Empirical Evaluation of Japan's 2003 Law Regarding Childcare Support: Effects on Fulltime Female Employment[1]

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<Long abstract>

We empirically investigate the effectiveness of Japan's 2003 Act on Advancement of Measures to Support Raising Next-Generation Children, referred to as "the Next-Generation Support Law" in this study. It is motivated by the lower female labor participation rate in Japan as compared to that in other developed countries. This Law aims to bring about a society where anyone who wishes to work while raising children can do so. More concretely, it aims to improve the work–life balance of all employees. We use data from the Longitudinal Survey of Adults in 21st Century conducted by the Ministry of Health, Labour and Welfare of Japan. In particular, we examine the working behavior of fulltime female employees who have a child less than 3 years old. We employ the difference-in-difference method by using a multinomial logit model. We analyzed data on female employees in two groups of companies: one group comprising companies with more than 300 employees, for which it has been mandatory since 2005 to formulate action plans to improve the work–life balance of employees, and the other group comprising companies with less than 299 employees, for which such formulation is not mandatory. Our analysis results are as follows. (i) We find limited evidence on the effectiveness of the Law. The work–life balance of working mothers did not differ significantly between these two groups. (ii) The Law has a marginal impact in the case of small companies with less than 99 employees as regards increase in taking childcare leave. (iii) A time-trend of an increased probability of taking childcare leave after the enforcement of the Law is observed. However, after controlling for individual characteristics and economic variables in our regression analysis, this trend becomes marginal. Moreover, we do not find a time-trend of a decreased probability of unemployment of working mothers. Those two trends are considers to be independent of the enforcement of the Law. Thus, this study's results reveal that as of 2010, this Law by itself has not been very effective in improving the work–life balance of working mothers. Therefore, further improvements to and combinations of policies are required.

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<Short abstract>

We empirically investigate the effectiveness of Japan's 2003 Act on Advancement of Measures to Support Raising Next-Generation Children. It aims to improve the work–life balance of employees. In particular, we examine the working behavior of fulltime female employees who have a child less than 3 years old. We find limited evidence on the effectiveness of the Act. The work–life balance of working mothers did not differ significantly whether the Act is mandatory. The Act has a marginal impact in the case of smaller companies as regards increase in taking childcare leave. Therefore, further improvements of policies are required.

Key Words : Work-Life Balance, Continuing employment, Childcare leave, Policy Evaluation, Difference in difference.

JEL コード： J13, J18

1. Introduction

While the advancement of low birthrate and aging is major concern for policy making in Japan, the improving the conditions for work and family balance is important. The Act on Advancement of Measures to Support Raising Next-Generation Children (short for "the next generation support law," or "the Law" in this paper) was promulgated in 2003. The Law aims to realize the society where anyone who wishes to can work while raising children (MHLW; 2013). It is motivated by the lower female labor participation rate in Japan as compared to that in other developed countries. The objective this paper is to evaluate the effectiveness of this law by using government panel data. In April 2005, the Law enforced employers to formulate general employer's action plan (short for "action plan" in this paper). It is for improving the employment environment of balancing child care and the work. The Law also enforced to report its formulation to the ministry of health, labor and welfare of Japan (short for "MHLW" in this paper). It is mandate to the company with more than 301 employees as of 2005. It is also recommended to the company with less than 300 employees. MHLW recommended analyzing the current situation of work and family balance of employees, and setting the companies' goal for action plan. MHLW also recommended that the goal should be quantitative measure as possible such as childcare leave acquisition rate for female employees and the number of persons who take childcare leave per year for male employees.[5] The companies which completed the action plan and meet the standard established by MHLW can be certified/authorized (l call "certified company" in this paper) by MHLW.[6] Meeting eight standards are required to be certified company. Those include that the period of the action plans is 2-5 years, action plans are implemented and the goals set in the action plans has been achieved, and, during the period of the action plans, one or more male employees took child care leave and the child care leave acquisition rate for females is 70% or more, etc.[7] The certification starts from 2007. The certified companies are recognized as childcare supporting firm. They can use the next generation support certification logo "Kurumin" for their sales marketing, or recruitment of labor forces. In addition, the favorable tax treatment system is also introduced for those certified companies.[8] The Law is a temporary legislation with a 10-year term limit from April 2005 until March 2015. Handling of the Law after expiration is going to be examined based on the situation at the point in time. Therefore, it is important to evaluate

[5] MHLW shows an example of action plan, which includes that the rate of taking childcare leave should be n% or more for female, and the number of those who take childcare leave should be n, or more for male, etc.
[6] The certification is given based on the request to MHLW.
[7] After 2008 revision of the law, accouchement of action plan to employees and publication of it became mandatory. In addition, the requirement to take childcare leave by male employees is relaxed such as obtaining shortening working hours by male who have child before entering elementary school, etc.
[8] The tax treatment includes an additional depreciation deductions of 32% of the normally allowed depreciation limit for buildings, etc. acquired, newly constructed, extended, or reconstructed during a certain period of time of the business year, etc.

the effectiveness of this law. However, empirical studies for investigate the effectiveness of this law has not been accumulated enough.

Many of past studies shows that the policies to expand taking childcare leave system contribute the improvements of continuing employment for working women. For example, Waldfogel, Higuchi, and Abe (1999) examined the effects of the rate of taking childcare leave on working women's job retention after childbirth in the United States, Britain and Japan. They found that childcare leave coverage increases the likelihood that working women will return to their employer after childbirth in all three countries. They suggest that the expansion in childcare leave coverage is likely to lead to increased employment of woman workers after childbirth. Nishimoto (2004) examined the decision making of working women pertaining to childcare leave. She found that working women tend to take childcare leave and return to work earlier when they live with parents and if they live in an area where there is lack of adequate childcare nurseries, and if there is a childcare nursery at one's company. Baker and Milligan (2008) examined the introduction and expansion of job-protected maternity leave in Canada. They found that find that expansions of job-protected leaves do increase the leave-taking and job continuity.

On the other hand, there also many studies to show that the expansion of taking childcare leave system is little impact on the improvements of employment environment of working women. For example, Baum (2003) investigated the effect of maternity leave legislation of the United States. He found that the legislation has small and statistically insignificant effects on employment and wages. He discussed that the maternity leave legislation may have little effect because the mandated leave is short and unpaid and many employers provided maternity leave benefits prior to the statutes. Imada and Ikeda (2006) showed that the rate of women who stay in the same job until childbirth is not increasing, and childcare leave system is not effective in job continuity without family support and childcare center. Lalive and Zweimüller (2009) analyzed the effects of changes in the duration of paid job-protected parental leave for the Austrian reform in 1990. They found that the extended parental leave significantly reduces return to work, and employment and earnings also decrease in the short run, but not in the long run. Asai (2014) investigated the effect of an increase in the rate of return to work income replacement of childcare leave. She uses Keio Household Panel Survey from 2004 to 2001, and found that the reform did not lead to an increase in the number of women who returned to work.

Regarding the investigation of the effectiveness of the Law, past studies are limited. Mizuochi (2012) investigated the effect of the Law by using the employment status survey of the ministry of internal affairs and communications. He uses the difference in difference estimation, and found that the Act has a positive effect on the joint probability of childbirth and women's job continuity. However, he only examined whether working mothers

continue their job or not, and did not consider the taking childcare leave. In addition, he did not control the economic conditions for his estimations. The Japan institute for labour policy and training (2013) found that many companies with more than 300 employees developed its rules for childcare leave after the enforcement of the Law. The certified companies tend to be better environment for the work-life balance. However, the results of this report are based on the tabulation and did not officially investigate the effectiveness of the Law.

We use the longitudinal survey of adults in 21st century of MHLW to examine working behavior for fulltime working women who give a birth and need child caring. We employed the difference in difference approach using a multinomial logit model. The treatment group is female employees who work for the companies with more than 300 employees where the report of the action plan is mandate. The control group is female employees who work for the companies with less than 299 employees where the report is not mandate. We also use individual characteristics and economic conditions as control variables.

We found that the Law has limited impact to increase taking childcare leave and to decrease being unemployed by itself. We find no evidence of the difference of the improvement of the work-life balance for working women according to the enforcement depending on company size. We found the marginal evidence for the effectiveness of the Law for improving the environment to take child care leave easily after the enforcement in 2005 for small companies with less than 99 employees. In addition, we found the evidence of time trend to get off working and take childcare leave for working women who gave the birth. It seems to the work-Life balance of working mothers is improving after the enforcement of the Law in 2005. However, after the controlling individual characteristics and economic conditions in out regression analysis, those time trends became marginal. Moreover, we found no evidence for time trend for reducing unemployment of working mothers. Lastly, we found that the company size effects exist. Fulltime working mothers who work for lager companies have tendency to take childcare leave easily, and to restrain from being unemployed. Those time-trends and the company size effect are considered to be independent of the law. Thus, this study's results reveal that as of 2010, this Law by itself has not been very effective in improving the work–life balance of working mothers. Therefore, further improvements to and combinations of policies are required.

The paper proceeds as follows. Section 2 presents hypothesis and data. Section 3 describes the results, Section 4 conclusions of the paper.

2. Hypotheses and Data

2.1. Hypothesis

We first look at the public data about the recent situations of work-Life balance from the view of the Law. According to the MHLW 2013a, for the companies with more than 301 employees, 12,929 companies are submitted the action plan in 2006. It increased to 14,021 companies in 2012. Considering the number of existing companies of this size being 11,954 according to the census data, almost all companies of this size are considered to submit the action plan. The number of companies with less than 300 employees which submit the action plan is 2006 companies in 2006. It increases gradually year by year. In 2011, the companies with more than 100 and less than 299 employees were enforced to submit the plan by the revised next generation support law in 2011. The number of companies with less than 300 employees increases from 24,276 in 2010 to 51,300 in 2011. However, the total number of the existing companies of this size is 1,662,438 (Economic Census; 2010). Therefore, the submission rate is still quite low. It is 1.5% even in 2010 when the last year for our analysis. Next, we look at the change of the number of "certified company." The certified companies have increased gradually. However, the number of certified company is considerably limited compared to the number of companies which submit the action plan. The total number of certified companies is 920 companies in 2010. The reason for this limitation is considered to be the difficulty to attain some rules for certification. Alternatively, the tax reduction may not be enough incentive for obtaining the certification. Lastly, the ratio of woman who takes childcare leave with respect to the one who gave a birth last year is 64.0% in 2002. It increases to 90 .6% in 2010 (MHLW; 2013b). It seems that most of working women take childcare leave, and the policy to support them seems to be effective. However, careful considerations are required to evaluate this statistics. Working women who resigned the companies around giving the birth are not included in this ratio. Therefore, policy evaluation only by the childcare leave taking ratio is not sufficient. Total working behavior for female employees who need child caring must to be investigated.

Working mothers have to decide the working behavior whether taking a childcare leave, continuing work without taking childcare leave, or leaving her job which means unemployment. The direct cost for the taking childcare leave is that no income will be earned during the leave. In addition, the promotion may be postponed, or the formation of the carrier may be late, which cause the reduction of her life-time income in the long run. In other words, taking childcare leave increases the opportunity cost. On the other hand, she is continuously employed and can return to work in near future. By continuing to work without taking childcare leave, she obtains regular income. However it has also costly because she has to use some kind of childcare service, or ask her parents to help for child caring. She may use reduced working hours system in a company, or may refuse a transfer to other working locations. This kind of work style may also cause postponing her promotion and be late for the formation of her carrier. In addition, the communication time with her child may decreases and it may reduce her happiness.

Choosing unemployment is the most costly in terms of money. It may reduce her income permanently. However, she has to choose this decision for some reasons. Working hours or work location may not be favorable for her. She may not obtain parent help or her husband cannot provide childcare sufficiently. Furthermore, even though the company has childcare leave rules, the company may not be good environment in which taking childcare leave is easy. She chooses the working behavior in the way maximizing the expected utility considering those benefit, cost and constraints. Such behaviors should include continuing working, taking childcare leave, or resigning the company.

The next generation support law is not only policy for improving the condition of work-life balance. Multiple policies to advancing the work-life balance have been developed since 2000. The Child Care and Family Care Law is one of the important policies. Panel A of Figure 1 shows the history of reforms for the next generation support law and the child care and family care law after 2003. The next generation support law is proclaimed in 2003 and it has major revise in 2008. The formulation of action plan and report to MHLW becomes mandate after 2011 for the companies with more than 101 and less than 300 employees. There are two revisions for the child care and family care law in 2004 and 2009. In the 2004 revision, the period to take childcare leave can be extended until a child became 1.5 years old who are on the list to get nurseries, and temporary employees who meet certain requirement can take childcare leave. In the 2009 revision, the right for childcare leave is guaranteed until the child reaches 1 year of age, or 1.5 year of age for certain cases. Employers are obligate to provide the shortening of working hours for worker who takes care of child under 3 years old. The working behavior of temporary employees may change due to the revision of the child care and family care law. However, we limit for our investigation to the fulltime employees. We think that the revision of the child care and family care law has smaller impact for the working behavior for the fulltime employees. However, strictly speaking, it is true that one cannot distinguish the effectiveness of two laws in some parts. Care must be required to interpret results in this paper.

[Insert Figure 1 here]

Considering such circumstances, we examine following three hypotheses about the relation between the enforcement of the Law and working behavior for working mothers.

Hypothesis 1: Whether the Law effectively increases the childcare leave for working mothers.

Hypothesis 2: Whether the Law effectively increase continuing employment and restrain being unemployed for working mothers.

The third hypothesis comes from the difference of company size. The Law is enforced to formulate action plan and submit it to the prefectural labour bureaus of MHLW for the companies with more than 301 employees. Therefore, the effectiveness of Law may be depends on the company size.

Hypothesis 3: The effectiveness of the Law is different according to the company size.

The company size distinction of actual Law is whether the company with more than 301 employees or that of less than 300. On the contrary, the company size distinction of the survey is whether the company with more than 300 employees or that of less than 299. We believe that there is not so large difference between two distinctions for our analysis, unless the number of companies with 300 employees is extremely large, which seems to be unlikely.

2.2. Data

The data we use in this paper is constructed from Longitudinal Survey of Adults in 21 Century of MHLW of Japan.[9] The first survey was conducted in 2002. The target of this survey is males and females (and their spouses) in Japan who is with the age range of 20 to 34 yeas old at the end of October 2002 (MHLW; 2013c). There are four types of questionnaire in this survey, the questionnaire for male, that for female, that for male spouse, and that for female spouse. We use only the responses of questionnaire for female, and that for female spouse is not used, because important individual attributions such as company size or type of jobs are missing for spouse female. This survey is panel type survey and conducted every year on the first Wednesday of November. The 11th survey has been conducted until 2012. [10] In the first survey in 2002, the survey was distributed to the total of 35,448 persons, and 29,052 responses were collected. The effective collection rate is 82%. The ninth survey in 2010 is distributed to the total of 18,910 persons and 13,063 responses were collected. The effective collection rate becomes 69%. The survey in 2013 was done for different cohort. We use 9 years of panel data from the first survey in 2002 to the ninth survey in 2010 for this paper. However important question for this paper about taking childcare leave starts 2003. Main period of our investigation is between 2003 and 2010.

[9] For details of this survey, please see http://www.mhlw.go.jp/english/database/db-hss/dl/shw-10.pdf. According to the MHLW, the main objective of this survey is to continuously observe the actual situation of marriage, birth, employment etc to obtain basic data for panning, implementation of health, welfare and labor administrative policy.
[10] From 2002 to 2009, and 2012, the survey was distributed physically by survey conductors. Respondents answered confidentially and sealed backed to the survey conductors. In 2010 and 2011, the survey was done by mail bases.

The definition of variables that we use in this paper is in Appendix A. Table 1 shows the descriptive statistics for those variables.

The dummy variable “childcare leave” is 1 when the respondent takes a childcare leave during past one year, or 0 otherwise. The question for childcare leave starts from 2003. The target for this question is the person who has experience to work at a company etc. including part-time jobs for the last one year, and who has children under 3 years old. Other respondents are not required to answer this question. Before 2008, the condition of child age is different. It is the children under the first grade in elementary school. The age of this child is usually less than 6 years old. The variable “employment status” is either “work”, “temporary leave” including childcare leave or family care leave etc., or “unemployed”. In the questionnaire, childcare leave or other leave such as family care leave is not distinguishable. In order to investigate total working behavior of female employee, I define “work status” from the combination the variable employment status and childcare leave. Figure 2 shows the definition of work status. It is “work” when the employment status is work and variable childcare leave is 0 or missing. It is “childcare leave” when the variable childcare leave is one and employment status is work or temporary leave. It is “unemployment” when the employment status is unemployment independent of the variable childcare leave. It is “other leave” when the employment status is temporary leave and the variable childcare leave is 0 or missing. We use works status as dependent variable for the regression analysis later.

[Insert Figure 2 here]

In order to investigate working behavior of female employees who need child caring. We first I extract fulltime female employee from our original data. Then, we extract data by following 4 different conditions constructed by the combination of employment status of last year (which stands for “L.employment status” in this paper) and child age:

Condition (A): L.employment status is either work or temporary leave, and child age is less than or equal to 3 years old.

Condition (B): L.employment status is either work or temporary leave, and child age is less than or equal to 1 years old.

Condition (C): L.employment status is work, and child age is less than or equal to3 years old.

Condition (D): L.employment status is work, and child age is less than or equal to1 years old.

Even though the objective of the Law is to improve the work-life balance for both male and female

employees, we only investigate female employee's behavior. This is because male employees working behavior has not changed so much since 2000. For example, the childcare leave acquisition rate for male is still considerably low. It is 0.56% in 2004 and 1.38% in 2010 according to the MHLW. Next, we focus our analysis to the fulltime workers and exclude temporary workers, because the effect of the Law to temporary workers is considered to be limited. The temporary workers are not eligible to take childcare leave before 2004. Even after 2005, temporary workers only who meet certain condition can take childcare leave. Further, we use the employment status of last year, because, by doing this, we can include working women who resign her job around the birth to our analysis. Lastly, we excluded government employees because the investigation of private sectors is important for improving the country-wide improvement of work-life balance. The local governments tend to achieve the law proactively. Condition (A) is the most relaxed condition. It targets employed female regardless of working or leaving. According to the child care and family care law, employees can take the childcare leave in general until the child reached 1 year old. Some companies allow employees to take childcare leave until child reaches 3 years old. Then, we consider the both child age condition. The condition (D) is the most limited. It includes only female employees who actually work last year and have the possibility to take childcare leave for the first time for the child.

3. Results

3.1. Simple Analysis

In literature, the childcare leave acquisition ratio is typically used for evaluating the work-life balance. In our data, the childcare leave ratio can be calculated as the mean of variable childcare leave in Table 1. Column (2) of Table 1 is the extracted data under the condition (A). The number of observation is 1,328, which is about half compared to the other variables. This indicates that many answers of this question are missing. The mean of childcare leave who answered this question is 0.83. It is over 90% between 2003 and 2008. Those numbers are considerably high compared to other public statistics as I mentioned before. We think that the responded who actually take childcare leave mainly answer this question. The person who does not take childcare leave is considered to omit the answer. We should not use this variable directly to evaluate the effectiveness of the new generation law.

[Insert Table 1 here]

Table 2 shows the transition of the variable work status under the condition (A). Panel A is the transition of the total data that is no company size distinction. Before the law enforcement in 2005, the ratio of childcare leave is about 31-32%. The ratio increases after the enforcement of 2005. It is up to 45.3% in 2008 and 44.4% in 2009.

The ratio of unemployed is 12.5% in 2003 and 16.3% in 2004. It deceases after 2005. It is down to 5.8% in 2008 and 8.6% in 2009. Panel B shows the transition of the work status for the companies with more than 300 employees. Regarding the childcare leave and unemployed, even though the absolute level is different from that of Panel A, overall tendency is similar. The ratios of childcare leave increases after 2005, and the ratios of unemployed decreases after 2005. These results indicate that the law enforcement seems to be successfully changing the working behavior of female employees. It seems to establish the trend to take childcare leave and restrain the being unemployed. However, we have the different results in our regression analysis when we control the individual attributions and economic situations later. Panel C shows the transition of the work status for the companies with less than 299 employees. Interestingly, the trends are similar to that of Panel B, even though the law is not enforced to those small companies. We will discuss this later using regression analysis.

[Insert Table 2 here]

Table 3 shows the statistical difference of working behavior about taking childcare leave and being unemployed according to the next generation law enforcement in 2005. Panel A shows the difference of childcare leave and Panel B shows that of unemployment. The data is extracted by the condition (A). Data of panel A is limited that the work status is either work or childcare leave. Unemployed or other leave is not included. Panel A is aimed for investigating the difference of working behavior between choice of work or childcare leave for continuing employed female. The Column (1) in panel A is the difference of childcare leave using the total data that is not distinguished by the company size. Before 2005 (2003 or 2004), the mean of childcare leave ratio is 0.395. That of after 2005 is 0.486. The childcare leave ratio increased by 0.091, which is statistically significant at 1% level. Column (2) shows the result for the companies with more than 300 employees. After 2005, the childcare leave increased by 0.074, which is statistically significant at 10% level. Column (3) shows the result for the companies with less than 299 employees. The childcare leave increased by 0.101 after 2005, which is statistically significant at 1% level. The results indicate that the childcare leave tends to increase after 2005 independent of company size.

Panel B shows the difference of being unemployed according to the enforcement of the law in 2005. In this table, all state of work status is used, including work, childcare leave, unemployed and other leave. Column (1) of panel B shows the difference of the mean of unemployed with no distinction of company size. This is the ratio of the number of unemployed persons divided by that of employed persons which consist of work, childcare leave and other leave. There is no statistical difference for the mean of unemployed according to the enforcement. Column (2) is result for the company size more than 300, and (3) is that of less than 299. Those results are not statistically

significant either. Those results indicate that the law has not been effective to restrain unemployment for working women.

[Insert Table 3 here]

3.2. Regression Analysis

The results of previous subsection are intuitive. However, one cannot distinguish among year trend of working behavior, company size effect, and the effect of the law itself. In addition, those results are not considered the individual attributions such as family size, type of job, or income, as well as economic condition. Therefore, we employed the difference in difference approach by estimating multinomial logit model:

$$\Pr(\textit{Work Status} = k) = f_{(k)}\left(\beta_0 + \beta_1 \cdot \textit{Year}2005 + \beta_2 \cdot \textit{Lcompsize}300 + \beta_3 \cdot \textit{Year}2005 \times \textit{Lcompsize}300 + \gamma \cdot X + \varepsilon\right)$$

The dependent variable is work status, which takes either "work," "childcare leave," "unemployed," or "other leave". The dependent variables are as follows. Year2005 is dummy variable which takes one after 2005, or zero otherwise. Lcompsize300 is dummy variable which takes one if the company size of last year is more than 300 employees, otherwise zero.[11] $\text{Year2005} \times \text{Lcompsize300}$ is the cross product of two variables. X is control variables which include individual attributions and economic conditions. The detail of control variables is in Appendix A. The β_1 represents time-trend, the β_2 represents the company size effect, and the β_3 represents the effectiveness of the Law. If the law is effectively increase the childcare leave, the β_3 should be positive and statistically significant when the work status is childcare leave. If the law effectively decreases the unemployment, the β_3 should be negative and statistically significant when the work status is unemployed. T represents the total number of independent variables, γ represents the coefficients of control variables, ε represents residual, and $f_{(k)}()$ is appropriate function for multinomial logit model.

Table 4 shows the average marginal effect from the multinomial logit model without control variables. Column (A) is the marginal effect under the condition (A): employment status last year was either work or temporary leave and child age is less than or equal to 3 years old. There are time trends that working women choose to take childcare leave. The probability of choosing work significantly decreases by 12.3% after Year 2005. On the contrary, the probability of choosing childcare leave significantly increases by 14.5% after Year 2005. The probability of choosing unemployed is not statistically significant. There is also company size effect. The marginal

[11] We use the company size of last year. Otherwise, the company size for unemployed is missing.

effect of Lcompsize300 for working is negative, that for childcare leave is positive, and that for unemployed is negative. Those marginal effects are statistically significant. Those results indicates that female employees who works for larger companies tend to take childcare leave instead of choosing continuing working or being unemployed, which is independent of the law enforcement. The cross products of Year2005 and Lcompsize300 for any work status are not statistically significant, which means that the law enforcement has not been effective. There is no statistical difference between the companies with more than 300 employees which are forced to submit action plan, and the companies with less than 300 employees which are under effort level. For other conditions, we find the time trend for increasing childcare leave in condition (B) and (C). We also find company effect for childcare leave and unemployment in condition (B), (C) and (D). However, the cross products of Year2005 and Lcompsize300 are not statistically significant for any work status in any of condition (B), (C), and (D). Those results indicate that the effectiveness of the next generation law is considerably limited.

[Insert Table 4 here]

Table 5 shows the marginal effect from multinomial logit model with control variables. Time trends for increasing the childcare leave is generally disappear. The coefficient of Year2005 for childcare in condition (A) is still significant. However, in other conditions, the coefficients of Year2005 for childcare are not significant. The company effects are still existence. The cross product of Year2005 and Lcompsize300 are not significant for any of work status of any conditions.

Regarding other control variables, working women who have older children increase the probability for continuing work as well as taking childcare leave, and decrease the probability for being unemployed. This seems partly due to the past experience of successful usage of childcare leave for the older children, or partly due to the possibility of care of younger child by the older brothers. Working women who live with their parents increase the probability for continuing working. We also find the decrease of the probability for childcare leave in condition (A). Parents are considered to help for caring the children substituting for younger households who have ability to earn larger income. The marginal effects of age for unemployed are negative and significant in any conditions. This may be due to the increase of the opportunity cost for older working women. Such cost includes the missing of relatively large income or the difficulty to find another job if resigning the company for childcare. However, those of childcare leave and work are mixed. The probabilities of work decreases and that of childcare leave increases for university graduates for any conditions. However, the probabilities for unemployment are not significant for university graduates. The probabilities of unemployed increase significantly for office worker or sales in any conditions. This may be because the flexibility of working time or working locations is limited for those jobs, or

large opportunity cost for companies to cover the employees who take childcare leave, which means that the opportunity costs for replacement of new labor forces for companies are relatively low for those jobs. The probability of unemployed increases significantly for the region where there are many children on the waiting list to get nurseries for all conditions. We also find that the marginal effects for work are negative for condition (A) and (C). Reducing those children on waiting list is important to promote more women to be labor markets. The probability of unemployed increases significantly as the regional demand-supply ratio of labor forces increases. This may the opposite to the intuition. However, this can be interpreted that working women may considered to be easy to find new job when the ratio is high even after leaving the company for childcare. This tendency can also be seen in the case of stock return. The probability of childcare leave decreases significantly and that of unemployed increases significantly when stock return is appreciated. This seems that working women tend to quit companies when the economic conditions are relatively better and finding new jobs seem to be easier.

[Insert Table 5 here]

The effectiveness of the Law may be different according to the different company size. In order to check the robustness of our results, we estimated the multinomial model for using the different company size dummies. Table 6 and Table 7 show the average marginal effect using Lcompsize100 and its cross product instead of using Lcompsize300. Lcompsize100 is a dummy variable which takes one when the company of last year is more than 100 employees, and zero otherwise. Table 6 is the average marginal effect without control variables. Table 7 is that with control variables. Overall results of these two tables are similar to those of table 5 and table 3. There are positive time trend for increasing taking childcare leave in Table 6. However, most of time trends disappear in Table 6. The company effects exist in both Table 6 and Table6. Tendency for controls variables in Table 6 are similar to that of Table 4. The cross product of Year2005 and Lcompsize100 are not generally significant. However, in condition (A) of both Table 4 and table 5 the cross product of Year2005 and Lcompsize100 for work is positive and significant, that of childcare leave is negative and significant. Those results indicate that the female employees who work for the companies with less than 99 employees tend to get off work and take childcare leave after the enforcement of the Law. Those small companies are not actually enforced to submit action plan. However, those companies are recommended by MHLW to make effort. Making effort itself seems to be effective to establish the better environment for work and life balance for working women. This may be due to the announcement effects. Even though the law enforces larger companies to establish and submit action plan, the managements of those smaller companies may recognizes that they will be enforced near future and should prepare the making plans or rules inside the company. Alternatively, the tax deduction by accomplishing the goal of action plan may be

appealing especially for those smaller companies. We also investigated the different company size effect using Lcompsize500 or Lcompsize1000. However, the results are similar to the case of Lcompsize300. Those results are not shown in this paper. In addition, the effectiveness of the enforcement of the next generation law may have time lags. It is enforced in 2005. However companies may need time to prepare for adoption of the law. It may be better to use Year2006 dummy instead of Year2005 to examine time trend effect. Year2006 dummy is one after 2006, or zero otherwise. Therefore, we used Year2006 instead of year2005 for estimating the marginal effects. However, the results for Year2006 tend to be less effective compared to the table 4 and tabel5, where Year2005 is used. We also estimated the multinomial logit model using each year dummy variables instead of using stock return. However, estimate results are similar to that of above. Those results are not shown in this paper.

[Insert Table 6 and Table 7 here]

In sum, the both the hypothesis 1 and the hypothesis 2 are not confirmed. The Law has no impact to increase taking childcare leave and to decrease being unemployed by itself. We find no evidence of the difference of the improvement of the work-life balance for working mothers among two company groups. One group is the companies with more than 300 employees. Those companies are enforced to formulate action plan to improve the work-life balance of employees and report it to MHLW by the Law after 2005. The other group is companies with less than 299 employees in which the formulation of action plan is not mandatory. The hypothesis 3 is marginally confirmed. We found the evidence for the effectiveness of the Law for improving the environment to take child care leave easily after the enforcement in 2005 for small companies with less than 99 employees. This seems to be announcement effect for employer of those small companies. They may believe that they will be enforced to formulate and report action plan to MHLW near future.

Other than those hypotheses, firstly, we found the evidence of time trend to get off working and take childcare leave for working mothers. It seems to the work-life balance of working women is improving after the enforcement of the Law in 2005. This result is consistent with literature. However, after the controlling individual attributions and economic conditions in out regression analysis, those time trends become marginal. Secondly, we found no evidence for time trend for reducing unemployment around the birth according to our data and analysis. Lastly, we found that the company size effects exist. Fulltime female employees who work for lager companies have tendency to take childcare leave easily, and to restrain from being unemployed. Those results are not related directly with the enforcement of the Law.

4. Conclusion

We empirically investigate the effectiveness of “Thee Act on Advancement of Measures to Support Raising Next-Generation Children of Japan, (shorting for the next generation support law or the Law in this paper). The Law aims to realize the society where anyone who wishes to can work while raising children. More concretely, it is for improving the work-life balance of all employees. We use Longitudinal Survey of Adults in 21 Century of the MHLW of Japan. In particular, we examine the working behavior of fulltime female employees whose children are less than or equal to 3 years old. We employ the difference in difference method by using a multinomial logit model. We analyzed data on female employees in two groups of companies: one group comprising companies with more than 300 employees, for which it has been mandatory since 2005 to formulate action plans to improve the work–life balance of employees, and the other group comprising companies with less than 299 employees, for which such formulation is not mandatory. Our analysis results are as follows. (i) We find limited evidence on the effectiveness of the Law. The work–life balance of working mothers did not differ significantly between these two groups. (ii) The Law has a marginal impact in the case of small companies with less than 99 employees as regards increase in taking childcare leave. (iii) A time-trend of an increased probability of taking childcare leave after the enforcement of the Law is observed. However, after controlling for individual characteristics and economic variables in our regression analysis, this trend becomes marginal. Moreover, we do not find a time-trend of a decreased probability of unemployment of working mothers. Those two trends are considers to be independent of the enforcement of the Law. Thus, this study’s results reveal that as of 2010, this Law by itself has not been very effective in improving the work–life balance of working mothers. Therefore, further improvements to and combinations of policies are required.

The possible reason for limited effectiveness of the Law seems to be lack of enough incentives for companies to improve the work-life balance of employees. One incentive is becoming “certified company,” which is recognized as childcare supporting firm. The company can use the logo “Krumin” for their sales marketing or recruitment and so on. Even though the number of the companies which formulate the action plan is large, the number of the certified companies is limited. This is because the satisfaction of the standard established by MHLW may be difficult to attain such as the number of childcare related holidays for male employees. It seems that the certification standards which many companies can implement relatively easily have to be introduced. In addition, according to the HMLW (2014), this certified system and the logo “Krumin” may not be popular to the public. Even though the cost to be certified company is high, its effect may be not worth to explore. Increasing of the public awareness of this system and the logo should be required. Further, for the certified company, the tax deduction is also available. However, many companies did not use the tax deduction treatments (MHLW; 2014). It

may not be good incentive for the companies. Reforms of the tax reduction for the certified companies should be considered. The other reason of limited effectiveness seems to be related to the penalty of formulation or attainment of the goal of the action plan. Currently, there is no penalty, even though the company does not formulate or attain its goal at the end period of action plan. The MHLW may introduce the penalty not for attaining its goal. However, it may increase the labor cost for working women and may cause the more unemployment. Careful considerations are required for introducing the penalty.

For the future research, working behavior for male employees should be studied. The Law is not only for female, but also for improvement of the work-life balance of male employees. However, the working behavior of male has not changed. For example, the ratio of taking childcare leave has not improved. Further, working hours are long and acquisition rate of the paid vacation is still low. Investigation of the Law and other current policies for male employees is required to advance the new policies to improve working behavior for male and female employees.

There are several limitations for this paper. First, the sampling bias may exist. The working women who plan to take childcare leave may choose to enter the company initially in which taking childcare leave relatively easily. Alternatively, the working women who plan to resign the company after she give the birth may not care about the environment of work and family balance of the company and may chose the company which relatively worse environment. Second, the year dummy such as Year2005 may capture the different economic change other than the effect of the enforcement of the Law, which is not controlled by our other independent variables. In other words, our control variable in regression analysis may not be enough due to the limitation of the survey. Those biases may affect our results. Careful interpretation of this paper should be required. However, even though the difficulty of moderate of those biases, empirical studies are helpful for considering future policies.

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Figure 1: Work and family balance related law in Japan

Panel A: Transition of work and family balance related law in Japan

	Next generation support law	Child care and Family leave law
2003	Initially promulgated	
2004		Revised 2004 law promulgated
2005	Formulation of the action plan and report it to MHLW are enforced to the companies with more than 301 employees.	Revised 2004 law enforced: Securing the right to take childcare leave for temporary employees who meet certain requirement, and securing the right to take childcare leave until child who needs nurseries reaches 1.5 yeas old.
2007	The certification for childcare supporting firm by MHLW starts.	
2008	Revised 2008 law promulgated	
2009	The publication of the action plan and accouchement to employees are enforced to the companies with more than 301 employees.	Revised 2009 law promulgated
2010		Revised 2009 law enforced: obligation to shorten working hours for workers who take care of child under 3 years old, etc., and securing the right to take childcare leave until child reaches 1 year and 2 months if both parents take childcare leave.
2011	Formulation of the action plan, report it to MHLW, publication and accouchement to employees are enforced to the companies with more than 101 employees.	
2015	Temporary legislation limit	

Note: Investigation period of this paper is between 2003 and 2010.

Panel B: Enforcement of work and family balance related law in Japan depending on company size

	2003-2004	2005-2009	2010
Company with more than 300 employees		Next generation law enforced. 2004 child care and family leave law enforced.	Next generation law enforced. 2009 child care and family leave law enforced.
Company with less than 299 employees		Next generation law recommend. 2004 child care and Family leave law enforced.	Next generation law recommend. 2009 child care and Family leave law enforced (only for the company with 101 employees).

Note: The company size distinction of actual law is given by companies with more than 301 employees and companies with less than 2009. However, the company size distinction of the survey is given above.

Figure 2: Definition of dependent variable work status

		Childcare leave=		
		0	1	Missing
Employment status=	Work	Work status = Work	Work status = Childcare leave	Work status = Work
	Temporary leave	Work status = Other leave	Work status = Childcare leave	Work status = Other leave
	Unemployed	Work status = Unemployed	Work status = Unemployed	Work status = Unemployed

Table 1: Descriptive statistics

		(1)			(2)			(3)		(4)		(5)		(6)		(7)		(8)		(9)		(10)	
Screening		No			Condion (A): L.employment status last year is work or temporary leave, and child age is less than or equal to 3 years old																		
Year		2002-2010			2003-2010			2003		2004		2005		2006		2007		2008		2008		2009	
		N	Mean	Std.	N	Mean	Std.	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean	N	Mean
Employment status	Work	87,411	0.70	(0.46)	2,735	0.62	(0.49)	413	0.66	347	0.59	353	0.59	365	0.62	349	0.58	295	0.64	316	0.62	297	0.63
	Temporary leave		0.02	(0.14)		0.27	(0.44)		0.22		0.26		0.25		0.22		0.29		0.31		0.31		0.29
	Unemployed		0.28	(0.45)		0.12	(0.32)		0.13		0.15		0.16		0.16		0.13		0.05		0.08		0.08
Childcare leave		2,882	0.56	(0.50)	1,328	0.83	(0.38)	140	0.99	133	0.91	147	0.98	143	0.99	148	0.94	144	0.97	249	0.59	224	0.56
Work status	Work	87,411	0.69	(0.46)	2,735	0.43	(0.49)	413	0.50	347	0.44	353	0.39	365	0.42	349	0.40	295	0.40	316	0.41	297	0.43
	Childcare leave		0.02	(0.13)		0.39	(0.49)		0.32		0.35		0.39		0.38		0.38		0.47		0.46		0.41
	Unemployed		0.28	(0.45)		0.12	(0.32)		0.13		0.15		0.16		0.16		0.13		0.05		0.08		0.08
	Other leave		0.01	(0.10)		0.07	(0.25)		0.06		0.06		0.06		0.05		0.09		0.07		0.06		0.07
Lcompsize100		46,609	0.47	(0.50)	2,441	0.61	(0.49)	395	0.64	306	0.58	314	0.60	321	0.62	307	0.60	258	0.62	279	0.60	261	0.58
Lcompsize300		46,609	0.30	(0.46)	2,441	0.40	(0.49)	395	0.40	306	0.38	314	0.38	321	0.39	307	0.39	258	0.43	279	0.42	261	0.43
Lcompsize500		46,609	0.23	(0.42)	2,441	0.31	(0.46)	395	0.32	306	0.29	314	0.28	321	0.30	307	0.30	258	0.33	279	0.33	261	0.35
Lcompsize1000		46,609	0.15	(0.36)	2,441	0.22	(0.41)	395	0.22	306	0.21	314	0.22	321	0.19	307	0.19	258	0.23	279	0.24	261	0.26
Child age less than 3 years old		39,444	0.46	(0.50)	2,748	1.00	(0.00)	417	1.00	355	1.00	354	1.00	365	1.00	349	1.00	295	1.00	316	1.00	297	1.00
Child age less than 1 years old		39,444	0.24	(0.43)	2,748	0.60	(0.49)	417	0.56	355	0.60	354	0.64	365	0.58	349	0.61	295	0.61	316	0.63	297	0.60
Older children		74,363	0.11	(0.31)	2,748	0.40	(0.49)	417	0.41	355	0.43	354	0.43	365	0.41	349	0.36	295	0.40	316	0.36	297	0.39
Live with parent		83,824	0.55	(0.50)	2,704	0.32	(0.47)	409	0.40	352	0.37	350	0.34	361	0.32	336	0.32	291	0.29	311	0.26	294	0.23
Age		88,848	31.12	(5.10)	2,748	32.15	(3.71)	417	30.56	355	30.84	354	31.53	365	31.97	349	32.47	295	33.25	316	33.49	297	34.02
Education	Junior or high School	88,328	0.36	(0.48)	2,726	0.26	(0.44)	416	0.34	353	0.33	351	0.26	361	0.26	346	0.23	290	0.23	313	0.21	296	0.18
	Junior or professional college		0.43	(0.49)		0.50	(0.50)		0.48		0.50		0.51		0.50		0.52		0.49		0.50		0.49
	University		0.20	(0.40)		0.24	(0.43)		0.18		0.17		0.23		0.24		0.25		0.28		0.28		0.32
	Other		0.02	(0.12)		0.01	(0.08)		0.01		0.01		0.01		0.01		0.01		0.00		0.00		0.01
L.job	Professional	49,352	0.26	(0.44)	2,716	0.40	(0.49)	399	0.37	349	0.36	351	0.37	361	0.40	349	0.43	294	0.41	316	0.43	297	0.48
	Office worker		0.31	(0.46)		0.35	(0.48)		0.35		0.37		0.34		0.36		0.36		0.36		0.34		0.32
	Sales		0.12	(0.32)		0.05	(0.21)		0.06		0.04		0.05		0.04		0.04		0.05		0.04		0.05
	Service		0.17	(0.37)		0.08	(0.28)		0.08		0.09		0.12		0.09		0.07		0.08		0.08		0.06
	Production		0.08	(0.26)		0.07	(0.26)		0.09		0.09		0.09		0.07		0.06		0.06		0.06		0.04
	Other		0.07	(0.26)		0.04	(0.20)		0.05		0.04		0.03		0.03		0.04		0.03		0.05		0.05
Income	I < 2.5m	68,001	0.33	(0.47)	2,622	0.06	(0.24)	401	0.08	324	0.08	337	0.08	348	0.06	332	0.04	287	0.03	307	0.03	286	0.06
	2.5m <= I < 5.0m		0.36	(0.48)		0.22	(0.41)		0.22		0.21		0.23		0.19		0.24		0.22		0.23		0.21
	5.0m <= I < 7.5m		0.21	(0.41)		0.40	(0.49)		0.36		0.42		0.39		0.44		0.42		0.38		0.38		0.36
	7.5m <= I		0.10	(0.30)		0.33	(0.47)		0.33		0.30		0.30		0.31		0.30		0.37		0.36		0.37
Region dummy of many child on waiting list		88,859	0.32	(0.47)	2,748	0.23	(0.42)	417	0.22	355	0.20	354	0.19	365	0.24	349	0.23	295	0.24	316	0.27	297	0.27
Regional demand-supply ratio of labor force		88,859	0.79	(0.33)	2,748	0.82	(0.32)	417	0.65	355	0.86	354	0.97	365	1.06	349	1.04	295	0.90	316	0.49	297	0.51
Regional inflation		88,859	-0.30	(0.77)	2,748	-0.17	(0.75)	417	-0.30	355	-0.06	354	-0.37	365	0.17	349	-0.01	295	1.34	316	-1.27	297	-0.80
Stock return		88,859	0.02	(0.20)	2,748	0.05	(0.21)	417	0.10	355	0.08	354	0.36	365	0.09	349	-0.04	295	-0.46	316	0.10	297	0.06

(Note) Row (1) represents total data, and from row (2) to (10) represents data after screening.

Table 2: The number of respondents of dependent variable work status

Panel A: Transition of total data

	2003		2004		2005		2006		2007		2008		2009		2010		Total	
Work	196	(50.1%)	138	(46.0%)	123	(39.3%)	138	(43.0%)	125	(40.7%)	108	(41.9%)	114	(40.9%)	117	(44.8%)	1,059	(43.6%)
Childcare leave	124	(31.7%)	94	(31.3%)	117	(37.4%)	113	(35.2%)	113	(36.8%)	117	(45.3%)	124	(44.4%)	101	(38.7%)	903	(37.2%)
Unemployed	49	(12.5%)	49	(16.3%)	56	(17.9%)	56	(17.4%)	43	(14.0%)	15	(5.8%)	24	(8.6%)	23	(8.8%)	315	(13.0%)
Other leave	22	(5.6%)	19	(6.3%)	17	(5.4%)	14	(4.4%)	26	(8.5%)	18	(7.0%)	17	(6.1%)	20	(7.7%)	153	(6.3%)
Total	391		300		313		321		307		258		279		261		2,430	

Panel B: Transition of company with more than 300 employees

	2003		2004		2005		2006		2007		2008		2009		2010		Total	
Work	63	(40.9%)	55	(47.8%)	47	(39.2%)	53	(42.1%)	43	(36.1%)	34	(30.9%)	34	(29.3%)	52	(46.0%)	381	(39.2%)
Childcare leave	68	(44.2%)	40	(34.8%)	51	(42.5%)	49	(38.9%)	54	(45.4%)	57	(51.8%)	70	(60.3%)	43	(38.1%)	432	(44.4%)
Unemployed	13	(8.4%)	11	(9.6%)	16	(13.3%)	17	(13.5%)	13	(10.9%)	6	(5.5%)	6	(5.2%)	9	(8.0%)	91	(9.4%)
Other leave	10	(6.5%)	9	(7.8%)	6	(5.0%)	7	(5.6%)	9	(7.6%)	13	(11.8%)	6	(5.2%)	9	(8.0%)	69	(7.1%)
Total	154		115		120		126		119		110		116		113		973	

Panel C: Transition of company with less than 299 employees

	2003		2004		2005		2006		2007		2008		2009		2010		Total	
Work	133	(56.1%)	83	(44.9%)	76	(39.4%)	85	(43.6%)	82	(43.6%)	74	(50.0%)	80	(49.1%)	65	(43.9%)	678	(46.5%)
Childcare leave	56	(23.6%)	54	(29.2%)	66	(34.2%)	64	(32.8%)	59	(31.4%)	60	(40.5%)	54	(33.1%)	58	(39.2%)	471	(32.3%)
Unemployed	36	(15.2%)	38	(20.5%)	40	(20.7%)	39	(20.0%)	30	(16.0%)	9	(6.1%)	18	(11.0%)	14	(9.5%)	224	(15.4%)
Other leave	12	(5.1%)	10	(5.4%)	11	(5.7%)	7	(3.6%)	17	(9.0%)	5	(3.4%)	11	(6.7%)	11	(7.4%)	84	(5.8%)
Total	237		185		193		195		188		148		163		148		1,457	

Table 3: Difference of work status according to the enforcement of the next generation law

Panel A: Difference of childcare leave

Work status	(1)			(2)			(3)		
	Work or childcare leave								
Companies	Total data			Company with more than 300 employees			Company with less than 299 employees		
	N	Mean of childcare leave	std.err.	N	Mean of childcare leave	std.err.	N	Mean of childcare leave	std.err.
Before 2005	552	0.395	(0.021)	226	0.478	(0.033)	326	0.337	(0.026)
After 2005	1,410	0.486	(0.013)	587	0.552	(0.021)	823	0.439	(0.017)
Diff.		0.091	(0.011)		0.074	(0.039)		0.101	(0.032)
t-value		3.642	***		1.898	*		3.156	***

(Note) *** represents statistical significance at P<0.01, ** at P<0.05, and * at P<0.1. The next generation law is enforced in 2005. The mean of childcare leave represents mean of ratio of childcare leave and work. Data for unemployed and other leave are not included.

Panel B: Difference of unemployment

Work status	(1)			(2)			(3)		
	Work, childcare, unemployed, or other leave								
Companies	Total data			Company with more than 300 employees			Company with less than 299 employees		
	N	Mean of unemployed	std.err.	N	Mean of unemployed	std.err.	N	Mean of unemployed	std.err.
Before 2005	691	0.142	(0.013)	269	0.089	(0.017)	422	0.175	(0.019)
After 2005	1,739	0.125	(0.008)	704	0.095	(0.011)	1,035	0.145	(0.011)
Diff.		-0.017	(0.015)		0.006	(0.021)		-0.030	(0.021)
t-value		-1.128			0.285			-1.461	

(Note) *** represents statistical significance at P<0.01, ** at P<0.05, and * at P<0.1. The next generation law is enforced in 2005. Mean of unemployed represents mean of ratio of unemployed and employed. The employed includes working, childcare leave and other leave. Data:

Table 4: Marginal effect of multinomial logit model with company size 300 employee dummy and no control

Condition		(A)				(B)				(C)				(D)			
L.employment status		Work or tenporary leave				Work or tenporary leave				Work				Work			
Child age		less than 3 yeas old				less than 1 yeas old				less than 3 yeas old				less than 1 yeas old			
Dependent variable work status		Work	Childcare leave	Un-employed	Other leave	Work	Childcare leave	Un-employed	Other leave	Work	Childcare leave	Un-employed	Other leave	Work	Childcare leave	Un-employed	Other leave
Policy Evaluation	Year2005	-0.072 **	0.094 ***	-0.028	0.006	-0.035	0.085 **	-0.054 **	0.003	-0.051	0.060 **	-0.024	0.016	-0.036	0.069	-0.053	0.020
		(0.028)	(0.029)	(0.017)	(0.015)	(0.025)	(0.036)	(0.025)	(0.023)	(0.033)	(0.030)	(0.021)	(0.018)	(0.033)	(0.045)	(0.035)	(0.031)
	Lcompsize300	-0.075 **	0.147 ***	-0.089 ***	0.017	-0.066 *	0.205 ***	-0.167 ***	0.028	-0.058	0.112 ***	-0.076 **	0.022	-0.085 *	0.219 ***	-0.174 ***	0.039
		(0.038)	(0.038)	(0.028)	(0.019)	(0.037)	(0.050)	(0.043)	(0.029)	(0.045)	(0.038)	(0.033)	(0.023)	(0.051)	(0.061)	(0.058)	(0.040)
	Year2005×Lcompsize300	0.008	-0.040	0.038	-0.006	-0.023	-0.042	0.073	-0.008	0.012	-0.023	0.020	-0.008	-0.044	-0.027	0.082	-0.011
		(0.046)	(0.045)	(0.033)	(0.022)	(0.046)	(0.060)	(0.051)	(0.034)	(0.054)	(0.045)	(0.040)	(0.027)	(0.064)	(0.074)	(0.070)	(0.048)
N		2,430	2,430	2,430	2,430	1,478	1,478	1,478	1,478	1,784	1,784	1,784	1,784	924	924	924	924

(Note) *** represents statistical significance at P<0.01, ** at P<0.05, and * at P<0.1.

Table 5: Marginal effect of multinomial logit model with company size 300 employee dummy and controls

	Condition	(A)				(B)				(C)				(D)			
	L.employment status	Work or tenporary leave				Work or tenporary leave				Work				Work			
	Child age	less than 3 yeas old				less than 1 yeas old				less than 3 yeas old				less than 1 yeas old			
	Dependent variable Work status	Working	Childcare leave	Un-employed	Other leave	Working	Childcare leave	Un-employed	Other leave	Working	Childcare leave	Un-employed	Other leave	Working	Childcare leave	Un-employed	Other leave
Policy Evaluation	Year2005	-0.096 ***	0.077 **	0.007	0.011	-0.022	0.028	-0.010	0.003	-0.091 ***	0.046	0.015	0.030	-0.024	-0.002	-0.001	0.027
		(0.030)	(0.031)	(0.017)	(0.016)	(0.027)	(0.038)	(0.025)	(0.025)	(0.034)	(0.032)	(0.021)	(0.020)	(0.034)	(0.047)	(0.034)	(0.036)
	Lcompsize300	-0.119 ***	0.160 ***	-0.058 **	0.018	-0.074 *	0.166 ***	-0.115 ***	0.022	-0.094 **	0.101 **	-0.035	0.027	-0.080	0.131 **	-0.092 *	0.040
		(0.039)	(0.039)	(0.027)	(0.020)	(0.038)	(0.051)	(0.040)	(0.030)	(0.045)	(0.040)	(0.032)	(0.024)	(0.050)	(0.061)	(0.054)	(0.044)
	Year2005×Lcompsize300	0.046	-0.044	0.013	-0.014	0.005	-0.011	0.024	-0.018	0.045	-0.008	-0.016	-0.021	-0.012	0.040	0.003	-0.031
		(0.046)	(0.045)	(0.032)	(0.023)	(0.046)	(0.060)	(0.047)	(0.035)	(0.053)	(0.046)	(0.038)	(0.028)	(0.061)	(0.073)	(0.064)	(0.050)
Older Children		0.050 **	0.056 ***	-0.095 ***	-0.011	0.081 ***	0.097 ***	-0.179 ***	0.001	0.076 ***	0.059 ***	-0.120 ***	-0.016	0.127 ***	0.129 ***	-0.253 ***	-0.003
		(0.021)	(0.021)	(0.016)	(0.011)	(0.019)	(0.029)	(0.025)	(0.016)	(0.025)	(0.021)	(0.021)	(0.013)	(0.024)	(0.035)	(0.034)	(0.022)
Live with parent		0.081 ***	-0.059 ***	-0.007	-0.015	0.061 ***	-0.045	0.005	-0.022	0.082 ***	-0.032	-0.033 *	-0.017	0.100 ***	-0.048	-0.031	-0.021
		(0.022)	(0.023)	(0.015)	(0.012)	(0.020)	(0.029)	(0.022)	(0.018)	(0.026)	(0.024)	(0.019)	(0.014)	(0.027)	(0.037)	(0.030)	(0.025)
Age		0.022 ***	-0.006 **	-0.016 ***	-0.001	0.004	0.009 **	-0.017 ***	0.003	0.031 ***	-0.011 ***	-0.018 ***	-0.002	0.008 **	0.007	-0.018 ***	0.004
		(0.003)	(0.003)	(0.002)	(0.002)	(0.003)	(0.004)	(0.003)	(0.002)	(0.003)	(0.003)	(0.002)	(0.002)	(0.004)	(0.005)	(0.004)	(0.003)
Education	Junior or professional college	-0.069 **	0.068 ***	0.004	-0.004	-0.058 **	0.094 ***	-0.024	-0.012	-0.044	0.041	0.005	-0.002	-0.072 **	0.095 **	-0.013	-0.010
		(0.027)	(0.026)	(0.017)	(0.014)	(0.028)	(0.035)	(0.026)	(0.022)	(0.030)	(0.026)	(0.019)	(0.016)	(0.035)	(0.042)	(0.033)	(0.029)
	University	-0.146 ***	0.134 ***	0.005	0.006	-0.093 ***	0.141 ***	-0.042	-0.006	-0.108 ***	0.074 **	0.027	0.007	-0.116 ***	0.120 **	-0.006	0.002
		(0.032)	(0.032)	(0.021)	(0.016)	(0.031)	(0.042)	(0.031)	(0.025)	(0.037)	(0.033)	(0.026)	(0.019)	(0.042)	(0.052)	(0.041)	(0.034)
	Other	-0.148	0.127	-0.015	0.036	-0.216 ***	0.303 **	-0.118	0.031	-0.091	0.062	-0.059	0.088	-0.260 ***	0.311	-0.256 ***	0.205
		(0.123)	(0.130)	(0.079)	(0.066)	(0.023)	(0.150)	(0.076)	(0.123)	(0.162)	(0.140)	(0.101)	(0.098)	(0.028)	(0.262)	(0.025)	(0.261)
Ljob	Office Worker	0.010	-0.036	0.059 ***	-0.033 ***	0.019	-0.031	0.065 ***	-0.053 ***	-0.014	-0.020	0.062 ***	-0.028 **	0.014	-0.028	0.077 **	-0.063 **
		(0.025)	(0.024)	(0.016)	(0.012)	(0.024)	(0.031)	(0.023)	(0.017)	(0.028)	(0.026)	(0.019)	(0.014)	(0.032)	(0.039)	(0.031)	(0.025)
	Sales	-0.049	-0.027	0.077 **	-0.001	-0.016	-0.072	0.112 **	-0.024	-0.064	-0.040	0.081 *	0.023	-0.044	-0.109	0.163 **	-0.010
		(0.050)	(0.047)	(0.035)	(0.027)	(0.045)	(0.060)	(0.048)	(0.037)	(0.061)	(0.050)	(0.043)	(0.036)	(0.056)	(0.075)	(0.065)	(0.052)
	Service	0.080 **	-0.072 *	0.023	-0.031 *	0.057	-0.032	0.011	-0.035	0.050	-0.029	0.016	-0.037 *	0.067	-0.020	0.012	-0.059
		(0.039)	(0.037)	(0.024)	(0.018)	(0.040)	(0.052)	(0.034)	(0.029)	(0.043)	(0.040)	(0.028)	(0.019)	(0.052)	(0.066)	(0.047)	(0.036)
	Projuction	-0.015	-0.002	0.016	0.001	-0.004	0.038	-0.027	-0.007	0.002	-0.030	0.030	-0.002	-0.006	0.009	0.006	-0.009
		(0.042)	(0.044)	(0.028)	(0.024)	(0.041)	(0.056)	(0.039)	(0.036)	(0.051)	(0.045)	(0.038)	(0.029)	(0.064)	(0.077)	(0.066)	(0.058)
	Other	-0.062	0.018	0.015	0.029	-0.023	0.060	-0.050	0.012	-0.070	0.018	0.028	0.024	-0.041	0.104	-0.065	0.002
		(0.053)	(0.054)	(0.037)	(0.036)	(0.046)	(0.069)	(0.044)	(0.051)	(0.063)	(0.056)	(0.047)	(0.041)	(0.058)	(0.087)	(0.059)	(0.069)
Income	2.5m <= I < 5.0m	-0.032	-0.017	0.072 **	-0.022	-0.054	-0.015	0.097 **	-0.028	-0.050	0.010	0.059	-0.019	-0.051	-0.015	0.096	-0.029
		(0.047)	(0.048)	(0.029)	(0.024)	(0.044)	(0.058)	(0.041)	(0.035)	(0.060)	(0.051)	(0.039)	(0.032)	(0.064)	(0.081)	(0.066)	(0.056)
	5.0m <= I < 7.5m	0.010	-0.013	0.016	-0.013	-0.043	0.037	0.022	-0.015	-0.045	0.055	0.007	-0.017	-0.057	0.085	-0.003	-0.026
		(0.045)	(0.046)	(0.027)	(0.024)	(0.043)	(0.056)	(0.039)	(0.034)	(0.057)	(0.049)	(0.038)	(0.031)	(0.062)	(0.078)	(0.063)	(0.054)
	7.5m <= I	0.064	-0.072	-0.004	0.011	-0.055	0.015	0.008	0.032	-0.030	0.054	-0.027	0.003	-0.072	0.109	-0.048	0.011
		(0.048)	(0.048)	(0.029)	(0.025)	(0.047)	(0.060)	(0.043)	(0.037)	(0.060)	(0.050)	(0.039)	(0.033)	(0.067)	(0.080)	(0.067)	(0.057)
Region dummy of many child on waiting list		-0.065 **	0.023	0.059 ***	-0.017	0.010	-0.043	0.071 ***	-0.038 *	-0.062 **	0.029	0.062 ***	-0.028	-0.004	-0.023	0.088 ***	-0.061 **
		(0.026)	(0.025)	(0.016)	(0.014)	(0.026)	(0.033)	(0.024)	(0.021)	(0.030)	(0.025)	(0.020)	(0.018)	(0.036)	(0.040)	(0.032)	(0.031)
Reginal demand-supply ratio of labor force		-0.066 *	0.030	0.061 ***	-0.025	-0.040	0.002	0.072 **	-0.034	-0.076 *	0.020	0.088 ***	-0.032	-0.068	-0.011	0.118 ***	-0.039
		(0.036)	(0.035)	(0.023)	(0.018)	(0.038)	(0.046)	(0.032)	(0.028)	(0.041)	(0.036)	(0.027)	(0.023)	(0.051)	(0.058)	(0.044)	(0.041)
Regional inflation		0.016	-0.028	0.007	0.004	0.005	-0.024	0.009	0.010	0.025	-0.036 *	0.015	-0.004	0.008	-0.040	0.033	-0.001
		(0.019)	(0.019)	(0.014)	(0.010)	(0.018)	(0.025)	(0.019)	(0.014)	(0.022)	(0.020)	(0.017)	(0.011)	(0.025)	(0.032)	(0.027)	(0.019)
Stock return		0.067	-0.171 **	0.110 **	-0.006	0.053	-0.194 **	0.147 **	-0.005	0.086	-0.179 **	0.125 **	-0.032	0.063	-0.239 **	0.234 ***	-0.059
		(0.067)	(0.067)	(0.045)	(0.034)	(0.063)	(0.083)	(0.062)	(0.048)	(0.079)	(0.072)	(0.055)	(0.039)	(0.086)	(0.107)	(0.084)	(0.066)
N		2,257	2,257	2,257	2,257	1,375	1,375	1,375	1,375	1,652	1,652	1,652	1,652	855	855	855	855

(Note) *** represents statistical significance at P<0.01, ** at P<0.05, and * at P<0.1.

Table 6: Marginal effect of multinomial logit model with company size 100 employee dummy and no control

Condition		(A)				(B)				(C)				(D)			
L.employment status		Work or tenporary leave				Work				Work or tenporary leave				Work			
Child age		less than 3 yeas old				less than 3 yeas old				less than 1 yeas old				less than 1 yeas old			
Dependent variable work status		Work	Childcare leave	Un-employed	Other leave	Work	Childcare leave	Un-employed	Other leave	Work	Childcare leave	Un-employed	Other leave	Work	Childcare leave	Un-employed	Other leave
Policy Evaluation	Year2005	-0.123 ***	0.145 ***	-0.039 *	0.017	-0.095 **	0.079 *	-0.025	0.042 *	-0.068 **	0.135 ***	-0.081 **	0.014	-0.059	0.080	-0.075 *	0.054
		(0.036)	(0.039)	(0.021)	(0.020)	(0.042)	(0.041)	(0.026)	(0.025)	(0.030)	(0.048)	(0.032)	(0.031)	(0.039)	(0.061)	(0.045)	(0.043)
	Lcompsize100	-0.157 ***	0.214 ***	-0.078 ***	0.021	-0.139 ***	0.151 ***	-0.056 *	0.043 *	-0.128 ***	0.253 ***	-0.147 ***	0.023	-0.146 ***	0.229 ***	-0.139 ***	0.055
		(0.039)	(0.041)	(0.025)	(0.021)	(0.045)	(0.042)	(0.029)	(0.026)	(0.035)	(0.051)	(0.037)	(0.032)	(0.045)	(0.063)	(0.051)	(0.045)
	Year2005×Lcompsize100	0.082 *	-0.098 **	0.036	-0.020	0.078	-0.042	0.008	-0.044	0.039	-0.092	0.074 *	-0.022	0.004	-0.017	0.069	-0.056
		(0.046)	(0.048)	(0.030)	(0.024)	(0.054)	(0.049)	(0.036)	(0.030)	(0.042)	(0.060)	(0.044)	(0.037)	(0.057)	(0.075)	(0.062)	(0.052)
N		2,430	2,430	2,430	2,430	1,784	1,784	1,784	1,784	1,478	1,478	1,478	1,478	924	924	924	924

Table 7: Marginal effect of multinomial logit model with company size 100 employee dummy and controls

Condition		(A)				(B)				(C)				(D)			
L.employment status		Work or tenporary leave				Work or tenporary leave				Work				Work			
Child age		less than 3 yeas old				less than 1 yeas old				less than 3 yeas old				less than 1 yeas old			
Dependent variable		Work	Childcare	Un-	Other	Work	Childcare	Un-	Other	Work	Childcare	Un-	Other	Work	Childcare	Un-	Other
Work status			leave	employed	leave		leave	employed	leave		leave	employed	leave		leave	employed	leave
Policy Evaluation	Year2005	-0.153 ***	0.130 ***	0.004	0.018	-0.060 *	0.074	-0.023	0.009	-0.146 ***	0.075 *	0.021	0.050 *	-0.059	0.013	-0.000	0.047
		(0.037)	(0.041)	(0.021)	(0.021)	(0.031)	(0.050)	(0.032)	(0.033)	(0.043)	(0.043)	(0.025)	(0.027)	(0.039)	(0.063)	(0.043)	(0.047)
	Lcompsize100	-0.196 ***	0.230 ***	-0.051 **	0.017	-0.142 ***	0.233 ***	-0.106 ***	0.015	-0.165 ***	0.151 ***	-0.026	0.039	-0.153 ***	0.191 ***	-0.081 *	0.043
		(0.039)	(0.042)	(0.025)	(0.021)	(0.035)	(0.052)	(0.036)	(0.033)	(0.045)	(0.043)	(0.029)	(0.027)	(0.046)	(0.063)	(0.048)	(0.048)
	Year2005×Lcompsize100	0.120 ***	-0.106 **	0.008	-0.021	0.068	-0.072	0.027	-0.023	0.118 **	-0.046	-0.026	-0.046	0.049	0.013	-0.011	-0.051
		(0.046)	(0.049)	(0.029)	(0.025)	(0.042)	(0.061)	(0.043)	(0.038)	(0.053)	(0.051)	(0.035)	(0.031)	(0.055)	(0.076)	(0.057)	(0.054)
Older Children		0.053 **	0.051 **	-0.093 ***	-0.011	0.084 ***	0.093 ***	-0.178 ***	0.001	0.079 ***	0.056 ***	-0.119 ***	-0.016	0.131 ***	0.127 ***	-0.256 ***	-0.003
		(0.021)	(0.021)	(0.016)	(0.011)	(0.019)	(0.029)	(0.025)	(0.016)	(0.025)	(0.022)	(0.021)	(0.013)	(0.024)	(0.035)	(0.034)	(0.022)
Live with parent		0.084 ***	-0.063 ***	-0.006	-0.015	0.063 ***	-0.049 *	0.008	-0.022	0.085 ***	-0.035	-0.032 *	-0.018	0.100 ***	-0.050	-0.029	-0.021
		(0.022)	(0.023)	(0.015)	(0.012)	(0.020)	(0.029)	(0.022)	(0.018)	(0.026)	(0.024)	(0.019)	(0.014)	(0.026)	(0.037)	(0.030)	(0.025)
Age		0.021 ***	-0.005	-0.016 ***	-0.001	0.004	0.010 ***	-0.017 ***	0.003	0.031 ***	-0.010 ***	-0.019 ***	-0.002	0.007 **	0.008 *	-0.019 ***	0.004
		(0.003)	(0.003)	(0.002)	(0.002)	(0.003)	(0.004)	(0.003)	(0.002)	(0.003)	(0.003)	(0.002)	(0.002)	(0.004)	(0.005)	(0.004)	(0.003)
Education	Junior or professional college	-0.066 **	0.066 **	0.004	-0.004	-0.053 **	0.090 **	-0.024	-0.013	-0.041	0.039	0.005	-0.003	-0.063 *	0.091 **	-0.015	-0.012
		(0.027)	(0.026)	(0.017)	(0.014)	(0.027)	(0.035)	(0.026)	(0.022)	(0.030)	(0.026)	(0.019)	(0.016)	(0.034)	(0.042)	(0.033)	(0.029)
	University	-0.144 ***	0.131 ***	0.007	0.007	-0.084 ***	0.128 ***	-0.037	-0.006	-0.108 ***	0.072 **	0.028	0.007	-0.102 **	0.104 **	-0.003	0.001
		(0.032)	(0.031)	(0.021)	(0.016)	(0.031)	(0.041)	(0.032)	(0.025)	(0.037)	(0.033)	(0.026)	(0.020)	(0.042)	(0.051)	(0.041)	(0.034)
	Other	-0.099	0.074	-0.011	0.035	-0.211 ***	0.280 *	-0.107	0.038	-0.049	0.023	-0.060	0.086	-0.252 ***	0.295	-0.256 ***	0.214
		(0.125)	(0.124)	(0.089)	(0.066)	(0.022)	(0.162)	(0.085)	(0.132)	(0.160)	(0.128)	(0.109)	(0.099)	(0.027)	(0.290)	(0.026)	(0.289)
Ljob	Office Worker	0.010	-0.035	0.058 ***	-0.032 ***	0.025	-0.041	0.067 ***	-0.052 ***	-0.017	-0.018	0.062 ***	-0.027 *	0.017	-0.035	0.080 ***	-0.063 **
		(0.025)	(0.024)	(0.016)	(0.011)	(0.024)	(0.031)	(0.023)	(0.017)	(0.028)	(0.025)	(0.019)	(0.014)	(0.032)	(0.039)	(0.031)	(0.025)
	Sales	-0.054	-0.022	0.075 **	0.001	-0.013	-0.078	0.113 **	-0.022	-0.067	-0.038	0.080 *	0.026	-0.036	-0.126 *	0.170 ***	-0.009
		(0.050)	(0.047)	(0.035)	(0.027)	(0.045)	(0.060)	(0.048)	(0.037)	(0.060)	(0.050)	(0.043)	(0.037)	(0.058)	(0.074)	(0.066)	(0.053)
	Service	0.076 **	-0.069 *	0.023	-0.030 *	0.058	-0.035	0.012	-0.034	0.045	-0.026	0.016	-0.036 *	0.068	-0.025	0.016	-0.058
		(0.038)	(0.038)	(0.024)	(0.018)	(0.039)	(0.052)	(0.035)	(0.029)	(0.043)	(0.040)	(0.028)	(0.019)	(0.051)	(0.066)	(0.048)	(0.036)
	Projuction	-0.016	-0.001	0.016	0.002	0.005	0.028	-0.025	-0.007	0.001	-0.026	0.026	-0.001	0.002	0.010	-0.003	-0.009
		(0.042)	(0.044)	(0.028)	(0.024)	(0.041)	(0.056)	(0.038)	(0.036)	(0.051)	(0.046)	(0.038)	(0.028)	(0.063)	(0.078)	(0.063)	(0.056)
	Other	-0.072	0.027	0.013	0.032	-0.017	0.048	-0.046	0.014	-0.080	0.026	0.026	0.027	-0.029	0.089	-0.061	0.002
		(0.052)	(0.053)	(0.036)	(0.036)	(0.046)	(0.068)	(0.046)	(0.052)	(0.062)	(0.055)	(0.047)	(0.042)	(0.054)	(0.084)	(0.061)	(0.068)
Income	2.5m <= I < 5.0m	-0.025	-0.025	0.073 **	-0.023	-0.049	-0.018	0.094 **	-0.028	-0.046	0.005	0.060	-0.020	-0.043	-0.021	0.094	-0.030
		(0.046)	(0.048)	(0.029)	(0.024)	(0.042)	(0.058)	(0.042)	(0.034)	(0.060)	(0.052)	(0.039)	(0.032)	(0.062)	(0.080)	(0.066)	(0.055)
	5.0m <= I < 7.5m	0.020	-0.025	0.018	-0.013	-0.034	0.028	0.020	-0.014	-0.038	0.047	0.008	-0.017	-0.040	0.069	-0.005	-0.024
		(0.045)	(0.046)	(0.027)	(0.023)	(0.042)	(0.055)	(0.040)	(0.034)	(0.058)	(0.050)	(0.037)	(0.031)	(0.061)	(0.078)	(0.063)	(0.053)
	7.5m <= I	0.077	-0.087 *	-0.002	0.013	-0.044	0.003	0.006	0.035	-0.021	0.042	-0.026	0.005	-0.050	0.083	-0.049	0.015
		(0.047)	(0.048)	(0.029)	(0.025)	(0.046)	(0.059)	(0.044)	(0.037)	(0.061)	(0.052)	(0.039)	(0.033)	(0.067)	(0.080)	(0.066)	(0.056)
Region dummy of many child on waiting list		-0.066 **	0.027	0.056 ***	-0.017	0.006	-0.035	0.066 ***	-0.038 *	-0.062 **	0.031	0.059 ***	-0.029	-0.009	-0.018	0.087 ***	-0.061 *
		(0.026)	(0.025)	(0.016)	(0.014)	(0.025)	(0.032)	(0.023)	(0.022)	(0.030)	(0.025)	(0.020)	(0.018)	(0.035)	(0.040)	(0.032)	(0.031)
Reginal demand-supply ratio of labor force		-0.059	0.021	0.063 ***	-0.025	-0.031	-0.013	0.078 **	-0.034	-0.070 *	0.012	0.090 ***	-0.033	-0.057	-0.028	0.127 ***	-0.041
		(0.036)	(0.035)	(0.023)	(0.018)	(0.037)	(0.046)	(0.033)	(0.028)	(0.041)	(0.036)	(0.027)	(0.023)	(0.050)	(0.057)	(0.045)	(0.041)
Regional inflation		0.015	-0.027	0.007	0.005	0.004	-0.024	0.009	0.011	0.022	-0.034 *	0.015	-0.003	0.005	-0.038	0.032	0.001
		(0.019)	(0.019)	(0.014)	(0.010)	(0.018)	(0.024)	(0.019)	(0.014)	(0.022)	(0.020)	(0.017)	(0.011)	(0.025)	(0.031)	(0.027)	(0.019)
Stock return		0.062	-0.171 **	0.114 **	-0.005	0.057	-0.212 **	0.158 **	-0.003	0.076	-0.173 **	0.126 **	-0.030	0.073	-0.263 **	0.246 ***	-0.055
		(0.066)	(0.067)	(0.045)	(0.034)	(0.062)	(0.083)	(0.062)	(0.048)	(0.079)	(0.072)	(0.055)	(0.039)	(0.085)	(0.107)	(0.085)	(0.067)
N		2,257	2,257	2,257	2,257	1,375	1,375	1,375	1,375	1,652	1,652	1,652	1,652	855	855	855	855

(Note) *** represents statistical significance at P<0.01, ** at P<0.05, and * at P<0.1.

Appendix A: Definition of variables

Variable	Unit	Definition
Employment status	Category variable	It is work, temporary leave, or unemployed. Temporary leave includes childcare leave and family leave.
Childcare leave	Dummy variable	It is 1 when the parson takes the childcare leave within one year or 0 otherwise.
Work status	Category variable	It is work, childcare leave, unemployed, or other leave. See Figure 2 for detailed definition.
Year2005	Dummy variable	It is 1 after 2005 or 0 otherwise.
Year2006	Dummy variable	It is 1 after 2006 or 0 otherwise.
Lcompsize100	Dummy variable	It is 1 if the person works last year for the company with more than 100 employees or 0 otherwise.
Lcompsize300	Dummy variable	It is 1 if the person works last year for the company with more than 300 employees or 0 otherwise.
Lcompsize500	Dummy variable	It is 1 if the person works last year for the company with more than 500 employees or 0 otherwise.
Lcompsize1000	Dummy variable	It is 1 if the person works last year for the company with more than 1000 employees or 0 otherwise.
Child age less than 3 years old	Dummy variable	It is 1 if the child age is less than or equal 3 years old or 0 otherwise.
Child age less than 1 year old	Dummy variable	It is 1 if the child age is less than or equal 1 years old or 0 otherwise.
Older children	Dummy variable	It is 1 if the child has one more order brother/sister or 0 otherwise.
Live with parent	Dummy variable	It is 1 if the person lives with parent or 0 otherwise.
Age	Years old	Age of working women.
Education	Category variable	It is junior or high school, junior or profession college, university, or other.
Job	Category variable	It is office worker, sales, service, production, or other. Security, agricultural, and transportation are included in other.
Income	Million Japanese Yen	Family income of last one year including bonus. If spouse lives in a separate house, income of spouse is not considered.
Region dummy of many child on waiting list	Dummy variable	It is one for the prefecture where the children on waiting lists to get nurseries is more than or equal 1000 or 0 otherwise. The prefecture is based on the first survey. The movement is not considered due to the survey structure.
Regional demand-supply ratio of labor force		Seasonally adjusted demand-supply ratio of labor force of MHLW by prefecture.
Regional inflation	%	Consumer price index of Ministry of Internal Affairs and Communications by prefecture.
Stock return	%	Annual return of the Nikkei 225 stock index.