

The Effect of Work-Life Balance Policies on Women Employees Turnover : Evidence from Japanese Firm-Level Panel Data

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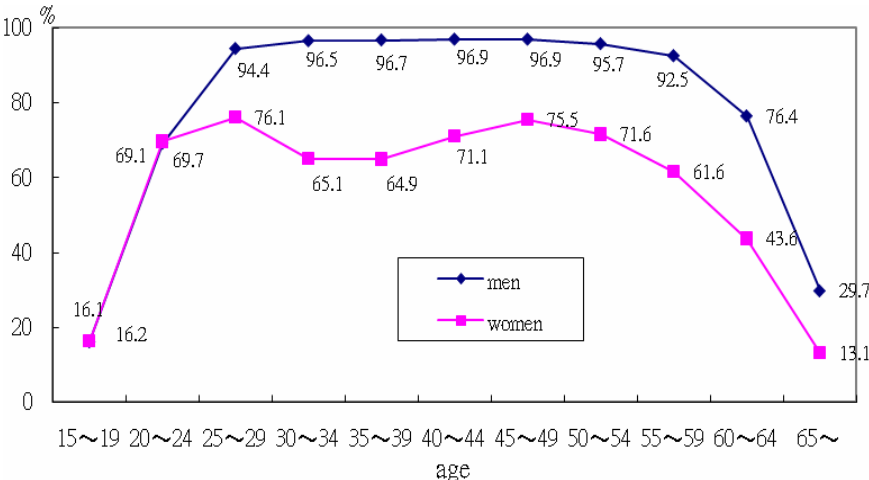
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INTRODUCTION

Figure 1 showing the percentage of women over 15 in the labor force by age bracket in Japan in 2008 represents a curve shaped like the alphabetical letter M, with the age brackets 25 to 29 and 45 to 49 being two peaks. It means that a majority of women quit their jobs when they get married or give birth to a child, and re-enter the labor market when their children have grown up.

Even if the child-care leave law was enforced in Japan in April 1992¹, the declining trend of women labor force participation between 25 to 29 and 30 to 34 still exist. It means that only child-care leave system is not enough for the women after their childbirth. Work-life conflict could happen to employees at each stage in life. As a result, the demands of managing work and life balance need to be addressed for many families.

Figure 1. Women labor force participation rate by age bracket in Japan, 2008



※ The data is from Ministry of Internal Affairs and Communications in Japan 「Labor Force Survey」

¹ Formally it is called “Law Concerning the Welfare of Workers Who Take Care of Children or Other Family Members Including Child Care and Family Care Leave”. The law was established in May 1991.

Work-life balance policies now encompass a wide range of programs, including maternity leave, child and family care leave and flexible work arrangements². Firms' adoption of work-life policies have grown significantly in recent years. Yet firms also are seeking ways to reduce the cost of benefits in the current competitive and cost-conscious climate.

In this paper, we set out to examine whether firms that adopt various work-life balance policies increase the job tenure and decrease turnover probability of women employees. We draw on the data in 2000, 2005 and 2008 editions of Quarterly Female Employment Report in Japan to examine our assumption.

METHOD

Data

For this study, the data are drawn from the 2000, 2005 and 2008 editions of Quarterly Female Employment Report in Japan. The survey was conducted in 1998, 2003 and 2006 respectively and the sample sizes that the report offered was 926 in 1998, 986 in 2003 and 1093 in 2006.

In 2000 edition, the specific practices were: maternity leave system within the statutory period (6 weeks before childbirth and 8 weeks after childbirth), the full amount of maternity pay, child-care leave system within the statutory period (children under the age of 1), child-care leave benefit, family-care leave system (a total of 93 days), family-care leave benefit and flextime system. The survey in 2005 and 2008 editions just listed work-life balance practices including maternity leave system within the statutory period, the full amount of maternity pay, child-care leave system within the statutory period.

In order to discuss the specific initiatives of work-life balance policies in our study, we use the variables of maternity pay, child-care leave benefit, family-care leave system, family-care leave benefit and flextime system as work-life balance indexes in 2000 edition. Simultaneously, we use only maternity pay as work-life balance index in 2005 and 2008 editions.

Hypothesis

Firms that have access to work-life balance policies will have longer job tenure of women employees, lower turnover rate of women employees and higher retention rate of new women graduates.

² Japan Ministry of Health, Labour and Welfare declares some work-life balance policy indexes such as child-care/ family-care system and benefits. See <http://www.mhlw.go.jp/general/seido/koyou/ryouritu/shihyou.html>

Estimation Methods

First, we use ordinary least squares (OLS) method in cross sectional data of 2000, 2005 and 2008 editions respectively to test our hypothesis. And then we use four methods: pooled OLS, first differencing, random effects and fixed effects³ to test our hypothesis.

$$(1) y_{it} = X_{it}'\beta + \alpha + \varepsilon_{it}$$

where i refers to the firm, and t is time. y_{it} is a dependent variable about job tenure, turnover rate and retention rate of women employees. α is a scalar, β is $K \times 1$ and X_{it} is the it th observation on K independent variables. An OLS provides consistent and efficient estimates for α and β if the assumption of α is a correct specification.

$$(2) y_{it} = X_{it}'\beta + \alpha_i + \varepsilon_{it}$$

where α_i is the unobserved heterogeneity term, assumed to be firm-specific and time-invariant. Since we have panel data of firms, we are able to control for time-constant unobserved heterogeneity which may bias the results from cross sectional studies if these unobserved factors correlate with independent variables. Thus, we can difference the data across two years⁴ and then we also present random and fixed effects models in data of three years⁵. The random effects estimator is only valid if α_i is uncorrelated with the independent variables. Later we will test the validity of the random effects estimator by a Hausman test.

RESULTS

(I) Cross Sectional Analysis

First, hypothesis predicted that firms with work-life balance policies would have longer job tenure of women employees. We display only the result of OLS regression on 2000 edition⁶.

In Table 1, the variables maternity pay, family-care leave and flextime system are statistically significant at 1% level in model 1, model 3 and model 5 respectively. It means that adopting of maternity pay, family-care leave and flextime system are predictive of higher women tenure.

We included all independent variables together in model 6 simultaneously. In all work-life balance indexes, only the coefficients on maternity pay and flextime system are significant in

³ In the first differencing and random effects methods, we can include industry dummy variables, but these drop out of the fixed effects analysis.

⁴ We just have the data of turnover rate and retention rate of women employees in 2005 and 2008 editions. We first use a pooled cross section and then we difference all variables.

⁵ Because we have the data of job tenure of women employees in 2000, 2005 and 2008 editions, we can use panel data methods.

⁶ Actually, we have run the cross section analysis on 2000, 2005 and 2008 editions respectively. We only report the result of OLS on 2000 edition here.

model 6. It means that only maternity pay and flextime system policies are associated with higher women tenure if we adopt all work-life balance policies at the same time.

Table 1. WLB policies and job tenure of women employees (2000 survey only)-OLS

Dependent variable	1. women tenure						2. tenure gap
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Control variables							
organization size	0.323 (0.087)***	0.323 (0.089)***	0.27 (0.092)***	0.295 (0.112)***	0.251 (0.087)***	0.208 (0.108)*	0.456 (0.192)**
industry (base:manufacturing)							
media	0.617 (-0.741)	0.795 (0.743)	0.707 (0.785)	1.114 (0.579)*	0.979 (0.722)	1.056 (0.578)*	-2.133 (0.869)**
consulting	-0.42 (0.320)	-0.197 (0.323)	-0.37 (0.368)	-0.455 (0.401)	-0.183 (0.289)	-0.739 (0.347)**	-4.421 (0.914)***
telecommunications	-0.067 (0.210)	0.001 (0.206)	0.064 (0.230)	-0.349 (0.288)	0.069 (0.221)	-0.367 (0.343)	-4.215 (0.790)***
trading	0.171 (0.179)	0.236 (0.187)	0.261 (0.207)	0.082 (0.302)	0.36 (0.193)*	0.259 (0.308)	-1.098 (0.638)*
finance	0.096 (0.181)	0.308 (0.166)*	0.324 (0.182)*	0.354 (0.224)	0.556 (0.187)***	0.344 (0.282)	-1.488 (0.638)**
energy	0.872 (0.359)**	0.962 (0.379)**	0.722 (0.378)*	0.747 (0.376)**	0.889 (0.362)**	0.67 (0.308)**	-0.914 (1.135)
services	0.253 (0.197)	0.263 (0.200)	0.208 (0.206)	0.406 (0.276)	0.398 (0.199)**	0.485 (0.265)*	-2.405 (0.497)***
women married rate	0.595 (0.105)***	0.597 (0.106)***	0.552 (0.108)***	0.593 (0.139)***	0.573 (0.100)***	0.579 (0.130)***	-0.586 (0.166)***
women age	0.513 (0.044)***	0.516 (0.045)***	0.523 (0.046)***	0.581 (0.055)***	0.507 (0.044)***	0.571 (0.053)***	-0.352 (0.053)***
men tenure	0.236 (0.020)***	0.243 (0.021)***	0.234 (0.021)***	0.238 (0.026)***	0.247 (0.019)***	0.241 (0.024)***	
WLB variables							
maternity pay	0.399 (0.150)***					0.538 (0.203)***	0.434 (0.410)
child-care benefit		-0.199 (0.339)				-0.094 (0.491)	0.65 (0.984)
family-care leave			0.407 (0.148)***			0.19 (0.196)	0.496 (0.430)
family-care benefit				0.055 (0.344)		-0.184 (0.246)	0.374 (0.645)
flextime					0.603 (0.162)***	0.611 (0.196)***	-0.838 (0.378)**
Constant	-12.574 (1.513)***	-12.689 (1.531)***	-12.609 (1.577)***	-14.296 (1.893)***	-12.251 (1.499)***	-13.944 (1.815)***	14.084 (2.403)***
Observations	619	615	575	374	617	366	366
Adjusted R-squared	0.77	0.77	0.77	0.79	0.79	0.81	0.27

***indicates significance at 1% level; **indicates significance at 5% level; *indicates significance at 10% level.
Robust standard errors are in parentheses.
WLB is an abbreviation for work-life balance.

Second, hypothesis also predicted that firms with work-life balance policies would have lower turnover rate of women employees and higher retention rate of new women graduates.

In our analysis in 2005 edition, we just use maternity pay as a work-life balance index. And because we have the data of turnover rate of women employees and retention rate of new women graduates in 2008 edition⁷, we use independent variable maternity pay in 2005 edition and dependent variable turnover rate and retention rate in 2008 edition to undertake our analysis⁸.

The result of OLS regression on 2005 edition is in Table 2. The coefficient on maternity pay is statistically significant in women tenure models (model 1 and model 2). This result is the same with the result of OLS regression on 2000 edition.

⁷ More precisely, the survey of 2008 edition was conducted in 2006 but the data of turnover rate was in 2005.

⁸ Therefore, it becomes a single cross sectional data. Instead of running the cross section analysis on 2005 and 2008 editions respectively, this data set solves the problem of causal relationship.

In Table 2, we can see that the coefficient on maternity pay is insignificant in model 3 and model 4. Contrary to expectation, maternity pay has no impact on turnover rate of women employees.

Meanwhile, hypothesis also predicted that firms with work-life balance policies would have higher retention rate of new women graduates. We can see that the coefficient on the maternity pay is significant at 5% level both in model 5 and model 6. With regard to retention rate of new women graduates, adopting of maternity pay policy tends to increase the retention rate of new women graduates. Thus we can say that hypothesis receive partial support in our study.

Table 2. The effect of WLB policies (2005 survey only) – OLS

Dependent variable	1. women tenure		2. women turnover rate		3. new women graduates retention rate	
	[1]	[2]	[3]	[4]	[5]	[6]
Control variables						
organization size	0.682 (0.155)***	0.331 (0.132)**	-0.122 (0.048)**	-0.027 (0.041)	0.322 (0.071)***	0.267 (0.074)***
industry (base:manufacturing)						
media	-0.635 (0.686)	-0.328 (0.630)	-0.41 (0.211)*	-0.457 (0.128)***	0.091 (0.358)	0.172 (0.494)
consulting	-2.17 (0.645)***	-0.509 (0.602)	-0.037 (0.272)	-0.071 (0.258)	0.047 (0.373)	-0.357 (0.248)
telecommunications	-0.861 (0.294)***	0.356 (0.261)	-0.073 (0.104)	-0.29 (0.094)***	-0.02 (0.160)	-0.069 (0.163)
trading	0.796 (0.387)**	0.62 (0.354)*	-0.184 (0.117)	-0.201 (0.093)**	0.161 (0.225)	-0.002 (0.223)
finance	-0.198 (0.405)	-0.148 (0.374)	0.214 (0.157)	0.308 (0.137)**	-0.176 (0.220)	-0.167 (0.232)
energy	2.388 (0.965)**	1.282 (0.839)	-0.74 (0.247)***	-0.095 (0.121)	-0.731 (0.195)***	-0.817 (0.224)***
services	-0.968 (0.468)**	0.06 (0.356)	0.079 (0.126)	-0.071 (0.103)	-0.46 (0.162)***	-0.321 (0.178)*
women married rate	1.124 (0.192)***	0.82 (0.172)***	-0.268 (0.057)***	-0.204 (0.049)***	0.097 (0.090)	0.118 (0.090)
women age	0.641 (0.066)***	0.501 (0.061)***	-0.06 (0.016)***	-0.054 (0.013)***	-0.023 (0.024)	-0.056 (0.026)**
men tenure		0.343 (0.033)***				
men turnover				0.385 (0.043)***		
men retention						0.246 (0.072)***
WLB variable						
maternity pay	1.08 (0.331)***	0.626 (0.301)**	-0.165 (0.107)	-0.119 (0.098)	0.329 (0.167)**	0.411 (0.166)**
Constant	-13.962 (2.121)***	-12.428 (1.925)***	0.038 (0.596)	0.617 (0.503)	-0.407 (0.959)	0.533 (1.006)
Observations	447	440	288	283	229	198
Adjusted R-squared	0.69	0.77	0.37	0.53	0.14	0.23

***indicates significance at 1% level; **indicates significance at 5% level; *indicates significance at 10% level.

Robust standard errors are in parentheses.

All independent variables in 2005 edition were conducted in 2003 and the dependent variables were conducted in 2005.

The variables turnover rate and retention rate are replaced by a log odds ratio (logit).

(II) Panel Data Analysis

Because we have the data of turnover rate of women employees and retention rate of new women graduates only in 2005 and 2008 editions, we difference the data across the two years. Besides, we have the data of job tenure of women employees in 2000, 2005 and 2008 editions, so we first use pooled OLS on the three years and then we use random effects and fixed effects methods.

(i) First differencing

An analysis using a single cross section or just a pooling of the cross sections will produce biased and inconsistent estimators. To remove unobserved firm effect, we difference all variables. Therefore, we regress the change in dependent variables on the change in all independent variables.

Table 3 shows the result of using OLS after first differencing. We just focus on the coefficient on maternity pay change⁹. The coefficient on maternity pay change is statistically significant at 1% level only in model 5¹⁰. It means that firms with maternity pay system in 2005 and without that system in 2008 decrease the retention rate of new women graduates.

Table 3. The effect of WLB policies (2005 and 2008) - First Differencing

Dependent variable	1. women tenure		2. women turnover rate		3. new women graduates retention rate	
	(1)	(2)	(3)	(4)	(5)	(6)
Control variables						
organization size						
log (women)	-0.977 (0.186)***	-2.653 (0.475)***	1.277 (0.537)**	0.491 (0.711)	0.247 (0.956)	0.63 (1.226)
log (men)	0.392 (0.262)	1.989 (0.455)***	-0.584 (0.572)	0.19 (0.867)	0.462 (1.088)	1.383 (1.405)
women married rate	-0.084 (0.103)	0.191 (0.153)	0.019 (0.189)	0.124 (0.215)	0.097 (0.336)	0.154 (0.369)
women age	0.46 (0.032)***	0.5 (0.045)***	0.026 (0.066)	0.102 (0.072)	0.202 (0.113)*	0.232 (0.158)
men tenure	0.193 (0.039)***	0.164 (0.053)***				
men turnover			0.325 (0.086)***	0.427 (0.087)***		
men retention					0.688 (0.153)***	0.484 (0.200)**
overtime		0.002 (0.013)		-0.015 (0.017)		0.042 (0.032)
women on main carrer track rate		-0.374 (0.322)		0.085 (0.496)		-1.31 (1.214)
maternity pay change (base: 05 no, 08 no)						
05 no, 08 yes	0.21 (0.304)	-0.227 (0.445)	0.133 (0.527)	-0.561 (0.606)	-0.517 (0.847)	0.419 (0.992)
05 yes, 08 no	0.254 (0.487)	0.666 (1.018)	0.308 (0.678)	0 (0)	-3.005 (1.573)*	0 (0)
05 yes, 08 yes	-0.082 (0.137)	-0.039 (0.204)	0.315 (0.225)	0.363 (0.296)	0.334 (0.404)	-0.098 (0.542)
Constant	0.27 (0.074)***	0.175 (0.101)*	-0.43 (0.130)***	-0.674 (0.151)***	-0.3 (0.235)	-0.34 (0.297)
Observations	393	196	114	68	62	32
Adjusted R-squared	0.43	0.52	0.17	0.27	0.29	0.36

***indicates significance at 1% level; **indicates significance at 5% level; *indicates significance at 10% level.

Robust standard errors are in parentheses.

We regress the change in dependent variables on the change in all independent variables.

(ii) Pooled OLS, random effects, and fixed effects

We use also three methods: pooled OLS, random effects, and fixed effects to test our

⁹ We create new dummy variables with regard to maternity pay change in first differenced equation. Four groups are allowed: ① firms without maternity pay system in 2005 and 2008 ② firms without maternity pay system in 2005 and with that system in 2008 ③ firms with maternity pay system in 2005 and without that system in 2008 ④ firms without maternity pay system in 2005 and 2008. We choose ① to be a base group.

¹⁰ It is in the case of firm with maternity pay system in 2005 and without maternity pay system in 2008.

hypothesis in the data of 2000, 2005 and 2008 editions. The estimation results are in Table 4. We can see that the coefficient on the maternity pay is significant at 1% level both in the pooled OLS and random effects models¹¹. And for almost all variables, the estimators have the same sign between pooled OLS and random effects models. When we eliminate the unobserved effect entirely by using fixed effects, the maternity pay premium falls notably and the coefficient on the maternity pay is not significant in fixed effects model. The Hausman test tends to receive the fixed effects estimators and if random effects model is used, then the estimators are generally inconsistent. Therefore, in the fixed effects estimation, firms with maternity pay system can't explain the job tenure of women employees.

Table 4. The effect of WLB policies (2000, 2005 and 2008)- Pooled OLS, Random effects and Fixed effects

<u>Dependent variable</u>	<u>women tenure</u>		
	<u>Pooled OLS</u>	<u>Random Effects</u>	<u>Fixed Effects</u>
Control variables			
organization size			
log(women)	-0.109 (0.056)*	-0.232 (0.066)***	-1.393 (0.172)***
log(men)	0.462 (0.060)***	0.584 (0.072)***	0.621 (0.215)***
industry (base:manufacturing)			
media	0.011 (0.229)	-0.107 (0.284)	
consulting	-1.013 (0.357)***	-1.434 (0.470)***	
telecommunications	-0.42 (0.153)***	-0.677 (0.193)***	
trading	0.189 (0.142)	0.11 (0.180)	
finance	0.164 (0.167)	0.369 (0.206)*	
energy	0.809 (0.383)**	0.942 (0.451)**	
services	-0.091 (0.113)	-0.266 (0.138)*	
women married rate	0.473 (0.052)***	0.361 (0.052)***	0.018 (0.079)
women age	0.624 (0.014)***	0.652 (0.014)***	0.657 (0.021)***
men tenure	0.214 (0.009)***	0.155 (0.009)***	0.016 (0.013)
WLB variable			
maternity pay	0.588 (0.110)***	0.573 (0.126)***	0.115 (0.250)
Constant	-15.938 (0.555)***	-16.272 (0.597)***	-8.675 (1.415)***
Diagnostic Test			
Number of observation	1861	1861	1861
Number of groups	1195	1195	1195
R-sq:			
within		0.6349	0.7155
between		0.8153	0.5414
overall		0.8123	0.5677
F test that all u _i =0	F(1194, 660) =4.29 Prob > F = 0.0000		
Breusch and Pagan Lagrangian multiplier test	Chi2(1)=179.94 Prob > Chi2= 0.0000		
Hausman specification test	Chi2(6)=324.54 Prob > Chi2= 0.0000		

***indicates significance at 1% level; ** at 5% level; * at 10% level.
Values in parentheses are standard errors of the estimated parameters.

¹¹ The random effects estimator is preferred when we use Breusch and Pagan Lagrange-multiplier test (LM test).

CONCLUSIONS

Based on our analysis, it is believed that this article contributes to the work-life balance literature in several ways. First, we have provided empirical support for the idea that full amount of maternity pay system has an effect on higher retention rate of new women graduates even though it is in the case of the cross sectional analysis. Different from the prior studies, work-life balance policies explains retention rate of new women graduates rather than turnover rate of women employees in our study¹².

Secondly, using panel data allows us to control for firm specific effects. Although we find the maternity pay system has no effect on job tenure of women employees in the fixed effects model, we are able to control for time-constant unobserved heterogeneity which may bias the results from cross sectional studies if these unobserved factors correlate with work-life balance policies.

Thirdly, rather than focusing on a limited set of formal or informal work-life policies alone, we have examined the effect of various work-life policies on the job tenure of women employees. In sum, our findings are suggestive of a future research agenda.

A limitation to this study is the use of detailed information about each organization. As noted earlier, Quarterly Female Employment Report in Japan provides information on the types of work-life balances policies available within a company. However, it is not apparent whether employees are able to use the policies on offer. Future research needs to evaluate the effect of different types of work-life balance policies on employees. For example, what kind of work-life balance policies bring about a reduction in work-life conflict, an increase in employee loyalty or a reduction in turnover, eventually an increase in financial performance.

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¹² In our study, the definition of retention rate of women employees is that new women graduates stay in the same company 3 years after their first work or not.

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