

Determining factors in the career continuance of female workers with maternity leave

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Abstract

While there is a plethora of studies on the career disruption of women related to childbirth and childrearing, little research has been dedicated to the examination of female workers who were able to resume a career as a result of a maternity protection system in Korea. This paper investigates how women's employment is protected through maternity protection system using panel data which was compiled from female workers enrolled in the Employment Insurance database who took childbirth leave in 2009 and 2010. This panel contains information regarding the female workers' use of the maternity protection system and changes in their employment status over the period between January 2009 and May 2012.

Keywords: Career disruption, Women's employment, Maternity leave, Childbirth leave, Maternity protection system

1. Maternity leave and return to the workplace

Despite the steadily growing number of female workers in South Korea who are granted maternity leave, the career disruption experienced by women of childbearing and childrearing age remains a serious concern. While there is a plethora of studies on the career disruption of women related to childbirth and childrearing in Korea, little research has been dedicated to the examination of female workers who were able to resume a career as a result of a maternity protection system. This research aims to investigate how women's employment is protected through the assistance of a maternity protection system.

Toward that goal, this research has compiled the panel data on information related to female workers enrolled in the Employment Insurance database who took childbirth leave in 2009 and 2010, focusing on their use of a maternity protection system and changes in their employment status recorded over the period between January 2009 and May 2012. The panel data includes figures on the dates upon which the female workers who applied for childbirth leave between January 2009 and May 2012 became entitled and disentitled as beneficiaries of employment insurance, as well as the dates of initiation and termination of their childbirth leaves and childcare leaves.

The data set also contains information on the characteristics of the subjects' employers, including the company ID registered with the employment insurance agency, business type, company size, and location. In addition, demographic characteristics of the female workers are featured, including age, the relevant child's age, monthly average working hours, occupation, employment pattern, and childbirth leave benefits. This panel data was compiled by tracking such information up until May 22, 2012. In order to determine whether employment was maintained for at least six months from the date of termination of childbirth or childcare leave, women whose leave expired after November 22, 2011 were excluded from the analysis. As a result, the subjects of this research included a total of 141,185 female workers: 76,356 women who took childbirth leave before May 2012 and 64,829 women who took both childbirth and childcare leaves in the period between January 2009 and November 22 in 2011.

Among those who took childbirth leave in 2009 and 2010, according to the results of the analysis, a total of 76,000 women (54.2%) took only childbirth leave up to May 2012 and 64,000 women (45.8%) took both childbirth and childcare leaves¹. In other words, only 45.8% of women who had taken childbirth leave also took childcare leave. Of the women who took only childbirth leave, 29.9% (42,000 out of 141,000 persons) returned to their job following the leave and remained employed without disruption until May 2012. 0.9% (1,273 persons) resigned during their leave and 23.4% (33,000 persons) returned to their workplace after the leave but quit within six months (Figure 1).

As to the 64,000 women who took both childbirth and childcare leaves, 2.6% (3,654 of 141,000 persons) elected to terminate their work during the childcare leave, 21.6% quit following the childcare leave, and 21.5% remained employed until May 2012. In sum, 55.1% (42,000 persons) of those who took only childbirth leave and 47.3% (30,000 persons) of those who took both

¹ The 395 female workers who took childbirth leave between 2009 and May 2012, returned to work but rapidly moved to another company, took a childcare leave from the second company, and then moved to a third company, were excluded from analysis.

childbirth and childcare leaves continued in their careers at the same company for a minimum six months after their maternity leave had ended. All in all, 51.5% (73,000 persons) of the 141,000 female workers who took childbirth leave between 2009 and 2010, excluding those who were in their childcare leave at the time, returned to their careers following their childbirth or childcare leave. The remained (48.5%) disengaged from employment either during (3.5%) or after (45.0%) their leave.

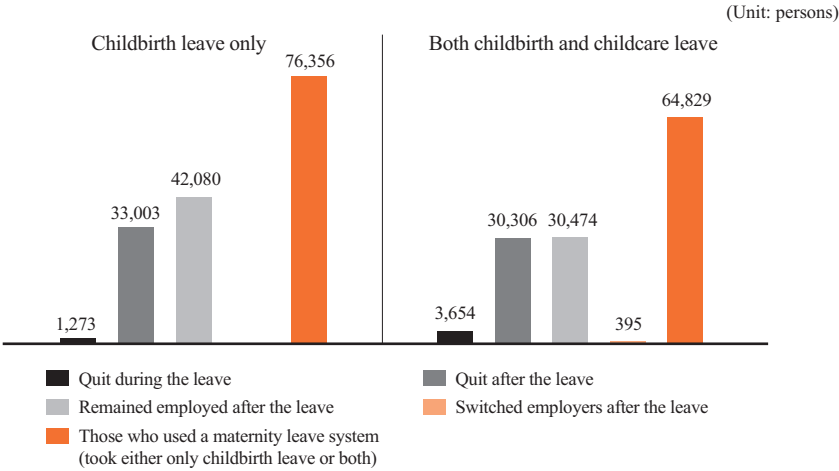


Figure 1. Use of childcare leave by those who took childbirth leave and their return to the workplace

2. Determining factors in the resumption of female workers’ working following childbirth leave

1) Analysis model and characteristics of variables

The goal of childbirth and childcare leaves is to protect the right to maternity of pregnant female workers in support of their provision of childcare, and defend their employment status. As shown above, however, only approximately 40-50% of the female workers who took maternity leave continued working. Accordingly, this research investigated the factors that affect the continuation of women’s working (or their resignation) in relation to maternity leave.

Equation (2) represents a career continuance (or resignation) function to illustrate whether or not a female worker at a specific company who initiated a childbirth or childcare leave in the year t remains employed at the same company in the year $t+1$, which is at least six months distant

from the end of the leave. Equation (2) was obtained by converting equation (1), a cumulative logistic function of career continuance probability, to a linear model. Equation (2), which is a binary logit model, can be estimated through explanatory variables including the subject's demographic characteristics (X_i) that determine the pseudo-dependent variable, which represents the career continuance (or resignation), the subject's job characteristics (Φ_i), and the subject's company characteristics (Ψ_i). $P[Y_i = 1 | X_i, \Phi_i, \Psi_i]$ shows the probability for a woman who is employed at a specific company in the year t to remain employed at the same company in the year $t+1$. $\text{logit}(P)$ refers to $\log[P/(1-P)]$.

$$P(Y_i = 1) = \frac{\exp(z_i)}{1 + \exp(z_i)} = \frac{1}{1 + \exp(-z_i)} \quad (1)$$

$$\text{Logit}(P[Y_i = 1 | X_i, \Phi_i, \Psi_i]) = z_i = \beta_0 X_i + \beta_1 \Phi_i + \beta_3 \Psi_i \quad (2)$$

As to the explanatory variables used to estimate equation (2), human characteristics variables include age, tenure, and age of children entitled for maternity leave. The employment characteristics included occupation, salary, and number of monthly work hours. Finally, the company characteristics included industry type, company size, location, and proportion of female employees. The changes of employment status of a woman with maternity leave are also affected by household characteristics such as her spouse's employment status, number of children, and cohabitation with parents. Due to difficulties in obtaining such data, however, this research used only limited data to examine the factors affecting the career continuance or resignation of female workers who access a maternity protection system.

Table 1 presents explanatory variables used to estimate the career continuance ratio in regards to maternity leave. In terms of the average values of dependent variables, 55.1% of those who took childbirth leave only and 47.3% of those who took both childbirth and childcare leaves continued working. The average ages of female workers at the time of the beginning of their leave were similar between those who took childbirth leave and for those who took childcare leave, at 30.97 and 30.89 years old, respectively².

The age of the child at the time of women's applying for a childcare leave was roughly three months old. The total period of employment of female workers at the time of applying for childbirth leave was 54.2 months, slightly less than in the case of childcare leave (56.94 months). The proportion of female workers whose salary was 1.35 million won or over per month, which is

2 This implies that the women who took childcare leave applied for childcare leave slightly earlier than those who took only childbirth leave.

the upper limit for maternity leave salaries, was 55.8% for those using a childbirth leave and 46.3% for those using a childcare leave.

Table 1. Average values and standard deviations of major variables

| | Female workers who took childbirth leave | | | |
|---|--|--------------------|--------|--------------------|
| | Mean | Standard deviation | Mean | Standard deviation |
| Return to the workplace in relation to hildbirth/ childcare leave (resumed working=1; resigned=0) | 0.55 | (0.497) | 0.47 | (0.499) |
| Age (years old) at the time of beginning childbirth/childcare leave | 30.97 | (3.215) | 30.89 | (3.222) |
| Age (months old) of the child related to childcare leave | - | - | 3.13 | (2.785) |
| Length of employment (months) at the time of beginning of childbirth/childcare leave | 54.21 | (43.553) | 56.94 | (140.837) |
| Monthly work hours (hours) | 210.55 | (15.001) | 210.37 | (16.171) |
| Salary (1=when the ordinary salary is 1.35 million won or over; 0=less than 1.35 million won) | 0.56 | (0.497) | 0.46 | (0.499) |
| Occupation type (reference: Clerks) | | | | |
| Managers | 0.09 | (0.289) | 0.08 | (0.269) |
| Professionals | 0.29 | (0.454) | 0.24 | (0.426) |
| Production related | 0.04 | (0.205) | 0.09 | (0.287) |
| Services/sales | 0.08 | (0.277) | 0.15 | (0.353) |
| Elementary workers | 0.04 | (0.188) | 0.05 | (0.212) |
| Company size (reference: 100-299 employees) | | | | |
| Less than 5 employees | 0.14 | (0.349) | 0.15 | (0.353) |
| 5-19 employees | 0.22 | (0.416) | 0.17 | (0.377) |
| 20-99 employees | 0.22 | (0.414) | 0.13 | (0.334) |
| 300-999 employees | 0.11 | (0.318) | 0.12 | (0.323) |
| 1,000 employees or more | 0.17 | (0.373) | 0.34 | (0.473) |
| Industry type (reference industry: wholesale/retail and restaurant/hotel business) | | | | |
| Manufacturing | 0.18 | (0.381) | 0.20 | (0.400) |
| Electricity/gas, sewage, construction, transportation | 0.06 | (0.242) | 0.08 | (0.265) |

| | Female workers who took childbirth leave | | | |
|--|--|--------------------|------|--------------------|
| | Mean | Standard deviation | Mean | Standard deviation |
| Facility management and other personal service business | 0.07 | (0.249) | 0.09 | (0.289) |
| Publishing/information, specialized science and technology service | 0.14 | (0.352) | 0.15 | (0.358) |
| Finance and insurance, real estate business | 0.11 | (0.311) | 0.10 | (0.300) |
| Public administration, education service | 0.07 | (0.252) | 0.08 | (0.265) |
| Public health, social welfare service | 0.24 | (0.428) | 0.17 | (0.379) |
| Proportion of female employees (reference: less than 30%) | | | | |
| 10-49% | 0.20 | (0.397) | 0.23 | (0.423) |
| 50-69% | 0.16 | (0.367) | 0.18 | (0.386) |
| 70-100% | 0.35 | (0.476) | 0.34 | (0.474) |
| Company location (reference: 9 provinces) | | | | |
| In Seoul | 0.41 | (0.492) | 0.46 | (0.499) |
| In one of the 6 major urban areas (Gwangyeoksi) | 0.18 | (0.386) | 0.17 | (0.380) |

2) Analysis of determining factors in career continuance

Table 2 shows the estimated results of factors affecting the career continuance or resignation of female workers who took only childbirth leave. According to the analysis, the estimated coefficients of tenure and age variables were statistically significant in the positive direction, while the estimated coefficient of actual work hour variable was statistically insignificant. In other words, female workers who are older and have a longer duration of employment in relative terms were more likely to continue their career upon completion of their maternity leave than were their counterparts. In particular, the marginal effect of the age variable (3.1%) was higher than that of the length of employment variable (1.4%). The estimated coefficients of salary dummy variables were significant in the positive direction and the likelihood for those whose ordinary salary was over 1.34 million won to return to work after childbirth leave was 38.1% higher than their counterparts.

In terms of the estimated coefficients of occupation dummy variables, only dummy variables for professionals and service/sales were statistically significant in the negative direction. In other words, female professionals were 12.6% less likely to remain employed following a childbirth

leave than were office workers. In the case of female service or sales workers, the figure was 15.6%. This indicates that when other conditions are controlled, the chance of service or sales workers continuing their career is even lower than that of professionals doing so.

When it comes to company characteristics, the estimated coefficients of dummy variables representing company size were all statistically significant. Women working at a larger company were more likely to remain employed after a childbirth leave. Compared to women working at a company with 100-299 employees, those working at a company with less than five employees were 40.5% less likely to return to work after a childbirth leave. Those working at a company with 5-19 employees showed 34.4%, and those at a company with 20-99 employees were 24.0% less likely. Meanwhile, the career continuance rates of those working at a larger company with 300-999 employees and 1,000 employees or more were 9.7% and 100% higher, respectively.

Regarding the estimated coefficients of industry dummy variables, those showing statistical significance were the dummy variables of facility management and other personal service business, finance/insurance and real estate business, public administration and education service, and public health and welfare service. Compared to the wholesale/retail and restaurant/hotel industries, which traditionally hire more female workers, women working in business facility management and other personal service were 16.8% less likely to resume working after their leave. Female workers in public health and welfare service, public administration and education service, and finance/insurance and real estate industries were 10.1%, 48.9%, and 70.4% more likely to remain employed after their leave than those at the benchmark industries, respectively.

Table 2. Analysis of determining factors in the career continuance of female workers after childbirth leave

| | Estimated coefficient (β) | Standard error (S.E.) | Marginal effect Exp (β) |
|----------------------|-----------------------------------|-----------------------|---------------------------------|
| Constant | -1.816 *** | 0.149 | 0.163 |
| Length of employment | 0.014 *** | 0.000 | 1.014 |
| Age | 0.031 *** | 0.003 | 1.031 |
| Monthly work hours | 0.000 | 0.001 | 1.000 |
| Salary | 0.323 *** | 0.018 | 1.381 |
| Managers | -0.023 | 0.030 | 0.977 |
| Professionals | -0.135 *** | 0.025 | 0.874 |

| | Estimated coefficient (β) | Standard error (S.E.) | Marginal effect Exp (β) |
|---|-----------------------------------|-----------------------|---------------------------------|
| Services/sale | -0.169 *** | 0.033 | 0.844 |
| Production related | 0.017 | 0.045 | 1.017 |
| Elementary workers | -0.068 | 0.045 | 0.934 |
| Less than five employees | -0.519 *** | 0.032 | 0.595 |
| 5-19 employees | -0.422 *** | 0.028 | 0.656 |
| 20-99 employees | -0.275 *** | 0.027 | 0.760 |
| 300-999 employees | 0.093 *** | 0.033 | 1.097 |
| 1,000 employees or more | 0.693 *** | 0.033 | 2.000 |
| Manufacturing | 0.012 | 0.032 | 1.012 |
| Electricity/gas, sewage, construction, transportation | -0.016 | 0.040 | 0.984 |
| Facility management and other personal service business | -0.184 *** | 0.038 | 0.832 |
| Publishing/information, professionals, scientific and technical service | 0.023 | 0.030 | 1.023 |
| Finance and insurance, real estate business | 0.533 *** | 0.037 | 1.704 |
| Public administration, education service | 0.398 *** | 0.041 | 1.489 |
| Public health, social welfare service | 0.096 *** | 0.035 | 1.101 |
| Proportion of female employees (30-49%) | 0.061 * | 0.025 | 1.063 |
| Proportion of female employees (50-69%) | 0.010 | 0.027 | 1.010 |
| Proportion of female employees (70% or over) | -0.156 *** | 0.026 | 0.855 |
| Located in Seoul | -0.269 *** | 0.019 | 0.763 |
| Located in one of the 6 major urban areas (<i>Gwangyeoksi</i>) | 0.004 | 0.023 | 1.004 |
| Log likelihood ratio | 88,418.198 | | |
| Pseudo- R^2 | 0.205 | | |
| Number of cases | 72,283 | | |

Notes: 1) *: $p < 0.1$; **: $p < 0.05$; ***: $p < 0.01$.

2) The length of employment and age are based on at the time of beginning of the childbirth leave.

Those working at a company with a proportion of female employees standing at 30-49% were 6.3% more likely to remain employed after childbirth leave than were those working at a company with the proportion of female workers less than 30%. Furthermore, the estimated coefficient of the dummy variable of companies which proportion of female employees is 70% or higher was statistically significant in the negative direction. In other words, the career continuance rate of women at those companies was 14.5% lower than the results found in

the benchmark category. Among the company location dummy variables, only estimated coefficient of regional variable for Seoul was statistically significant. When other conditions were equal, women working at a company located in Seoul were 14.5% less likely to remain employed after a childcare leave compared to their peers at a company located in other designations (province).

Table 3 presents the estimated results of the factors affecting the career continuance or resignation of female workers who took childbirth leave. According to the analysis, the estimated coefficients of the variables of women's age, child's age, and length of employment at the time of application for childcare leave were statistically significant in the positive direction. In other words, women who are older and have a longer duration of employment showed a greater likelihood of returning to the workplace compared to their counterparts. Age and duration of employment raised the chance for career continuance by 0.9% and 0.7%, respectively. The marginal effect of the child's age variable was 5.4%, indicated that the older the child, the more likely is the mother to remain employed.

The estimated coefficients of monthly work hour variables were statistically significant in the negative direction. Longer actual work hours increased the likelihood of female workers' resignation after childcare leave. The estimated coefficients of salary dummy variables were statistically significant in the positive direction. In greater detail, those whose ordinary income is 1.35 million or over are 47.1% more likely to remain employed following their leave than are their counterparts.

The estimated coefficients of all job type dummy variables were statistically significant. Dummy variables for managers, professionals, and service/sales workers were statistically significant in the negative direction. In other words, women in these occupations were more likely to resign after their childcare leave compared to their peers in wholesale/retail and restaurant/hotel businesses. For the marginal effects of occupation dummy variables, managers, professionals, and service/sales persons were respectively 9.4%, 7.7%, and 19.2% less likely to resume working compared to those serving in the benchmark industries. Meanwhile, mechanics and mechanical machinery assemblers were 30.1% and 22.3% more likely, respectively, to continue working than were their benchmark peers.

The estimated variables of company size variables were all statistically significant. The career continuance of female workers after childcare leave was significantly distinct by company size. Compared to female workers at companies with 100-299 employees, those working at companies with 300-999 employees and 1,000 employees or more were 25.5% and 118% more likely to return to the workplace after childcare leave. Those at companies maintaining less than five

employees, 5-19 employees, and 20-99 employees were respectively 39.1%, 41.0%, and 30.0% less likely to resume working after childcare leave.

The estimated coefficients of all the industry dummy variables, with the exception of the publishing and professionals, scientific and technical service industry dummy variables, were statistically significant. Compared to those in wholesale/retail and restaurant/hotel industries, women working in electricity and gas/sewage/construction/transportation, finance /insurance and real estate, public health/social welfare service, and public administration/education service industries were 16.7%, 43.9%, 55.7%, and 146% respectively more likely to continue their career after childcare leave. However, the probabilities of career continuance for women in the facility management/other personal service and manufacturing industries were respectively 11.8% and 10.9% lower than their benchmark peers. In other words, when other conditions are equal a significant number of female workers in public administration/education service and public health/social welfare service industries return to working compared to their peers in other industries.

Table 3. Analysis of determining factors in the career continuance of female workers after a childcare leave

| | Estimated coefficient (β) | Standard error (S.E.) | Marginal effect Exp (β) |
|---|-----------------------------------|-----------------------|---------------------------------|
| Constant | -0.876*** | 0.157 | 0.416 |
| Length of employment | 0.007*** | 0.000 | 1.007 |
| Age | 0.009*** | 0.003 | 1.009 |
| Age of the child related to childcare leave | 0.053*** | 0.003 | 1.054 |
| Monthly work hours | -0.003*** | 0.001 | 0.997 |
| Salary | 0.386*** | 0.019 | 1.471 |
| Managers | -0.099*** | 0.036 | 0.906 |
| Professionals | -0.081*** | 0.029 | 0.923 |
| Services/sale | -0.213*** | 0.031 | 0.808 |
| Production related | 0.201*** | 0.039 | 1.223 |
| Elementary workers | 0.263*** | 0.044 | 1.301 |
| Less than 5 employees | -0.496*** | .038 | .609 |
| 5-19 employees | -0.528*** | .036 | .590 |
| 20-99 employees | -0.357*** | .036 | .700 |

| | Estimated coefficient (β) | Standard error (S.E.) | Marginal effect Exp (β) |
|---|-----------------------------------|-----------------------|---------------------------------|
| 300-999 employees | 0.227*** | .037 | 1.255 |
| 1,000 employees or more | 0.779*** | .033 | 2.180 |
| Manufacturing | -0.115*** | 0.037 | 0.891 |
| Electricity/gas, sewage, construction, transportation | 0.154*** | 0.042 | 1.167 |
| Facility management and other personal service business | -0.126*** | 0.039 | 0.882 |
| Publishing/information, professionals, scientific and technical service | -0.011 | 0.034 | 0.989 |
| Finance and insurance, real estate business | 0.364*** | 0.041 | 1.439 |
| Public administration, education service | 0.900*** | 0.044 | 2.460 |
| Public health, social welfare service | 0.443*** | 0.041 | 1.557 |
| Proportion of female employees (30-49%) | 0.070** | 0.027 | 1.073 |
| Proportion of female employees (50-69%) | -0.218*** | 0.029 | 0.804 |
| Proportion of female employees (70% or over) | -0.430*** | 0.030 | 0.651 |
| Located in Seoul | -0.164*** | 0.024 | 0.849 |
| Located in one of the 6 major urban areas (<i>Gwangyeoksi</i>) | -0.051* | 0.026 | 0.950 |
| Log likelihood ratio | 74317.454 | | |
| Pseudo- R^2 | 0.197 | | |
| Number of cases | 60,766 | | |

Notes: 1) *: $p < 0.1$; **: $p < 0.05$; ***: $p < 0.01$.

2) Length of employment and age are based on at the time of beginning of the childbirth leave.

According to the estimated results of the proportion of female employees dummy variables, the career continuance rate of female workers at companies with a proportion of female employees standing at 30-49% was 7.3% higher than at the benchmark (companies with a proportion of female workers less than 30%). At the companies with a proportion reaching 50-69% and 70% or higher, women were respectively 19.6% and 34.9% less likely to return to working after a childcare leave. More explicitly, when the proportion of female employees reaches 50% or more, the career continuance rate was reversely related to the proportion of female employees. The estimated coefficients of company location dummy variables were also all statistically significant. According to the results, female workers at companies located in Seoul and in the six major urban areas (*Gwangyeoksi*) were 15.1% and 5.0% less likely to remain in their job, respectively, compared to their peers at companies located in other provinces (Do).

3. Summary and policy implications

Regarding the career continuance of female workers using a maternity protection system, the rate of those taking only childbirth leave (55.1%) was slightly higher than that of those taking both childbirth and childcare leaves (47.0%). Also, the rate was higher among women working at larger companies and differed significantly with company size. By industry, the career continuance rates of female workers in facility management and other personal service, public health/social welfare service, and wholesale/retail and restaurant/hotel sector were among the lowest. In terms of job type, the career continuance rate was lowest in the manager group, followed by the service/sales group.

Regarding the factors affecting the career continuance of female workers taking maternity leave, duration of employment, the woman's age, and the child's age all positively contributed to career continuance. In terms of work conditions, higher salaries were conducive to women's decisions to remain employed, while longer work hours lowered their motivation for career continuance.

The findings of this research suggest a need to introduce customized measures by company size and industry to promote career continuity among female workers following maternity leave. In addition, measures to improve work conditions for female workers and to increase the career continuance rate among female workers with shorter durations of employment appear to be required. Finally, policies to enhance the employment structure for female workers, such as the improvement of salaries and work conditions for younger female workers, need to be introduced in tandem with support for maternity protection and work-family balance.

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