6.0%	9.3%

Note: 1) Previous employee for Unemployed and Not in Labour Force. 2) Previous employee and turnover in the last three years for Unemployed and Not in Labour Force. 3) Excluding Agriculture, Forestry, and Fishing. Occupation for Employed is only based on *Monthly Labour Force Survey* 2003 (Jan. -March). The total employed is thus 5,238 thousand persons.

Source: Statistics Bureau, *Detailed Tabulation of Labour Force Survey* , 2003, Jan.-March.

When comparing the characteristics of the voluntary/involuntary unemployed with those who are in employment or with those who are not in labor force, there are more young women or people under 35 years old among the voluntary unemployed. Furthermore, these voluntary unemployed workers were in a variety of industries/occupations in their previous jobs, mainly in the service occupations. In contrast, involuntary unemployed workers tend to be male and more than 45 years old. They were mainly engaged in the production processes in the manufacturing sector in their previous jobs (see Table1). We should note, however, that these figures from the

official government's statistics are calculated as a stock of unemployment, thus prohibiting us from understanding the inflow to and outflow from the unemployment pool by reasons for job separation[2].

Changes in the number of unemployment depend on the inflow to and outflow from the unemployment pool. From the policy viewpoint for reducing unemployment, it is desirable to reduce the inflow to and promote the outflow from the unemployment pool. This paper will focus on the outflow from the unemployment pool, namely, on the process of reemployment. More specifically, the paper will analyze factors for determining reemployment in its early stage of unemployment, and empirically examine these determinants for wage change when the unemployed find reemployment. The paper will draw on the cross-sectional data of those who left the previous jobs during the period from 1997 through 1999 and searched for jobs at the Public Employment Services offices in large cities in Japan.

The subsequent Section II reviews previous empirical studies focusing on labor turnover and wage change in Japan, and presents my research problems. Section III deals with empirical analyses on labor turnover and wage change after briefly overviewing the characteristics of data. The final section summarizes the results and presents conclusions.

Ⅱ. Previous Studies

The majority of studies in Japan on the process of reemployment of those who left the job tend to explain changes in wage by the transferability of skills that the worker accumulated in the past, or by the changes in job matching before and after moving. It is generally considered that the usefulness of "firm specific skill" (Becker 1964) of

those who accumulated their skills in the previous job will be lost when moving. The usefulness of skills that is general to the industry or the occupation, however, tends to be maintained. The degree of wage increase for those who moved within the same occupation or the industry will thus be greater (or smaller wage decrease) than those who moved across occupations or industries. According to the study by Abe, by holding individual characteristics and industry premium constant, the degree of wage change in the individuals who move across industries is 0.3 % to 3 % smaller than those who move within the same occupation or industry, thus acknowledging the loss of industry-specific human capital (Abe 1996). Furthermore, Abe finds that the older the worker is, and more blue-collar than white-collar he is, the more industry-specific human capital he loses. From the similar perspectives, there are some empirical studies on the transferability of the occupation-specific skills before and after moving. Some studies find that the middle aged to older workers tend to experience greater wage decrease when moving, and that the degree of wage decrease tends to be smaller when moving within the same occupation (Kishi 1998; Yugami 2001). It is further recognized that it is more advantageous to move within the same occupation for engineers or technicians, or for workers in the sales occupation whose skills are characterized by stronger occupation-specificity (Ohashi and Nakamura 2002).

On the other hand, there are other studies that accounted for the heterogeneity among movers, which suggest that the degree of job matching of the voluntary and the involuntary unemployed may possibly differ.[3] In their studies, Abe, and Ohashi and Namakura also find that the degree of wage increase tends to be greater (or smaller wage decrease) for the voluntary unemployed than for the involuntary unemployed, thus revealing the fact that the voluntary unemployed tend to improve their job matching

while the involuntary unemployed tend to aggravate their job matching.

The heterogeneity among movers, however, cannot be explained only by job matching. As Gibbons and Katz point out, reasons for job separation may possibly inform productivity of the worker (Gibbons and Katz 1991). In the comparative analysis of the involuntary unemployed who are laid off without recall with those who are displaced due to plant closings, they demonstrate that a laid-off worker turns out to be "a less productive lemon"(Ibid 1991). Due to the unavailability of the statistical data in Japan that distinguishes dismissal from bankruptcy, there is no research conducted from the above perspectives. Matsushige, however, analyzes the reemployment processes using the data from Japanese security companies that bankrupted during the latter half of the 1990s (and unfortunately, with no analysis on wage change due to the lack of data on wage) (Matsushige 2003). Compared to previous studies, he obtains intriguing results and contends that there is no correlation between age and the probabilities of finding reemployment, and that what is important is whether or not the worker possesses the skill that the labor market needs. His study thus suggests the probability for the distribution of differing abilities of workers depending on whether or not he quits the job voluntarily, and whether or not he is subject to the selection from the company.

The paper examines a hypothesis: it is reasons for job separation that explain the heterogeneity of movers. More specifically, a job separation by quitting a previous job (i.e. voluntary separation) accounts for a less productive group because the previous job did not have a good matching with the worker, and because the company did not prevent the worker from quitting the job. On the other hand, the involuntary unemployed are considered to account for a group demonstrating a good matching with

the previous job. Among the involuntary unemployed, those who are displaced due to dismissal or employment adjustment are considered to be less productive workers in the sense that they are subject to the selection by their employers (Gibbons and Katz 1991), whereas those who left their previous jobs due to bankruptcy or close downs are considered to be more productive on average. In the following analysis of the unemployment period and wage change, I will examine if reasons for job separation account for significant differences in the performance for reemployment among movers by paying attention to the transferability of human capital characteristics that are specific to industries or occupations.

Ⅲ. Empirical Analysis

A. Data Description

The paper draws on the data from *Kyushoku Katsudo ni kansuru Chosa* (*The Survey on Job Search*) conducted by the Japan Institute of Labour (a predecessor of the Japan Institute of Labour Policy and Training) from 1998 through 1999. The questionnaires were distributed among job seekers at 18 different Public Employment Services offices, and 7,219 job seekers answered the questionnaire (Effective Collection Rate: 23.5 %). Although it is desirable to utilize all data for the analysis, for the specific purpose of the analysis in this paper, I will rely only on the data samples that were collected from job seekers at one specific Public Service Employment office on their previous tenure. The data was collected in May 1999. The analysis will utilize the data from 2,104 samples (927 males, 1,117 females) that are limited to the job seekers under 60 years old with a previous employment, and will exclude the long-term unemployed who were in unemployment for more than two years or those who have any missing value for the

data sample. The Public Employment Service office is located in Tokyo Prefecture, and is the second largest office. Although the analysis only deals with displaced workers in large cities, this is the first study that utilizes this kind of micro data for the analyses of wage change, thus having profound implications for the field of study.

The study takes account of reasons for job separation. It examines whether or not reasons for job separation explain the heterogeneity of displaced workers. Reasons for job separation are broken down into four categories – (1) quit; (2) dismissal or encouraged retirement ('layoff'); (3) bankruptcy or close down of company; and (4) others – for analytical purposes. Descriptive statistics for the sample are presented in Table A1. Descriptions of the main variables according to the above four categories are shown in Table 2. Among the unemployed, for both males and females, those who quit the previous job tend to exhibit lower average ages and shorter tenure in the previous job, which results in the unemployed due to layoffs or bankruptcy exhibiting higher monthly earnings in the previous job. What are intriguing here are the reemployment rate and the duration of unemployment when the data was gathered.[4]
For both males and females, the unemployed due to bankruptcy show the highest reemployment rate of around 70 %, and the shortest duration of job search, which is 6.18 and 7.70 months, respectively. In contrast, the unemployed due to quit or layoffs show lower reemployment rate and longer duration of job search, excepting for the fourth category - "others." Through a simple comparison of the mean values, it is observed that the performance for reemployment is the highest among the unemployed due to bankruptcy, and the lowest among the unemployed due to quit.

When looking at present monthly earnings among those who found

Table 2
Descriptive Statistics of main variables by reason for job loss

	Means			
male	quit	layoff	bankruptcy	others
Entire Sample Size	351	193	160	223
Age in years	36.73	44.98	43.64	41.91
	(10.33)	(10.4)	(10.58)	(11.33)
Previous Tenure in years	5.27	12.52	11.96	7.41
	(6.2)	(11.66)	(10.63)	(8.93)
Log of previous monthly earnings	12.54	12.83	12.81	12.65
	(0.35)	(0.44)	(0.40)	(0.38)
Reemployed at survey date	0.68	0.68	0.74	0.63
	(0.47)	(0.47)	(0.44)	(0.48)
Months of job search	7.09	6.74	6.18	7.24
	(5.82)	(5.48)	(5.30)	(5.95)
Reemployed Sample Size	237	131	119	140
Log of current monthly earnings	12.48	12.62	12.63	12.52
	(0.34)	(0.39)	(0.34)	(0.33)
Changes in log monthly earnings	-0.08	-0.23	-0.21	-0.16
	(0.39)	(0.36)	(0.32)	(0.34)

	Means			
female	quit	layoff	bankruptcy	others
Entire Sample Size	604	125	99	349
Age in years	30.63	36.77	39.41	35.85
	(7.57)	(10.34)	(10.20)	(10.21)
Previous Tenure in years	4.67	5.6	6.02	5.1
	(4.22)	(6.98)	(6.09)	(5.65)
Log of previous monthly earnings	12.27	12.4	12.4	12.26
	(0.30)	(0.40)	(0.42)	(0.32)
Reemployed at survey date	0.59	0.54	0.69	0.6
	(0.49)	(0.50)	(0.47)	(0.49)
Months of job search	8.66	8.62	7.7	8.12
	(6.34)	(6.18)	(5.60)	(5.84)
Reemployed Sample Size	354	68	68	211
Log of current monthly earnings	12.08	12.08	12.17	12.12
	(0.40)	(0.58)	(0.33)	(0.38)
Changes in log monthly earnings	-0.18	-0.24	-0.25	-0.09
	(0.41)	(0.54)	(0.43)	(0.43)

Note: Standard deviations are in parentheses.

reemployment, there is a similar tendency of the unemployed due to bankruptcy exhibiting the highest, and the unemployed due to quit showing the lowest level. The attrition rate in wage, however, for both males and females, for the unemployed due to quit is the smallest, which results in narrowing of the gaps in the monthly earnings by

reasons for job separation. For males, the attrition rate of log-wage is 0.08 among the unemployed due to quit, while 0.21 among the unemployed due to bankruptcy. For females, the former is 0.18, and the latter 0.25. As shown in the study by Ohashi and Nakamura, those who quit the previous job to improve job matching are able to minimize wage decrease when moving, while those involuntary unemployed who left a previous job due to layoffs or bankruptcy experience a larger wage decrease because their job matching aggravates (Ohashi and Nakamura 2002). This will lead to the following question: Based on the heterogeneity by reasons for job separation, can we observe a gap in the duration of unemployment or a gap in wage between the current and the previous job when accounting for individual characteristics of job seekers or the accumulation of human capital specific to the industry or the occupation?

B. Duration Analysis

This section looks at the gaps in the average ability among the four (4) unemployed groups mentioned in the previous section, and examines their influence on the duration of unemployment by fully controlling the attributes of individual characteristics (e.g. sex, schooling, age at separation). I will utilize Cox's (1972, 1975) proportional hazard model, which is popularly used in the analysis of the duration of unemployment[5].

By using the duration of unemployment *t,* time-invariant explanatory variable *x,* and unknown coefficient β, a hazard rate function is shown as:

$$\lambda(t,x,\beta,\lambda_0) = \phi(x,\beta)\lambda_0(t)$$

which does not specify any function of baseline hazard λ_0. Among the sample whose unemployment duration is more than t_j, a conditional probability of an individual i to complete the duration of unemployment t_j is:

$$\Phi(x_j,\beta) / \sum_{j=i}^{n} \Phi(x_i,\beta)$$

Each period j constitutes a partial likelihood. Then, log-likelihood function (Cox's partial likelihood) will be:

$$L(\beta|x)=\sum_{i=1}^{n}\left[ln\ \Phi(x_i,\beta)\ -\ ln\left(\sum_{j=i}^{n} \Phi(x_j,\beta) \right) \right]$$

in order to estimate β, which maximizes the above function.

I will examine here whether or not differences among reasons for job separation influence the probabilities for finding reemployment by controlling not only such individual attributes as sex, schooling, age at separation, but previous job characteristics as industry, occupation, and firm-size. Descriptive Statistics for the sample are presented in Table A1. Table 3 presents the results from the above estimation, indicating the higher probabilities for male job seekers to find reemployment than female job seekers. There exists an insignificant correlation, however, between the reemployment rate and such individual characteristics as schooling, and previous industry and occupation. I should note that the reemployment rate for the older worker, such as those who are 33 – 44, or 45 – 59, is significantly lower than those who are

Table 3
Estimation result of proportional hazard function

Independent variables	Coefficient	Standard Error
female	-.180 **	.070
Age 30-44	-.298 **	.109
Age 45-59	-.291 **	.119
Previous tenure	-.083 **	.021
Previous tenure × Age 30-44	.067 **	.023
Previous tenure × Age 45-59	.066 **	.022
layoff	.089	.087
bankruptcy	.262 **	.091
other reasons	-.007	.070
five schooling dummies, seven previous industry dummies, seven previous occupation dummies, and five previous firm-size dummies	yes	
Log likelihood	-9402.2457	
LR chi2(29)	105.13	
Prob> chi2	0.000	
Number of Observations	2,020	

Note: The reference groups for age and separation reason dummy variables are the individual who are less than 30 years old and separated from job due to quit. Other control variables are omitted in this table.
**denotes statistically significant at 5% level.

under 30 years old. Furthermore, the longer the previous job tenure is, the lower is the reemployment rate. The coefficient of interaction between age dummy and the job tenure indicates that the effect from the job tenure within each age-group is larger among older age groups – with greater effect for those who are 30-44, or 45-59 than those who are under 30 years old. It further indicates that the longer the previous tenure is, the higher is the reemployment rate (i.e. the smaller is the declining tendency of the reemployment rate).

By holding the above characteristics constant, when looking at the gaps among the reemployment rate by reason for job separation, the reemployment rate for the displaced workers due to bankruptcy is significantly higher than those who quit their previous jobs. In contrast, there are no significant differences in the reemployment rate between those who quit and those who are laid off. For these reasons, I can conclude that the displaced workers due to bankruptcy tend to exhibit higher average

ability than the unemployed due to other reasons, thus demonstrating the higher reemployment rate.

C. Earnings Equations

By limiting samples only to those who secured reemployment, this section compares their earnings before they left the job with the earnings after they are re-employed. Separating male from female samples, I estimate ordinary Mincer type earning function. Dependent variables here are logarithm of previous and present monthly earnings[6].

Table 4 presents the estimation results for males. Holding other factors constant, the results suggest that the previous earnings of those who left the job due to bankruptcy are 11%-15% higher than those who left the job due to quit, and that the previous earnings of those who left the job due to layoffs are 4%-5% higher than those who quit their previous jobs. I should note that the coefficient of layoff dummy is statistically insignificant here. On the other hand, the earnings after finding reemployment (see columns 3 and 4), the coefficient of separation dummy in the post separation period is smaller than the one in the pre-separation period, thus statistically insignificant. Those who left the job due to quit tend to improve their job matching, while the job matching tends to aggravate for those who experience involuntary separations. In addition, the premium of general skill accumulated in the previous job is 2.6% per year, amounting to 26% for those who were employed for 10 years previously. The earnings decrease when compared to the earnings of those who did not move.

Columns 5 through 7 present the results of from ordinary least squares estimation on log (present earnings/previous earnings). The square of previous tenure

Table 4
Estimation Results of Earnings Equations, Males Reemployed at Survey Date (Sample Size 627)

	Dependent Variables						
	previous earnings		present earnings		earnings change		
Independent variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
layoff	.042	.048	.040	.053	-.012	-.004	.011
	(.031)	(.044)	(.035)	(.049)	(.036)	(.049)	(.066)
bankruptcy	.108**	.149**	.053	.023	-.035	-.123**	-.203**
	(.033)	(.046)	(.036)	(.052)	(.037)	(.052)	(.076)
other reasons	.043	.015	.006	-.012	-.045	-.038	-.064
	(.030)	(.040)	(.033)	(.044)	(.034)	(.045)	(.060)
previous tenure	.030**	.029**	.026**	.026**	-.017**	-.019**	-.019**
	(.004)	(.004)	(.004)	(.005)	(.002)	(.003)	(.003)
previous tenure squared	-.0002	-.0002	-.001**	-.001**			
	(.0001)	(.0001)	(.0001)	(.0001)			
previous tenure × layoff		-.001		-.0004		.001	.001
		(.004)		(.004)		(.004)	(.004)
previous tenure × bankruptcy		-.004		.003		.009**	.009**
		(.004)		(.004)		(.004)	(.004)
previous tenure × other reasons		.003		.003		-.2.15e-06	-7.18e-06
		(.004)		(.004)		(.004)	(.004)
within industry mobility					.042	.042	-.012
					(.028)	(.027)	(.046)
within occupation mobility					.030	.031	.059
					(.027)	(.027)	(.045)
within industry × layoff							.005
							(.072)
within industry ×bankruptcy							.191**
							(.079)
within industry × other reasons							.081
							(.074)
within occupation ×layoff							-.035
							(.071)
within occupation × bankruptcy							-.074
							(.077)
within occupation × other							-.034
							(.074)
four schooling dummies,external experience and its square	Yes		Yes		Yes (excluding experience squared)		
five firm-size dummies, and permanent worker dummy	Yes (previous)		Yes (present)		Yes (previous and present)		
seven industry dummies, seven occupation dummies,	Yes (previous)		Yes (present)		No		
Adj R-squared	.562	.562	.308	.306	.292	.297	.298

Note: The reference groups for separation reason, for within industry mobility, and for within occupation mobility dummy variables are individuals who were separated from the job due to quit , moved across the industry and the occupation.
** denotes statistically significant at 5% level.

and external experience in the previous estimation is omitted here. In addition, dummy variables (moving within the same industry and occupation=1; moving across industry and occupation=0) are constructed and introduced to the estimation equation as substitute for the industry and the occupation dummies. The results in column 5 show that all coefficients of separation reason dummy indicate negative sign, which means that wage tends to decline for those who experience involuntary separations when

compared to the unemployed who quit the previous job. Furthermore, the results indicate an increasing tendency for wage to decline for those with a longer previous job tenure, for the premium of general skill accumulated in the previous job tends to decrease when moving. Column 6 shows that the earnings of displaced workers due to bankruptcy significantly decrease - 12 % - when compared to those who quit the previous job. Based on the results from the interaction of previous tenure and separation dummies, the effect of the previous tenure is 0.9% higher for the displaced workers due to bankruptcy than those who quit the previous job, indicating the fact that moving is not necessarily disadvantageous for those who accumulate general skill in their previous jobs.

Column 7 shows the transferability of skill. At a glance, the earnings decrease considerably; 20.3% for the displaced workers due to bankruptcy compared to those who quit the previous job. Moving thus seems to be disadvantageous especially for veterans with a longer previous tenure when considering the decrease in the earnings due to obsolescence of skill- 1.9% per year. The premium of general skill for the displaced workers due to bankruptcy, however, is 0.9% per year higher than those who quit the previous job. Furthermore, wage for the displaced workers due to bankruptcy is 19.1% higher when moving within the same industry than those who quit the previous job. By examining data on those who lost their jobs in major security companies in Japan, and Matsushige showed that the reemployment rate for older workers who accumulated their skills in the previous job is higher than the younger workers, and that moving is not necessarily disadvantageous for these older workers in the labor market if the distribution of abilities of the unemployed is held constant (Matsushige 2003). The results in column 7 suggest that those who left the job due to bankruptcy tend to be

more advantageous in moving within the same industry than those who left the job for other reasons. The results further indicate that regardless of the kind of industry or occupation, the more one accumulates general skill, the more advantageous he will be when moving. Those displaced workers due to bankruptcy, in particular, are considered to demonstrate higher average ability distribution when moving within the same industry. In contrast to other research results from studies in the United States, the Japanese case suggests that layoff cannot be considered as the only factor that functions as a label for low productivity. Employers, especially large companies in Japan, do not necessarily possess all the discretions for adjusting employment, and often resort to other methods, such as voluntary retirement. In this sense, there are other voluntary elements in Japan than the selections by employers.

The estimation results for female, as in the case for males, also indicate the influence of the premium for longer tenure or job matching when moving (see Table 5). The earnings function and their changes, however, indicate that the decrease in job matching for female displaced workers due to involuntary reasons, such as layoffs or bankruptcy, is greater than the decrease for male displaced workers (i.e., greater improvement in job matching for voluntary separation). The results further show that the premium for accumulating general skill is non-existent for female displaced workers. The wage decrease is thus greater than males for those who have a longer tenure in the previous job. For one reason, it is considered that female workers tend to have fewer opportunities for the OJT (on-the-job training) in their skill formation, and narrower career path than male workers. As a result, female workers possibly experience greater skill obsolescence than male workers by moving. Column 7 suggests, however, that the degree of wage decrease for those who left the previous job due to bankruptcy is

Table 5
Estimation Results of Earnings Equations, Females Reemployed at Survey Date (Sample Size 701)

	Dependent Variables						
	previous earnings		present earnings		earnings change		
Independent variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)
layoff	.043	.108**	.002	-.010	-.022	-.102	-.127
	(.039)	(.053)	(.050)	(.068)	(.052)	(.069)	(.095)
bankruptcy	.113**	.221**	.025	.038	-.083	-.149	-.092
	(.040)	(.066)	(.052)	(.086)	(.054)	(.089)	(.121)
other reasons	-.017	.060	.037	.091	.069	.038	.054
	(.026)	(.038)	(.033)	(.048)	(.035)	(.050)	(.063)
previous tenure	.020**	.030**	-.008	-.004	-.022**	-.029**	-.029**
	(.006)	(.007)	(.007)	(.008)	(.004)	(.006)	(.006)
previous tenure squared	-.0001	.0002	-.0005	.0005			
	(.0002)	(.0003)	(.0003)	(.0003)			
previous tenure × layoff		-.016		.002		.019	.019
		(.008)		(.011)		(.011)	(.011)
previous tenure × bankruptcy		-.023**		-.004		.015	.015
		(.011)		(.014)		(.015)	(.015)
previous tenure × other reasons		-.019**		-.013		.008	.008
		(.007)		(.008)		(.015)	(.009)
within industry mobility					-.007	-.005	-.040
					(.031)	(.031)	(.044)
within occupation mobility					.031	-.005	.074
					(030)	(.031)	(.043)
within industry × layoff							.110
							(.105)
within industry ×bankruptcy							.111
							(.106)
within industry × other reasons							.034
							(.071)
within occupation ×layoff							-.048
							(.105)
within occupation × bankruptcy							-.198
							(.106)
within occupation × other							-.054
							(.069)
four schooling dummies,external experience and its square	Yes		Yes		Yes (excluding experience squared)		
five firm-size dummies, and permanent worker dummy	Yes (previous)		Yes (present)		Yes (previous and present)		
seven industry dummies, seven occupation dummies,	Yes (previous)		Yes (present)		No		
Adj R-squared	.233	.242	.194	.194	.201	.202	0.202

Note: The reference groups for separation reason, for within industry mobility, and for within occupation mobility dummy variables are individuals who were separated from the job due to quit , moved across the industry and the occupation.
** denotes statistically significant at 5% level.

considerable, nevertheless statistically insignificant. Consequently it is more advantageous for these female workers to move within the same industry when compared to other female workers who quit their previous jobs. All in all, it is reasons for job separation that function as labels in the external labor market.

Ⅳ. Conclusion

The paper analyzed the reemployment process of the displaced workers by accounting for the transferability of skills that are specific to the industry and the occupation, and by accounting for their ability distributions. In particular, it examined whether or not reasons for job separation account for the average ability of the displaced workers. The results of the analyses in this paper can be summarized as follows:

First, the estimation results of the hazard function of the duration of unemployment demonstrate the lower reemployment rate for the middle-aged to older workers, and for those who have longer tenure in their previous jobs. The results further demonstrate, however, that the reemployment rate for the displaced workers due to bankruptcy or company close downs is significantly higher than those who quit their previous jobs voluntarily. The results also indicate that the gap in the reemployment rate for the displaced worker due to encouraged retirement or layoffs and those who quit their previous jobs voluntarily is statistically insignificant.

Secondly, from the estimation results of the earnings function, I observed that the decrease in the earnings for those who left the previous jobs involuntarily, particularly for displaced workers due to bankruptcy, tends to be greater than the decrease in the earnings for those who quit the previous job. The former tend to aggravate their job matching, while the latter improve their job matching by moving. These results conform to the findings by Ohashi and Nakamura (2002). The wage premium for the accumulation of general skill for displaced workers due to bankruptcy, however, is greater than those who quit the previous job. For this reason the wage increase for these displaced workers tends to be greater than those who quit their previous jobs when moving within the same industry. Furthermore, the results from

the analysis on the earnings show that there are not any statistically significant differences between those who quit the previous job and those who left the job due to layoffs.

Based on these results I am able to state that the unemployed do not necessarily form a homogenous group, and that the displaced workers through involuntary separation, such as bankruptcy or company close downs, constitute a high average ability group. Furthermore, those who left the job due to bankruptcy tend to experience greater decrease in their average earnings than those who left the job for other reasons because their job matching will aggravate by moving. In spite of the overall decrease in the earnings, I am able to state that these displaced workers, particularly for older workers who accumulated general skills in their previous jobs, can possibly minimize the decrease in wage, and furthermore, will be more advantageous when moving within the same industry compared to workers who left the job for other reasons. For these reasons I can conclude that the job separation within the same industry due to bankruptcy or company close downs may function as a label for higher average ability for this group.

In contrast to other studies in the United States, the Japanese case suggests that layoffs cannot be considered as the only factor for clearly labeling low productivity. Employers, especially large companies in Japan, do not necessarily possess all the discretions for adjusting employee numbers, and often resort to other methods, such as voluntary retirement.

Appendix

Table A1
Descriptive statistics of samples for duration analysis

Variable	Mean	Std. Dev.	Min	Max
Months of unemployment	8.067	5.892	0.03	24
Reemployed at Survey Date*	0.631	0.483	0	1
female*	0.559	0.497	0	1
age 19-29*	0.397	0.489	0	1
age 30-44*	0.343	0.475	0	1
age 45-59*	0.260	0.438	0	1
previous tenure	6.525	7.620	1	40
previous tenure × age 19-29	1.351	2.210	0	12
previous tenure × age 30-44	2.016	4.148	0	29
previous tenure × age 45-59	3.158	7.918	0	40
quit*	0.454	0.498	0	1
layoff*	0.151	0.358	0	1
bankruptcy*	0.123	0.329	0	1
other reasons*	0.272	0.445	0	1
junior high and high school*	0.328	0.470	0	1
junior college*	0.150	0.357	0	1
higher vocational school*	0.161	0.367	0	1
university and graduate school*	0.361	0.480	0	1
previous permanent worker*	0.855	0.353	0	1
previous (Construction)*	0.109	0.312	0	1
previous (Manufactring)*	0.175	0.380	0	1
previous (Retaile Trade and Accomodation)*	0.162	0.369	0	1
previous (Services)*	0.190	0.392	0	1
previous (Transport and Communications)*	0.056	0.230	0	1
previous (Finance, Insurance and Real Estate)*	0.113	0.317	0	1
previous (Other Industry)*	0.195	0.396	0	1
previous (Managerial Occupation)*	0.157	0.364	0	1
previous (Administrative Support)*	0.368	0.482	0	1
previous (Sales)*	0.173	0.379	0	1
previous (Professional and Technician)*	0.086	0.280	0	1
previous (Production and Construction Laborers)*	0.074	0.261	0	1
previous (Transportation, Security and Cleaning)*	0.043	0.202	0	1
previous (Other Occupation)*	0.099	0.299	0	1
previous firm-size (-29)*	0.306	0.461	0	1
previous firm-size (30-99)*	0.193	0.395	0	1
previous firm-size (100-299)*	0.152	0.359	0	1
previous firm-size (300-999)*	0.126	0.332	0	1
previous firm-size (1000-)*	0.222	0.416	0	1
Sample Size	2,104			

Note: * denotes dummy variables, 1 if the sample falls under its category, or 0 otherwise.

Figure A2
Descriptive statistics of male samples for earnings functions

Variable	Mean	Std. Dev.	Min	Max
ln (previous earnings)	12.703	0.400	11.290	13.816
ln (present earnings)	12.547	0.356	11.290	14.260
earnings change	-0.156	0.364	-2.125	2.485
quit*	0.378	0.485	0	1
layoff*	0.209	0.407	0	1
bankruptcy*	0.190	0.392	0	1
other reasons*	0.223	0.417	0	1
previous tenure	8.922	9.483	1	39
previous tenure squared	169.375	315.807	1	1521
previous tenure × quit	2.231	4.953	0	38
previous tenure × layoff	2.614	7.200	0	39
previous tenure × bankruptcy	2.376	6.797	0	38
previous tenure × other reasons	1.700	5.166	0	37
within industry mobility*	0.550	0.498	0	1
within occupation mobility*	0.493	0.500	0	1
within industry × quit*	0.207	0.406	0	1
within industry × layoff*	0.110	0.313	0	1
within industry × bankruptcy*	0.128	0.334	0	1
within industry × other reasons*	0.105	0.307	0	1
within occupation × quit*	0.182	0.386	0	1
within occupation × layoff*	0.100	0.301	0	1
within occupation × bankruptcy*	0.112	0.315	0	1
within occupation × other reasons*	0.099	0.299	0	1
junior high and high school*	0.338	0.473	0	1
junior college*	0.148	0.356	0	1
higher vocational school*	0.046	0.210	0	1
university and graduate school*	0.467	0.499	0	1
external experience	10.295	10.442	0	40
external experience squared	214.860	321.975	0	1600
previous firm-size (-29)*	0.309	0.463	0	1
previous firm-size (30-99)*	0.231	0.422	0	1
previous firm-size (100-299)*	0.163	0.369	0	1
previous firm-size (300-999)*	0.142	0.349	0	1
previous firm-size (1000-)*	0.155	0.362	0	1
present firm-size (-29)*	0.352	0.478	0	1
present firm-size (30-99)*	0.211	0.408	0	1
present firm-size (100-299)*	0.196	0.397	0	1
present firm-size (300-999)*	0.116	0.321	0	1
present firm-size (1000-)*	0.124	0.330	0	1
previous permanent*	0.915	0.278	0	1
present permanent*	0.788	0.409	0	1
previous (Construction)*	0.129	0.336	0	1
previous (Manufactring)*	0.223	0.417	0	1
previous (Retaile Trade and Accomodation)*	0.203	0.402	0	1
previous (Services)*	0.171	0.377	0	1
previous (Transport and Communications)*	0.086	0.281	0	1
previous (Finance, Insurance and Real Estate)*	0.072	0.258	0	1
previous (Other Industry)*	0.116	0.321	0	1
present (Construction)*	0.113	0.317	0	1
present (Manufactring)*	0.190	0.392	0	1
present (Retaile Trade and Accomodation)*	0.131	0.337	0	1
present (Services)*	0.225	0.418	0	1
present (Transport and Communications)*	0.096	0.294	0	1
present (Finance, Insurance and Real Estate)*	0.054	0.227	0	1
present (Other Industry)*	0.191	0.394	0	1
previous (Managerial Occupation)*	0.282	0.450	0	1
previous (Administrative Support)*	0.105	0.307	0	1
previous (Sales)*	0.211	0.408	0	1
previous (Professional and Technician)*	0.093	0.290	0	1
previous (Production and Construction Laborers)*	0.137	0.344	0	1
previous (Transportation, Security and Cleaning)*	0.093	0.290	0	1
previous (Other Occupation)*	0.080	0.271	0	1
present (Managerial Occupation)*	0.159	0.366	0	1
present (Administrative Support)*	0.116	0.321	0	1
present (Sales)*	0.199	0.400	0	1
present (Professional and Technician)*	0.091	0.288	0	1
present (Production and Construction Laborers)*	0.132	0.339	0	1
present (Transportation, Security and Cleaning)*	0.204	0.403	0	1
present (Other Occupation)*	0.097	0.297	0	1
Sample Size	627			

Note: * denotes dummy variables, 1 if the sample falls under its category, or 0 otherwise.

Figure A3
Descriptive statistics of female samples for earnings functions

Variable	Mean	Std. Dev.	Min	Max
ln (previous earnings)	12.264	0.326	11.156	14.431
ln (present earnings)	12.099	0.412	9.210	14.457
earnings change	-0.165	0.432	-2.773	3.135
quit*	0.505	0.500	0	1
layoff*	0.097	0.296	0	1
bankruptcy*	0.097	0.296	0	1
other reasons*	0.301	0.459	0	1
previous tenure	4.243	3.958	1	36
previous tenure squared	33.641	91.821	1	1296
previous tenure × quit	2.029	3.148	0	29
previous tenure × layoff	0.425	2.103	0	35
previous tenure × bankruptcy	0.494	1.871	0	15
previous tenure × other reasons	1.295	3.103	0	36
within industry mobility*	0.408	0.492	0	1
within occupation mobility*	0.502	0.500	0	1
within industry × quit*	0.193	0.395	0	1
within industry × layoff*	0.044	0.206	0	1
within industry × bankruptcy*	0.049	0.215	0	1
within industry × other reasons*	0.123	0.328	0	1
within occupation × quit*	0.247	0.431	0	1
within occupation × layoff*	0.051	0.221	0	1
within occupation × bankruptcy*	0.054	0.227	0	1
within occupation × other reasons*	0.150	0.357	0	1
junior high and high school*	0.305	0.461	0	1
junior college*	0.161	0.368	0	1
higher vocational school*	0.255	0.436	0	1
university and graduate school*	0.278	0.448	0	1
external experience	7.636	9.305	0	36
external experience squared	144.766	255.944	0	1296
previous firm-size (-29)*	0.302	0.460	0	1
previous firm-size (30-99)*	0.187	0.390	0	1
previous firm-size (100-299)*	0.153	0.360	0	1
previous firm-size (300-999)*	0.113	0.316	0	1
previous firm-size (1000-)*	0.245	0.431	0	1
present firm-size (-29)*	0.381	0.486	0	1
present firm-size (30-99)*	0.204	0.403	0	1
present firm-size (100-299)*	0.146	0.353	0	1
present firm-size (300-999)*	0.081	0.274	0	1
present firm-size (1000-)*	0.188	0.391	0	1
previous permanent*	0.809	0.393	0	1
present permanent*	0.553	0.497	0	1
previous (Construction)*	0.090	0.286	0	1
previous (Manufactring)*	0.147	0.354	0	1
previous (Retaile Trade and Accomodation)*	0.144	0.351	0	1
previous (Services)*	0.207	0.405	0	1
previous (Transport and Communications)*	0.040	0.196	0	1
previous (Finance, Insurance and Real Estate)*	0.127	0.333	0	1
previous (Other Industry)*	0.245	0.431	0	1
present (Construction)*	0.070	0.255	0	1
present (Manufactring)*	0.097	0.296	0	1
present (Retaile Trade and Accomodation)*	0.126	0.332	0	1
present (Services)*	0.185	0.389	0	1
present (Transport and Communications)*	0.058	0.235	0	1
present (Finance, Insurance and Real Estate)*	0.097	0.296	0	1
present (Other Industry)*	0.367	0.482	0	1
previous (Managerial Occupation)*	0.068	0.253	0	1
previous (Administrative Support)*	0.549	0.498	0	1
previous (Sales)*	0.150	0.357	0	1
previous (Professional and Technician)*	0.080	0.271	0	1
previous (Production and Construction Laborers)*	0.026	0.158	0	1
previous (Transportation, Security and Cleaning)*	0.004	0.065	0	1
previous (Other Occupation)*	0.123	0.328	0	1
present (Managerial Occupation)*	0.054	0.227	0	1
present (Administrative Support)*	0.592	0.492	0	1
present (Sales)*	0.098	0.298	0	1
present (Professional and Technician)*	0.068	0.253	0	1
present (Production and Construction Laborers)*	0.021	0.145	0	1
present (Transportation, Security and Cleaning)*	0.013	0.113	0	1
present (Other Occupation)*	0.153	0.360	0	1
Sample Size	701			

Note: * denotes dummy variables, 1 if the sample falls under its category, or 0 otherwise.

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Notes

[1] Latest monthly unemployment rate (seasonally adjusted) is 5.2% in Nov. 2003.

[2] It is possible to grasp the annual flow of those who left the job by reasons for job separation through *The Survey on Employment Trend* published by the Ministry of Health, Labour and Welfare. The report, however, focuses its analysis on the level of the current PES offices, and thus does not account for the increasing unemployment due to bankruptcy or close down of own business.

[3] Bartel and Borjas (1978) examined the relations between reasons for job separation and wage change in the United States, and observed a significant positive effect in the wage growth among those who quit jobs compared to job stayer. Its effect, however, is limited to young men, and mature men who quit the job tend to show either negative or zero effect on wage growth.

[4] In this study I look at the number of days that the job seeker spent for job search activity, not the duration of unemployment. For those who found reemployment, the time spent for their job search is thus considered to be the duration of unemployment. Strictly speaking, it is more desirable to add the time while the unemployed person was not in the labor force. Nevertheless, the sample bias is weakened by limiting the sample to those who left the job within two years, and by excluding older workers, more

than 60 years old, whose intensity of job search activity is considered to be lower.

[5] See Keifer (1988) for the specification of the Proportional Hazard Function model.

[6] Descriptive statistics of the male samples for earnings equation are presented in tableA2, and those of the female samples are presented in tableA3.