Wage premiums for firms' work-life balance practices: evidence from Japanese matched firm-worker data

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Keywords

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Abstract

This paper explores how firms and workers assess the cost of work-life balance practices such as the flextime system, generous child/family care leave, and the short-time working system, which are considered key elements in human resource management. Specifically, we investigate whether workers' wages are lowered when work-life balance practices are introduced in the workplace. The paper is based on two types of data in Japan: actual wage data and data gathered from a hypothetical survey. In the survey, we asked firms and workers the same hypothetical questions, for example, "By how much could wages be reduced if work-life balance practices are introduced?" The answers to these questions reveal huge gaps between workers' and firms' wage premiums. That is, many workers answered that a wage cut of 0–20 percent would be acceptable if work-life balance practices were introduced in their workplace. However, most firms either replied that a 100 percent wage cut would be necessary or that the introduction of work-life balance practices was out of the question. This result may reflect the fact that firms expect to incur heavy costs in introducing work-life balance practices, which may explain the low adoption rate of such practices in Japan. Based on the actual data, we estimate a negative wage premium of about 9 percent for male workers who work under flextime schedules. This implies that despite the anticipated cost of introducing work-life balance practices, firms could introduce these practices if workers bear the costs by accepting lower wages.

1. Introduction

While employees' need to achieve work-life balance is growing, firms are not necessarily active in adopting work-life balance practices such as the flextime system, generous child/family care leave, and the short-time working system. For example, the ratio of firms adopting flextime scheduling is only 5.9 percent in Japan (General Survey on Working Conditions, Ministry of Health, Labour and Welfare). The low adoption rate is more evident for smaller firms: it is 3.5 percent for firms with less than 100 employees, 10.7 percent for those with 100–999 employees, and 32.0 percent for those with more than 1,000 employees.

One of the possible reasons for the low adoption rates is the cost of adopting and maintaining work-life balance practices. Firms probably expect work-life balance practices to have large monetary and non-monetary costs, including workplace inefficiency. They may also believe that the costs of adopting these practices would outweigh the potential benefits like

lower employee turnover, higher labor productivity due to enhanced morale, and higher recruiting effectiveness.

However, even if the costs of these practices are more than the benefits, firms can adopt them by transferring the costs, in the form of lower wages, to workers who benefit from the practices. In other words, if workers regard their labor condition as a package that includes wages, benefits, job profile, and the workplace environment, firms that provide a variety of attractive work-life balance practices could hire employees at lower wages, other factors being equal. This concept is known as the compensating or hedonic wage hypothesis proposed by Rosen (1986). For example, under the compensating wage hypothesis, a positive wage premium is necessary to hire workers for dangerous jobs compared to safe jobs. Similarly, given equal productivities, higher wages should be paid to temporary workers who face greater job insecurity than permanent workers. By the same token, firms with rich work-life balance practices could attract workers at lower wages, and we would observe negative wage premiums for such firms.

Although many studies have investigated the compensating wage hypothesis, only a few focus on work-life balance practices. The results of such studies are mixed. For example, Johnson and Provan (1995) and Gariety and Shaffer (2002) report that workers in firms adopting the flextime system tend to earn higher wages than other workers in the United States. On the other hand, Baughman et al. (2003) find that the US firms that provide flexible scheduling policies tend to pay lower entry-level wages than their competitors do.

The above studies are likely to suffer from the ability bias, which states that high-ability workers who earn higher wages could find jobs at firms with better workplace environments. Furthermore, considering that wages are likely determined as a result of bargaining between workers and firms, it is important to determine the perceived cost of work-life balance practices for both workers and firms.

Therefore, this paper will explore the cost of work-life balance practices for firms and workers using firm-worker matched Japanese data. Specifically, we ask firms and workers hypothetical questions such as "By how much could wages be reduced if work-life balance practices are introduced?" We compare the subjective costs of these practices for firms and workers and discuss the implications of discrepancy in costs for work-life balance practices. To the best of our knowledge, this is the first attempt to measure the hypothetical or subjective cost of work-life balance practices for both firms and workers. We also use actual wage data from another firm-worker matched Japanese data set to examine how negative wage premiums are estimated when the ability bias is taken into account. We specifically control for unobservable firm-specific characteristics by taking advantage of the firm-worker matched data structure.

The rest of this paper is organized as follows. In Section 2, we explain the data used in the analysis. Then, in Section 3, we discuss the distributions of hypothetical wage premiums of work-life balance practices for firms and workers. In Section 4, by estimating the workers' wage function, we examine how large the observed wage premiums are. Finally, we conclude the paper in Section 5,

2. Data

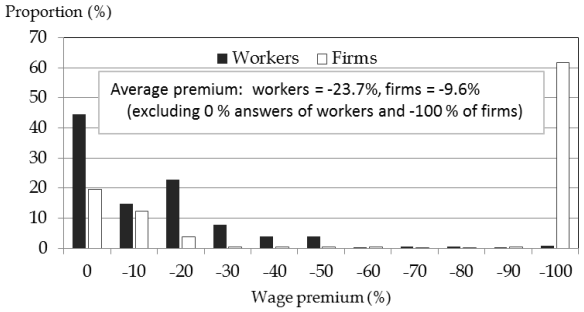
The data for subjective wage premiums for work-life balance practices comes from an original survey, "Survey on human capital formation and work-life balance," conducted for both firms and workers by the Research Institute for Economy, Trade, and Industry (RIETI) of the Ministry of Economy, Trade and Industry (METI) in January–February 2012. This survey was administered to firms with more than 100 employees. Each of the respondent firms was also asked to choose at least five white-collar employees to participate in the employee survey. Those employees were asked to fill in and return the questionnaire by mail. As a result, information became available on 719 of the 5,677 firms (representing a response rate of 12.7 percent) and 4,439 matched employees. From the data, we selected white-collar, regular employees above 20 years of age, who usually worked more than 20 hours a week.

The data for actual wages and work-life balance practices come from another original survey, "International survey on work-life balance," conducted for firms and workers by the RIETI in December 2009–January 2010. The survey scheme was the same as the above survey, but this survey gathers information on actual wages and the adoption of work-life balance practices. The available sample consists of 1,677 of the 9,628 firms (representing a response rate of 17.4 percent) and 10,055 matched male employees. After removing outliers and missing values, we obtained data on 4,449 permanent Japanese employees.

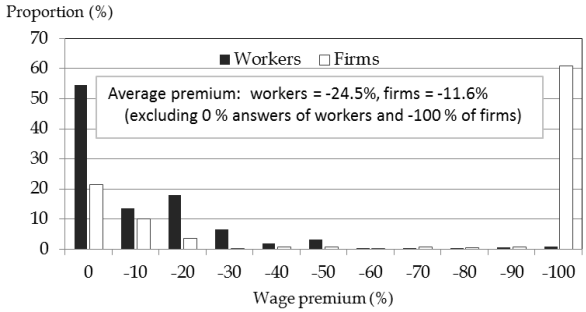
3. The subjective cost of work-life balance practices for firms and workers

We first discuss the subjective cost of work-life balance practices using data from the "Survey on human capital formation and work-life balance." The survey asks both firms and workers the following question: "How much of a wage cut is appropriate if the following work-life balance practices are introduced in the workplace: (1) flexible work scheduling system, (2) child/family care leave above the legal minimum standard, and (3) short-time working system, respectively?"The respondent firms are asked to fill in appropriate wage cut rates or choose the alternative, "the introduction of work-life balance practice is out of the question." For firms that chose the latter, we interpret the appropriate wage cut rate to be100 percent. Employees were also asked to fill in the wage cut rates that would be acceptable to them to compensate for the introduction of work-life balance practices. If a worker chose zero wage cuts, it implies that they would not accept wage cuts for an improvement in their work conditions through the introduction of such practices.

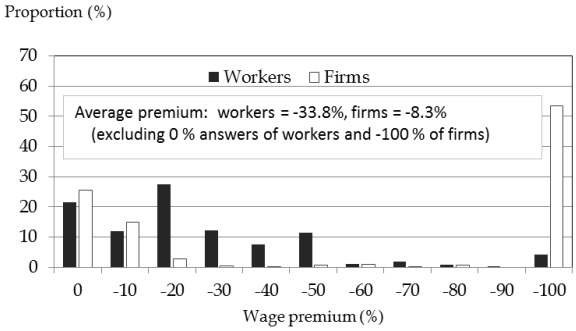
Figure 1 illustrates the distributions of the subjective costs of the three practices. Looking first at the flexible work scheduling system for firms and female and male workers in Figures 1(1) and 1(2), we find that for 40–50 percent of the workers, a wage cut is not acceptable, whereas the acceptable wage cut rate is around 10–20 percent. On the other hand, although some firms answered that 10–20 percent wage cuts are appropriate, more than 60 percent of the firms regard introduction of the practice as out of the question. Thus, there is a large discrepancy in the cost of flexible work scheduling perceived by firms and workers. This discrepancy may be one of the reasons for the practice not being adopted widely in the workplace.



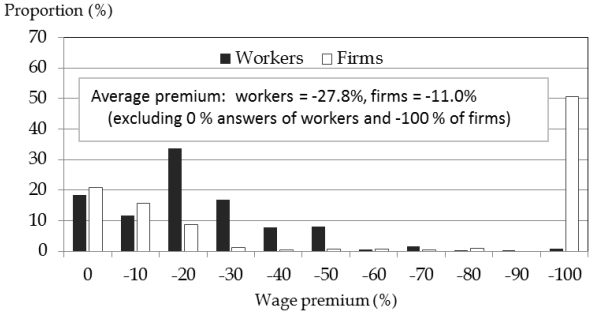
(1) Flexible work scheduling system (male)



(2) Flexible work scheduling system (female)



(3) Child/family care leave above the legal minimum (female)



(4) Short-time working system (female)

Figure 1: Distributions of subjective cost for work-life balance practices

It is important to note, however, that when the extreme answers—0 percent for workers and 100 percent for firms—are excluded; the average negative wage premiums seem less divergent. The average negative wage premium calculated by excluding workers who selected 0 percent wage cuts is 23.7 percent for females and 24.5 percent for males. Likewise, the average negative wage premium calculated by excluding firms that selected 100 percent wage cuts (firms that responded "out of the question") is 9.6 percent. Therefore, in these firms, a flexible work scheduling system could be introduced if wages were lowered by about 10 percent. Furthermore, more drastic wage cuts might be possible because workers in these firms have larger negative wage premiums than in other firms. Thus, if firms were to take the potential needs of workers into consideration, they could not only enhance workers' well-being, but also reduce their human-resource cost by introducing a flexible work scheduling system along with wage reductions.

Regarding child/family care leave above the legal minimum standard and the short-time working system, we plot the distributions of the subjective wage premiums in Figures 1(3) and 1(4), respectively. Since these practices are mainly used for female workers in Japan, we show only the distributions of female workers. Similar to the results seen for the flexible work scheduling system, these figures show that more than 50 percent of the firms consider the introduction of these practices as out of the question. However, we also observe that workers are

likely to accept larger wage reductions for the introduction of these practices than for the flexible work scheduling system. The average negative wage premium calculated by excluding workers who answered 0 percent wage cuts is 33.8 and 27.8 percent for child/family care leave above the legal minimum standard and the short-time working system, respectively. Thus, it can be concluded that female workers' need for these practices is more than for the flexible working system. Interestingly, firms evaluate smaller negative wage premiums of 8–11 percent for the introduction of these practices. Therefore, it is possible that the adoption of these practices would also enable firms to reduce their personnel cost.

4. Regression analysis for the actual negative wage premiums

We calculate the actual negative wage premium by estimating a wage function that includes work-life balance practices as an explanatory variable. Specifically, using the data from the "International survey on work-life balance," we estimate the following Mincer-type wage function:

$$w_i = X_i\beta + WLB_i\theta + u_i \ ,$$

where w_i is the log hourly wage of worker i(annual earnings divided by annual hours worked);X_i is a vector of covariates for the wage function including tenure, tenure squared, age, university graduate dummy, management dummy, occupation dummies, industry dummies, return on sales, and firm age; and u_i is an error component. WLB_i is a variable for work-life balance practices. WLB_i includes (1) a flextime system variable that takes 1 if a worker uses the flextime system and 0 otherwise, (2) a child care leave variable that takes 1 if a worker has used the leave system and 0 otherwise, and (3) a short-time working system variable that takes 1 if a worker has used the system and 0 otherwise.

We determine whether the coefficient of the work-life balance practice dummies (θ) is negative, since the compensating wage hypothesis indicates negative wage premium for work-life balance practices. In estimating the equation, however, several factors should be taken into account. First, ability and selection biases should be considered. Ability bias arises if workers with higher productivity get better jobs with both higher wages and generous work-life balance practices. Conversely, selection bias arises if workaholic workers choose a firm where long working hours are the norm and there are no work-life balance practices. To account for these ability and selection biases, we estimate the wage function as a Heckman's treatment-effect model by using firm age, ratio of female managers, ratio of temporary workers, age, university graduate dummy, and manager dummy as instruments.

Second, we consider the omitted variable bias pointed out by Bloom and Van Reenen (2006). They state that firms with better human resource management are likely to have better work-life balance practices, and higher productivity is observed for these firms. That is, if we omit factors such as unobservable management quality in the above equation, the estimates would be biased. Thus, we estimate the wage function as a firm fixed-effect model, where we control for unobservable firm-specific factors including management quality. The firm fixed-effect model is feasible because the firm-worker matched data enable us to identify the workers who work for the same firms.

Third, the compensating wage hypothesis would not be supported if the labor force was less mobile, as is the case with the Japanese labor market. Unless workers are able to change their jobs, a firm without work-life balance practices need not necessarily set higher wages to attract workers. To take labor mobility into account, we estimate wage functions using the sub-sample of workers who are regarded as more mobile, such as those who have experienced a job change or those who work for small and medium firms.

Tables1 (1) to 1(4) summarize the estimation results for the flextime system (males and females), child care leave system (females), and short-time working system (females). Looking first at Table 1(1) regarding the flextime system for female workers, ordinary least squares (OLS) regression estimates indicate that female workers using the system tend to earn 10–15 percent higher wage rates. This result goes against the compensating wage hypothesis. However, considering the results of the treatment-effect model and firm fixed-effect model, where we control for the ability, selection, and omitted variable biases, no positive wage premiums are estimated. This result is the same for the estimation using sub-samples of job-changers and workers in small and medium firms.

Next, Table 1(2) shows the estimation results of the flextime system for male workers. The table indicates that unlike for female workers, the firm fixed-effect model yields significantly negative coefficients for the flextime system. The negative wage premium is about 5 percent for the entire sample, 6 percent for those working in firms with less than 300 employees, and 9 percent for the sub-sample of job-changers. This indicates that the compensating wage hypothesis holds for male workers using the flextime system, especially for those who have an option to change jobs in the labor market.

	All sample			Small and medium firms			Job-changers		
	OLS	Treatment -effect Model	Firm fixed-effect	OLS	Treatment -effect Model	Firm fixed-effect	OLS	Treatment -effect Model	Firm fixed-effect
Flex-time system use	0.11**	-0.01	0.06	0.10**	-0.01	0.07	0.15**	-0.00	0.20
dummy	(0.03)	(0.14)	(0.04)	(0.04)	(0.17)	(0.05)	(0.05)	(0.25)	(0.15)
Tenure	0.02**	0.02**	0.01**	0.01**	0.01**	0.01**	0.01*	0.01*	0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)
$Tenure^2$	-0.03**	-0.03**	-0.02*	-0.02*	-0.02*	-0.02*	-0.03+	-0.02+	-0.00
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.03)
Age	0.01**	0.01**	0.01**	0.01**	0.01**	0.01**	0.01**	0.01**	0.01*
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
University graduate	0.13**	0.14**	0.08**	0.11**	0.11**	0.08**	0.09**	0.09**	0.02
dummy	(0.01)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)	(0.03)	(0.04)
manager dummy	0.15**	0.14**	0.19**	0.16**	0.15**	0.18**	0.20**	0.19**	0.23**
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)	(0.03)	(0.03)	(0.06)
Return on sales	0.67**	0.64**		0.60**	0.58**		0.63**	0.62**	
	(0.11)	(0.11)		(0.14)	(0.13)		(0.19)	(0.18)	
Firm establishment	0.00	0.00		0.00	0.00		0.00	0.00	
year	(0.00)	(0.00)		(0.00)	(0.00)		(0.00)	(0.00)	
Number of obs.	1,552	1,519	2,010	1,158	1,136	1,453	594	583	774

Notes: 1. Numbers in parentheses are robust standard errors.
2. **, *, and + indicate statistical significance at the 1, 5, and 10% levels.

Table 1(1): Wage function with the flextime system **(females)**

	All sample			Small and medium firms			Job-changers		
	OLS	Treatment -effect Model	Firm fixed-effect	OLS	Treatment -effect Model	Firm fixed-effect	OLS	Treatment -effect Model	Firm fixed-effect
Flex-time system use	0.08**	0.13	-0.05**	0.07**	0.02	-0.06**	0.05+	-0.14	-0.09+
dummy	(0.01)	(0.13)	(0.02)	(0.02)	(0.19)	(0.02)	(0.03)	(0.23)	(0.04)
Tenure	0.01**	0.01**	0.01**	0.01**	0.01**	0.01**	0.00	0.00	0.01+
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
$Tenure^2$	-0.02**	-0.02**	-0.02**	-0.01**	-0.01**	-0.02**	-0.00	-0.00	-0.01
	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.01)	(0.01)	(0.01)
Age	0.02**	0.02**	0.02**	0.02**	0.02**	0.02**	0.01**	0.01**	0.02**
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
University graduate	0.07**	0.07**	0.04**	0.06**	0.06**	0.03**	0.06**	0.06**	0.04**
dummy	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)
manager dummy	0.12**	0.12**	0.13**	0.14**	0.13**	0.14**	0.17**	0.17**	0.14**
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)	(0.02)
Return on sales	0.76**	0.74**		0.79**	0.77**		0.53**	0.52**	
	(0.06)	(0.06)		(0.08)	(0.08)		(0.10)	(0.10)	
Firm establishment	0.00*	0.00**		0.00**	0.00**		0.00*	0.00*	
year	(0.00)	(0.00)		(0.00)	(0.00)		(0.00)	(0.00)	
Number of obs.	3,868	3,807	4,834	2,901	2,853	3,519	1,498	1,474	1,885

Notes: 1. Numbers in parentheses are robust standard errors.
2. **, *, and + indicate statistical significance at the 1, 5, and 10% levels.

Table 1(2): Wage function with the flextime system **(males)**

	All sample			Small and medium firms			Job-changers		
	OLS	Treatment -effect Model	Firm fixed-effect	OLS	Treatment -effect Model	Firm fixed-effect	OLS	Treatment -effect Model	Firm fixed-effect
Child care leave	-0.03	-0.09	-0.05*	-0.01	-0.13	-0.03	-0.01	0.58	-0.09
experience dummy	(0.02)	(0.19)	(0.02)	(0.02)	(0.28)	(0.03)	(0.04)	(0.43)	(0.06)
Tenure	0.02**	0.02**	0.02**	0.01**	0.01**	0.02**	0.01+	0.01*	0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)
$Tenure^2$	-0.03**	-0.03**	-0.02**	-0.02*	-0.02*	-0.02*	-0.02	-0.02+	-0.00
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.03)
Age	0.01**	0.01**	0.01**	0.01**	0.01**	0.01**	0.01**	0.01**	0.01*
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
University graduate	0.14**	0.14**	0.08**	0.11**	0.10**	0.08**	0.09**	0.11**	0.02
dummy	(0.01)	(0.02)	(0.02)	(0.02)	(0.03)	(0.02)	(0.03)	(0.04)	(0.04)
manager dummy	0.14**	0.15**	0.19**	0.15**	0.16**	0.18**	0.19**	0.16**	0.24**
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)	(0.03)	(0.04)	(0.06)
Return on sales	0.63**	0.60**		0.57**	0.56**		0.56**	0.55**	
	(0.12)	(0.11)		(0.15)	(0.13)		(0.21)	(0.19)	
Firm establishment	0.00	0.00		0.00	0.00		0.00	-0.00	
year	(0.00)	(0.00)		(0.00)	(0.00)		(0.00)	(0.00)	
Number of obs.	1,552	1,519	2,010	1,158	1,136	1,453	594	583	774

Notes: 1. Numbers in parentheses are robust standard errors.
2. **, *, and + indicate statistical significance at the 1, 5, and 10% levels.

Table 1(3): Wage function with child care leave (females)

	All sample			Small and medium firms			Job-changers		
	OLS	Treatment -effect Model	Firm fixed-effect	OLS	Treatment -effect Model	Firm fixed-effect	OLS	Treatment -effect Model	Firm fixed-effect
Short-time working	0.06*	-0.17	-0.08*	0.08*	-0.26	0.02	0.09+	0.04	-0.10
system experience	(0.03)	(0.30)	(0.03)	(0.03)	(0.42)	(0.05)	(0.05)	(0.70)	(0.12)
Tenure	0.02**	0.02**	0.01**	0.01**	0.01**	0.01**	0.01	0.01	0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)
$Tenure^2$	-0.03**	-0.03**	-0.02**	-0.02*	-0.02+	-0.02*	-0.02	-0.02	-0.01
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.03)
Age	0.01**	0.01**	0.01**	0.01**	0.01**	0.01**	0.01**	0.01**	0.01*
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
University graduate	0.12**	0.13**	0.09**	0.10**	0.09**	0.08**	0.08**	0.09**	0.03
dummy	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)	(0.03)	(0.05)
manager dummy	0.12**	0.12**	0.19**	0.12**	0.12**	0.16**	0.17**	0.17**	0.22**
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)	(0.03)	(0.04)	(0.06)
Return on sales	0.65**	0.63**		0.58**	0.57**		0.54*	0.55**	
	(0.12)	(0.12)		(0.15)	(0.14)		(0.21)	(0.19)	
Firm establishment	0.00	0.00		0.00	0.00		-0.00	-0.00	
year	(0.00)	(0.00)		(0.00)	(0.00)		(0.00)	(0.00)	
Number of obs.	1,552	1,519	2,010	1,158	1,136	1,453	594	583	774

Notes: 1. Numbers in parentheses are robust standard errors.
2. **, *, and + indicate statistical significance at the 1, 5, and 10% levels.

Table 1(4): Wage function with short-time working system (females)

Tables 1(3) and 1(4) summarize the results of child care leave and the short-time working system for female workers. The tables show negative wage premiums of 5–8 percent in the firm fixed-effect models. It should be noted, however, that promotions or wage increases for those using these systems are usually restricted. Since we could not exclude this possibility, this result should be interpreted with caution.

5. Conclusion

This paper explored how firms and workers assess the cost of work-life balance practices such as the flextime system, generous child/family care leave, and the short-time working system, which are considered key elements in human resource management. Specifically, we investigated whether workers' wages are lowered when work-life balance practices are introduced in the workplace. We considered two types of Japanese data—actual and from a hypothetical survey. In the survey, we asked firms and workers the same hypothetical questions, for example, "By how much could wages be reduced if work-life balance practices are introduced?" From the answers to these questions, we find huge gaps between workers' and firms' wage premiums. That is, many workers answered that a wage cut of 0–20 percent is acceptable, while most firms either replied 100 percent wage cut is necessary or the introduction of work-life balance practice is out of the question. This result may reflect the fact that firms expect to incur heavy costs in introducing work-life balance practices, which may explain the low adoption rate of such practices in Japan. Based on the actual data, we estimate a negative wage premium of about 9 percent for male workers who work under flextime schedules. This result implies that even if introducing work-life balance practices entails heavy costs, firms could introduce them if workers bear these costs by accepting lower wages.

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