



Effects of Intra-corporate Policies on the Work of Female Employees

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On the basis of a survey performed at Japanese pharmaceutical companies, we analyze the processes and the influence that family-friendly policies exert on the promotion of women employees and corporate performance through women's activities. In particular, Structural Equation Modeling is used to clarify complex causality between the promotion of women employees and personnel policies.

The results of our analysis indicate that even if complex relations between the variables are taken into account, productive improvements due to family-friendly policies are not observed. Although family-friendly policies do not have a direct effect on the promotions or wages of women, they have an indirect effect on women's promotions and wage increases through the length of their tenure.

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On the basis of a survey performed at Japanese pharmaceutical companies, we analyze the processes and the influence that family-friendly policies exert on the promotion of women employees and corporate performance through women's activities. In particular, Structural Equation Modeling is used to clarify complex causality between the promotion of women employees and personnel policies.

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1 Introduction

This study examines if measures for family-friendly policies affect the promotion of female employees and if female promotions as part of family-friendly initiatives eventually increase corporate performance.

Japan is often said to be a less advanced country in providing equal opportunities to female workers among developed countries. The GEM (Gender Empowerment) index formulated by the United Nations Development Program (UNDP) indicates how much women are empowered in society. Our country ranks in 44th place among 79 countries.²

The government and private companies have been making efforts to develop women-friendly working conditions, such as the formulation of the Equal Employment Opportunity Law, the promotion of positive action, the prevention of sexual harassment and the implementation of family-friendly measures. As Figure 1 illustrates, we have to admit that signs of improvement have been emerging slightly over the past years. The percentage of women taking managerial posts such as subsection chief, section chief and division chief have been gradually increasing and the percentages have more than doubled with all these positions when comparing the findings in 1988 with those in 2003.

However, this does not mean that the correlations between support measures and the growing percentage of female managerial personnel are widely recognized in society. As a matter of fact, there is not an adequate level of explanation about the primary reasons for the noticeably low percentage of Japanese female managerial personnel relative to those in other countries. In view of this situation, this paper examines the effect of intra-corporate policies on the working conditions of female employees.

This study is comprised as follows: The second section reviews preceding studies to explain how this paper will contribute to future research on the conditions of female workers. The third section discusses the clues in which personnel policies will have effects on the percentage of female managerial personnel and ultimately on the business performance of companies. The fourth section examines analytical data and presents the results. The fifth section concludes this paper.

² Atô and Akachi (2003) postulated that Northern European countries and France provide substantial support for both “family-friendly policy” and “economic measures for child-rearing.” However, German-speaking countries do not provide effective support for “family-friendly policy” and Southern European countries are inadequate in both categories. In the English-speaking countries, the situation is the same as in Southern European countries with respect to family-friendly policies, but the full development of civil child care services in English-speaking countries virtually facilitates employment and child care at the same time. If GEM is 1, this indicates full gender equality. As of 2003, Japan’s GEM was 0.515, which suggests that the country needs to further enhance its family-friendly policies, including economic support.

2 Preceding Studies

In Japan, one important issue on female employment in labor economics is wage differentials between male and female workers. With a focus on data by industrial sector, Tomita (1988) analyzed the relationship between gender gaps in the gradients of wage profiles and gender discrimination in employment management. As a result of this examination, he pointed out that there are smaller gender gaps in the gradients of wage profiles with industries in which gender discrimination is less likely with regard to recruitment and personnel relocation in the same company. Higuchi (1991) also analyzed how gender discrimination in employment management affects wage profiles by estimating with wage functions. He mentioned that there are smaller gaps in the gradients of the wage-employment year's profiles between men and women in industries where equal treatment is more likely regardless of gender differences in job education and training and the utilization of the female workforce. In addition, focusing on detailed data from many companies, Mitani (1995) analyzed how gender discrimination in employment management affects gender disparities in wage profiles and employment years between male and female workers. His results have shown that with regard to gender gaps in wage profiles, the effect of working years on salary standards is smaller with companies that have more gender-equal employment management. The gender gaps were quite small in the case of workers with the same number of employment years. He also discovered that there were smaller gaps between male and female workers in the number of employment years with companies having more gender-equal employment management.

Besides these studies, recent Japanese studies have paid much attention to the positive utilization of the female workforce and family-friendly policies. It has frequently been pointed out that many Japanese female workers interrupt their careers in their late twenties for marriage and child care (Ōsawa, 1994). Their early departure means the undesirable suspension of career. More specifically, they break away from employment before a large amount of time and costs spent for their job training are recovered. This is considered to be one of the major factors that prevents aggressive use of the female workforce by companies. Therefore, to promote female employment, it is essential to create an environment where childbirth and child care do not obstruct women's continuing employment. That is, recently researchers have begun to recognize the necessity of balancing work with private life.

One of the studies that could be important for this issue is the child care leave system. There have already been a considerable number of studies on the effect of this system. Shigeno and Okusa (1998) have demonstrated that the child-rearing leave system works to facilitate continuous female employment, if not affecting marriage. Morita and Kaneko (1998) have also pointed out that the child care leave system is effective for boosting continuous female employment.

In addition to the child-care leave system, much attention has been recently paid to the diverse and flexible personnel management of facilitating the balance of work and life. One of those innovative approaches is to examine the effect of various family-friendly policies. The concept of “family-friendliness” emerged in Western countries after the 1980s as a method to balance work and private lives against the background of increasing working mothers, declining birthrates and accelerating social aging trends, more diverse family types and noticeable changes in individual lifestyles. For example, Sakazume (2002) has postulated that family-friendly measures are effective for boosting worker morale, improving working conditions and reducing the percentage of women breaking away from employment.

Moreover, recent studies have paid particular attention to the effect of family-friendly measures on corporate performance. In Japan, many companies have tended to consider that the utilization of female workers and family-friendly policies would put a heavier financial burden on their business and that the policies were unworthy of active implementation. However, some studies in Western countries have demonstrated that there are no negative correlations between female employment and economic performance. Greenwald (1996) argues that corporate managers often introduce family-friendly policies for the sake of better working conditions and that those special measures will definitely yield larger profits for companies. Perry-Smith and Blum (2000) also postulate that family-friendly policies have a positive impact on organizations as a mechanism for competitive advantage. In addition, Shepard, Clifton and Kruse (1996) have pointed out that companies with a flexible employment structure such as the flextime system can raise their productivity by 10% compared to those without such systems, which suggests that more flexible employment systems lead to productivity improvement³.

Based on these studies some researchers have argued that the active use of female employees and family-friendly initiatives will have a positive impact on corporate performance in our country. (Higuchi, Asami, Hirakawa, Ōzeki and Mori, 2006). Amid these trends, surveys on the correlations between the two factors from the corporate perspective were made such as in the case of Takeishi (2006) and Wakisaka (2006).

As noted above, there is a large amount of research on female employment, but there are still many aspects requiring study. The biggest challenge is how to specify the causality between personnel management and corporate performance. For example, it is conceivable that a company could gain remarkable achievements by introducing family-friendly policies. At the same time,

³ Work-life initiatives encompass a variety of practices that aid workers in balancing the demands of work and personal life (Lobel and Kossek, 1996). Organizations can enhance their ability to recruit and retain a top-quality workforce if they provide employees with flexibility and resources to help them combine work and family more easily (Greenhaus and Parasuraman, 1999; Lobel, 1999). Providing work schedule flexibility reduces the level of work-family conflict (Hammer, Allen and Grigsby, 1997) and enhances satisfaction with family life (Parasuraman *et al.*, 1996).

however, there is a conceivable scenario in which a company could afford to take family-friendly policies because some other factors have caused the company to achieve good performance. It is necessary to closely examine the causality between family-friendly measures and corporate performance to correctly understand the situation. Furthermore, there are several steps necessary until intra-corporate measures can have a substantial effect on easing gender gaps in wages and promotions, but there is only a small amount of analytical data on this point.

Many of the preceding studies are based on survey data for individuals or companies. The survey data on individual employees may not have accurate information about personnel policies. It is necessary to collect accurate information on personnel systems from companies. In the meantime, it is more appropriate to collect information about the attributes of workers directly from individual employees; it is particularly desirable to obtain information about wages and promotions and psychological aspects, including working motivations. Therefore, an analysis through the matching of these two patterns is more valid. With a focus on this critical point, this study is based on the matched data for both companies and individual workers.

3 Structural Equation Modeling

This paper uses Structural Equation Modeling (SEM) for data analysis. Figure 2 shows the path illustrations of covariance structure analyses for the relationship between family-friendly policies and female employment.

This method is called Covariance Structure Analysis or Structural Equation Modeling and is a form of statistical methodology for examining the causality within social and natural phenomena. The method handles latent variables that cannot be directly measured unlike observed variables and stems from Confirmatory Factor Analysis, which was espoused by Joreskog and Lawley (1968) and Joreskog (1969). Subsequently, the significance of analyzing covariance structures was recognized and this recognition developed into the examination of the causality among constituent factors by integrating path analysis and confirmatory factor analysis. Then, Joreskog (1978) devised the Linear Structure Relations (LISREL) model. This method was originally used in education and psychology and has also been utilized in business administration and economics.⁴

⁴ There are complicated relationships among other variables in addition to the path illustrations. There are conceivable correlations between career development by female job rotation and particular vocational training measures for women and the percentages of female employment and sales per employee, just comparative to family-friendly policies. There can be correlations between female promotion and morale and sales per employee. The validity of these correlations should be statistically examined. Applied studies on covariance structure analysis include the effect of predictive emotional reactions on actions (Richard *et al.* 1996), the effect of evaluation criteria for public policies on individual behaviors (Maurer *et al.* 1996), one's psychological tendency to show sympathy or delight for others' misfortune (Brigham *et al.* 1997), decisive factors on consumers' garbage disposal (Taylor and Todd, 1997), changes in awareness among university students with part-time jobs as private tutors (Fresco, 1997) and

The necessity for using this method is caused by the complicated causality between family-friendly policies and other variables. Many of the preceding studies focus on the individual effects of family-friendly policies on the motivation and morale of female workers, their productivity, promotions and employment years. However, the causality between those factors is not always set in one specific direction. A number of multiple directions can be considered for the cause and effect and inverse direction could work out.

For example, in a working environment in which the effective implementation of family-friendly policies actually facilitates female employment, the percentage of female workers is likely to rise. Conversely, in a situation where there is a large pool of female business resources or many female employees continue to work without interrupting their career partway through their employment, it is necessary to launch family-friendly policies in an effort to create better working conditions and fully utilize the female workforce.

In addition, it is conceivable that there are multiple relationships between family-friendly initiatives and corporate performance. Companies can secure a pool of more capable female workers by employing family-friendly measures, and female workers' in high level positions can contribute to increasing corporate performance. However, if an enterprise in a tight management condition finds embarking on family-friendly actions a heavy burden, an enterprise would not launch such policies. Alternatively, some companies achieving good performance can afford to introduce family-friendly policies. There is conceivable interconnectedness between sales per employee and family-friendly measures or the percentage of female employment and family-friendly measures. Given this possibility, the relationships among variables can be considerably complicated as is illustrated in Figure 2. Figure 2 is based on observed variables, not on latent variables. The arrow marks checked in both directions between variables indicate that the variables show correlation and covariation with one another and that relationships are too unclear to identify the causality. Confidence in our model was verified by the Chi-square test, the most common statistical method.⁵

4 Data and Analytical Results

This section examines the relationship between personnel management concerning women and other variables on the basis of the arguments in the previous section especially to see if

physical exercises for health maintenance (Fuchs, 1996).

⁵ This method is called the structural equation if latent variables are included, but the causality among observable variables can be analyzed by the measurement equation. Variables are usually categorized into exogenous and endogenous variables. The hypothesis that the path coefficient is 0 is based on Wald statistics. Moreover, the path coefficient from erroneous variables is set as 1 for the sake of securing distinguishability. For the assessment of the whole covariance structure analysis model, indexes, such as GFI (Goodness of Fit Index), AGFI (Adjusted GFI) and RMSEA (Root Mean Square Error of Approximation), AIC (Akaike's Information Criteria), are often used. In this study, the validity of the model is verified by the Chi² test.

family-friendly policies can lead to better corporate performance as Takeishi (2006) and Wakisaka (2006) point out.

This paper has referred to the matched data based on the *Fact-Finding Survey on Employment Management* focusing on companies listed in the *Report on the Employment Promotion Measures for the Pharmaceutical Industry* and the *Survey on The Employees' Awareness* conducted for employees working in the companies.

These surveys were conducted in 1995. The survey on employment management focused on 230 member companies of the Tokyo Pharmaceutical Manufacturers' Association and 270 member companies of the Osaka Pharmaceutical Manufacturers Association. Survey forms were distributed to the enterprises by post and the completed forms were collected by the same method. Valid answers were collected from 310 companies and the percentage of collection was 62%. The forms of the survey on employees' awareness were internally distributed to 5,000 full-time employees of 120 companies primarily running pharmaceutical operations among the 310 organizations that gave valid answers to the survey on employment management, and the completed forms were collected in the same way. There were answers from 3,462 workers of 102 companies and the percentage of collection was 69.2%.

In conducting analyses, we calculated the percentage of extraction for each company from a sample number of female employees and re-extracted allowing redundant data so as to restore the total numbers. However, we excluded cases in which only a few samples of employees for one company were extracted. Using the same reasoning, we excluded small and medium-sized enterprises with particularly small numbers of employees. We also excluded cases where the percentage of total number restoration exceeded 100% due to a noticeable number of employees despite an adequate level of samples.

Table 3 shows basic statistics focusing on the characteristics of analytical variables. Note that corporate attributes represent statistical data based on original samples but that employee attributes show statistics after the population restoration was conducted.

The average number of employees was 1,046.266, which suggests that the data include fairly large companies. The foreign-owned company percentage of 15.2% is also characterizing the data. The pharmaceutical preparation and manufacture industry constitutes as high as 61.3%. Companies with labor unions made up 45.8%, which means almost half of the companies have a labor union. The percentage of female employment was 31%; the employees of the survey included part-timers. Sales per employee (including male workers) were 42,521,210 yen, which were considerably high.

Next, this section looks at personnel measures for female workers. The category of family-friendliness means to what extent companies have the nursing care leave system, the child care leave system, workplace children's day care facilities and the home caregiver dispatching

system, and each item is given one standard numerical point. Table 3 shows the total of these items with its maximum being 4. The average was 1.077, not a high value. This suggests that companies implement on average just one system for the four policies. With regard to career development through female job rotation, only 7.7% of the companies have that type of system. For particular job training methods for women, only 11.9% of the companies have such a system. This means that few companies implement substantial policies for the utilization of female employees.

In addition, with respect to the attributes of individual female workers, the values are based on the survey of employee awareness with a focus on full-time employees. Employee average number of years for education was 14.228; the percentage of married women was 29.4% and the average service duration was 5.771 years. For the index of managerial positions, ordinary workers were set as 1, project manager and subsection chief posts as 2 and section chief post as 3. As a result of examinations, we noticed that no women were in a position higher than the section chief post. The average figure was 1.101, which suggests that most of the samples were ordinary workers. The average of their annual income was 4,075,450 yen. The questionnaire was based on eight categories: less than 3 million yen; 3 million to 4 million yen; 4 million to 5 million yen; 5 million to 6 million yen; 6 million to 7 million yen; 7 million to 8 million yen; 8 million to 10 million yen; and more than 10 million yen. For convenience of calculating average values for each category, we set 2 million yen for “less than 3 million yen” and 15 million yen for “more than 10 million yen” and focused on the medians with the other categories. With respect to the category of “job motivation,” we set “not motivated at all” as 1, “not motivated so much” as 2, “moderately motivated” as 3 and “highly motivated” as 4. The average was 2.264, which is indicative of low motivation as a whole.

Furthermore, the data used for this study allow for job type identification, which facilitates the observation of the percentages of female promotion to managerial positions by gender and job type as shown in Table 4. The average percentage of female promotion to managerial positions—1.21%—is remarkably low compared to the male percentage of 24.84%. However, there are considerable differences by job type. The relatively high percentages of female promotion to managerial positions were marked in the R&D and indirect sectors. The male average percentage with the R&D department was 28.6% and their percentage with the indirect sector was 43.86%. Comparison of the female percentage with the indirect sector with that of men in managerial positions suggests that female promotion in the indirect area is still inactive. In the meantime, the female promotion percentage with MR operations is exceedingly low. MR means sales operations and the characteristics of this category make it particularly difficult for female workers to operate. Now, we will consider factors for female promotion exclusively from the perspective of personnel management just like in the case of many preceding studies, before examining the model in the previous section to examine explanatory variables that affect promotion. We place a particular focus

of attention on the R&D and indirect sectors in which adequate samples can be secured and the percentages of female promotion to managerial positions are higher. In conducting analyses, we use the job categories for female employees, setting up “ordinary workers” as a standard criterion, and apply the Ordered Probit Model.⁶

Table 5 shows the examination results of the R&D sector. As was expected, age was the positive factor for female promotion. Marriage turned out to be a negative factor at approximately the 10% level significance. With regard to personnel measures, the award system for long service and the annual salary system work well for female promotion. In the case of foreign-owned companies, female employees were likely to be elevated to higher posts. In addition, the percentages of female workers in a managerial position were low with the head offices both in Tokyo and Osaka. Labor unions were a negative factor, but they were not statistically significant.

Furthermore, Table 6 presents crucial factors for female promotion in the indirect sector. The number of educational years proved to be a significant effect. Unexpectedly, however, graduation from the pharmaceutical department was a negative factor for working in the indirect sector of pharmaceutical companies. This suggests that specialized pharmacy knowledge was not so important for promotion in the indirect sector. Age was positively significant just like in the case of the R&D sector, but marriage had a positive effect in contrast to the R&D sector. Regarding personnel management, feedback on employee performance evaluation turned out to be a negative effect. Management by objective was a positive effect and feedback on performance evaluation was a negative effect, but both items were statistically insignificant. With respect to family-friendly measures, the nursing care leave system was a negative factor, whereas the child-care leave system and the short-hour service and fixed work day system proved to be positively significant at the 10% level. Particular training systems for female workers were a positive factor for promotion.

As noted above, as far as the R&D and indirect sectors are concerned, there are no consistent causalities observed between personnel measures and female promotion patterns. In addition, with regard to family-friendly policies, which are a primary focal point of this study, no significant factors were detected with the R&D sector. In the case of the indirect sector, the nursing care leave system was a negative factor, while the child-care leave system proved to be a positive factor. Moreover,

⁶ The three numerical values of job category are a dependent variable. The Ordered Probit model is as follows:

$$L(\alpha, \beta_1, \beta_2 \cdots \beta_k) = \prod_{Y_i=0} \{1 - F(\beta_1 + \beta_2 \cdot X_{2i} + \cdots + \beta_k \cdot X_{ki})\} \cdot \prod_{Y_i=1} \{F(\beta_1 + \beta_2 \cdot X_{2i} + \cdots + \beta_k \cdot X_{ki}) - F(\beta_1 + \beta_2 \cdot X_{2i} + \cdots + \beta_k \cdot X_{ki} - \alpha)\} \cdot \prod_{Y_i=2} F(\beta_1 + \beta_2 \cdot X_{2i} + \cdots + \beta_k \cdot X_{ki} - \alpha)$$

We can obtain the maximum likelihood by calculating the logarithm of this likelihood function and maximizing it. The variation and covariance of the maximum likelihood can be obtained by partially differentiating the logarithmic likelihood twice. We calculated average marginal effects after the estimations.

marriage showed contrary effects with the two sectors and consistent explanatory variables were observed only with age.

It is impossible to clarify in this analysis if these results are due to the absence of effective personnel systems for female promotion beyond the walls of job types or if there are no interactive correlations specified between female promotion and personnel management, as noted above. Therefore, it is necessary to use Structural Equation Modeling mentioned in the previous section.

Table 7 shows the result of structural equation model. A particularly notable point is the effect of personnel measures for female employees on other variables. With respect to the effect of family-friendly initiatives on the percentage of female workers, the path coefficient showed a minus value. This indicates that female employees are likely to work longer in companies that employ substantial family-friendly systems. In summary, there seem to be positive correlations between corporate family-friendly initiatives and the percentage of female workers. However, if companies recognize that they require enormous costs to implement family-friendly systems, they are likely to employ fewer women to avoid the financial burden. This tendency is shown in the examination results.

In addition, it became clear that companies with a high percentage of female employees are more likely to have effective family-friendly systems. That is, those companies introduce family-friendly measures to deal with a large number of female workers. Conceivably, analyses not based on interactive correlations find positive relationships between the two factors just because of the latter causality.

Furthermore, family-friendly measures have a considerably direct impact on reducing sales per employee. Employees utilizing the child-rearing and nursery care leave systems retain their positions as employees during the period. Though they virtually give no service to the company in the duration of their leaves, the total number of corporate employees does not change in statistics. However, in fact, the number of workers often increases by the employment of supplementary staff, but they may not have a particular effect on improving corporate performance. In contrast, it is observed that companies with high sales per employee are more likely to employ full-blown family-friendly policies. Those enterprises achieving good performance can afford to allocate business resources to implementing family-friendly policies. This suggests that the positive correlations between sales per employee and family-friendly measures may be based on good corporate performance.

Family-friendly policies do not have a direct effect on female promotion and a significantly negative coefficient was observed. However, those measures have an effect on rising female working years, which indirectly work better for female workers. This is because longer service years lead to promotion and promotion causes wage increases. Some analyses on the positive effect of

family-friendly policies on pay raises and promotions seem to reflect these indirect effects.

For the effects of other female-related special measures, career development through female job rotation turned out to have a negative effect on rising through the ranks to higher posts, if not statistically significant. In addition, the effect of particular job training systems for female employees on motivation was positive but not significant, and was not effective for elevating female workers to higher positions.

5 Conclusion

This study examined the matched data based on the *Fact-Finding Survey on Employment Management* and the *Survey on the Employees' Awareness* focusing on companies listed in the *Report on the Employment Promotion Measures for the Pharmaceutical Industry* to analyze the effect of intra-corporate policies on female employment. These data enabled us to collect information about corporate measures from companies and information about the distinctive attributes and behaviors of individual workers from employees. There were two remarkable points observed: the correlations between family-friendly policies and productivity and the effect of those initiatives on female promotions and wage increases.

We first examined the relationships among variables affecting female promotion in R&D and indirect sectors before getting into complicated specific model analyses. However, we could not discover any consistent causality about the effect of personnel measures, including family-friendly policies, on female promotion patterns.

Next, we examined the interconnectedness between female promotion and personnel management and the complicated relationships among variables. However, we found that there were no noticeable indicators hinting that family-friendly measures are effective for boosting productivity. In addition, with respect to the effect of family-friendly measures on female promotion and wage increases, we demonstrated that those measures do not have a direct impact on female promotion and payment levels but that they are effective for increasing female employment years. Longer employment years are likely to facilitate personnel promotion and wage increase.

It is necessary to note that these examination results are centered on just the pharmaceutical industry and that they are based on data obtained in the early phase in which demands for competitive performance evaluation systems and family-friendly policies only began to rise. As our future tasks, it is essential to analyze updated data and assess policy effects with a focus on a wider range of areas in a recent situation where family-friendly measures have become more common.

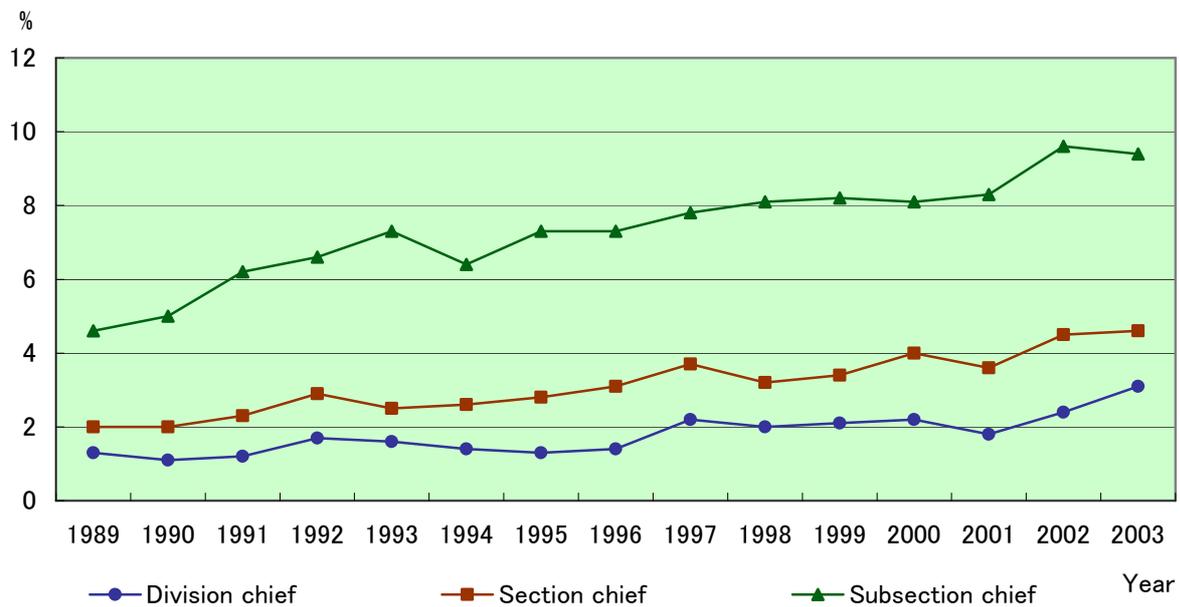
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Figure 1: Changes in the Percentage of Female Personnel
in Managerial Positions (Total Number of Businesses)



Source: The Basic Survey on Wage Structure

Figure 2: Structural Equation Modeling of Family-Friendly Policies

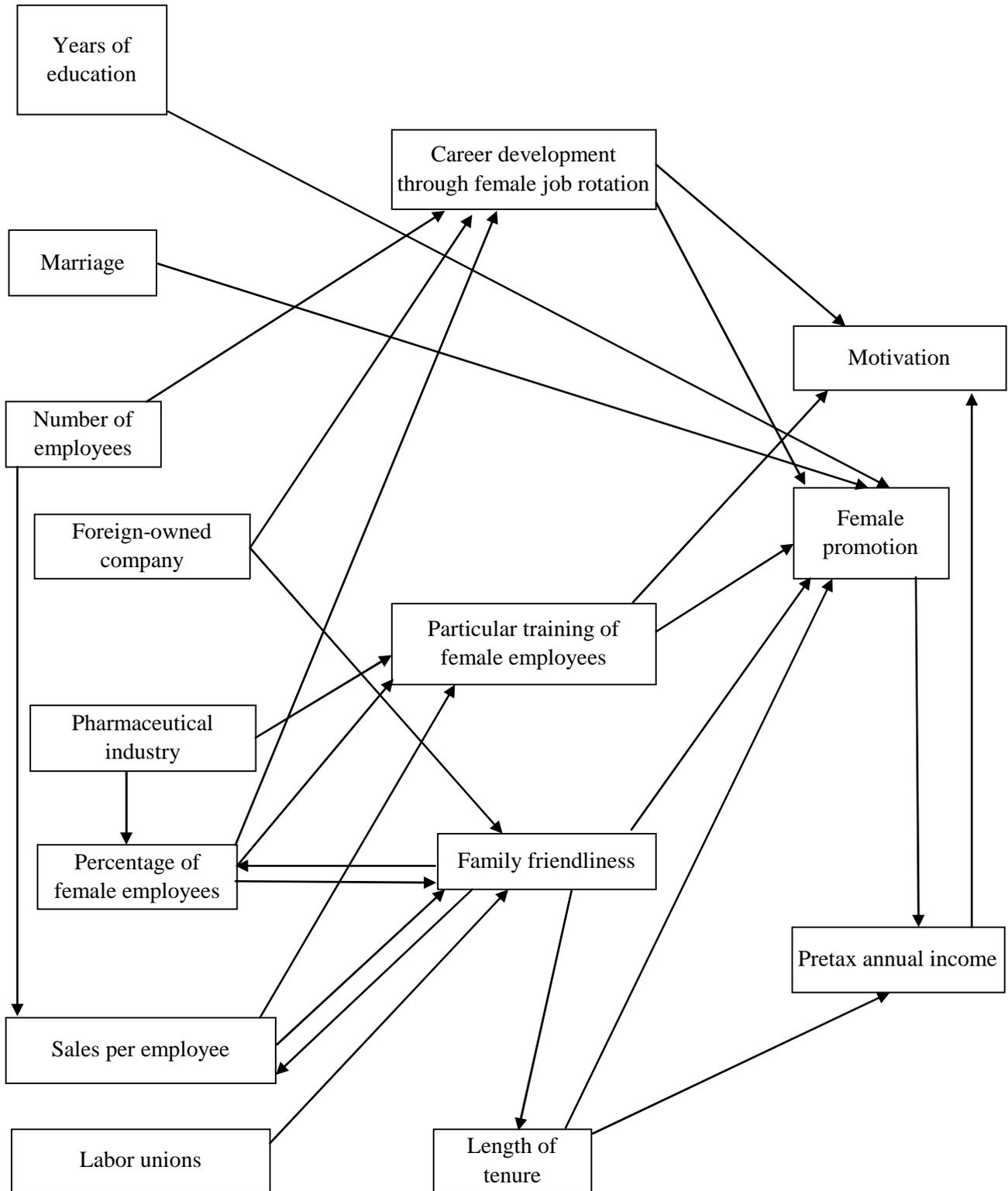


Table 3: Summary of Statistics

	Variables	Means (the rate of 1 in the case of dummy variables)	Standard Deviation (except dummy variables)
Corporate attributes	Number of employees	1046.266	2178.651
	Foreign-owned companies	0.152	
	Pharmaceutical companies	0.612	
	Labor unions	0.458	
	The percentage of female employees	0.31	0.154
	Sales per employee (males included) <small>unit:10,000</small>	4252.121	8089.223
	The extent of family-friendliness	1.077	0.687
	Female career development through job	0.077	
	Particular training of female employees	0.119	
The attributes of female employees	Number of years of education	14.228	0.014
	Marriage	0.294	
	Length of tenure	5.771	0.146
	Pretax annual income	407.545	149.424
	Managerial position	1.101	0.358
	Motivation level (four categories)	2.264	0.014

Note: N=3462

Table 4: The Percentage of Managerial Personnel by Gender and Job Type (%)

	Percentage of male managerial personnel	Percentage of female managerial personnel
R & D sector	28.60	2.49
MR sector	27.92	0.85
Production and distribution sector	11.86	0.30
Indirect sector	43.86	2.11
Total (%)	24.84	1.21

Table 5: Decisive Factors for Female Promotion in the R&D Sector
Dependent Variable: Index of Managerial Positions

	Marginal Effect	Standard Error
Age	0.312	0.085 ***
Married=1, others=0	-0.879	0.445 *
Award system for long service (yes=1, no=0)	2.278	0.524 ***
Annual salary system (yes=1, no=0)	1.084	0.520 *
Reemployment system (yes=1, no=0)	1.017	0.723
Fixed workplace system (yes=1, no=0)	0.887	0.567
Head office in Tokyo	-2.467	0.640 ***
Head office in Osaka	-1.184	0.360 **
Foreign-owned companies	3.778	0.923 ***
Labor unions (yes=1, no=0)	-0.355	0.245
Sample size	159	
Wald Chi ² (10)	56.020	
P-value >Chi ² (10)	0.000	
Pseudo R ²	0.696	

Note: 1) Analytical method is the Ordered Probit Model. And we calculate the marginal effects for the probability of outcome 1. or 2.

2)***, ** and * indicate significance at the 1%, 5% and 10% levels respectively.

Table 6: Decisive Factors for Female Promotion in the Indirect Sector

Dependent Variable: Index of Manegial Positions

	Marginal Effect	Standard Error
Number of years of education	0.302	0.140 *
Graduation from the pharmaceutical department	-0.883	0.385 **
Age	1.001	0.050 *
Married=1, others=0	0.181	0.052 ***
Management by objective (yes=1, no=0)	0.609	0.320
Promotion test system (yes=1, no=0)	-0.469	0.310
Feedback on performance evaluation (yes=1, no=0)	-1.088	0.355 ***
Nursery care leave system (yes=1, no=0)	-0.735	0.205 ***
Child-care leave system (yes=1, no=0)	1.277	0.600 *
Short-time service and fixed workday system (yes=1, no=0)	0.583	0.254 *
Fixed workplace system (yes=1, no=0)	-0.343	0.246
Particular training of female employees (yes=1, no=0)	1.399	0.215 ***
Career development through job rotation (yes=1, no=0)	0.504	0.380
Sample size	358	
Wald Chi ² (13)	70.42	
P-value >Chi ² (13)	0.000	
Pseudo R ²	0.439	

Note: 1) Analytical method is the Ordered Probit Model. And we calculate the marginal effects for the probability of outcome 1. or 2.

2)***, ** and * indicate significance at the 1%, 5% and 10% levels respectively.

Table7: Structural Equation Modeling

Exogenous Variables		Endogenous Variables	Coef.	P-Value
Number of years of education	--->	Managerial position	0.061	***
Married dummy	--->	Managerial position	-0.101	0.054
The number of employees	--->	Sales per employee	0.915	***
The number of employees	--->	Particular training of female employees	3.E-04	***
Foreign-owned dummy	--->	Female career development through job rotation	-0.089	0.108
Foreign-owned dummy	--->	Family-friendly measures	-0.549	***
Foreign-owned dummy	--->	Managerial position	0.012	0.061
Pharmaceutical manufacturer	--->	Percentage of female employees	-0.189	0.014
Pharmaceutical manufacturer	--->	Managerial position	-0.189	***
Percentage of female employees	--->	Particular training of female employees	0.706	***
Percentage of female employees	--->	Family-friendly measures	2.527	***
Percentage of female employees	--->	Managerial position	0.452	***
Sales per employee	--->	Particular training of female employees	3.E-04	***
Sales per employee	--->	Family-friendly measures	2.E-04	***
Dummy with labor unions	--->	Family-friendly measures	0.875	***
Female career development through job	--->	Managerial position	-0.046	0.315
Particular training of female employees	--->	Motivation	0.159	0.277
Particular training of female employees	--->	Managerial position	-0.034	0.740
Family-friendly measures	--->	Percentage of female employees	-0.046	***
Family-friendly measures	--->	Sales per employee	-2282.351	***
Family-friendly measures	--->	Employment years	1.693	0.015
Family-friendly measures	--->	Managerial position	-0.032	***
Length of tenure	--->	Managerial position	0.025	***
Length of tenure	--->	Pretax annual income (unit: 10,000 yen)	9.812	***
Promotion to subsection chief and higher	--->	Motivation	0.02	0.140
Promotion to subsection chief and higher	--->	Pretax annual income (unit: 10,000 yen)	128.64	***
Pretax annual income (unit: 10,000 yen)	--->	Motivation	0.001	***

Note: 1) N=21586: The results of redundant sampling to secure the consistency of the percentage of extraction for each company.

2)Coef shows the values of path coefficients. ***P-value is less than 0.01.

3)GFI=0.923 AGFI=0.902 Chi2 Test=86. The three tests provide modeling validity.