

The Union Wage Effect in Japan

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Abstract

Previous studies point to Japanese labor unions' lack of bargaining power that results from their organization at an enterprise level. However, a detailed examination of the institutional setting backed by the Labor Standard Law and Trade Union Law reveals that unions have strong bargaining power against deteriorating work conditions. This paper examines the effect of unions on wages using the Japan General Social Surveys 2000-2003, which cover a period of economic stagnation. We find a robust union-wage premium for both males and females. A Cotton-Neumark decomposition reveals that about one fifth of union workers' higher wage is explained by the difference in the union and non-union wage structures. We also can confirm the union-wage compression effect using the DiNardo, Fortin, and Lemieux (1996) method. Union workers are likely to think that they will not find jobs with similar compensation packages if they leave their current jobs. In sum, unions in Japan contribute to an increase in the average wage and compress the wage distribution among their workers. This result is reconciled with previous findings by considering the uniqueness of the macro-economic conditions of the sample period.

Key Words: Labor Union, Wage, Compensation Package, Job Security, Japan

JEL Classification Code: J31, J33, J51

1. Introduction

Union density has declined steadily for the last 25 years in Japan; the estimated union density was 30.8% in 1980 and decreased to 18.1 % in 2007. This figure has sparked a hot debate within the general public on the role of labor unions. Some critics argue that the role of trade unionism has ended in a time of global competition and that a decline in union density is a sign that the role of labor unionism as it has been known has ended (The Daily Yomiuri(2006)). Opposing this popular opinion, union leaders claim that unions still play a significant role in improving the welfare of the working class.

Despite the vast public interest in the role of unions, surprisingly little is known about whether labor unions contribute to an increase in their members' wage level or job security. This is mainly because of a lack of micro data that record each worker's union status, as is generated by the Current Population Surveys in the United States.

Several exceptional studies have examined this issue. Kalleberg and Lincoln (1988) and Tsuru and Rebitzer (1995) both found a negligible union wage premium for a sample from the late 1980s and early 1990s based on their original surveys. Tachibanaki and Noda (2000) examined whether unionized firms pay more to typical workers than non-unionized firms. They did not find a union wage premium using data from the early 1990s. Brunello (1992) even found that unionized firms paid a lower average wage than non-unionized firms in the late 1980s.

In contrast, Noda (2005) found a positive wage premium in the early 2000s and pointed to the possibility that unions resisted nominal wage cuts when such cuts were common during the late 1990s and early 2000s. Blanchflower and Bryson (2002) also found a union wage premium using data from the International Social Survey Program

(ISSP) for the years 1994-96, 1998, and 1999. In a recent work, Nitta and Shinozaki (2008) also found a union wage premium using the Japanese General Social Surveys 2000-2003.

The results for the union wage premium might have differed among studies because of small sample sizes and differences in sampling methods and sample periods. There seems to be no consensus on the size of the union wage premium in Japan. Several studies have estimated a zero union premium, but this is rather puzzling, considering the robust and large union wage premiums in the US and Europe (Blanchflower and Bryson (2004)). The zero union premium also contradicts direct evidence that unions succeed in gaining wage increases as a result of wage bargaining (Fuess (2001)). It is also notable that studies that have covered the late 1990s, which was a recession period, as the sample period have tended to obtain a positive union wage premium, while those studies that covered the 1980s and early 1990s, which was a booming period, tended not to estimate a positive premium.

The purpose of this study is to examine the effect of labor unions on the wage structure, exploiting newly available, individual-based micro data that records workers' union status from the Japanese General Social Surveys (JGSS) 2000-2003. In addition, this study examines how union status affects workers' subjective probability of obtaining a similar compensation package once workers leave their current jobs. We also offer an explanation for the asymmetric union wage premium during the booming and recession periods based on an institutional constraint imposed by Japanese labor law.

This paper's contribution to the literature is three-fold. First, we examine the effect of union status on the wage structure, using nationally representative survey data.

Second, the JGSS includes a question to capture workers' perceptions of how much they enjoy the relation-specific rent from their current jobs. Third, we explain why union bargaining power varies over the business cycle in the Japanese institution of labor relations.

Our research strategy is quite simple. Hourly rate of pay or worker's subjective probability of obtaining a similar compensation package once workers leave their current job is regressed upon a union status dummy variable and other demographic covariates. Japan does not experience the fundamental institutional change that affects the unionization rate independent of wage determination. Without having a credible instrumental variable that affects union status, but is independent from wage determination, we rely on an OLS estimation, as Lewis (1986) eventually recommended after reviewing many articles. Thus, we should note that the union wage premium reported in this study is an upper bound of the causal effect of union status on wage because omitted variables in the wage equation are likely to have a positive correlation with union status (Lewis (1986)). In addition to the straight estimation of the union wage premium, we also analyze the effect of union status on the entire wage distribution by employing the Cotton-Neumark decomposition and DiNardo et al. (1996). Workers' subjective perceptions of relation-specific rent is similarly regressed upon the union status and demographic covariates.

We found about a 17-percentage-point union wage gap in the OLS regression after controlling for the detailed demographic covariates and a 7-percentage-point after controlling for industry/occupation and firm-size dummy variables. According to the Cotton-Neumark decomposition, of the 30-percentage-point, raw-wage differential between union and non-union workers, about 25-percentage-points are attributable to a

difference in mean endowments, and the other 5-percentage-points are attributable to the difference in wage structure. Unions compress the wage structure mainly by reducing the return to tenure. DiNardo et al. (1996)'s procedure indicates that if the wage determination mechanism is that of union workers, then the non-union workers' wage distribution would be more equal than their actual wage distribution.

When speculating about leaving their current jobs, union workers are more likely than non-union workers to feel that they will not obtain an equivalent compensation package in their next jobs. This perception is consistent with the hypothesis that union workers are more likely to enjoy the relation-specific rent with their employers, given that union workers' perceptions reflect the facts.

The organization of the paper is as follows. Section 2 briefly overviews the mechanism by which union activity results in a union premium in the Japanese institutional setting and the macroeconomic background of the sample period. This section also explains why unions may have stronger bargaining power in a recession than in a boom. Section 3 introduces the empirical strategy. Section 4 explains the data, and section 5 lays out the results of the wage estimations. Section 6 explains the results of the regression of the perceived rent of jobs on union status. Section 7 attempts to reconcile our results with those of previous studies, and the last section concludes.

2. Labor Unions in Japan and Macroeconomic Conditions of the Early 2000s

This section provides a brief overview of labor relations and trade unions in Japan to see how unions could potentially affect work conditions.*1 In addition, we

overview the macroeconomic conditions of the early 2000s. As we mentioned above, Japan's union density was 18.1 % in 2007, and varied by employer size. The union participation rate of companies with more than 1,000 employees was 57.6%, whereas that of companies with less than 99 employees was only about 4%.*2

The organizational structure of Japan's labor unions is overwhelmingly dominated by enterprise-based unions, which are organized at each company. Each union comprises a mix of regular and permanent employees, without any distinction between white-collar and blue-collar workers. Craft unions and industry trade unions also exist, but more than 90% of unions are enterprise-based unions. Furthermore, about 65% of labor unions in Japan are located in union shops or closed shops (Ministry of Health, Labour and Welfare (2003)). In other words, a significant portion of union workers becomes members of unions automatically when they begin to work for a company and do not join unions on their own initiative.*3

Bargaining is mainly conducted between enterprise-based unions and companies, and unions negotiate all working conditions, such as annual wage increases, lump-sum benefits, job security, working hours, and fringe benefits. Enterprise-based unions may not have strong bargaining power because their wage gain results in lower profits for employers. These lower profits may prohibit employers from raising capital and limit the growth of firms such that it hurts workers in the long run. This potentially adverse effect is severe for workers in Japan, who tend to have long-term relationships with their employers.*4 The lack of bargaining power resulting from enterprise-based unionism may be the reason why previous studies in Japan did not find a significant union wage premium (Tsuru and Rebitzer (1995) and Kalleberg and Lincoln (1988)).

To compensate for weak bargaining power, individual unions join together to

form industry-level trade unions and national centers (a typical example is the Japanese Trade Union Confederation, *Rengo*). In addition, in 1955 union leaders devised a unique wage negotiation system called the Spring Wage Offensive (*Shunto*). The Spring Wage Offensive is a united campaign, mainly for higher wages, launched each spring by each industrial trade union. There are two main objectives behind the establishment of the Spring Wage Offensive: (1) to compensate for the enterprise-based unions' lack of bargaining power as individual entities and (2) to distribute wage increases proportionately across companies and industries through simultaneous wage negotiations. That is, the wage increase rate set by the top firm in a major industry (i.e., the pattern setter) is taken as the standard. The influence on wage increases spreads to the other large companies in the concerned industry, followed by large firms in other industries, and to medium- and small-scale companies. Finally it spreads to the non-union sector (Sako (1997)). Similar spillover is observed across industries. Pattern-setting industries, such as the steel industry, determine wages through negotiation, and this wage settlement affects the wage setting of other industries (Tsuru (1992)). Due to these spillover effects, the causal effect of unionism on wage level may have been hidden and resulted in the absence of a union wage gap in previous studies.

However, several studies confirm that union wage contracts extend for a longer period than non-union wage contracts and this make the nominal wage more rigid, and accordingly, the union wage premium tends to be larger during recessions than during economic booms (Moore and Raisian (1980), Hendricks (1981), Pencavel and Hartsog (1984), and Wunnava and Honey (1991)). Noda (2005) argues for the same possibility in the recent Japanese context. This counter-cyclical union wage premium may be reinforced by the Japanese labor law setting. Japanese labor law mandates that any

employer who continuously employs ten or more workers must draw up work rules (*Shugyo Kisoku*), including the methods of deciding upon, computing, and paying wages. The work rules apply to all workers in both unionized and non-unionized firms. However, there is a big difference between them when an employer modifies work rules unfavorably to workers, such as a wage cut. When there is no union, the precedents allow employers to change the work rules without workers' consent if the change is "rational." In contrast, in the case of unionized firms, the employers must conclude collective agreements (*Roudou Kyoyaku*) with the labor unions to modify the contract (Sugeno (2004)).*5 In sum, unionized firms pay a lot more to modify work rules than non-unionized firms in Japan. This legal institution makes unionized and non-unionized firms asymmetric when a wage cut is negotiated. Thus we expect a larger union wage premium in the period of deflation, when the nominal wage tend to fall.

As for the macroeconomic conditions of the sample period, Figure 1 reports the time series of indexes of price change: the consumer price index, the whole-sale price index, and the GDP deflator. All the indicators tell us that the analysis period, which is 2000-2003, was a period of nominal deflation. With this macroeconomics backdrop, we expect to observe a larger union wage premium than in a usual period.

3. Empirical Strategy

3.1. Regression and the Cotton-Neumark Decomposition

We estimate the union wage gap by estimating the following equation that allows for different coefficients for the sexes:

$$\log(wage)_i = \alpha_1 union_i + x_i \beta_1 + \alpha_2 union_i \times female_i + female_i \times x_i \beta_2 + e_i, \quad (1)$$

where i is the index for workers and $wage$ is hourly wage. This variable is constructed from annual earnings divided by the annual hours of work.*6 As for explanatory variables, $union$ is the union status dummy variable that takes one if the respondent i is a union member, x is the vector of the explanatory variables that includes the constant, years of education,*7 actual job experience, its square, job tenure, its square, the dummy variable that takes one if married, and the dummy variables corresponding to the number of children.

Under the exogeneity assumption, $E[e_i | union_i, female_i, x_i] = 0$, the OLS estimator is an unbiased estimator. We allow for the heteroskedasticity in e_i , and the standard errors are adjusted for the presence of this heteroskedasticity. The parameter α_1 corresponds to the union wage premium among males, and $\alpha_1 + \alpha_2$ corresponds to the premium for females.

This specification does not allow for the effect of unionism on the return to workers' characteristics. However, Freeman (1980) pointed out that labor unions tend to seek standardized wage payments based on workers' objective characteristics, such as educational background, occupational classification, and seniority to maintain solidarity among union members. Based on US data, he found that labor unions compress the wage distribution. Lewis (1986) and Booth (1995) reviewed papers on the union wage compression effect and concluded that labor unions tend to compress the wage structure by lowering the returns to education, job tenure, etc. An interview conducted in October 2007 by one of the authors with a union leader in Japan also confirms that unions tend to ask employers to standardize the pay scheme.

To allow for the difference in the wage structures for the union and non-union

sectors, we estimate (1) for union and non-union workers separately, as follows:

$$\ln(\text{wage})_i = z_i[\text{union}_i\gamma^{\text{union}} + (1-\text{union}_i)\gamma^{\text{non-union}}] + e_i, \quad (2)$$

where $z_i = [x_i, \text{female}_i \times x_i]$. We assume $E(e_i | z_i, \text{union}_i) = 0$ and from the law of iterated expectation, $E(e_i | \text{union}_i) = E(E(e_i | z_i, \text{union}_i) | \text{union}_i) = 0$.

Using different coefficients for each sector, we can decompose the difference in the means of the log wage for union and non-union workers by the Cotton-Neumark decomposition:

$$\begin{aligned} & E[\ln(\text{wage}) | \text{union} = 1] - E[\ln(\text{wage}) | \text{union} = 0] \\ &= E[z | \text{union} = 1]\gamma^{\text{union}} - E[z | \text{union} = 0]\gamma^{\text{non-union}} \\ &= (E[z | \text{union} = 1] - E[z | \text{union} = 0])\gamma^{\text{pooled}} \\ &+ E[z | \text{union} = 1](\gamma^{\text{union}} - \gamma^{\text{pooled}}) \\ &+ E[z | \text{union} = 0](\gamma^{\text{pooled}} - \gamma^{\text{non-union}}). \end{aligned} \quad (3)$$

The first term of the decomposition corresponds to the wage differential resulting from the difference in the endowments. The second term of the decomposition corresponds to the "advantage" of union workers caused by the wage determination mechanism evaluated at the mean characteristics of union workers. The last term of the decomposition corresponds to the "disadvantage" of being a non-union member evaluated at the mean characteristics of non-union members.

3.2. DiNardo et al. (1996) Decomposition

The discussion thus far has focused on the union effect on the means of the wage distribution. We may overlook the complex effect of unionism on the wage distribution just by looking at the means. For example, if the existence of unions compresses the residual wage distribution, we cannot detect this effect just by looking at the

distribution's means. Thus, we attempt to examine the effect of unions on the whole wage distribution using the method proposed by DiNardo et al. (1996).

First, the wage distribution of non-union workers is given as

$$f^{nu}(y) \equiv \int f^{nu}(y|z)h(z|nu)dz, \quad (4)$$

where $f^{nu}(y|z)$ is the wage determination mechanism in the non-union sector that maps human capital z to the distribution of the log (wage), which is denoted as y . The variable nu corresponds to the non-union sector, and u corresponds to the union sector.

The wage distribution of union workers is given as

$$f^u(y) \equiv \int f^u(y|z)h(z|u)dz. \quad (5)$$

We then ask what the wage distribution of non-union workers would be if the wage structure were that of union workers, while keeping the distribution of z identical to its distribution of non-union workers. This counterfactual distribution is given as:

$$f_{nu}^u(y) \equiv \int f^u(y|z)h(z|nu)dz. \quad (6)$$

The above counterfactual distribution is theoretically possible to calculate if we estimate the joint density $h(z|nu)$, but it is difficult because the vector z in our application is high dimensional.

Then the trick of DiNardo et al. (1996) is to replace $f^u(y|z)h(z|nu)$ with $f^u(y|z)h(z|u)$ with some reweighing. The $f^u(y|z)h(z|u)$ is simply the distribution of $\ln(wage)$ among union workers, and it is easily estimated with the

kernel-density estimation. The transformation is

$$\begin{aligned} f_{nu}^u(y) &\equiv \int f^u(y|z)h(z|nu)dz \\ &= \int \theta^u(y|z)h(z|u)dz, \end{aligned} \tag{7}$$

where $\theta \equiv \frac{h(z|nu)}{h(z|u)} \frac{P(u)}{P(nu)}$. Notice that $h(z|nu) = \frac{h(nu, z)}{P(nu)} = \frac{P(nu|z)h(z)}{P(nu)}$ from the

Beyes rule. Similarly, $h(z|u) = \frac{P(u|z)h(z)}{P(u)}$. Thus $\theta = \frac{P(nu|z)}{P(u|z)} \frac{P(u)}{P(nu)}$. Note that

$P(u|z)$ is the propensity score to be in the union sector given z , and $P(nu|z)$ is the propensity score to be in the non-union sector given z .

This counterfactual distribution is estimated by estimating the wage distribution of union workers by the kernel density estimation using re-weighting.

4. Data

We use repeated, cross-sectional data from the Japanese General Social Surveys (JGSS) conducted in 2000, 2001, 2002, and 2003.*8 The JGSS is designed to be the Japanese counterpart to the General Social Surveys of the US. Each cross-section includes about 3,000 individuals that are representative of all men and women between the ages of 20 and 89. The surveys adopt a two-step, stratified sampling method and were conducted during October and November of each survey year. This survey asks standard questions regarding labor force status, working conditions, and family structure through face-to-face interviews.

The original pooled sample includes 12,299 observations. We drop those ages 61 and above, as well as those not working, those self-employed, and those employed as public officers. We restrict the analysis sample to permanent and regular workers (*Joyo*

Ippan Rodosha) whose positions are at the ranking of section chief or below (*Kacho*).*9 The Japanese Trade Union Law does not admit the union membership of persons who represent the employers' interests. However, those do not coincide with most management position workers.*10 In practice, more than half of the section chiefs are union members in Japan (Hisamoto (1994)).*11 Therefore we construct our analysis sample including the section chiefs and positions below them.*12 The resulting sample size is reduced to 2,864. Among these observations, we drop the observations with missing values for wage and for the explanatory variables in the wage regression. The final sample size is 2,211.

The union status variable is constructed from the question asking, "Do you belong to a labor union?" The respondents are asked to choose one from the following three options: 1. I am a member of a labor union at my workplace, 2. I am a member of a labor union outside of my workplace, 3. I am not a member of any labor union. Those who answered 1. are coded as union members in this study.*13

The hourly wage is constructed from the previous year's annual labor income and the number of usual working hours, including overtime. Respondents are asked their annual income during the previous year in the following question. "What was the annual income from your main job during the last one year? Please state the amount before taxes and other deductions." The annual income is asked in ranges. The central value of each range is used to transform annual income into a continuous variable. Annual hours of work are calculated by multiplying the usual working hours per week by 52. This calculation of hourly wage is potentially erroneous, but it is the only way to calculate the hourly wage in a consistent way for the entire sample period.*14 In addition, this measurement is preferable because the numerator includes the bonus

payment that unions often negotiate.

The descriptive statistics of the analysis sample by union status are tabulated in Table 1, Panel A. Of the 2,211 respondents, 776 are union members and 1,435 are non-union workers. The union participation rate is about 35%, which is much higher than the national figure. This is not surprising because the sample dropped those age 61 or over, as well as part-time workers and workers in the position of department chief (*Bucho*) or above.

The average hourly wage of union workers is about 32% higher than the average of non-union workers. Union and non-union workers are about the same age at the mean. Union workers are more likely to be male, and tend to be more educated and have longer tenures. Union workers have fewer years of potential job experience because they are about the same age as non-union workers, but have more years of education. Union and non-union workers are similar in terms of marital status and number of children. Union workers are less likely to feel that it would be easy to find a comparable job in terms of its compensation package.

5. Results

5.1. Basic Wage Regression Results

Table 2 reports the results of the OLS regressions of the log wage on union status, along with other control variables. The simplest regression result reported in Column 1 indicates that union workers earn about 30% more than non-union workers.

After controlling for human capital and demographic variables, the union wage premium shrinks to 17%, as reported in Column 2. This result is consistent with the

findings in Table 1, Panel A, which indicate that union workers tend to have characteristics that result in higher wages. Adding industry/occupation/firm size/prefecture/city size category dummy variables further reduces the estimated union premium to 7%, as reported in Column 3. This result indicates that unions are likely to be formed in high-wage industries/occupations/regions and larger firms. The coefficient for the interaction term of female and the union dummy variables is zero. Thus there is no difference in union wage premiums by gender.

The coefficients for the other explanatory variables are standard. According to the specification without industry/occupation/firm size/prefecture/city size category dummy variables (Column 2), there is a 6% return to education for males and a 10% return to education for females. The return to education for males is lower than the standard results found in Japanese studies, but this is most likely because managerial workers are not included in our analysis sample. Concave wage - experience/tenure profiles are estimated for both genders.

Married men earn more than unmarried men, while married women earn less than unmarried women. Women with children earn less than women without children. These findings are consistent with the predictions of the theory of household production, which holds that married men put more effort into market production, while married women put more effort into household production (Becker (1985)). The marriage premium for men also is explained by the institution of wage payment in many Japanese firms, which tends to compensate men for having dependent family members.

5.2. The Cotton-Neumark Decomposition

Table 2, Columns 4 and 5 report the results of the separate wage regressions

with demographic control variables for union and non-union workers. Columns 6 and 7 report the separate regression results with industry/occupation/firm size/prefecture/city size category dummy variables. The returns to education are smaller for both sexes in the union sector. This result could be interpreted as evidence for the union wage compression effect. However, heterogeneous selection into union jobs also can account for this finding if more-educated workers with low, unobserved ability and less-educated workers with high, unobserved ability are both likely to be union workers. This type of selection could occur when unionism has a causal effect on compressing the returns to education. Thus the OLS estimate may overstate the union wage compression effect regarding the returns to education.

The returns to potential experience are similar for both sectors. However, the return to tenure is larger in the non-union sector than in the union sector for males, when neglecting the quadratic term. This finding can causally be interpreted as the union wage compression effect. At the same time, union workers have, on average, longer job tenure (Table 1, Panel A) and a lower return to tenure. If unions protect the employment of the low-quality worker-job match, then the positive correlation between job-match quality and job tenure (Jovanovic (1979)) may be weaker among union workers. The causal interpretation of this result is rather difficult.

It is also worth pointing out that unions reduce both the marriage premium for males and the marriage penalty for females. Unions may neutralize the advantage of being free from household duties for males and the disadvantage of being burdened with household duties for females. Also, women with children are less penalized in the union sector.

As reported at the bottom of Table 2 Columns 6 and 7, the wage differential

between union and non-union workers is about 30%. This wage differential is decomposed using the Cotton-Neumark decomposition technique into the following three parts: 25% of the difference comes from the difference in the average endowment, 3% is explained by the advantage of the union wage structure compared with the pooled wage structure evaluated at the sample mean of the union workers, and 1% is explained by the disadvantage of the non-union wage structure compared with pooled wage structure evaluated at the sample mean of the non-union workers.

5.3. Wage Compression Effect

As Freeman (1980) suggested, labor unions tend to avoid wage dispersion to maintain solidarity among union members. To examine this union wage compression effect, we first compare the standard deviation of the wage distribution for the union and non-union sectors for each industry. Table 1 Panel B reports the standard deviation of the wage distribution by industry, and the figures for many industries indicate that the union sector has a lower standard deviation than the non-union sector, although the union sector tends to have a higher mean log wage. This is rough evidence for the union wage compression effect.

In addition, the non-parametric analysis of the wage distribution by union status is implemented. The log wage distribution of union and non-union workers for the pooled sample appears in Figure 2. The figure clearly shows that the wage distribution of union workers is located to the right of the wage distribution of non-union workers. This shift in location reflects the union wage premium without controlling for the explanatory variables.

The counterfactual wage distribution is the wage distribution of non-union

workers that would occur if the union-sector wage determination were to prevail in the non-union sector. The location difference of the counterfactual and actual-wage distributions of non-union workers reflects the union-wage premium adjusted for the detailed explanatory variables.

A comparison of the counterfactual and actual union wage distribution indicates that union workers have a higher skill distribution than non-union workers, but the gap is not large for high-skilled workers. In addition, the counterfactual distribution is more centered around its mode than the actual non-union wage distribution.

A comparison of the actual wage distributions of union and non-union workers indicates that the slope of the distribution's upper tail is steeper among union workers. A natural question to raise is whether this difference comes from a difference in the underlying distributions of workers' characteristics or the difference in the wage determination mechanisms between sectors.

It is notable that the slopes of the right tail of the counterfactual distribution of non-union workers and the actual distribution of union workers are close. Thus, the steeper right-tail wage distribution of union workers is caused by the wage determination mechanism in the union sector. This implies that the union wage determination mechanism does not benefit high-skill workers who earn 3,000 yen per hour ($\approx \exp(8) \approx \text{US\$30}$).

The findings from the DFL decomposition are consistent with the union wage compression hypothesis. However, we must recognize that the correlation between observed skill and unobserved skill is assumed to be identical across union and non-union sectors.

5.4. Rent Accrued to Union Workers

The JGSS includes a unique question that presumably captures whether respondents enjoy compensation packages above the ongoing market level. The question asks, "If you lose your (current) job, about how easy would it be for you to find a (new) job with another employer with approximately the same income and fringe benefits you now have?" Those who answer "easy" for this question are presumably receiving a compensation package at a level that is traded in a perfectly competitive labor market. In contrast, those who answer "not easy" enjoy some rent above the market level. This rent is perhaps created from the relation-specific productivity between workers and employers or from imperfect competition in the product market. Unions' collective bargaining may be considered to help workers obtain a larger proportion of the relation-specific rent.

Table 3 indicates that union workers are about 10 percentage points less likely to feel that it is easy to find a job comparable to their current job in terms of compensation package. This clearly shows that union workers perceive that they enjoy rent above the compensation package offered in a perfectly competitive labor market. In addition, the result in Column 3 suggests that the union effect is virtually identical even after conditioning on the log wage. Taking workers' perceptions seriously, this implies that unions increase the level of non-wage fringe benefits.

The efficiency implication for the existence of rent in the union sector is not straightforward. Whether the rent created by union activity reduces the worker's shirking in the context of the efficiency wage literature (e.g. Shapiro and Stiglitz (1984)) is not clear because the union also may reduce the firing probability. The lower firing probability reduces the discipline device aspect of the rent-ridden wage. However,

this relation-specific rent may reduce labor mobility across sectors and result in a difference in the marginal labor productivity across sectors, as is claimed in the literature on "job lock" (e.g. Kapur (1998)).

6. Discussion

Our results that confirm the union and non-union gap for wage and non-wage job aspects contradict the findings from most of the previous studies for Japan (Brunello (1992), Tachibanaki and Noda (2000) and Tsuru and Rebitzer (1995)). Previous studies have tended to point to the weaknesses of enterprise-based unionism. Our results might differ from those of previous studies because of differences in the sample period, the sampling method, the sample geographic coverage, or the sample size.

Tsuru and Rebitzer (1995) used individual survey data collected through interviews with respondents within a 30km radius of Tokyo station. To address the possibility that the difference in the results between their study and ours is a result of regional coverage, we restrict our data to the sample taken from the following four prefectures that are generally considered to form the Tokyo metropolitan area: Tokyo, Kanagawa, Saitama, and Chiba. The estimated union coefficient is 0.11, with a standard error of 0.06 without industry/occupation/firm size/prefecture/city size dummy variables, and -0.04 with a standard error of 0.07 with these dummy variables. The regression result with dummy variables implies that the difference in the regional sample restriction may be another cause for the discrepancy between Tsuru and Rebitzer (1995)'s and our results.

Another possible reason for the discrepancy between our current results and those of previous studies may be the difference in the sample structure. Studies such as

Brunello (1992) and Tachibanaki and Noda (2000) used firm-level data and examined the difference in the average wages between unionized and non-unionized firms. If a union wage gap emerges in unionized firms between union and non-union workers, and the average wage of unionized firms is equivalent to that of non-unionized firms, we find a union wage gap in the individual-level sample, but not in the firm-level sample. This explanation, however, is not very plausible in the Japanese context because many enterprise unions are on popular union shop clauses.

The last explanation is based on the sample selection. If the union coefficient in the wage regression is heterogeneous across firms, then the OLS estimator estimates the average union wage gap. The union density in Japan declined from 25.2% in 1990 to 19.6% in 2003, according to the Basic Survey on Labor Unions by the Ministry of Health, Labour and Welfare. If this decline in union density occurred in conjunction with the survival of unions with strong bargaining power and the disappearance of unions with weak bargaining power, then the estimated union wage gap should decline. However, the drastic difference of our estimates from those of previous studies does not seem to be reconciled by the 5-percentage-point decline in union density.

7. Conclusion

We examined the difference in the wage distribution between union and non-union workers in Japan. In addition, we also examined the difference in union and non-union workers' perceptions of the non-wage aspects of their jobs. Although there has been research in other developed countries on these topics, studies conducted in Japan have been scarce because of a lack of individual micro data that records workers' union status, as well as their earnings and work hours.

The newly available, individual-level micro data set, from the Japan General Social Surveys, enables us to examine the union effect on the wage distribution and the workers' subjective perceptions of the relation-specific rent. Contrary to empirical findings based on firm-level surveys or relatively small-scale individual surveys, we robustly find that union workers enjoy higher wages on average. In addition, a Cotton-Neumark decomposition and a DiNardo et al. (1996) decomposition indicate that workers in union sectors have less wage dispersion than workers in non-union sectors. These findings are consistent with findings from the US and the UK.

In addition to the significant difference in the wage structure between union and non-union sectors, we find that union workers are more likely than non-union workers to feel that it would be difficult to find new jobs that offer compensation packages that would be comparable to those of their current jobs.

Combining the results for the wage structure and the perceived rent, we conclude that labor unions in Japan play a significant role in improving workers' compensation packages. In addition, the results suggest that unions may have an ability to equalize the wage distribution among their members. Although these results contradict those of previous studies in Japan, we must note that our sample period mainly covers an extraordinary period of deflation.

There are several important points that are not answered in this paper and are left for future research. First, because of the sample period limitation, we could not estimate the union wage premium during an economic boom. Since the JGSS survey is continuing and the Japanese economy is expanding, the estimation of the union wage premium based on more recent data is an interesting research topic. Second, we could not clearly identify the reason why unions increase their members' wage. Unionism

could increase the members' wage through enhancing the productivity of the workplace or simply increasing the bargaining power for rent sharing. Distinguishing these two possibilities has significant policy implications, but is left for future research.

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Notes

*1 Those interested in more details about Japanese labor relations should refer to Sako and Sato (1997).

*2 It also differed significantly across industries. It was high in electricity, gas, heat supply, and water (58.4%) and financing and insurance (51.7%), while it was low in agriculture, forestry, and fisheries (3.8%), wholesale and retail trade (9.8%), food and beverage and hotel (2.9%), and service industries (6.6%).

*3 These are especially common in electricity, gas, heat supply, and water; wholesale and retail trade; and food and beverage and hotel industries, and in large companies.

*4 Koike (1983) explains this effect as "the risk sharing model."

*5 The Labor Standard Law article 92, section 1 states the preemption of collective agreements over work rules.

*6 This variable naturally does not include the monetary value of fringe benefits, such as housing offered by the company. Because unions also can negotiate for a higher level of fringe benefits, using monetary compensation as the dependent variable may underestimate the total compensation gap between union and non-union workers. Self-reported hours of work is a noisy measure of actual hours of work, but Ogura and Sakaguchi (2004) report that self-reported hours of work from household surveys and company-reported hours of work based on payroll records co-moves with the gap of 10-12%, and they attribute a part of the gap to unpaid overtime. Ohtani (2000) claims that unions increase the overtime wage premium and reduce the hours of work. We then can infer that unions reduce unpaid overtime and increase the actual overtime wage premium. This effect is also included as a part of the union wage premium, but this does not cause a conceptual problem because this is a causal effect of unionism on the actual wage.

*7 The continuous variable of the years of education is constructed from the discrete response regarding the last school from which the respondent graduated. High school graduates are assigned 12 years, junior or technical college graduates are assigned 14 years, 4-year college graduates are assigned 16 years, and post-graduate school graduates are assigned 18 years of education. One year is subtracted for those who dropped out from the last school attended. Those who finished the last school before the schooling system reform after World War II (about 15% of the sample) also are assigned the appropriate years of education based on the old educational system.

*8 The JGSS are designed and carried out at the Institute of Regional Studies at Osaka University of Commerce in collaboration with the Institute of Social Science at the University of Tokyo under the direction of Ichiro Tanioka, Michio Nitta, Hiroki Sato, and Noriko Iwai, with Project Manager, Minae Osawa. The project was supported financially by a Gakujutsu Frontier Grant from the Japanese Ministry of Education, Culture, Sports, Science and Technology for the 1999-2003 academic years, and the datasets are compiled and distributed by the SSJ Data Archive, Information Center for Social Science Research on Japan, Institute of Social Science, the University of Tokyo.

*9 We include 1. regular employee with no managerial responsibilities, 2. group leader or foreman, 3. sub-section head (*kakaricho*) and 4. section chief (*Kacho*) in our sample. Department chief (*bucho*) and above are dropped from the sample.

*10 Those who may not become members of the union because of the Trade Union Law, Art. 2, Proviso No. 1 are: (1) "officers" (e.g., directors, comptrollers, trustees, superintendents); (2) "workers at the supervisory level having the direct authority to hire, fire, promote, or transfer workers" (i.e., high-level supervisors with authority in personnel matters); (3) "workers at the supervisory level having access to confidential information relating to the employer's labor relations plans and policies so that their official duties and obligations directly conflict with their loyalties and obligations as members of the union concerned" (e.g., supervisors of personnel-management sections); and (4) "other persons who represent the interests of the employer."

*11 Hisamoto (1994) also shows that department chiefs' union participation rate is about 1% and only 1.6% of labor unions consider them as a target of organization.

*12 The union participation rate of contingent workers is very small, only 6.75% in our sample. Thus, unions are not popular in the contingent employment sector and we drop them from the sample.

*13 About 38% of the analysis sample consists of union members. Among these union members, about 36% are members of the labor union at the workplace, and only 2% are members of a labor union outside of the work place. We excluded the members of outside labor unions from the definition of labor union status because most institutional settings of labor relations are based on company-based unions.

*14 Until 2002, workers were asked about their hourly, daily, or monthly wage depending on how often they received their payment. The correlation coefficient of two alternative log wage measures is 0.83. The results of the wage regression were essentially unchanged.

Table 1: Descriptive Statistics
Sample: 2000-2003 Pooled
Panel A: Variables Used for the Wage Distribution Analysis

	Total		Union		Non-Unio n	
	Mean	S.D.	Mean	S.D.	Mean	S.D.
Log hourly Wage	1942.41	1327.29	2249.29	1201.49	1776.47	1362.48
Age	39.88	11.15	38.54	10.68	40.60	11.34
=1 if Female	0.34	0.47	0.30	0.46	0.36	0.48
Education	13.04	2.19	13.42	2.10	12.83	2.21
Experience	20.83	11.89	19.11	11.45	21.76	12.02
Tenure	12.03	9.83	14.38	10.22	10.76	9.38
=1 Married	0.71	0.45	0.70	0.45	0.71	0.45
# of Children	1.24	1.13	1.19	1.10	1.27	1.15
Number of Observations	2211		776		1435	
<Subjective Answer>						
Easy to find comparable job	0.26		0.20		0.30	
Number of Observations	2085		740		1345	
	Percent		Percent		Percent	
<Industry>						
Agriculture, Forestry & Fishery, Mining	0.23		0.00		0.35	
Construction	9.26		4.64		11.77	
Manufacturing	29.91		37.50		25.79	
Electricity, Gas, Steam Supply, Water works	0.82		1.55		0.42	
Transportation	7.81		10.44		6.38	
Wholesale Trade, Retail Trade & Restaurants	14.34		10.05		16.68	
Financial Institutions & Real Estate Services	5.27		8.63		3.43	
	32.23		27.06		35.04	
Industries not elsewhere classified	0.14		0.13		0.14	
<Firm size>						
1-29	27.36		6.96		38.40	
30-299	23.56		47.81		10.45	
300-999	34.10		24.10		39.51	
1000-	14.97		21.13		11.64	
<Occupation>						
Professional and Engineer	6.15		8.12		5.09	
Managerial	5.74		5.54		5.85	
Clerical	3.57		5.03		2.79	
Sales	2.80		1.80		3.34	
Service	29.22		29.38		29.13	
Security	3.89		3.61		4.04	
Agricultural, Forestry, Fishery	11.90		10.70		12.54	
Transportation and Telecommunication	0.14		0.00		0.21	
Production	5.97		6.96		5.44	
Unclassified	30.62		28.87		31.57	

Note: "Easy to find comparable job" dummy variable is constructed from the question asking, "If you lose your (current) job, about how easy would it be for you to find a (new) job with another employer with approximately the same income and fringe benefits you now have?" A dummy variable is set equal to 1 if respondents chose "Very easy" or "Somewhat easy" and to 0 if they chose "Not easy."

Table 1 Panel B Wage Distribution by Industry

<Industry>	Total		Union		Non-Union	
	Mean	SD	Mean	SD	Mean	SD
Agriculture, Forestry & Fishery, Mining	1618.76	1013.44	-	-	1618.76	1013.44
Construction	1805.19	1132.96	2053.06	1114.90	1752.08	1133.01
Manufacturing	1996.46	1137.01	2407.93	1205.52	1671.09	963.89
Electricity, Gas, Steam Supply, Water Works	2773.31	1377.60	3182.55	1006.29	1954.81	1737.47
Transportation	1856.27	988.59	2008.12	949.34	1721.10	1008.25
Wholesale Trade, Retail Trade & Restaurants	1642.42	832.21	1831.27	779.22	1580.53	841.23
Financial Institutions & Real Estate Services	2076.58	1191.01	2143.41	1076.53	1985.20	1337.99
Industries not elsewhere classified	2046.71	1734.04	2293.39	1398.17	1943.10	1848.56
	2163.46	1338.40	1923.07	-	2283.65	1869.75

Table 2: The Effect of Union Status on Log Wage
Sample: 2000-2003 Pooled
Dependent Variable: Log (Wage)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Sector	Pooled	Pooled	Pooled	Non-union	Union	Non-union	Union
Union	0.30 (0.03)	0.17 (0.03)	0.07 (0.03)	-	-	-	-
Education	-	0.06 (0.01)	0.02 (0.01)	0.06 (0.01)	0.04 (0.01)	0.01 (0.01)	0.04 (0.01)
Experience	-	0.03 (0.01)	0.03 (0.01)	0.03 (0.01)	0.03 (0.01)	0.03 (0.01)	0.04 (0.01)
Experience ² /100	-	-0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)
Tenure	-	0.02 (0.00)	0.03 (0.00)	0.03 (0.01)	0.02 (0.01)	0.03 (0.01)	0.01 (0.01)
Tenure ² /100	-	-0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)
Married	-	0.10 (0.05)	0.11 (0.05)	0.14 (0.06)	0.02 (0.06)	0.16 (0.06)	0.03 (0.06)
One Child	-	0.06 (0.05)	0.02 (0.05)	0.06 (0.07)	0.05 (0.06)	0.01 (0.07)	0.03 (0.07)
Two Children	-	0.09 (0.04)	0.06 (0.04)	0.10 (0.06)	0.08 (0.06)	0.04 (0.06)	0.10 (0.06)
Children ≥ 3	-	0.04 (0.05)	0.03 (0.05)	0.02 (0.07)	0.05 (0.07)	-0.03 (0.07)	0.11 (0.07)
Female	-	0.03 (0.01)	0.02 (0.01)	-0.54 (0.24)	-0.36 (0.29)	-0.52 (0.25)	-0.31 (0.33)
Female * Union	-	-0.50 (0.19)	-0.48 (0.19)	0.04 (0.02)	0.01 (0.02)	0.03 (0.02)	0.01 (0.02)
Female * Education	-	0.02 (0.05)	0.05 (0.05)	-0.00 (0.01)	-0.01 (0.01)	-0.01 (0.01)	-0.03 (0.01)
Female * Experience	-	-0.00 (0.01)	-0.01 (0.01)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)
Female * Experience ² /100	-	-0.00 (0.00)	-0.00 (0.00)	-0.01 (0.01)	0.04 (0.01)	0.00 (0.01)	0.04 (0.01)
Female * Tenure	-	0.01 (0.01)	0.01 (0.01)	0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)	-0.00 (0.00)
Female * Tenure ² /100	-	-0.00 (0.00)	-0.00 (0.00)	-0.13 (0.11)	-0.05 (0.12)	-0.13 (0.10)	-0.07 (0.12)
Female*Married	-	-0.10 (0.08)	-0.11 (0.08)	-0.21 (0.12)	-0.06 (0.13)	-0.13 (0.12)	0.07 (0.14)
Female*One Child	-	-0.15 (0.09)	-0.08 (0.09)	-0.23 (0.11)	-0.01 (0.11)	-0.20 (0.11)	0.05 (0.12)
Female*Two Children	-	-0.16 (0.08)	-0.15 (0.08)	-0.15 (0.12)	-0.22 (0.14)	-0.06 (0.12)	-0.11 (0.14)
Female*Children ≥ 3	-	-0.16 (0.09)	-0.11 (0.09)	0.06 (0.01)	0.04 (0.01)	0.01 (0.01)	0.04 (0.01)
Occupation, Industry, Firm Size, Prefecture, City Size Dummy Variables	No	No	Yes	No	No	Yes	Yes

$\bar{x}^u \hat{\beta}^u - \bar{x}^{nu} \hat{\beta}^{nu}$	-	-	-	0.30	0.30		
				(0.05)	(0.05)		
$(\bar{x}^u - \bar{x}^{nu}) \hat{\beta}^{pooled}$	-	-	-	0.14	0.25		
				(0.05)	(0.05)		
$\bar{x}^u (\hat{\beta}^u - \hat{\beta}^{pooled})$	-	-	-	0.10	0.03		
				(0.03)	(0.002)		
$\bar{x}^{nu} (\hat{\beta}^{pooled} - \hat{\beta}^{nu})$	-	-	-	0.05	0.01		
				(0.02)	(0.001)		
Observations	2211	2211	2211	1435	776	1435	776
R-squared	0.06	0.40	0.52	0.35	0.42	0.51	0.62

Note: Heteroskedasticity robust standard errors are reported in parentheses. All specifications include year dummy variables. Standard errors for Cotton-Neumark decomposing are calculated by bootstrap with 10,000 re-sampling.

Table 3: The Effect of Union Status on Perception of Rent

Dependent Variable: =1 if respondents chose “Very easy” or “Somewhat easy” to the question “If you lose your (current) job, about how easy would it be for you to find a (new) job with another employer with approximately the same income and fringe benefits you now have?”

Estimation Method: Probit

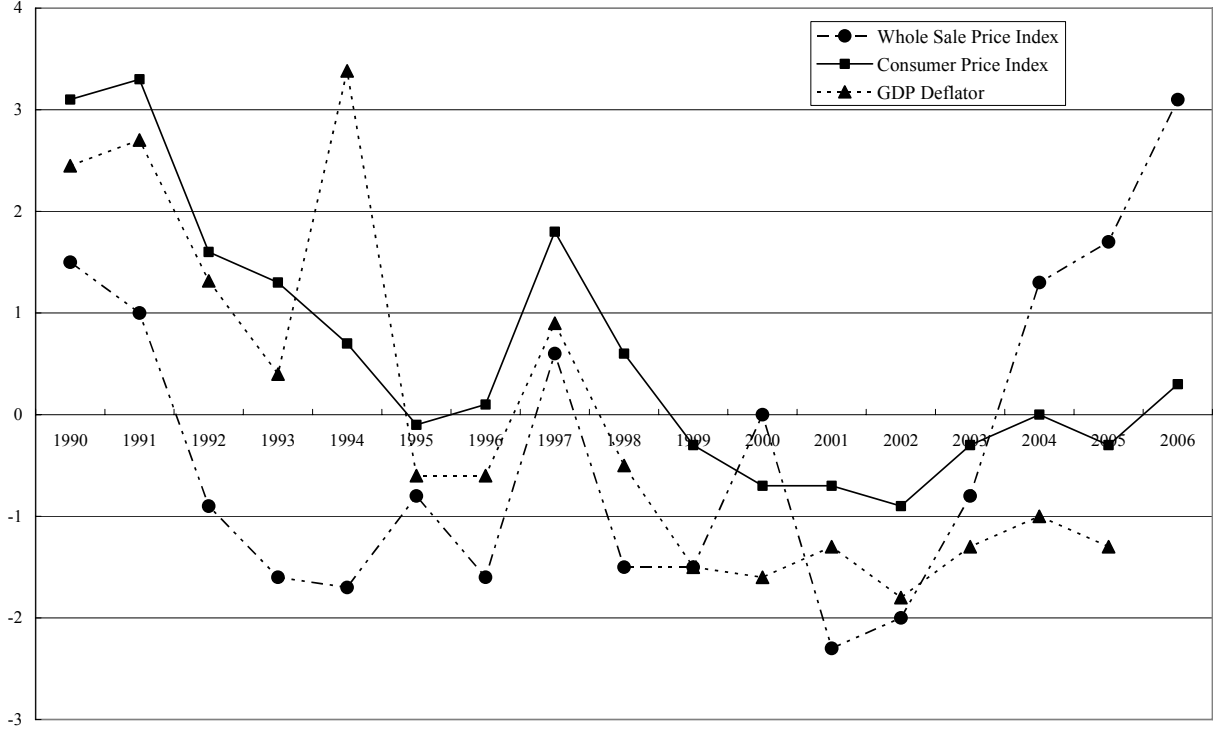
Sample: 2000-2003 Pooled.

	Easy to Find a Job with Similar Compensation			
	(1)	(2)	(3)	(4)
Union	-0.10 (0.02)	-0.08 (0.02)	-0.09 (0.02)	-0.06 (0.03)
ln(Wage)	-	-0.09 (0.02)	0.01 (0.02)	0.01 (0.02)
Demographic Variables	No	No	No	Yes
Occupation, Industry, Firm Size, Prefecture, City-size Dummy Variables	No	No	Yes	Yes
Observations	2085	2085	2085	2085
Log Likelihood	-1197.02	-1182.71	-1093.41	-1015.16

Note:

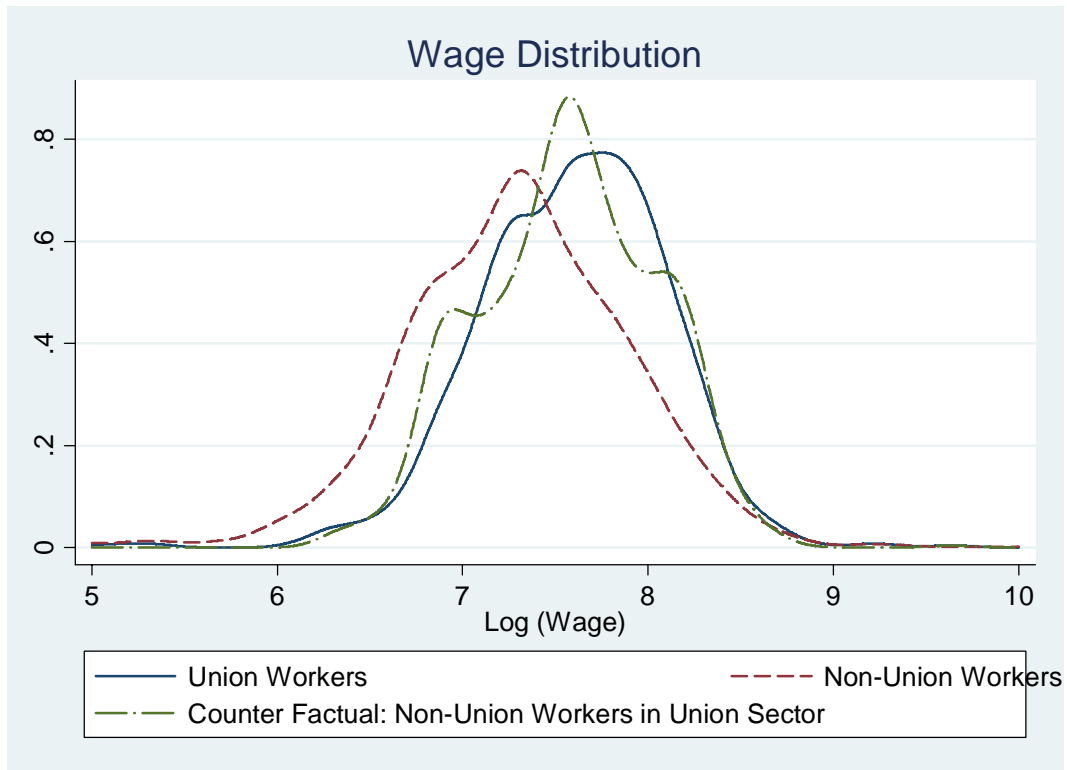
1. Marginal effects evaluated at the sample means of explanatory variables are reported. Standard errors are calculated so that the t-statistics are preserved.
2. All specifications include year dummy variables.

Figure 1: Time Series of Price Index of Japan



Source: Cabinet Office, Government of Japan, Bank of Japan, and Ministry of Internal Affairs and Communications.

Figure 2: DiNardo, Fortain and Lemieux Decomposition
Sample: 2000-2003 Pooled



Note: The kernel density estimations are implemented using a Gaussian kernel with the optimal bandwidth. The weight used for re-weighting is calculated based on the logit regression of union status on the explanatory variables included in Table 2, Column 3.