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Author: Fumio Ohtake

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Unions, the Costs of Job Loss, and Vacation

Fumio Ohtake

13.1 Introduction

Many researchers have pointed out that Japanese workers' effort level is high. They often cite the low nonattendance rate in Japan as evidence of high worker effort since it is difficult to measure actual effort levels (Koshiro 1978, 1980; Ishida 1985).[1] This paper investigates the effects of human resource management systems, such as steep tenure-wage profiles, nonvested retirement allowance systems, and labor market conditions, on the amount of vacation time taken by workers in Japan.

The fact that wages are cut proportionally in response to nonattendance in Japan would seem to imply that nonattendance does not affect productivity. However, nonattendance has potential productivity effects, as pointed out by Koike (1981) and Weiss (1985). First, nonattendance reduces working hours. Second, nonattendance increases costs because firms are forced to reallocate workers in order to cover for absent workers. The characteristics of both the jobs and skills of workers can alter the productivity effects of nonattendance. For example, in auto assembly plants, where the complementarity of workers on a line is very high, nonattendance should have negative productivity effects. If nonattendance has negative productivity effects, firms should have employment systems with in-

Fumio Ohtake is professor at the Institute of Social and Economic Research at Osaka University.

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1. For example, Koike (1981) points out that worker morale affects absenteeism.

centives designed to reduce nonattendance, such as counting it in merit ratings and making it a factor in dismissal decisions.

We should distinguish between good and bad vacation time. Good vacations are paid holidays, sick leaves, or legal or contracted vacations. Bad vacations consist of nonattendance due to absenteeism, shirking, and absence without leave. Bad vacations have larger negative productivity effects than good vacations. However, the distinction between these two types of vacation is relatively weak in Japan, as will be explained presently.

This paper compares the effect of the costs of job loss (to workers) on the amount of vacation time taken in firms with and without unions. The cost of job loss is high when the tenure-wage profile is steep, retirement allowances are nonvested, or finding an alternative job is difficult. According to the bonding hypothesis of Lazear (1979), steep tenure-wage profiles and nonvested retirement allowances increase worker effort by increasing the opportunity cost of shirking because workers are fired if their shirking is detected. The efficiency wage hypothesis can also explain the amount of vacation time taken. Both higher unemployment rates and higher wage rates increase the costs of job loss; therefore, workers will increase their effort correspondingly.

Although no worker shirks (and thus is dismissed) in equilibrium in these theoretical models, it is an important assumption that firms can dismiss workers if they do shirk. However, it is very difficult to dismiss full-time workers in unionized firms in Japan. Although Japanese firms have long-term employment practices with high employment security, widely known as lifetime employment, Japan does not have legislation generally prohibiting dismissals without just cause. Restrictions on dismissals are provided by case law.[2] Since employment security is provided by case law, workers must file suit in court in order to challenge dismissals (Araki 2002). Although workers in unionized firms are protected by case law because unions can support workers undergoing legal proceedings, workers in nonunionized firms may be dismissed more easily. This is because it is difficult for a worker to file suit in court without union support due to high legal costs.[3]

Under this legal system, the effectiveness of internal and external threats in reducing vacation time is affected by the presence or absence of a union. Internal threats include the costs of job loss due to a wage system with a steep tenure-wage profile and a nonvested retirement allowance system. External threats include the difficulty of finding alternative jobs due to high wages at the current job and high unemployment. Because unions reduce

2. The costs of illegal dismissals for firms are very high. If the employer's exercise of the right to dismiss is judged to be abusive and invalid, the employer is obligated not only to give the employee back pay covering the period of dismissal, but also to reinstate him or her.

3. There is no low-cost individual dispute settlement system specifically provided for workers, as is available in European countries.

the potency of internal and external threats of job loss (by making it more difficult for employers to dismiss workers), vacation time taken by employees should be less responsive to such threats in unionized firms than in nonunionized firms.

We should take into account Japanese employment practices when we analyze the determinants of vacation time. First, the Labor Standards Law in Japan stipulates a minimum length of paid vacation apart from any union contract. Second, Japanese workers often use granted annual paid leave retroactively. As Dore (1973, 187–88) writes:

> It is almost universally the practice to ask that days taken off for sickness should be counted as part of one's annual holiday. (That way one gets a perfect attendance record which automatically gets one some way towards a good merit rating.) The next, more or less legitimate, claim on holidays is for attending weddings and funerals. Those who do not use up their ten, fifteen or twenty day's holiday in these ways, may take other days off with the foreman's agreement, though it may be a rather unwilling ex post facto agreement.

Moreover, until recently, many Japanese firms accorded disadvantageous treatment to workers who had taken paid annual leave. As Sugeno (1992, 269) writes: "There are still a significant number of enterprises in which the taking of annual leave would have a negative effect on various allowances (e.g., a perfect-attendance allowance), bonuses and wage raises."[4] These employment practices may partly explain the low level of vacation taken in Japan. Thus, in this paper, I examine both pure vacation time and a broader definition of vacation time, including used annual paid leave.

This paper is organized as follows: Section 13.2 briefly surveys the literature on the economic analysis of vacation; section 13.3 discusses the data; section 13.4 presents the models; section 13.5 discusses the estimation results; and section 13.6 concludes.

13.2 Vacation Determinants: Theory and Evidence

13.2.1 The Contracted Working Hours Model and the Worker Discipline Model

There are two main economic explanations for vacation. First, workers use vacation to minimize discrepancies between contracted working hours and optimal working hours, which maximizes utility at a given wage rate. Second, workers use vacation time to shirk under imperfect monitoring (Brown and Sessions 1996; Barmby, Sessions, and Treble 1994).

4. The 1988 law revising the Labor Standards Law provided that "an employer must not reduce the wages or otherwise accord disadvantageous treatment to a worker for having taken paid annual leave" (Supp. Provns, Art. 134).

In order to reduce vacation time taken due to shirking under imperfect monitoring, firms can increase the costs of job loss by paying an efficiency wage (Shapiro and Stiglitz 1984) and providing a bonding system, such as a nonvested retirement allowance or a steep tenure-wage trajectory (Lazear 1979). An important assumption in the models of Shapiro and Stiglitz (1984) and Lazear (1979) is that shirking workers who are detected by a firm will be dismissed. Thus, I call these two models worker discipline models.

Efficiency wages or bonding mechanisms will not work unless the dismissal probability is higher for workers who take more vacation. Ferguson and Filer (1986) find empirical evidence consistent with these theories in U.S. data. In Japan, the retirement allowance system may work to reduce vacation time. According to the *Survey on Honor and Disciplinary Action* by the Institute for Labor Administration (Romu Gyosei Kenkyusho 1997), workers who are absent more than two weeks without leave are dismissed in disgrace in most Japanese firms; 91 percent of firms do not pay any allowance on principle in disciplinary dismissals.

The efficiency wage model also suggests that the business cycle should affect vacation. According to the efficiency wage model, vacation should change procyclically (Leigh 1985; Kaivanto 1997) since the cost of job loss is lower in periods of low unemployment.[5]

Thus, the basic hypothesis of vacation determination models based on the worker discipline theory is represented by the following vacation time function:

$$\text{Vac} = f(cjl, \boldsymbol{X}), f_{cjl} < 0, \tag{1}$$

where Vac is vacation time, *cjl* is cost of job loss that is affected by the steepness of the tenure-wage profile and the size of the retirement allowance in the bonding model and the active ratio of job openings to applicants in the efficiency wage model,[6] and $\boldsymbol{X}$ represents other factors affecting vacation time.

13.2.2 Unions and Vacation

The effect of unions on vacation time is theoretically ambiguous. Both union voice and union wage effects should decrease vacation time. If unions can improve working conditions, they may reduce vacation time by

5. This model is often called the worker discipline model. Another explanation for procyclical changes in vacation time is given by the selection bias model. This model posits that, in recessions, workers with high vacation levels are dismissed so that average vacation time decreases.

6. Since unemployment rate by prefecture is not available for the survey years, I use the active ratio of job openings to applicants, which is often used as a measure of the tightness of the labor market in Japan.

increasing workers' satisfaction. If unions can increase wages, the discrepancy between contracted working hours and optimal working hours will be reduced.[7]

On the other hand, since unions may reduce the potency of internal and external threats of job loss (by making it more difficult for employers to dismiss workers) as Green and MacIntosh (1998) showed, vacation time should be less responsive to such threats in unionized firms than in nonunionized firms. Since employment security is provided by case law, workers need to file suit in court in order to be protected against dismissal. Although workers in unionized firms are protected by case law, workers in nonunionized firms may be dismissed easily because of high legal costs in Japan. I express this hypothesis as

$$\frac{\partial f}{\partial cjl}\Big|_{\text{nonunion firms}} < \frac{\partial f}{\partial cjl}\Big|_{\text{union firms}} \leq 0. \tag{2}$$

Moreover, because of high firing costs, managers in unionized firms may increase monitoring costs instead of paying efficiency wages or creating a bonding system. Workers in unionized firms may accept high levels of monitoring through performance evaluation in exchange for high job security.[8] Another possibility is that unionized firms try to screen for workers with a low tendency toward taking vacation since it is more difficult to dismiss union workers.

13.3 Data

I use firm-level microdata from the 1985 and 1993 *General Survey on Working Hours and Conditions* (GSWHC) conducted by the Ministry of Labor in Japan. Firms with more than thirty employees are surveyed about various issues concerning working conditions every year. I selected the 1985 and 1993 surveys because these two surveys asked firms about both retirement allowance systems and vacation.

There were 4,910 firms included in the 1985 survey, and 4,951 firms in the 1993 survey. When I restrict the sample to records without missing values for the retirement allowance question, 3,117 records remain. I use this smaller sample to estimate my models.

To measure vacation, I use average days of vacation for full-time workers in each firm. I use two definitions of vacation: bad vacation only and total vacation. Bad vacation only is defined as worker absence except for annual holidays, paid vacation, and special vacation, such as sick leave. Total

7. Here, I assume that the substitution effect is larger than the income effect.

8. The merit pay system is applied to blue-collar workers as well as to white-collar workers in Japan (Fujimura 1989).

Table 13.1 **Bad Vacation Rate and Days, by Firm Size**

Firm Size	1985 (N = 4,910)	1993 (N = 4,951)	Total (N = 9,861)	Union (N = 4,614)	Nonunion (N = 5,247)	Total (N = 9,861)
			Bad Vacation Rate (%)			
5000+	0.472	0.426	0.447	0.452	0.365	0.447
1,000–4,999	0.509	0.518	0.514	0.482	0.651	0.514
300–999	0.806	0.499	0.635	0.646	0.620	0.635
100–299	1.240	0.862	1.034	0.907	1.110	1.034
30–99	1.694	1.055	1.354	1.039	1.406	1.354
Total	1.518	0.963	1.220	0.888	1.322	1.220
			Bad Vacation Days			
5000+	1.234	1.069	1.145	1.158	0.937	1.145
1,000–4,999	1.366	1.351	1.357	1.250	1.806	1.357
300–999	2.240	1.289	1.710	1.721	1.695	1.710
100–299	3.547	2.317	2.878	2.496	3.105	2.878
30–99	4.942	2.884	3.848	2.914	4.002	3.848
Total	4.406	2.618	3.446	2.453	3.751	3.446

Source: Author's calculation from the 1985 and 1993 GSWHC.

vacation is the sum of bad vacation only and days of used annual paid leave (good vacation). Annual paid leave is defined as the amount legally stipulated by article 39 of Japan's Labor Standards Law.

The supplementary provision of article 134 in the 1987 revision of Japan's Labor Standards Law states that the "employer must not reduce the wages or otherwise accord disadvantageous treatment to a worker for having taken paid annual leave." However, "there is a case which holds that the treatment of consumed annual-leave days as absences for bonus purposes does not violate public policy and good morals because of the extent of disadvantageous treatment" (Sugeno 1992, 281).

Most Japanese workers do not use all of their annual paid leave. The average utilization ratio of annual paid leave is about 50 percent according to the 1993 GSWHC. According to the 1997 Japan Institute of Labor survey on sick leave (JIL 1998), 77.5 percent of workers reported that they did not use all of their annual paid leave because they had made provisions for sickness and injury. The 1997 JIL survey also shows that Japanese workers tend to use annual paid leave rather than sick leave for short-term illness.

Tables 13.1 and 13.2 show mean bad vacation and total vacation time by firm size, calculated from the full sample of 9,989 firms. The bad vacation rate was 1.5 percent in 1985 and 0.96 percent in 1993.[9] The bad vacation

9. A possible institutional reason for the fact that the bad vacation rate was lower in 1993 than in 1985 is the revision of the Japanese Labor Standards Law. The 1987 revision increased the starting number of annual paid leave days from six to ten. It supplemented this increase with a provision that confirmed that disadvantageous treatment of workers who take annual leave violates the principle guaranteeing such leaves.

Table 13.2 Total Vacation Rate and Days, by Firm Size

Firm Size	1985 (N = 4,910)	1993 (N = 4,924)	Total (N = 9,834)	Union (N = 4,608)	Nonunion (N = 5,226)	Total (N = 9,834)
			Total Vacation Rate (%)			
5000+	4.072	5.059	4.598	4.632	4.013	4.598
1,000–4,999	3.721	3.950	3.852	3.990	3.268	3.852
300–999	3.298	3.612	3.472	3.834	2.967	3.472
100–299	3.442	3.618	3.537	3.924	3.308	3.537
30–99	3.592	3.464	3.524	3.965	3.451	3.524
Total	3.545	3.523	3.533	3.941	3.408	3.533
			Total Vacation Days			
5000+	10.563	12.519	11.606	11.689	10.173	11.606
1,000–4,999	9.839	9.906	9.877	10.192	8.542	9.877
300–999	8.965	9.158	9.072	9.992	7.794	9.072
100–299	9.648	9.444	9.535	10.468	8.980	9.535
30–99	10.355	9.297	9.794	10.847	9.619	9.794
Total	10.109	9.342	9.699	10.552	9.436	9.699

Source: Author's calculation from the 1985 and 1993 GSWHC.
Note: Total vacation is the sum of bad vacation and the used annual paid leave.

rate is lower in larger firms than in smaller firms. Average days of bad vacation are 3.4 days for the full sample and about 1 day for a sample of large firms only. This may be explained by evidence that the sick leave system is more prevalent in larger firms in Japan, as found in the 1997 JIL survey and the 1997 GSWHC. In the United States and the United Kingdom, on the other hand, absence rates are higher in larger firms (Winkler 1980; Allen 1981; Allen 1982; and Wilson and Peel 1991).

On average, the bad vacation rate is lower in union firms than in nonunion firms. However, for firms with more than 300 employees, both bad and total vacation rates are higher in union firms than in nonunion firms.

13.4 Estimation Model and Descriptive Statistics

13.4.1 Estimation Model

I test the worker discipline hypotheses by specifying linear functions for vacation taken in firm i, Vac_i, by union status:

$$\text{Vac}_{Ui} = \alpha_U \text{Ret}_{Ui} + \beta_U \text{Fwage}_{Ui} + \gamma_U \text{JOA}_{Ui} + \delta_U \mathbf{X}_{Ui} \quad (3)$$

$$\text{Vac}_{Ni} = \alpha_N \text{Ret}_{Ni} + \beta_N \text{Fwage}_{Ni} + \gamma_N \text{JOA}_{Ni} + \delta_N \mathbf{X}_{Ni}, \quad (4)$$

where U and N represent unionized and nonunionized firms, respectively. Ret, Fwage, and JOA are proxies for the costs of job loss to workers. Ret_{Xi}

is the ratio of retirement allowance to wage at the mandatory retirement age. Fwage is the wage at the mandatory retirement age. JOA is the ratio of active job openings to applicants in the prefecture where the firm is located. **X** is a vector of other firm characteristics. The predictions in equation (2) are then represented by the following hypotheses:

HYPOTHESIS 1. $\alpha_N < \alpha_U \leq 0$

HYPOTHESIS 2. $\beta_N < \beta_U \leq 0$

HYPOTHESIS 3. $\gamma_N > \gamma_U \geq 0$

Hypotheses 1, 2, and 3 state that internal and external costs of job loss motivate greater effort and reduce vacation and that the effects are greater in nonunionized firms than in unionized firms because of reduced threat credibility in the latter. A stronger version of these hypotheses is that costs of job loss have *no* impact in the unionized sector because it is too difficult to dismiss workers in unionized firms in Japan.

13.4.2 Explanatory Variables

Table 13.3 lists the explanatory variables used in the estimation. The average number of days of bad vacation is defined as total days of bad vacation divided by the number of full-time workers. As explained above, I also use a total vacation measure, which is defined as the sum of bad vacation days and used days of granted annual paid leave, since workers often use granted annual paid leave retroactively when they are absent due to sickness.[10]

Average wage at the mandatory retirement age is a proxy for the steepness of the tenure-wage profile if we assume that starting wages for new graduates are the same for all workers in Japan.[11] In the survey, firms are asked about the average monthly wages of workers who separate from the firm in the survey year due to mandatory retirement.

I use the sum of lump-sum retirement allowance payments and the present value of the company pension plan at the mandatory retirement age as a measure of the size of the retirement allowance. This retirement allowance is the average retirement allowance for workers who are dismissed during the survey year due to mandatory retirement.[12]

10. Of course, a high average vacation rate may mean good working conditions and may boost worker morale and productivity.

11. This assumption is reasonable because wage differences among young workers are small in Japan. The dispersion of earnings in 1993 was only 1.58 for workers aged twenty to twenty-four, as compared to 3.16 for workers aged sixty to sixty-four, where dispersion is measured as the ratio of the upper earnings limit of the 9th decile of male workers to the upper earnings limit of the 1st decile (D9/D1). The dispersion of starting wages in 1993 was only 1.16 for university graduates and 1.23 for high school graduates, according to the *Basic Survey on Wage Structure* (Policy and Research Division, Ministry of Labor 1993).

12. There are potential problems with using information about retirement allowances in cases of mandatory retirement. First, the retirement allowance system for retired workers may not be the same as for current workers. In this paper, I assume workers have static expecta-

Table 13.3 Sample Means

Variable	Description/Units	Full Sample	Union	Nonunion
Bad vacation rate	Percent	0.972	0.821	1.177
		(1.351)	(0.950)	(1.731)
Bad vacation days	Average days absent per worker	2.658	2.233	2.826
		(3.833)	(2.664)	(3.949)
Total vacation rate	Percent	4.034	4.281	3.701
		(1.945)	(1.848)	(2.025)
Total vacation days	Number of days	10.777	11.268	10.097
		(5.324)	(4.961)	(5.714)
Firm size	Number of workers	545.670	804.403	196.936
		(2416.282)	(3130.041)	(540.607)
Annual paid leave	Number of days of entitled annual paid leave	14.888	16.212	13.103
		(4.124)	(3.965)	(3.634)
JOA	Active ratio of job openings to applicants in firm's prefecture	0.789	0.764	0.820
		(0.292)	(0.283)	(0.301)
Retirement allowance	Amount of retirement allowance (in 1995 yen)	1280.014	1375.786	946.874
		(775.77)	(772.246)	(691.834)
Wage	Monthly wage at retirement (in 1995 yen)	32.224	33.819	30.075
		(10.432)	(10.592)	(9.816)
Point system	Dummy for point-based retirement allowance system	0.055	0.063	0.027
		(0.228)	(0.243)	(0.163)
University ratio	Share of university graduates among workers subject to mandatory retirement	0.110	0.129	0.085
		(0.266)	(0.273)	(0.253)
High school white-collar ratio	Share of high school graduates among white-collar workers subject to mandatory retirement	0.288	0.297	0.277
		(0.392)	(0.371)	(0.419)
High school blue-collar ratio	Share of high school graduates among blue-collar workers subject to mandatory retirement	0.180	0.191	0.165
		(0.344)	(0.335)	(0.356)
Six-day workweek	Six-day workweek dummy (Six-day workweek = 1, five-day workweek = 0)	0.130	0.0988	0.146
		(0.336)	(0.298)	(0.353)
Union	Union firm dummy (union = 1, nonunion = 0)	0.574	1.000	0.000
		(0.495)	(0.000)	(0.000)
Log bad vacation	Log of bad vacation days	0.238	0.114	0.405
		(1.328)	(1.319)	(1.322)
Log total vacation	Log of total vacation days	2.243	2.306	2.157
		(0.552)	(0.522)	(0.580)
Log retirement allowance	Log of retirement allowance	6.961	7.062	6.609
		(0.661)	(0.606)	(0.722)
Log wage	Log of monthly wage at retirement	3.423	3.475	3.353
		(0.316)	(0.305)	(0.318)
Log annual holidays	Log of number of annual paid leave days	2.654	2.752	2.522
		(0.333)	(0.281)	(0.352)
Log firm size	Log of firm size	5.212	5.660	4.609
		(1.245)	(1.260)	(0.932)
Log JOA	Log of active ratio of job openings to applicants	–0.310	–0.340	–0.269
		(0.386)	(0.384)	(0.385)
N		3,117	2,421	696

Source: Authors' calculations from the 1985 and 1993 GSWHC.

Notes: Observations with missing values, extreme values, or both are dropped. Extreme values are defined as those that are at least 4 standard deviations away from the mean. Wages and retirement allowances are standardized to 1995 yen using the Consumer Price Index (CPI).

The JOA is the active ratio of job openings to applicants in the prefecture where the firm is located. To capture information about contracted working hours, I incorporate a dummy variable for the length of the workweek. This dummy variable takes on a value of 1 if the firm has a six-day workweek and a value of zero if the firm has a five-day workweek. Firm size is defined using the sum of full- and part-time workers. The average number of legally stipulated annual paid-leave days is calculated for full-time workers in each firm.

If firms use a performance-evaluation system to determine wages and retirement allowances, they can rely on threats of changes in these compensation factors in addition to worker dismissal in order to reduce vacation. Although the survey does not include information on performance-evaluation systems, firms were asked about the introduction of a point-based retirement allowance system. In such systems, the amount of the retirement allowance is determined as a multiple of the monthly wage at the time of the worker's separation from the firm. The multiplier is a function of the length of tenure and the reason for separation. In some firms, only the length of tenure determines the amount of the retirement allowance. Under the point-based system, however, the amount of the retirement allowance is determined by the past performance of the worker. In this system, a worker with a high propensity for vacation will receive a smaller retirement allowance even if he or she is not dismissed in disgrace.

A worker's education level also affects his or her incentives. The steeper tenure-wage profile for more educated workers, as well as their preferences for time off, may affect vacation time taken. Since information about the education level of current workers is not available in the data, I use the distribution of education levels for retired workers in the survey year.

In the estimation of total vacation, I include the number of legally stipulated annual paid-leave vacation days as an explanatory variable, since a worker's tenure determines the number of legally stipulated holidays.

The expected signs of the coefficients on wage at retirement and retirement allowance are negative. According to the worker discipline hypothesis, the expected sign of the coefficient on JOA is positive. However, there is also a possibility of a negative coefficient for JOA. If firms can control the utilization rate of annual paid leave by workers in accordance with the business cycle, vacation time may increase in recessions when firms can more easily adjust to it.[13] In this case, vacation may be regarded as a

tions about their future retirement allowance system. Second, the selected sample is limited to firms with workers who quit the firm due to mandatory retirement. As a result, there is a sample selection bias in favor of larger firms. Although the mean firm size in the full sample, used in tables 13.1 and 13.2, is 201, that of the sample used in the estimation is 546.

13. Dore (1973) reports the actual practices of vacation in the Japanese company Hitachi: "Foremen are reluctant to have people take leave because they have a stake in a high attendance record and high production figures, and when order books are long, they are likely to be under considerable pressure from enthusiastic managers" (188).

method of labor adjustment.[14] Finally, the six-day workweek dummy variable is expected to have a positive effect on vacation time because the number of workers needing to be absent on workdays due to sickness or errands would be higher.

13.4.3 Descriptive Statistics

Table 13.3 reports descriptive statistics of the sample used in the estimation. The sample consists of 2,421 unionized firms and 696 nonunionized firms. The average firm size is 804 in unionized firms and 197 in nonunionized firms. The average bad vacation rate is about 1 percent, which is smaller than the average for the full sample in table 13.1. This reflects the bias toward large firms in the estimation sample. The average number of bad vacation days is 2.7. On average, bad vacation time is lower in union firms. On the other hand, unionized firms have a higher incidence of total vacation. The mean retirement allowance and monthly wage at retirement for the entire estimation sample are 12,800,000 yen and 320,000 yen, respectively.

13.5 Estimation Results

Table 13.4 reports regression results for a pooled estimation of unionized and nonunionized firms. Tables 13.5, 13.6, and 13.7 report results from specifications distinguishing between unionized and nonunionized firms. Table 13.5 employs bad vacation time as the left-hand-side variable, table 13.6 uses good vacation time, and table 13.7 utilizes total vacation time.[15]

Table 13.4 supports the worker discipline model because the wage at retirement and the retirement allowance have negative effects on bad and total vacation time taken. Table 13.5 reveals, however, that these effects do not differ between unionized and nonunionized firms.

The introduction of a point system for retirement allowances is predicted to have a negative effect on vacation time as long as it entails more precise monitoring: Table 13.5 shows that this theoretical prediction is borne out empirically and the reduction is greater in unionized firms than in nonunionized firms.

White-collar workers and workers with high levels of education take fewer bad vacation days. The steeper tenure-wage profile for highly educated workers and their preferences for vacation time may affect this result.

The JOA has a significant negative effect on bad vacation time in union-

14. Hildreth and Ohtake (1998) analyze an automobile assembly company that uses worker utilization rates as a method of labor adjustment in addition to changes in working hours.

15. I conduct an *F*-test for the equality of all estimated coefficients between the union and nonunion samples. The null hypothesis of equality of the coefficients is rejected. I estimated equations for the rate of absence as well as for days absent. The results are qualitatively the same. I also estimated equations using only firms with fewer than 1,000 employees and, again, did not find significantly different results.

Table 13.4 **Estimation Result for All Firms and All Vacation Types**

Dependent Variables	Bad Vacation	Good Vacation	Total Vacation
Log wage	–0.534***	–0.039	–0.092**
	(0.100)	(0.056)	(0.041)
Log retirement allowance	–0.253***	–0.046**	–0.075***
	(0.042)	(0.024)	(0.017)
Log JOA	0.074	0.071**	–0.006
	(0.059)	(0.033)	(0.024)
Log firm size	–0.091***	0.020*	–0.052***
	(0.021)	(0.012)	(0.008)
Log annual paid leave	–0.379***	0.235***	0.555***
	(0.071)	(0.039)	(0.029)
Point system	–0.374***	–0.029	–0.097*
	(0.125)	(0.070)	(0.051)
University ratio	–0.278***	–0.073	–0.234***
	(0.102)	(0.058)	(0.042)
High school white-collar ratio	–0.306***	0.068*	–0.174***
	(0.067)	(0.038)	(0.027)
High school blue-collar ratio	–0.174**	0.084**	–0.031
	(0.070)	(0.039)	(0.028)
Six-day workweek	0.212***	–0.014	0.096***
	(0.073)	(0.041)	(0.030)
1993 year dummy	–0.045	0.165***	0.083***
	(0.049)	(0.028)	(0.020)
Union	0.128***	0.166***	0.154***
	(0.052)	(0.029)	(0.021)
Constant	5.359***	1.357***	1.795***
	(0.342)	(0.192)	(0.139)
N	3,117	3,083	3,117
R^2	0.157	0.053	0.190

Source: GSWHC (1985, 1993).

Note: Standard errors are in parentheses. Sampling ratios are used as weight.

*Statistically significant at the 10 percent level.

**Statistically significant at the 5 percent level.

***Statistically significant at the 1 percent level.

ized firms and a significant positive effect on bad vacation time in nonunionized firms. The positive effect of JOA on bad vacation time in nonunionized firms is consistent with the worker discipline hypothesis. The negative effect of JOA on bad vacation time in unionized firms can be explained as follows. Since labor adjustment costs are high in unionized firms, such firms use bad vacation time as an additional control variable for labor adjustment. Unions may agree to this employment practice in exchange for employment security.

Lastly, the five-day workweek reduces days absent in unionized firms but has no significant effect on vacation in nonunionized firms.

Table 13.5 Estimation Results for Bad Vacation

	Model 1		Model 2	
Union/Nonunion Firms	Main Effect (Nonunion)	Interaction with Union Dummy	Main Effect (Nonunion)	Interaction with Union Dummy
Log wage	–0.592***	0.236	–0.486***	
	(0.149)	(0.202)	(0.100)	
Log retirement allowance	–0.211***	–0.074	–0.242***	
	(0.061)	(0.085)	(0.042)	
Log JOA	0.382***	–0.538***	0.381***	–0.539***
	(0.091)	(0.119)	(0.090)	(0.116)
Log firm size	–0.127***	0.046	–0.096***	
	(0.039)	(0.046)	(0.021)	
Log annual paid leave	–0.538***	0.431***	–0.554***	0.431***
	(0.097)	(0.144)	(0.095)	(0.142)
Point system	0.058	–0.518*	0.047	–0.489*
	(0.248)	(0.287)	(0.246)	(0.284)
University ratio	–0.119	–0.269	–0.278***	
	(0.163)	(0.209)	(0.101)	
High school white-collar ratio	–0.347***	0.082	–0.309***	
	(0.100)	(0.135)	(0.066)	
High school blue-collar ratio	–0.332***	0.347**	–0.325***	0.333***
	(0.102)	(0.139)	(0.099)	(0.129)
Six-day workweek	0.038	0.570***	0.0192	0.583***
	(0.111)	(0.153)	(0.109)	(0.146)
1993 year dummy	0.052	–0.213**	0.052	–0.169*
	(0.086)	(0.106)	(0.083)	(0.102)
Constant	5.900***	–1.728**	5.632***	–1.209***
	(0.506)	(0.708)	(0.378)	(0.386)
N	3,117		3,117	
R^2	0.177		0.168	

Source: GSWHC (1985, 1993).

Note: Standard errors are in parentheses. Sampling ratios are used as weight.

*Statistically significant at the 10 percent level.

**Statistically significant at the 5 percent level.

***Statistically significant at the 1 percent level.

Table 13.6 shows the differences in workers' behavior regarding good vacation time between unionized and nonunionized firms. In nonunionized firms, steepness of wage profile (wage at retirement) has negative effects on good vacation time. In nonunionized firms, this negative effect of steep wage profile on good vacation time disappears. There is no difference between union and nonunion firms for the effects of the amount of the retirement allowance on good vacation time. The estimation results for nonunion firms are consistent with the worker discipline hypothesis. The results for unionized firms are also consistent with the hypothesis shown in

Table 13.6 Estimation Results for Good Vacation

	Model 1		Model 2		Model 3	
Union/Nonunion Firms	Main Effect (Nonunion)	Interaction with Union Dummy	Main Effect (Nonunion)	Interaction with Union Dummy	Main Effect (Nonunion)	Interaction with Union Dummy
Log wage	–0.225***	0.314***	–0.252***	–0.277***		
	(0.083)	(0.113)	(0.079)	(0.105)		
Log retirement allowance	–0.032	–0.034			–0.063*	0.013
	(0.034)	(0.048)			(0.032)	(0.044)
Log JOA	0.192***	–0.196***	0.201***	–0.201***	0.192***	–0.198***
	(0.051)	(0.067)	(0.050)	(0.066)	(0.051)	(0.066)
Log firm size	0.144***	–0.173***	0.141***	–0.178***	0.136***	–0.165***
	(0.022)	(0.026)	(0.021)	(0.025)	(0.021)	(0.026)
Log annual paid leave	0.192***	0.132*	0.191***	0.110	0.169***	0.152**
	(0.054)	(0.080)	(0.054)	(0.079)	(0.053)	(0.080)
Point system	–0.104	0.055	–0.118	0.078	–0.105	0.058
	(0.138)	(0.160)	(0.138)	(0.159)	(0.138)	(0.160)
University ratio	–0.242***	0.195**	–0.261***	0.211**	–0.326***	0.315***
	(0.091)	(0.117)	(0.089)	(0.116)	(0.086)	(0.109)
High school white-collar ratio	0.012	0.130*	–0.007	0.127*	–0.054	0.213***
	(0.056)	(0.075)	(0.056)	(0.075)	(0.050)	(0.070)
High school blue-collar ratio	0.164***	–0.135*	0.157***	–0.132**	0.150***	–0.120
	(0.057)	(0.078)	(0.057)	(0.078)	(0.057)	(0.078)
Six-day workweek	–0.052	0.010	–0.041	0.023	0.050	0.001
	(0.062)	(0.086)	(0.061)	(0.084)	(0.062)	(0.086)
1993 year dummy	–0.021	0.273***	–0.018	0.271***	–0.046	0.308***
	(0.048)	(0.059)	(0.047)	(0.059)	(0.047)	(0.058)
Constant	1.599***	–0.4340	1.503***	–0.465	1.175***	–0.173
	(0.283)	(0.396)	(0.264)	(0.378)	(0.236)	(0.326)
N	3,083		3,083		3,083	
R^2	0.0859		0.0845		0.083	

Source: GSWHC (1985, 1993).

Note: Standard errors are in parentheses. Sampling ratios are used as weight.

*Statistically significant at the 10 percent level.

**Statistically significant at the 5 percent level.

***Statistically significant at the 1 percent level.

Table 13.7 Estimation Results for Total Vacation

	Model 1		Model 2		Model 3	
Union/Nonunion Firms	Main Effect (Nonunion)	Interaction with Union Dummy	Main Effect (Nonunion)	Interaction with Union Dummy	Main Effect (Nonunion)	Interaction with Union Dummy
Log wage	–.0137**	0.129	–0.226***	0.169**		
	(0.060)	(0.081)	(0.057)	(0.076)		
Log retirement allowance	–0.109***	0.058*			–0.128***	0.076**
	(0.024)	(0.034)			(0.023)	(0.032)
Log JOA	0.187***	–0.337***	0.217***	–0.364***	0.187***	–0.337***
	(0.037)	(0.048)	(0.036)	(0.048)	(0.037)	(0.048)
Log firm size	–0.075**	0.025	–0.086***	0.030	–0.080***	0.030
	(0.015)*	(0.019)	(0.015)	(0.018)	(0.015)	(0.018)
Log annual paid leave	0.386***	0.371***	0.382***	0.356***	0.372***	0.385***
	(0.039)	(0.058)	(0.039)	(0.057)	(0.038)	(0.058)
Point system	0.212**	–0.386***	0.166*	–0.334***	0.212**	–0.386***
	(0.100)	(0.116)	(0.100)	(0.116)	(0.100)	(0.116)
University ratio	–0.179***	–0.105	–0.244***	–0.045	–0.230***	–0.058
	(0.066)	(0.084)	(0.064)	(0.083)	(0.062)	(0.078)
High school white-collar ratio	–0.138***	–0.028	–0.156***	–0.015	–0.178***	0.011
	(0.040)	(0.054)	(0.040)	(0.054)	(0.036)	(0.050)
High school blue-collar ratio	–0.091**	0.151***	–0.115***	0.172***	–0.099**	0.159***
	(0.041)	(0.056)	(0.041)	(0.056)	(0.041)	(0.056)
Six-day workweek	0.074*	0.124**	0.112**	0.104*	0.076*	0.123*
	(0.045)	(0.061)	(0.044)	(0.061)	(0.045)	(0.061)
1993 year dummy	0.080**	–0.017	0.091***	–0.027	0.065*	–0.003
	(0.035)	(0.043)	(0.034)	(0.043)	(0.034)	(0.042)
Constant	2.736***	–1.875***	2.410***	–1.642***	2.480***	–1.635***
	(0.204)	(0.286)	(0.191)	(0.273)	(0.170)	(0.235)
N	3,117		3,117		3,117	
R^2	0.225		0.219		0.224	

Source: GSWHC (1985, 1993).

Note: Standard errors are in parentheses. Sampling ratios are used as weight.

*Statistically significant at the 10 percent level.

**Statistically significant at the 5 percent level.

***Statistically significant at the 1 percent level.

equation (2). The effects of firm size on good vacation time are different between unionized and nonunionized firms. In nonunionized firms, good vacation time increases as firm size increases. In unionized firms, firm size is independent of good vacation time. The 1993 year dummy has a positive effect on good vacation time in unionized firms.

The estimation results for total vacation time show clear differences in worker behavior in unionized versus nonunionized firms (table 13.7). The absolute value of the coefficient on wage at retirement in unionized firms is about one-tenth that of nonunionized firms. The absolute value of the coefficient on retirement allowance in unionized firms is about half that of nonunionized firms. Thus, when I use total vacation in the estimation, hypotheses 1 and 2 are supported. Hypothesis 3 is also supported by table 13.5, although γ_U is negative.

An additional difference between unionized and nonunionized firms is the coefficient on entitled annual paid leave. In unionized firms, the elasticity of total vacation time with respect to entitled annual paid leave is about 0.76, whereas in nonunionized firms it is approximately 0.35 to 0.55. Unionized workers use more legally stipulated annual paid leave than nonunionized workers.[16]

I decompose the effects of unions on vacation time using the Oaxaca decomposition. The difference in mean log vacation days is decomposed into two parts: the difference due to union and nonunion differences in the characteristics of both firms and employees, and the difference due to differences in coefficients.

$$\overline{\text{Vac}}_U - \overline{\text{Vac}}_N = \sum (\overline{\boldsymbol{X}}_{Uk} - \overline{\boldsymbol{X}}_{Nk})\beta_{Nk} + \sum \overline{\boldsymbol{X}}_{Uk}(\beta_{Uk} - \beta_{Nk}), \tag{5}$$

where $\overline{\text{Vac}}_i$ is the mean of log vacation days, $\overline{\boldsymbol{X}}_{ik}$ is the mean of the kth explanatory variable, and β_{ik} is the estimated coefficient in unionized firms (U) or nonunionized firms (N).

Table 13.8 shows the decomposition for bad vacations. The overall difference in bad vacation time between unionized and nonunionized firms is –28 percent. This is mainly caused by the difference in characteristics between unionized and nonunionized firms. The total mean difference effect is –43.9 percent. On average, unionized firms enjoy 43.9 percent less bad vacation time because of higher retirement allowances, steeper tenure-wage profiles, larger numbers of employees, and more days of entitled annual paid leave than nonunionized firms. However, the total difference due to coefficients is positive. This is mainly caused by the difference in the coefficients on days of entitled annual paid leave. In nonunionized firms, bad vacation time decreases in days of entitled annual paid leave. This negative relation is very weak in unionized firms.

16. A possible reason for this is that de facto vacation is more likely to be counted a part of annual holidays in union firms than in nonunion firms.

Table 13.8 Decomposition of Union and Nonunion Difference in Bad Vacation

	Mean Difference Effects	Coefficient Difference Effects	Total Effect
Log wage	–0.059	0.000	–0.059
Log retirement allowance	–0.109	0.000	–0.109
Log JOA	–0.027	0.183	0.156
Log firm size	–0.101	0.000	–0.101
Log annual paid leave	–0.128	1.186	1.058
Point system	0.017	–0.031	–0.014
University ratio	–0.012	0.000	–0.012
High school white-collar ratio	–0.006	0.000	–0.006
High school blue-collar ratio	–0.008	0.064	0.055
Six-day workweek	–0.001	0.058	0.057
1993 year dummy	–0.004	–0.092	–0.096
Constant	0.000	–1.209	–1.209
Total	–0.439	0.158	–0.281

Note: Decomposition is based on the estimation results for model 2 in table 13.5.

Table 13.9 Decomposition of Union and Nonunion Difference in Good Vacation

	Mean Difference Effects	Coefficient Difference Effects	Total Effect
Log wage	–0.027	1.091	1.064
Log retirement allowance	–0.014	–0.240	–0.255
Log JOA	–0.014	0.067	0.053
Log firm size	0.151	–0.979	–0.828
Log annual paid leave	0.044	0.363	0.407
Point system	–0.004	0.003	0.000
University ratio	–0.011	0.025	0.015
High school white-collar ratio	0.000	0.039	0.039
High school blue-collar ratio	0.004	–0.026	–0.022
Six-day workweek	0.002	0.001	0.003
1993 year dummy	0.001	0.149	0.150
Constant	0.000	–0.434	–0.434
Total	0.134	0.059	0.193

Note: Decomposition is based on the estimation results for model 1 in table 13.6.

Table 13.9 shows the decomposition of union and nonunion difference in good vacation. On average, unionized firms have higher level of good vacation by 19.3 percent. Most of the differences between union and nonunion firms come from differences in coefficients. The largest difference comes from the differences of coefficient of wage at the retirement. In unionized firms, steep wage profile does not reduce good vacation time. Workers in unionized firms enjoy taking good vacation without fear of dismissals.

Table 13.10 Decomposition of Union and Nonunion Difference in Total Vacation

	Mean Difference Effects	Coefficient Difference Effects	Total Effect
Log wage	–0.017	0.448	0.432
Log retirement allowance	–0.049	0.410	0.360
Log JOA	–0.013	0.115	0.101
Log firm size	–0.079	0.142	0.063
Log annual paid leave	0.089	1.021	1.110
Point system	0.008	–0.024	–0.017
University ratio	–0.008	–0.014	–0.021
High school white-collar ratio	–0.003	–0.008	–0.011
High school blue-collar ratio	–0.002	0.029	0.026
Six-day workweek	–0.003	0.012	0.009
1993 year dummy	–0.005	–0.009	–0.015
Constant	0.000	–1.875	–1.875
Total	–0.084	0.246	0.162

Note: Decomposition is based on the estimation results for model 1 in table 13.7.

Table 13.10 shows the decomposition for total vacations. On average, total vacation time in unionized firms is 16.2 percent greater than in nonunionized firms. This is mainly due to the differences in coefficients. In unionized firms, an increase in entitled annual paid leave does not decrease bad vacation time. The job security effects of unions increase total vacation time in unionized firms, and the vacation-reducing effects of steep tenure-wage profiles and retirement allowances are weaker in unionized firms.

13.6 Conclusion

I hypothesize that the presence or absence of a union mediates the effectiveness of internal and external threats in reducing vacation time taken. Internal threats include costs of job loss due to a nonvested retirement allowance system and a steep wage-tenure profile. External threats are characterized by the unemployment rate and potentially lower wages in jobs outside the firm. In particular, I argue that because unions reduce the potency of the internal and external threat of job loss (by making it more difficult for employers to dismiss workers), vacation time is less responsive to such threats in unionized firms than in nonunionized firms. The results of analysis of data from the 1985 and 1993 GSWHC in Japan support this hypothesis.

Since case law in Japan severely restricts unionized firms from dismissing workers, the simple worker discipline model based on dismissal does not apply. Unionized firms use more costly monitoring and merit pay sys-

tems than nonunionized firms. Therefore, the efficiency wage explanation of the dual market model by Bulow and Summers (1986) is not applicable to the Japanese labor market. However, the efficiency wage implication is supported in the nonunionized sector in Japan. Thus, it may be more appropriate to characterize the Japanese labor market as a three-sector market, with a unionized sector of full-time workers, a nonunionized sector of full-time workers, and part-time workers.

References

Allen, P. T. 1982. Size of workforce, morale, and absenteeism: A re-examination. *British Journal of Industrial Relations* 20 (1): 83–100.

Allen, Steven G. 1981. Compensation, safety, and absenteeism: Evidence from the paper industry. *Industrial and Labor Relations Review* 34 (2): 207–18.

Araki, Takashi. 2002. *Labor and employment law in Japan*. Tokyo: Japan Institute of Labor.

Barmby, Tim, John G. Sessions, and John G. Treble. 1994. Absenteeism, efficiency wages and shirking. *Scandinavian Journal of Economics* 96 (4): 561–66.

Brown, Sarah, and John G. Sessions. 1996. The economics of absence: Theory and evidence. *Journal of Economic Surveys.* 10 (1): 23–53.

Bulow, Jeremy I., and Lawrence H. Summers. 1986. A theory of dual labor markets with application to industrial policy, discrimination, and Keynesian unemployment. *Journal of Labor Economics* 4 (3): 376–414.

Dore, Ronald. 1973. *British factory-Japanese factory: The origins of national diversity in industrial relations.* London: George Allen & Unwin.

Ferguson, Ronald, and Randall Filer. 1986. Do better jobs make better workers? Absenteeism from work among inner-city black youths. In *The black youth employment crisis,* ed. Richard B. Freeman and Harry J. Holzer, 261–95. Chicago: University of Chicago Press.

Fujimura, Hiroyuki. 1989. International comparison of merit rating. *Journal of Japan Institute of Labour* no. 362:26–37.

Green, Francis, and Steven McIntosh. 1998. Union power, cost of job loss, and workers' effort. *Industrial and Labor Relations Review* 51 (3): 363–83.

Hildreth, Andrew K. G., and Fumio Ohtake. 1998. Labor demand and the structure of adjustment costs in Japan. *Journal of the Japanese and International Economies* 12 (2):131–50.

Ishida, Hideo. 1985. *International personnel management of Japanese firms* (in Japanese). Tokyo: Japan Institute of Labor.

Japan Institute of Labor. 1998. Research on the sick leave system in Japan. Research report no. 105. Tokyo: Japan Institute of Labor.

Kaivanto, Kim. 1997. An alternative model of pro-cyclical absenteeism. *Economic Letters* 54 (1):29–34.

Koike, Kazuo. 1981. *Skill-formation in small and medium firms* (in Japanese). Tokyo: Dobunkan.

———. 1991. *Economics of jobs* (in Japanese). Tokyo: Toyokeizai Shinposha.

Koshiro, Kazutoshi. 1978. Work incentive and labor relations in workers in large Japanese factories: Basic indexes for international comparison (in Japanese). In

International comparison of labor relations, ed. Mikio Sumiya, 91–116. Tokyo: University Press of Tokyo.

———. 1980. Quality of life of Japanese workers (in Japanese). *Journal of Japan Institute of Labor* no. 255 (June): 15–23.

Lazear, Edward P. 1979. Why is there mandatory retirement? *Journal of Political Economy* 87 (6): 1261–84.

Leigh, J. P. 1985. The effects of unemployment and the business cycle on absenteeism. *Journal of Economics and Business* 37 (2):159–70.

Ministry of Labor. 1985. *General survey on working hours and conditions.* Tokyo: Ministry of Labor.

———. 1993. *General survey on working hours and conditions.* Tokyo: Ministry of Labor.

Policy and Research Division, Ministry of Labor. 1993. *Basic survey on wage structure 1993* (in Japanese). Tokyo: Rodo Horei Kyokai.

Romu Gyosei Kenkyusho (Institute for Labor Administration). 1997. Chokai seido no jishhi jyokyo to unyo no jittai (Survey on disciplinary systems). *Rosei Jiho* no. 3322:2–27.

Shapiro, Carl, and Joseph E. Stiglitz. 1984. Equilibrium unemployment as a worker discipline device. *American Economic Review* 74 (3):433–44.

Sugeno, Kazuo. 1992. *Japanese labor law,* trans. Leo Kanowitz. Tokyo: University of Tokyo Press.

Weiss, Andrew. 1985. Absenteeism and wages. *Economics Letters* 19 (3): 277–79.

Wilson, Nicholas, and Michael J. Peel. 1991. The impact on absenteeism and quits of profit-sharing and other forms of employee participation. *Industrial and Labor Relations Review* 44 (3): 454–68.

Winkler, Donald R. 1980. The effects of sick-leave policy on teacher absenteeism. *Industrial and Labor Relations Review* 33 (2): 232–40.