Unpaid Overtime for White-collar Workers

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1 Introduction

It is said that there are many workers who work without being paid the legal allowance for overtime work in Japan. This is known as "unpaid overtime". In the 1980s, Japan was said to have longer working hours than other countries. In particular, it was thought that the phenomenon of unpaid overtime was unique to Japan and that this was one of the reasons behind long working hours in Japan. It wasn't until a few years ago that unpaid overtime hours started to be measured and it is thought that the actual situation was not fully understood in the 1980s. Even in other countries, studies measuring the amount of unpaid overtime are more or less nonexistent. As far as I know, unpaid overtime hours in Germany and the United Kingdom were measured in 1993. On the whole, the number of hours of unpaid overtime for male workers was 2.36 hours in Germany and 7.8 hours in the United Kingdom. The average number of hours of unpaid overtime worked by those who worked overtime, even if only occasionally, was 25.7 hours a month in Germany and 38.2 hours a month in the United Kingdom.

According to a study carried out by the Japanese Trade Union Confederation - Research Institute for Advancement of Living Standards (RENGO-RIALS) in June 2002, the average number of hours of unpaid overtime worked per month for men and women combined was 8.7 hours. The monthly average amongst those who had worked unpaid overtime for at least one hour was 29.6 hours[1]. As the studies in Germany and the United Kingdom were carried out over a period of ten years and the workers subject to the studies were different, a comparison between the levels of unpaid overtime is not possible. Nevertheless, it is safe to say that unpaid overtime exists in all three countries, thus making it impossible to say that this is a phenomenon exclusive to Japan.

As mentioned above, only a few attempts have so far been made to examine unpaid overtime not only in Japan, but also in other countries as well. The purpose of this paper is to investigate the actual situation of unpaid

[1] "Research on Diversification of Working Style and Working Hours " conducted by RENGO-RIALS (Research Institute for Advancement of Living Standard)

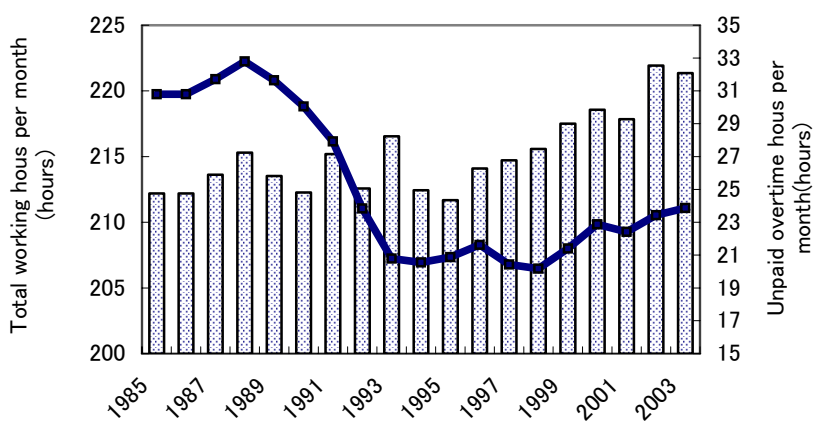
overtime.

2 Background of increasing unpaid overtime in Japan

The number of hours of unpaid overtime in Japan has increased in recent years. Figure 1 shows shifts in the estimated number of working hours in Japan. At the start of the 1990s, policies to reduce the number of working hours (including revisions to the Labor Standards Law designed to lead the way towards shorter working hours) proved effective, and the total number of working hours decreased substantially in comparison to figures in the 1980s. However, since the latter half of the 1990s, unpaid overtime has continued to increase, driving the total number of working hours ever upwards.

In line with increases in unpaid overtime in Japan, the authorities stepped up measures to rectify the situation during the period from the late 1990s into the new century. In April 2001, the Ministry of Health, Labor and Welfare issued recommendations for the rectification of the situation regarding unpaid overtime, and the resulting extra wages paid out by companies ordered to make corrective payments via the Labor Standards Inspection Office totaled 8.14 billion yen (70.7 million dollars) over the course of the next year and a half up to September 2002.

Figure1: Estimated total number of working hours and unpaid overtime hours per month (non-agricultural/combined male and female totals)



Source: Labour Force Survey and Survey on Wage Structure

Corrective measures such as these were implemented based on the idea of companies not paying workers sufficiently in line with the amount of overtime hours declared. According to a survey that asked workers their reasons for doing unpaid overtime, a large number of workers responded to the effect that "Even if I request to be paid, I won't get anything due to budgetary restrictions" indicating that companies force employees to work unpaid overtime. At times when there is excessive supply in the labor market, companies try to sift through the large number of job seekers and employ people who can work harder for lower pay. At times like these, workers are prone to put up with working overtime for no wages in order to gain employment or ensure that they retain their job.

However, not all unpaid overtime, which increased in the latter half of the 1990s, needs to be rectified. In fact, there are cases where companies are actually paying wages for so-called unpaid overtime. In the following sections, this paper verifies that amongst white-collar workers at large enterprises in the same category in terms of age, sex, qualifications and occupation, the overall yearly salaries of workers who work unpaid overtime are higher than those of workers who do not. The reason for this is thought to be that, although companies do not formally pay wages directly based on the number of overtime hours worked, in practice, hours put in are reflected in payments such as bonuses.

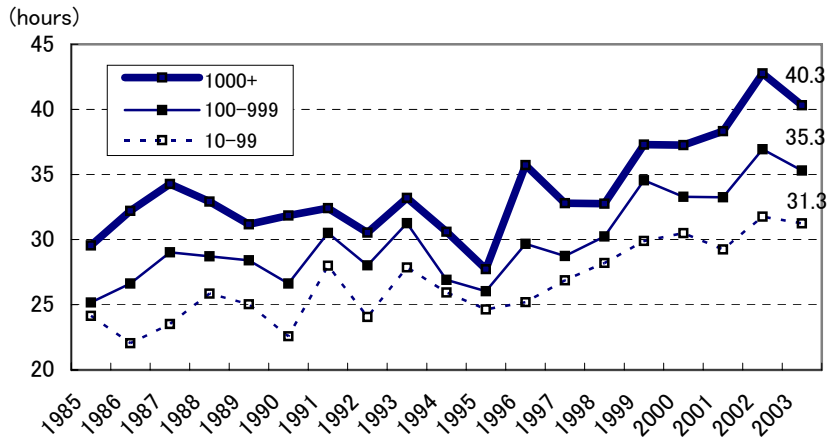
The reason behind why companies stopped paying wages directly based on hours of overtime worked is related to personnel management systems that were popular amongst large enterprises in the latter half of the 1990s. One of these is the performance-based system of personnel management whereby employees are paid in accordance with their results. This system is a reflection of the downturn in company performance in the 1990s and started to gain popularity as part of a movement to reassess the payment of wages in accordance with labor input. Another system, which is in the process of being introduced, is the Discretionary Labor System whereby as the quantity of advanced, specialized work assigned to employees has increased, all aspects of work - from methods of execution to time allocation - is left to the workers themselves. With specialized, advanced work, it is difficult to predict the number of working hours that will be required to reach completion. In cases where it is not possible to estimate the necessary number of working hours, under systems whereby workers receive a salary in return for the hours they

have worked, they try to boost their wages by working longer hours. Therefore, for more advanced, specialized work, rather than paying wages according to hours worked it makes more sense to pay wages based on the evaluation of final output. Both systems place greater emphasis on the performance of workers to whom they are applied and weaken the relationship between working hours and wages.

It is thought that the percentage of compensated unpaid overtime such as this increased in the 1990s. If the reason for the increase in unpaid overtime is said to be owing to an increase in the traditional type of uncompensated unpaid overtime, it is expected that unpaid overtime would have increased at small- and medium-scale companies. Small and medium scale businesses suffered a significant deterioration in performance in the 1990s and it is possible that companies did not pay workers for the number of overtime hours they declared because of cutbacks in funds to cover wages.

Figure 2 shows shifts in the number of unpaid overtime hours put in by male workers according to differences in the scale of companies. The bigger the scale of the company the greater the number of unpaid overtime hours worked per month. The average number of hours for the 1990s was 32.5 hours for large-scale companies with 1000 or more employees, 29.3 hours for medium-scale companies with between 100 and 999 employees, and 26.3 hours for small companies with less than 100 employees. The number of unpaid overtime hours at large companies also increased significantly during the period from the end of 1990 to the start of the year 2000. The number of unpaid overtime hours at large companies in 2002 was 42.7 hours, an increase of 10.3 hours in comparison to the average for the 1990s and roughly double the total for small- to medium-scale companies. Thus, it is large companies that exhibit more rapid increases in the number of unpaid overtime hours. The increase in unpaid overtime at large enterprises can only be explained as nothing more than unpaid work. Factoring in the increased popularity of new personnel systems that give rise to compensated unpaid overtime amongst large-scale companies, there is a strong possibility that workers actually receive wages in return for so-called unpaid overtime.

Figure 2: Number of unpaid overtime hours per month according to scale of firm (non-agricultural/male workers)



Source: Labour Force Survey and Basic Survey of Wage Structure

3 Compensated unpaid overtime

3-1 Previous works

Only a few economic leading studies about determinants of unpaid overtime do not regard unpaid overtime as simply nonpayment of labor. Rather, these studies think that unpaid overtime is paid for, and workers do it from their own motivation and of their own accord.

Pennenberg's (2002) study indicates that over a 10-year period, workers with unpaid overtime experience on average a 2 percent increase in real labor earnings using panel data in West Germany[2]. He finds supportive evidence for the investment character of unpaid overtime.

Mitani (1997) pointed out that the probability of doing unpaid overtime is high when the evaluation element is performance as opposed to the number of hours worked. In other words, unpaid overtime is undertaken in the belief that their efforts will be recompensed by future promotion accompanied by higher wages, although there is no immediate compensation.

In this way, the reason why firms compensate for unpaid overtime later is

[2] He uses longitudinal micro data from the German Socio Economic panel Study (GSOEP) for the years 1988 to 2000.

to provide an effort incentive. Ohashi (1989) looked at how firms pay bonuses to compensate employees for the intensity of work experienced since the last payment. If we read labor intensity to mean unpaid overtime, future payment for unpaid overtime can be considered as a means to encourage work effort.

Although Mitani (1997) highlighted the relationship between the evaluation system and unpaid overtime, he doesn't verify that unpaid overtime is actually recompensed. If the wages of workers who engage in unpaid overtime is lower than that of workers who do not, the firm simply introduces a new salary system and aims to reduce costs through wage controls. Therefore, this paper confirms as follows that the wage of workers doing unpaid overtime is higher.

3-2 Implicit contract

Based on this hypothesis, we will demonstrate that the more workers do unpaid overtime, the higher the reward they will receive. Workers will make a choice between two types of job. One is a job that requires unpaid overtime because the content of the work is variable, although the rewards are high. The other is a job that does not require unpaid overtime because the content of the work is fixed, although the rewards are low. This is an implicit contract concerning unpaid overtime and rewards that are agreed on between labor and management.

This contract is updated whenever firms offer a new job to workers. For example, in the case of an interview with the boss for the purpose of goal setting for the current term under the management-by-objectives system, this is a half-yearly or yearly event to decide the work method for a certain period. The reason why firms offer such a contract is that some jobs are difficult and complex. In the case of specialized and advanced jobs, it is hard for firms to predict the labor input required to complete them. When a firm cannot accurately assess the labor input requirement, a worker paid on an hourly basis will prolong working hours more than required in order to raise their reward. In this way, a performance-based wage is more appropriate for compensation for specialized and advanced jobs than an hourly wage. In addition, a firm must set higher rewards to ensure premium payment for working uncertain hours.

Furthermore, under the performance-based salary, it becomes irrelevant for workers to report their own working hours to the firm, as working hours are not the criteria used for evaluation. Therefore, this leads to the phenomenon

where workers underreport their working hours. However, a worker recognizes these extra working hours as unpaid overtime because an extra pay is not directly received for overtime hours. Then what choice do workers have when it comes to selecting a job in which the rewards are high but unpaid overtime is required?

We shall begin by considering a firm which employs n workers. It is assumed that the job performance of individual workers is equal, but they have different levels of leisure preference. For now, let us assume that the leisure preference of worker $i(i=1,\dots n)$ is $\theta_i(0 \le \theta \le 1)$, thus we write $\theta_1 > \theta_2 > \cdots > \theta_n$. The worker whose leisure preference is high is able to obtain a high level of utility from their leisure time, when endowment hours was distributed as working hours and spare time. On the other hand, the worker whose leisure preference is low gains considerable utility from compensation of labor, i.e. leisure preference is a variable to express whether the worker is a family-oriented person who prefers to spend a lot of time with their family, or a work-oriented person who places greater importance on their job. As a family-oriented worker feels distressed when working hours become longer, it becomes necessary to pay greater rewards for marginal labor.

When worker i selects the degree of difficulty of work $T_i(T_i) \ge 0$, then they will receive salary W_i. Also, we assume that workers have a price attached to their labor, and this price depends on the degree of difficulty of work as chosen by themselves and their leisure preference θ_i.

The unpaid overtime S of worker i depends on the degree of difficulty of the work T_i, so it is written as $S(T_i)$. Furthermore, we surmise that this unpaid overtime function $S(T_i)$ has the following characteristics:

assumption 1 (i) $S'(T_i) > 0$, (ii) $S''(T_i) > 0$, (iii) $S(0) = 0$

(i) Longer working hours are necessary in order to adequately complete more difficult work. (ii) As the work becomes more difficult and complex, the marginal unpaid overtime hours continue to increase. (iii) A job with the lowest degree of difficulty $Ti = 0$ does not require unpaid overtime. In other words, it means that the job is able to be adequately completed during basic working hours.

The worker i has the following utility function:

$$U_i = u(W_i - C(S(T_i), \theta_i))$$

$C(S(T_i), \theta_i)$ represents a workers' cost function for doing unpaid overtime, and has the following properties:.

Assumption 2 (i) $C_S > 0$, (ii) $C_{SS} > 0$, (iii) $C_\theta > 0$, (iv) $C_{S\theta} > 0$

(i)The more the workers do unpaid overtime, the larger the labor cost will become. (ii)The more the workers do unpaid overtime, the larger the marginal labor cost will become. Also, workers' labor cost depends on their leisure preference. (iii)The higher the level of leisure preference that workers have, the larger the labor cost will become, (iv)Thus, as unpaid overtime increases, the marginal cost also increases.

In addition, a firm receives profits $\pi(T_i)$, and $\pi' > 0$, $\pi'' < 0$. A worker does not need to receive rewards that exceed the profit that is obtained by completing his job. The utility maximization problem is expressed as follow.

$$\max_{T_i} U_i = u(W_i - C(S(T_i), \theta_i))$$
$$s.t. \quad \pi(T_i) - W_i \geq 0$$

The first-order condition for maximum utility reveals that the worker whose leisure preference is low will choose more difficult work, and the wage of workers who do unpaid overtime is high.

$$\frac{dT_i}{d\theta_i} < 0$$

$$\frac{dW_i}{ds_i} > 0$$

4 Empirical Method

Based on a previous hypothesis, this section demonstrates that white-collar workers in a large enterprise with a low leisure preference do unpaid overtime, and as a result their rewards increase.

The data is taken from "Survey of White-collar Employees". This survey was conducted by RENGO-RIALS in 1993 for white-collar employees in five significantly large firms. These five firms are automotive, electronics, chemical

and electric power companies, and a department store. The employees surveyed included both those who had been promoted and those who had not - including the section head, department head and directors but excluding top executives. The number of questionnaires distributed was 2,100, and the response rate was an impressive 86.5 %. Thus, the total number of completed questionnaires was 1,816. Summary statistics are reported in Table 2.

First, we use a probit model in order to investigate the decision making of unpaid overtime. Unpaid overtime *u* is determined by the following formula:

$$u^* = a + b\theta_i + u_i$$

$$u_i = 1 \quad if \quad u_i^* > 0, \quad 0 \quad otherwise$$

In the survey, respondents were asked, "When you are busy, do you do so-called unpaid overtime or job spill?" The dependent variable is the dummy

Table.1: Variables definition list

Explained variables	
Unpaid overtime dummy	=1 if the respondent answered positively to the question "When you are busy,do you do so-called unpaid overtime or job spill?"
	= 0 otherwise
Wage	Salary (Bonus included)

Explanatory variables	
Leisure Preference	=1 if the respondent answered positively to the question "Do you use all your paid days off?"
	= 0 otherwise
Job Change dummy	= 1 if the respondent has an experience of changing their job.
	= 0 otherwise
Post dummy	= 1 if the respondent is in a position equal to or higher than the chief executive.
	= 0 otherwise
Male dummy	= 1 if the respondent is male
	= 0 otherwise
Education	high school, junior college,university graduate
Age	Age
	$Age^2/100$
Working Hours	Generated from Basic Survey of Wage Census 1993
Firm dummy	Automotive firm A, Electronics firmB, Chemical firm C, Department storeE
	FirmD=1
Occupation	Clerk, Sales, Distribution, R&D, Production, Others
	Production=1

variable, which equals 1 if workers engage in unpaid overtime and 0 if otherwise. Among 1,816 workers (including 44 workers who did not answer the question), 1281 workers do unpaid overtime, 490 workers do not.

The leisure preference variable is used as the independent variable. Ogura (2000) verifies that a worker who has a high leisure preference takes annual paid leave more often, even if it is controlled for factors such as sex, age, occupation, industry. Therefore, we use a worker's situation of taking paid leave as a proxy variable of the worker's leisure preference. To be concrete, if the respondent answered positively to the question in the survey "Do you use all your paid days off?" they are assumed to have a high leisure preference, otherwise they are assumed to have a low leisure preference.

Table2: Summary statistics

Variable		No. of Observations	Mean	Standard Deviation
Unpaid overtime		1583	0.73	0.45
Salary		1583	6.40	0.36
Leisure Preference		1583	0.23	0.42
Job change		1583	0.74	0.44
Post		1583	0.14	0.35
Sex		1582	0.04	0.19
Education	High school	1583	0.91	0.28
	Junior college	1583	0.20	0.40
	University	1583	0.06	0.24
Age	Age	1583	33.70	6.21
	Age^2	1583	11.74	4.34
Working hours	Standard hours	1583	156.52	5.45
	Overtime hours	1581	14.02	5.60
	Overtime hours2	1581	228.02	144.85
Firm	Firm A	1583	0.15	0.36
	Firm B	1583	0.24	0.43
	Firm C	1583	0.22	0.41
	Firm D	1583	0.26	0.44
	Firm E	1583	0.13	0.33
Occupation	Clerk	1583	0.18	0.38
	Sales	1583	0.26	0.44
	Distribution	1583	0.07	0.25
	R&D	1583	0.06	0.23
	Production	1583	0.37	0.48
	Others	1583	0.08	0.27

Next, we shall proceed to an analysis of the relationship between unpaid overtime and workers' salaries. On the basis of the theory presented so far, the following remuneration function is estimated using ordinary least squares and the generalized method of moments. The logarithm of workers' yearly salary is used as the dependent variable. The independent variable is the unpaid overtime dummy *u*, which is used in the unpaid overtime formula as a dependent variable.

$$\ln W_i = \alpha_i + \beta u_i + \gamma over + \varepsilon$$

5 Empirical Result

First, we estimated the relationship between unpaid overtime and leisure preference (See Table3). A coefficient of the leisure preference variable is negative as expected, and statistically significant. This suggests that workers with a high leisure preference do not do unpaid overtime.

Next, Table 4 shows the estimation result of the effects on a worker's annual salary. The first and second column shows the results using OLS. The coefficient of unpaid overtime is not statistically significant and this suggests that unpaid overtime does not affect the salary when other factors are controlled.

Estimation results using GMM are shown in the third column, the coefficient of unpaid overtime is statistically significant. According to the result, workers who do unpaid overtime have salaries 9.4 % higher than other workers ($e^{0.090} = 1.094$). In addition, the validity of the estimation model of GMM is supported by J-statistics.

Basically, this indicates that workers with a low leisure preference do unpaid overtime and as a result the salary of such workers is high. This result is consistent with the implicit contract hypothesis that was presented in a previous section.

6 Conclusion

This paper's calculations verified that white-collar workers at large enterprises with low leisure preferences do unpaid overtime and the overall yearly salaries of workers who work unpaid overtime are higher than those of workers who do not. This result is consistent with the implicit contract hypothesis, that is, workers decide whether they do unpaid overtime according

Table3: Unpaid overtime and Leisure preference

Dependent variable= Unpaid overtime dummy

		(1)		(2)	
		Coefficient	Marginal effects	Coefficient	Marginal effects
Paid leave dummy		−0.523	−0.184	−0.523	−0.184
		(6.36)		(−6.30)	
Post		−0.025	−0.008	−0.054	−0.018
		(−0.24)		(−0.41)	
Sex		0.210	0.072	0.241	0.084
		(1.74)		(1.67)	
Working hours	Overtime hours			−0.002	−0.001
				(−0.27)	
Occupations	Clerk	−0.180	−0.061	−0.183	−0.062
		(−1.86)		(−1.86)	
	Sales	0.332	0.103	0.324	0.101
		(3.55)		(3.38)	
	Distribution	−0.104	−0.035	−0.105	−0.035
		(−0.73)		(−0.73)	
	R&D	0.096	0.030	0.099	0.032
		(0.61)		(0.63)	
	Others	−0.148	−0.050	−0.149	−0.051
		(−1.12)		(−1.13)	
Constant		0.521		0.533	
		(3.91)		(3.43)	
Pseudo R2		0.039		0.039	
No. of observations		1583		1581	
Lob likelihood		−890.96		−890.46	

Note：Data is Survey of White−collar Employees
Numbers in parentheses are t−statistics.

to their leisure preference and company pays higher wages to workers who do unpaid overtime. A part of this unpaid overtime is interpreted as a result of the ex-ante contract among the labor and management, rather than exploitation by a company.

Of course, there will be an objection to this regarding the explanation of unpaid overtime that increased rapidly in the latter half of 90's only for the reason mentioned above. The data used in this paper was collected in 1993, so the circumstances may be not same. Since the end of 2002, Rengo or the Ministry of Health, Labor and Welfare have continued with surveys about unpaid overtime, and an analysis using this data is expected in the near future.

Finally, we would like to reiterate the fact that we do not fully agree with

existing systems of unpaid overtime. In fact, in cases where a prior agreement between labor and management with regard to appropriate payment in return for hours worked, including unpaid overtime, is clearly lacking, some kind of administrative involvement is essential. To enable agreements between labor and management regarding working hours and payment to be formed easily, matters such as establishing legal procedures for information disclosure at the time when employment contracts are signed are likely to become important policy issues in the future.

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Table4: Estimation of Unpaid overtime and Wage

Dependent variable=Salary

		OLS (1) coefficients	OLS (2) coefficients	GMM coefficients
Unpaid overtime		0.001	0.001	0.090
		(0.13)	(0.07)	(2.26)
Job change		−0.087	−0.088	−0.093
		(−4.46)	(−4.50)	(−4.56)
Post		0.087	0.088	0.090
		(5.57)	(5.66)	(6.51)
Sex		0.196	0.199	0.190
		(9.08)	(9.24)	(7.41)
Working hours	Standard hours	0.009	0.009	0.009
		(2.84)	(2.80)	(2.38)
	Overtime	0.007	0.007	0.009
		(1.70)	(1.59)	(2.02)
	$Overtime^2$	−0.001	−0.001	−0.001
		(−3.76)	(−3.66)	(−3.97)
Age	Age	0.140	0.141	0.132
		(20.94)	(21.16)	(18.58)
	Age^2	−0.139	−0.140	−0.001
		(−13.73)	(−13.91)	(−12.89)
Education	High school	−0.094	−0.095	−0.089
		(−6.24)	(−6.35)	(−4.96)
	Junior college	−0.013	−0.012	−0.013
		(−0.75)	(−0.69)	(−0.70)
Firm	FirmA	−0.090	−0.092	−0.097
		(−4.95)	(−5.15)	(−5.63)
	FirmB	−0.184	−0.181	−0.191
		(−8.51)	(−8.46)	(−8.14)
	FirmC	−0.207	−0.208	−0.207
		(−6.36)	(−6.42)	(−5.89)
	FirmE	−0.264	−0.264	−0.274
		(−4.73)	(−4.77)	(−4.41)
Occupation	Clerk	0.006		
		(0.53)		
	Sales	−0.004		
		(−0.36)		
	Distribution	−0.022		
		(−1.37)		
	R&D	0.021		
		(1.24)		
	Others	−0.011		
		(−0.76)		
Constant		1.830	1.835	2.006
		(3.69)	(3.71)	(3.68)
No. of observations		1580	1580	1580
Pseudo R2		0.835	0.835	
J Statistics				9.253
p−value				0.160

Note : Data is Survey of White−collar Employees
Instrumental Variables are paid leave dummy, occupation dummy and constant.
Numbers in parentheses are t−statistics.