The Effect of Childcare Costs on Mothers' Labor Force Participation*

Akiko S. Oishi

Abstract

Using micro data from the *Basic Survey on People's Life* for 1998, this paper investigates (1) the childcare situation of preschoolers and (2) the economic situation of the households using licensed day-care centers. Then it analyzes (3) the impact of nursery fees on the labor force participation of mothers with preschool children.

Our main findings are as follows. First, households using licensed day-care centers are not always low-income households. Considering the fact that a large amount of subsidies is granted to licensed day-care centers, the question of fairness arises, because there are households that take care of children at home. Second, in most cases, mothers who use licensed day-care centers earn less than 1.3 million yen a year, so that they pay neither taxes nor social security premiums. Third, nursery fees have significantly negative effects on the labor force participation of mothers, and its elasticity is about -0.60. We also find that raising subsidies on nursery fees is effective in increasing the employment of mothers, especially that of low-income groups.

1.Introduction

With more women entering the labor market and the birthrate continuing its decades-long decline, the issue of childcare has been receiving increasing attention by policymakers. Economic theory predicts that mothers' decisions regarding labor supply and childcare demand are likely to be affected by childcare costs. In the United States, a number of studies have estimated the effect of the price of purchased childcare on the labor force participation of mothers[1]. Though estimated price elasticities reported by the authors vary from 0.06 to -1.26, most studies show negative effect of the price of childcare on mothers' employment. On the other hand, there have been few empirical studies on the women's labor supply in Japan which explicitly included childcare costs as explanatory variables. Moreover, past studies in Japan sometimes show positive or insignificant effect of childcare costs on mothers' labor supply and even if the price elasticities are negative, they are often extraordinary large (-2.6 to -4.3). This may be because most of the past studies used prefectural-average nursery fees as a variable which indicates childcare costs due to limited availability of the data.In this paper we employ micro data from the *1998 Basic Survey on People's Life* conducted by the Ministry of Health, Labor and Welfare to examine the impact of childcare costs on the labor force participation of mothers with preschool children. Childcare costs are estimated using a generalized tobit specification corrected for sample selection. The results of our analyses provide evidence to support the prediction that higher childcare costs lower the mothers' probability of participation. We also find that raising subsidies on nursery fees is effective in increasing the employment of mothers, especially that of low-income groups.

In the next section, we outline the Japanese childcare system and present the situation of households using licensed day-care centers. We then analyze the effect of childcare costs on mothers' labor force participation. Simulation results show how changes in nursery fees influence mothers' participation by each income group and wage level. Finally, we discuss the policy implications of nursery fees.

2.Present Situation of Childcare in Japan

2.1 Overview of the Japanese Childcare System

One of the characteristics of Japanese childcare system is the major role played by the government. The government sets standards for licensed day-care centers, includ-

ing the staff-child ratio and space of the facilities per child. If the centers are approved by governors of prefectures as satisfying the government standards, they can receive subsidies from the national and local governments. The government also sets standards for nursery fees for licensed day-care centers, though the actual fees are set by each municipality. The fee structure is dependent on parental income level, age of the child, and the number of siblings. Nursery fees tend to be lower for elder children, and if parents leave two or more children to licensed day-care centers, they are given discounts of up to 50 percent for older or younger children according to their income level. Besides such public services, there are non-licensed day-care centers run by private companies. But due to the absence of government subsidies, fees of such centers tend to be higher[2].

Before 1997 when the Child Welfare Law was amended, parents couldn't choose the particular licensed day-care center in which their child is cared for. It was the local welfare office that examined each applicant's need for childcare and decided who should be approved of, considering the mother's working hours and economic status of the family. The revision to the law has introduced a scheme to let parents select day-care centers, but in areas where shortage of day-care services is significant, the local welfare office still plays decisive role.

As of April 2001, there are 22,218 licensed day-care centers in Japan and they care for 1.83 million children, or 26 percent of preschool children[3]. However, the potential needs for licensed day-care services are considered to be large. For example, the number of children who cannot get into licensed day-care centers rose by 991 from a year ago to 35,144 in 2001 despite the fact that the full quota of licensed day-care centers throughout the country increased by 13,975 during the year. This is probably because the increased capacity of day-care centers caused "potential waiting children" to become "tangible waiting children."

In May 2001, Prime Minister Junichiro Koizumi promised to eliminate the waiting lists for licensed day-care centers, and the government allocated 31.6 billion yen in the fiscal 2002 budget proposal. Specifically, the government decided to create places for 50,000 more children to be taken care of at the licensed day-care centers in the year. To increase the supply of childcare services, existing regulations on the establishment of day-care centers have been relaxed and new entries to the childcare service business have been encouraged. The immediate purpose of this strategy is to support mothers with small children, but from a longer-term perspective, the government hopes that the policy will encourage women to have more children and that continued work of women will lead to higher tax and social insurance premium revenues.

The existence of waiting children suggests that demand for childcare services at day-care centers is greater than their supply. Two alternatives can be considered as methods for settling the question of these children: to increase the supply or to raise nursery fees. The present policy puts emphasis solely on quantitative adjustments and gives no consideration to the manipulation of nursery fees. However, the fees of licensed day-care centers are now set at a far lower level than actual childcare costs, and users enjoy great benefits, as has been pointed out by Takayama (1982), Katsumata (1994), Suzuki (1993), and Zhou and Oishi (2002). In addition, there are probably some grounds to argue that the fees of day-care centers, which are set at a lower level than the supply-demand equilibrium, stimulate demand and result in the occurrence of waiting children. Thus, a fair evaluation of childcare policies requires empirical studies on the effects of accessibility to day-care centers and nursery fees on the labor supply of women.

2.2 Childcare Situation of Preschoolers: Descriptive Findings

We use data from the *1998 Basic Survey on People's Life* on households with preschool children. The Survey is conducted by the Ministry of Health, Labor and Welfare as a household survey for each household member. The Survey includes information on family status, current job status, and situation of care of preschool children in the daytime. The analysis of this paper used 3,781 households comprising both parents with preschool children, i.e. children 6 years or younger excluding those in primary school. First, let us look at the childcare situations of preschoolers.

Distribution of Child's Primary Care Arrangement

Table 1 shows the sample households' childcare arrangements in the daytime by the mother's working status. In the total of 3,781 households, 1,270 (34%) mothers are working and in which 900 (24%) mothers are working as employees. Licensed day-care accounts for nearly half of all care for working mothers, versus only 7 percent for mothers at home. However, if we think of the large number of waiting children, it is surprising that one-fourth of the users of licensed day-care centers "have no jobs." The

probable reasons for this include: (1) some local governments (especially those in rural areas) have licensed day-care centers with room for admitting small children and so do not make it a requirement for admission that mothers are working; (2) some households are allowed to leave their children to licensed day-care centers for reasons other than the employment of mothers (e.g. sicknesses, care for the elderly or other family situations); (3) mothers taking childcare leave; and (4) mothers cheating the local welfare office.

For households with working mothers, grandparents play an important role as a primary caregiver, especially when the mother is employed. Since 45 percent of licensed day-care centers do not accept infants, and since alternatives to licensed day-care centers are quite limited in Japan, living with her (or her husband's) parents and getting help from them can sometimes be critical for a working mother.

Kindergartens, which provide care and education for preschool children aged 3 years and older, account for 16 percent of all care for preschool children, but are less common when the mother is employed. This may be because kindergartens usually care for children only 4 hours a day.

Table 2 shows the distribution of child's primary care arrangement by age of the youngest child. In the case of babies under the age of one, the parents are the only caregivers in 79 percent of the sample households, while only 4 percent leave their babies in the care of licensed day-care centers. In the case of households having children aged three years or over, higher ratios use licensed day-care centers or kindergartens.

Situation of Household Income

Figure 1 shows the distribution of income and Table 3 shows mean income of the households having preschoolers classified by primary childcare arrangement. The mean yearly income of households in which parents or grandparents are the only caregivers is 6.6 million yen, while that of the households using licensed day-care centers is 6.8 million yen. The difference in incomes between these two groups diminishes when incomes are adjusted by equivalence scale; the difference in means (2.24 million yen and 2.23 million yen, respectively) is statistically insignificant. The users of non-licensed day-care centers have higher ratios of high-income households: their mean income is 7.2 million yen, and 10% of them have an income of 12-15 million yen. The mean income of households using kindergartens is highest among all groups (7.3 million yen), partly because kindergartens are often located in large cities where people's living standard is high.

Incomes of fathers and mothers

Table 4 shows the incomes of fathers and mothers. Fathers' mean income of households using licensed day-care centers is lower than that of the households in which parents or grandparents are the only caregivers by 0.9 mil-

Table 1 Distribution of Child's Primary Care Arrangement, by Mother's Working Status

No. of households, percent

Primary care arrangement	Total	Not working	Working		
			Total	Employed	Self-employed, etc.
Parent	**1879**	**1715**	**164**	**77**	**87**
	(49.7)	(68.3)	(12.9)	(8.6)	(23.5)
Grandparent	**343**	**146**	**197**	**155**	**42**
	(9.1)	(5.8)	(15.5)	(17.2)	(11.4)
Licensed day-care centers	**747**	**180**	**567**	**439**	**128**
	(19.8)	(7.2)	(44.6)	(48.8)	(34.6)
Non-licensed day-care centers	**80**	**18**	**62**	**53**	**9**
	(2.1)	(0.7)	(4.9)	(5.9)	(2.4)
Kindergartens	**620**	**424**	**196**	**120**	**76**
	(16.4)	(16.9)	(15.4)	(13.3)	(20.5)
Other arrangements	**43**	**20**	**23**	**17**	**6**
	(1.1)	(0.8)	(1.8)	(1.9)	(1.6)
Unknown	**69**	**8**	**61**	**39**	**22**
	(1.8)	(0.3)	(4.8)	(4.3)	(5.9)
Total	**3781**	**2511**	**1270**	**900**	**370**
	(100.0)	(100.0)	(100.0)	(100.0)	(100.0)

Source: Author's calculations from the 1998 BSPL data.

Table 2 Distribution of Child's Primary Care Arrangement, by Age of the Youngest Child

No. of households, percent

Primary care arrangement	Total	Age of the youngest child						
		0	1	2	3	4	5	6
Total	**3781**	**774**	**775**	**634**	**537**	**501**	**489**	**71**
	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Parent	49.7	78.7	68.4	64.0	36.5	14.4	11.7	12.7
Grandparent	9.1	14.5	13.7	11.7	6.0	2.2	1.4	1.4
Licensed day-care centers	19.8	4.3	12.8	17.8	31.3	31.5	32.5	23.9
Non-licensed day-care centers	2.1	0.9	2.6	3.6	1.5	2.6	1.8	0.0
Kindergartens	16.4	0.0	0.0	0.0	22.5	45.3	47.4	56.3
Other arrangements	1.1	0.8	1.7	1.6	1.3	0.8	0.6	0.0
Unknown	1.8	0.9	0.9	1.3	0.9	3.2	4.5	5.6

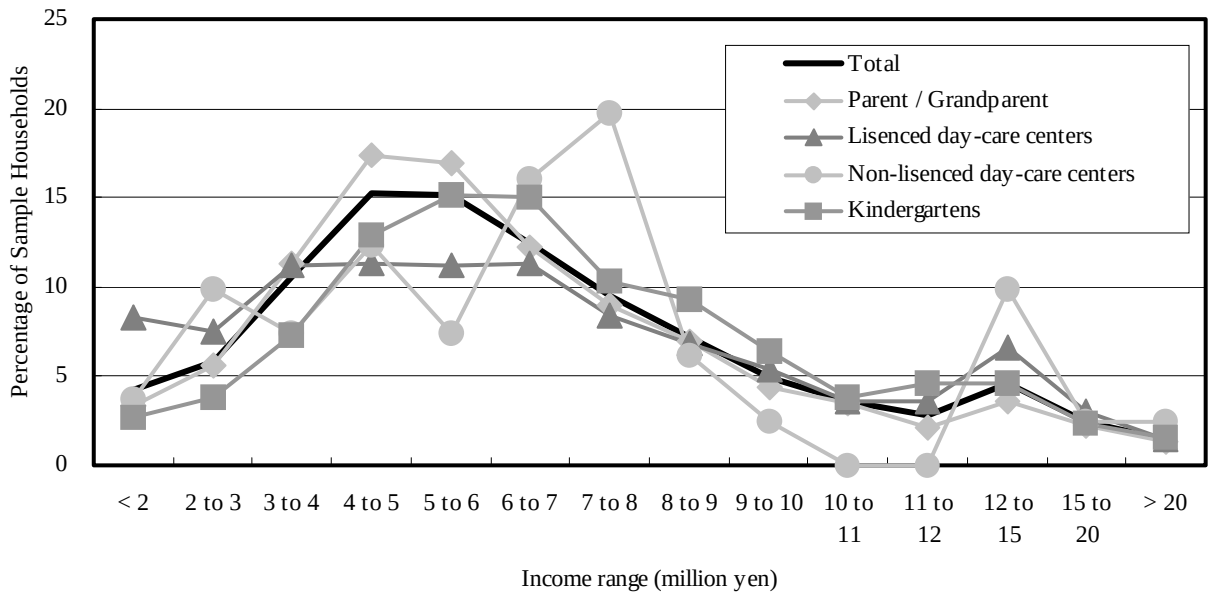
Source: Author's calculations from the 1998 BSPL data.

Table 3 Household Income, by Primary Childcare Arrangement

	No. of obs	Mean income	Mean income, EQV adjusted	Father's income	Mother's income
		million yen			
Total	**3819**	**6.793**	**2.296**	**4.938**	**0.697**
		(4.662)	(1.430)	(3.248)	(1.509)
Parent / Grandparent	**2232**	**6.596**	**2.241**	**4.960**	**0.411**
		(4.648)	(1.240)	(2.820)	(1.133)
Lisenced day-care centers	**757**	**6.774**	**2.225**	**4.051**	**1.430**
		(4.533)	(1.562)	(3.050)	(1.894)
Non-lisenced day-care centers	**81**	**7.212**	**2.561**	**4.923**	**1.554**
		(5.056)	(1.609)	(3.727)	(2.491)
Kindergartens	**628**	**7.341**	**2.517**	**6.003**	**0.577**
		(4.707)	(1.641)	(4.315)	(1.486)
Other arrangements	**45**	**7.239**	**2.333**	**4.338**	**0.683**
		(4.397)	(1.087)	(2.393)	(1.197)

Note: Standard errors in parentheses. Column 3 shows mean household income devided by the equivalence scale for household sizes (EQV), where EQV= 1+ 0.7*(number of adults -1) + 0.5*number of children.
Source: Author's calculations from the 1998 BSPL data.

Figure 1 Household Income, by Primary Childcare Arrangement



lion yen. In contrast, if we compare mothers' income, the former group exceeds the latter by 1 million yen. This means that although there is little difference in total household income between the two groups, there is difference in the incomes composition.

Fathers' mean income of households using non-licensed day-care centers have variations because of the small sample: while they are generally distributed more among lower income brackets, 6 percent of them have a yearly income of 10 million yen or more. Fathers' mean income of households using kindergartens is found to be highest among all groups.

On the other hand, mothers with income classified as "none" occupy 67 percent of the sample households. This is mainly because they are not working in many cases, and even if they work, there seem to be some cases in which mothers are working only as unpaid family workers. Even in households that leave their children to licensed day-care centers, 33 percent of them report no earnings for mothers and 26 percent of them report earnings to be within one million yen a year.

The existing tax system as well as social security system favor housewives and there is a "tax wedge" for married women who earn more than 1.03 million yen a year. Specifically, if a wife of a salaried worker makes more than 1.03 million yen a year, she has to pay income tax by her own, and the income deduction for a dependent spouse is no longer applicable to her husband[4]. Moreover, if she makes more than 1.3 million yen a year, or if she works more than 75 percent of regular workers' working hours, she is no longer exempt from paying premiums for public pensions. Instead, if she works part-time and makes more than 1.3 million yen a year, a fixed amount (13,300 yen per month in 2002) is levied on her as a premium for the *National Pension*[5]. If she works more than 75 percent of regular workers' working hours, she has to participate in the *Employees' Pension Insurance* in which both employers and employees contributes 8.675% of employee's monthly salary as premiums[6]. For fear of losing these tax and social security benefits, many housewives work part-time in Japan.

Table 5 shows the situation of taxation on mothers' incomes. As one can see from the table, 39 percent of mothers in households using non-licensed day-care centers pay income tax and 41 percent also contribute social insurance premiums. These figures are only 31 percent and 37 percent, respectively, for users of licensed day-care centers.

To summarize, if it were not for licensed day-care services, a significant number of mothers would have been unable to work and the income disparities among the childrearing households would have been wider. In that sense one can say that licensed day-care centers have some kind of inequality reducing effect; but the issue is whether

Table 4 Parents' Income,by Primary Childcare Arrangements

(percent)

	Father's income					Mother's income				
Income (million yen)	Total	Parent / Grandparent	Lisenced day-care centers	Non-lisenced day-care centers	Kindergartens	Total	Parent / Grandparent	Lisenced day-care centers	Non-lisenced day-care centers	Kindergartens
None	2.9	3.1	3.3	3.9	1.8	67.4	79.6	33.1	38.8	73.7
> 0.8	0.7	0.6	1.2	0.0	0.3	7.4	4.5	15.4	13.8	6.9
0.8 to 1	0.5	0.3	1.4	1.3	0.3	4.5	2.8	10.6	5.0	3.4
1 to 2	3.4	3.2	4.9	7.7	2.2	6.9	4.5	13.9	12.5	5.2
2 to 2.8	6.7	6.6	9.1	9.0	4.3	4.6	3.5	7.8	8.8	2.7
2.8 to 4	16.8	16.9	20.2	15.4	11.9	4.0	2.9	7.1	10.0	3.6
4 to 5	20.4	22.1	19.0	19.2	15.9	2.1	1.1	5.4	3.8	1.3
5 to 6	17.7	18.8	16.0	16.7	16.2	1.3	0.4	3.1	2.5	1.8
6 to 7	12.6	11.4	12.7	7.7	17.2	0.8	0.4	2.0	2.5	0.5
7 to 8	7.8	7.2	7.2	10.3	10.4	0.5	0.2	1.1	0.0	0.5
8 to 9	4.2	4.2	3.0	2.6	6.3	0.1	0.1	0.4	0.0	0.2
9 to 10	2.2	1.9	0.5	0.0	5.3	0.1	0.1	0.0	1.3	0.2
> 10	4.1	3.8	1.6	6.4	7.9	0.2	0.1	0.3	1.3	0.2
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.1	100.0	100.0	100.0

Source: Author's calculations from the 1998 BSPL data.

such effect could be justified from the viewpoint of equity and efficiency. According to the estimates of the Foundation for Children's Future (2000), the in-kind benefits arising from childcare services at licensed day-care centers are worth 0.9 million yen per year for an infant and 0.2-0.3 million yen per year for a child 3 years of age or older. Households that do not use (or are unable to use) licensed day-care centers are not eligible for such benefits even if their mothers are working. If we took account of the in-kind benefits as a part of household income, the actual living standard of households using licensed day-care centers would improve substantially. Despite that, one cannot expect these households to provide higher tax revenues or make higher social security contributions because mothers of these households often work part-time and earn income below the level of the dependent spouse's exemption.

3.Analyses of Childcare Cost on Mother's Labor Participation

3.1 Past Studies

Many empirical studies on the effects of childcare expenses on childcare demand and on the labor supply of mothers have been undertaken in the United States. The author leaves a detailed survey of such research to Blau (2000, 2001) and examines past studies in Japan. Komamura (1996) used data by prefecture and estimated a reduced form model of childcare demand with the admission rate of day-care centers as a dependent variable. The independent variables of the model include childcare costs, but the costs used here are prefecture-specific representative nursery fees for households with yearly income of 7-8 million yen. Komamura uses the estimated childcare demand as an independent variable for a model determining women's labor force participation rates. The elasticity of childcare demand (admission rate of day-care centers) due to a change in the childcare cost is high at -2.639. In addition, childcare costs have no significant direct impact on the labor supply.

Niimi (2002) followed Komamura and estimated childcare demand and women's labor supply functions using prefectural data. Like Komamura (1996), Niimi used prefecture-specific representative nursery fees for households with yearly income of 7-8 million yen, and the price elasticity of childcare demand was greater than that of Komamura (1996) at -3.5 to -4.3. Increases in childcare costs indirectly restrict the labor supply of women by reducing childcare demand. But, when nursery fees for households with yearly income of 3-4 million yen were used as explanatory variables, the effect of childcare costs on childcare demand was not significant and no impact of these costs on women's employment was observed. From these results, Niimi concluded that while higher nursery fees have no effect on the employment of women in low-income households, they do obstruct that of women in high-income brackets.

Shigeno (2001) used data from the *Survey on Population and Socioeconomic Situations* (1996) of the Ministry of Health, Labor and Welfare, and analyzed the impact of childcare costs on women's employment and the use of childcare leave. The survey covered mothers with babies aged six to eight months and investigated the yearly income of their households, whether or not they were employed, employment patterns, whether or not they were taking childcare leave, childcare patterns, and childcare costs. Shigeno inserted the estimation result of the childcare cost function into the employment probability and childcare leave-taking probability functions, and es-

Table 5 The Taxation on Mothers' Incomes, by Primary Childcare Arrangements

(percent)

	Total	Parent / Grandparent	Lisenced day-care centers	Non-lisenced day-care centers	Kindergartens
No earnings	**67.4**	**79.6**	**33.1**	**38.8**	**73.7**
With earnings	**32.6**	**20.4**	**66.9**	**61.3**	**26.3**
paying income tax	16.3	10.7	31.2	38.8	11.9
contributing SS premiums	18.4	12.1	36.5	41.3	12.7
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Source: Author's calculations from the 1998 BSPL data.

timated the impact of childcare costs on mothers' employment and childcare leave use. As a result, she found that childcare costs had a negative effect on employment and a positive effect on childcare leave. But, the data she used have some problems: they do not show mothers' income and the household income of the data included mothers' income. Apparently, the household income is not exogenous to mother's employment and estimation results might be biased.

Morita (2002) analyzed the effects of childcare services and childcare costs on the women's choice of working status, using data of the *Survey on Women's Employment and Childcare*. Because the survey data includes academic background and working hours of samples, it is possible to estimate a wage function. Morita first estimated a selectivity-adjusted wage function and then inserting the result into a multinomial logit model. The model includes such independent variables as information about childcare costs and childcare policies. Here she substitutes the collection rates of nursery fees by local governments as compared to government-level nursery fees for childcare costs. The outcome of her estimation is the opposite to that predicted by theory; for example, the higher childcare costs are, the higher the probability of employment becomes.

3.2 Analytical Framework

For our econometric analysis, we employ the model by Connelly (1992) in which the decision of a mother with young children to participate in the labor market is modeled as the outcome of maximizing her utility over goods, child quality, and leisure, subject to a production function for child quality, a money budget constraint, the mother's time constraint and the child's time constraint. Specifically, we estimate a probit model relating maternal employment to wages and childcare costs such that

$L^* = a_w \ln W + a_p P + a' X + \lambda \varepsilon$,

L =1 (participates) if L*>0,

L =0 (does not participate) otherwise

where L* is the labor supply of a mother having small children, W is her market wage, P is the hourly cost of childcare, X is a vector of other observed determinants, and ε represents unobserved determinants.

For other observable determinants X, we use the size of the city, dummy variables showing housing type and whether or not three generations live together and its cross term, variables affecting income restrictions (net household financial assets, incomes of other household members and its square term), and variables showing childcare burdens (age of the youngest child, number of children younger than school age).

The problem is that W is not observed in the samples that are not employed. Similarly, P is observed only in the samples who left children at licensed day-care centers. Therefore, we make the estimation following the steps stated below:

Step 1: Estimation of Market Wages

A wage function is defined as follows:

$\ln W = \Gamma' M + \gamma$

M is the factors affecting the level of market wage. Because this wage can be observed only amongst the members of samples that work, Heckman's two-stage estimation procedure is used to correct sample selection bias. Ages and their square terms, type of public pension programs in which samples take part, and the active opening ratio of the area concerned are adopted as variables affecting wage only. As noted later, the type of public pension plan is included to adjust the effects of working hours.

Step 2: Estimation of Nursery Fees

Assume that the childcare cost per child can be defined as follows:

$P^* = Z\theta + \varepsilon_{i2}$ if $\varepsilon_{i2} > -Z\theta$,

$\varepsilon_{i2} \sim N(0, \sigma_2^2)$

P* = 0 otherwise

where P* is the price of childcare which maximizes the mother's utility, and Z is household attributes and other factors affecting the determination of childcare costs. To correct for sample selection bias, we estimate a nursery fee function using Heckman's two-stage estimation procedure. Based on the estimated parameters, the amount of nursery fees to be paid when the mother is employed is predicted for each sample household.

As described in section 2, the nursery fees of licensed day-care centers are basically determined by parental income, the child's age, and the number of siblings. In addition to these variables, we include the nursery fee collection rate of each local government as compared to the government-level nursery fees (hereinafter referred to as "collection rates")[7] to capture the differences in nursery fees between areas. As a subsidy to the households using licensed day-care centers, most municipalities charge lower fees than the government standard, but there are very large gaps in the collection rate between areas. For example, Tokyo has the lowest collection rate: only about 35-40% that of the government standard.

In estimating nursery fee function, we must take

into account that if the mother is employed and the household's income (and the total tax payment) increases, nursery fees are raised accordingly. To reflect this mechanism on the nursery fee function, for the samples with non-working mothers, the logarithmic wage estimated at Step 1 (i.e., the income that would be earned if mothers work plus the current household income) and its square term are included as explanatory variables. The square term of household income is included as an explanatory variable because nursery fees have upper limits, although they are determined by the amount of taxes in principle.

Step 3: Estimation of The Participation Probit

The participation probit is estimated by including the predicted logarithm wage obtained at Step 1, the predicted nursery fees obtained at Step 2, and other factors.

Obtaining the Data for Nursery Fees

Because *The Basic Survey on People's Life* does not provide data on the amount of childcare costs paid by the parents, we estimate the nursery fees paid by the sample households using licensed day-care centers employing data on taxes and on the number and age of children that are available from the *Survey.* Specifically, we refer to the lists of nursery fees of local governments that classify households into 15 to 35 brackets according to the amounts of taxes paid and the number and age of children of households. The number of brackets and the nursery fee charged to each bracket differ from municipality to municipality. For example, in Nagano City, a household who paid income tax of 100,000 yen in the previous year will be classified as the 8th income bracket and be charged 41,500 yen per month to have their child younger than 3 years of age cared for in licensed day-care centers. On the other hand, in the 19 Wards in central Tokyo, the same household will be classified as the 11th income bracket and be charged only 21,500 yen per month. Thus, calculations are made for the 540 households for which these data were available[8].

The estimated monthly fees per child range from 0 (exempted) to 61,500 yen, with the average fee at 21,904 yen. One can say that households in Japan using licensed day-care centers enjoy relatively lower childcare costs than US households; employing 1990-1993 SIPP panels, Anderson and Levine (2000) reports the average weekly childcare costs for married mothers with children under six years of age to be $71.17, or 39,908 yen per month if calculated at the 1992 average exchange rate ($1=126.62 yen). Obviously, the lower fees of Japanese licensed day-care centers result from the ability-to-pay collection system and large subsidies by the central and local governments.

3.3 Estimation Results

Estimation Results of the Wage Function

The samples used for estimation are 3,417 households that have information on preschoolers and both parents without missing values[9]. Summary statistics of the variables used are shown in Table 6. The *Basic Survey on People's Life* contains no information on working hours. Therefore, the logarithm of the employee income of mothers in the past year is used here instead of wage rates per hour. Table 7 shows the result of the estimation of the wage function. The explanatory variables of the wage function include the type of public pension plan in which mothers take part. This is, as noted above, to adjust the effects of working hours. As discussed in section 2.2, the wives of salaried workers are no longer exempt from paying premiums for public pensions if they work more than 75 percent of regular workers' working hours or earn more than 1.3 million yen a year. This is why these wives limit, in most cases, their working hours. Thus, it can be said that the participation of married women in public pension plans has a close relation to their working hours. The estimation results also show that the wage income of women is significantly high if they take part in the *Employees' Pension Insurance (EPI)* or *Mutual-Aid Associations (MAA)* (compared to that of the *National Pension* subscriber), whereas it is significantly lower in the case of spouses of *EPI* or *MAA* subscriber. Compared to women in large cities, those in rural areas have significantly lower wage incomes. The active opening ratio[10] has a significantly positive effect on wage income, which indicates that wages tend to be higher in areas with a tight labor supply.

Estimation Results of the Nursery Fee Function

The estimation results of the nursery fee function are summarized in Table 8. While nursery fees become significantly higher if household income is higher, the coefficient of the square term of household income is negative, which indicates that marginal effect of income is decreasing. Compared to the case in which the youngest child is under the age of one, no significant differences in nursery fees are observed in fees for children aged one to two, but for children aged three or over, nursery fees are substantially lower. If two children are put in the charge of a licensed day-care center, their nursery fees are reduced

by 10,000 yen a month or so per child. A one percent rise in the collection rate increases nursery fees by 245 yen. Thus, nursery fees in Tokyo are lower than the government standard by about 16,000 yen on average.

Using the coefficients obtained here, predictions were also made of the nursery fees that the households would pay if mothers begin to work. The average fee thus calculated is 28,600 yen a month and the maximum fee is 57,200 yen.

Estimation Results of the Participation Probits

Table 9 shows the estimation results from three specifications of the participation probits. The central issue is which controls to include in the models. With no controls in the model, our nursery fees clearly capture the full impacts on participation, but may also be capturing other correlated participation determinants (e.g. there may be other reasons why mothers with preschool children tend to be out of the labor force besides childcare costs). On the other hand, with a full set of controls, we may be attribut-

Table 6 Summary Statistics

Variable	Variable		Mean	Std. Dev.	Minimum	Maximum
Labor force participation		3417	0.356	0.479	0	1
Estimated day nursery fees (10 thousand yen/month)		3417	2.864	0.993	0.006597	5.724284
Estimated log wage		3417	4.253	0.648	3.227058	6.295854
Estimated wage (10 thousand yen/year)		3417	91.626	86.655	25.2054	542.3188
Age		3417	32.143	4.846	19	49
Age squared		3417	1056.671	316.640	361	2401
City size (control: Metropolitan area)						
	150000 residents or more	3417	0.322	0.467	0	1
	50000 to 150000 residents	3417	0.223	0.416	0	1
	Less than 50000 residents	3417	0.055	0.227	0	1
	Rural area	3417	0.212	0.409	0	1
Pension status (control: National Pension subscriber)						
	EPI subscriber	3417	0.127	0.333	0	1
	MAA subscriber	3417	0.049	0.216	0	1
	Spouse of EPI subscriber	3417	0.525	0.499	0	1
	Spouse of MAA subscriber	3417	0.090	0.286	0	1
	Non-subscriber	3417	0.040	0.197	0	1
Active opening rate (time)		3417	0.542	0.158	0.19	0.99
Household's net financial assets		3417	-319.864	1297.810	-3500	3500
Housing status (control: Owned houses)						
	Rented houses owned privately	3417	0.256	0.437	0	1
	Issued houses	3417	0.060	0.238	0	1
	Rented houses owned by public corporations	3417	0.081	0.273	0	1
	Rented houses, n.e.s.	3417	0.020	0.141	0	1
Household type: extended family		3417	0.257	0.437	0	1
	Extended family ×Rented houses owned privately	3417	0.005	0.068	0	1
	Extended family ×Issued houses	3417	0.001	0.038	0	1
	Extended family ×Rented houses owned by public corporations	3417	0.003	0.054	0	1
	Extended family ×Rented houses, n.e.s.	3417	0.002	0.042	0	1
Unearned income		3417	593.834	328.989	0	2480
Unearned income squared		3417	46.084	59.942	0	615.04
Age of the youngest child (control: zero years old)						
	1 years old	3417	0.212	0.409	0	1
	2 years old	3417	0.170	0.376	0	1
	3 years old	3417	0.145	0.352	0	1
	4 years old	3417	0.136	0.343	0	1
	5 years old	3417	0.128	0.334	0	1
	6 years old	3417	0.018	0.133	0	1
Number of preschool children		3417	1.324	0.509	1	4
Day nursery fees collection rate (% of national standard)		3417	67.849	12.350	35.02	94.1

Table 7 Joint Log Wage, Labor Force Participation Results

	Coef.	Std. Err	z	P>|z|
Log Wage				
Age	0.071	0.050	1.410	0.160
Age squared	-0.001	0.001	-0.750	0.453
City size (control: Metropolitan area)				
150000 residents or more	-0.150	0.076	-1.960	0.050
50000 to 150000 residents	-0.183	0.079	-2.310	0.021
Less than 50000 residents	-0.173	0.125	-1.380	0.167
Rural area	-0.211	0.074	-2.840	0.005
Pension status (control: National Pension subscriber)				
EPI subscriber	0.811	0.077	10.490	0.000
MAA subscriber	1.421	0.083	17.200	0.000
Spouse of EPI subscriber	-0.614	0.085	-7.260	0.000
Spouse of MAA subscriber	-0.865	0.179	-4.830	0.000
Non-subscriber	-0.284	0.190	-1.490	0.136
Active opening rate (time)	0.349	0.156	2.240	0.025
Intercept	2.743	0.864	3.170	0.001
Labor Force Participation				
Age	0.182	0.063	2.900	0.004
Age squared	-0.002	0.001	-2.440	0.015
City size (control: Metropolitan area)				
150000 residents or more	0.148	0.096	1.540	0.123
50000 to 150000 residents	0.242	0.101	2.410	0.016
Less than 50000 residents	0.076	0.155	0.490	0.622
Rural area	0.390	0.106	3.670	0.000
Pension status (control: National Pension subscriber)				
EPI subscriber	1.756	0.098	17.840	0.000
MAA subscriber	2.290	0.173	13.250	0.000
Spouse of EPI subscriber	-0.554	0.080	-6.950	0.000
Spouse of MAA subscriber	-0.573	0.132	-4.350	0.000
Non-subscriber	-0.144	0.148	-0.970	0.331
Active opening rate (time)	0.343	0.193	1.780	0.076
Household's net financial assets	0.000	0.000	-0.060	0.956
Housing status (control: Owned houses)				
Rented houses owned privately	0.047	0.089	0.530	0.599
Issued houses	-0.162	0.166	-0.980	0.327
Rented houses owned by public corporations	0.255	0.124	2.050	0.041
Rented houses, n.e.s.	-0.138	0.241	-0.570	0.568
Household type: extended family	0.169	0.086	1.960	0.050
Extended family ×Rented houses owned privately	-0.230	0.405	-0.570	0.570
Extended family ×Issued houses	-0.080	0.928	-0.090	0.931
Extended family ×Rented houses owned by public corporations	-0.375	0.490	-0.760	0.445
Extended family ×Rented houses, n.e.s.	-0.764	0.387	-1.970	0.049
Unearned income	-0.001	0.000	-5.230	0.000
Unearned income squared	0.006	0.001	4.550	0.000
Age of the youngest child (control: zero years old)				
1 years old	-0.017	0.103	-0.160	0.871
2 years old	0.124	0.104	1.200	0.231
3 years old	0.436	0.103	4.210	0.000
4 years old	0.472	0.114	4.140	0.000
5 years old	0.606	0.115	5.260	0.000
Number of preschool children	0.083	0.067	1.240	0.215
Day nursery fees collection rate (% of national standard)	0.000	0.003	0.060	0.952
Intercept	-4.581	1.041	-4.400	0.000
rho	0.252	0.062		
sigma	0.681	0.028		
lambda	0.172	0.045		
Number of obs =	3417			
Censored obs =	2578			
Uncensored obs =	839			
Log likelihood =	-1985.021			

Note: z and P>|z| are the test of the underlying coefficients being 0.

Table 8 Joint Day Nursery Fees, Utilization Results

	Coef.	Std. Err	z	P>|z|
Day Nursery Fees				
Household income	34.249	3.961	8.650	0.000
Household income squared	-0.010	0.002	-4.940	0.000
Age of the youngest child (control: zero years old)				
1 years old	-3512.241	3042.258	-1.150	0.248
2 years old	-2832.910	3187.797	-0.890	0.374
3 years old	-12431.560	3146.330	-3.950	0.000
4 years old	-14525.990	3164.107	-4.590	0.000
5 years old	-15145.230	3107.877	-4.870	0.000
Number of preschool children	-10379.480	1038.040	-10.000	0.000
Day nursery fees collection rate (% of national standard)	245.816	29.541	8.320	0.000
Intercept	13492.210	5601.116	2.410	0.016
Day Nursery Utilization				
Age	0.011	0.060	0.190	0.851
Age squared	0.000	0.001	-0.140	0.891
City size (control: Metropolitan area)				
150000 residents or more	0.197	0.093	2.120	0.034
50000 to 150000 residents	0.142	0.101	1.410	0.159
Less than 50000 residents	0.410	0.138	2.960	0.003
Rural area	0.459	0.102	4.490	0.000
Pension status (control: National Pension subscriber)				
EPI subscriber	0.674	0.094	7.170	0.000
MAA subscriber	1.032	0.128	8.080	0.000
Spouse of EPI subscriber	-0.182	0.082	-2.210	0.027
Spouse of MAA subscriber	-0.103	0.123	-0.840	0.400
Non-subscriber	0.061	0.155	0.390	0.696
Active opening rate (time)	0.247	0.190	1.300	0.193
Household's net financial assets	0.000	0.000	-0.630	0.531
Housing status (control: Owned houses)				
Rented houses owned privately	0.003	0.087	0.030	0.972
Issued houses	-0.138	0.155	-0.890	0.373
Rented houses owned by public corporations	0.238	0.119	2.000	0.046
Rented houses, n.e.s.	0.170	0.202	0.840	0.399
Household type: extended family	-0.032	0.083	-0.380	0.702
Extended family ×Rented houses owned privately	-0.081	0.360	-0.230	0.821
Extended family ×Issued houses	-6.046	0.282	-21.410	0.000
Extended family ×Rented houses owned by public corporations	-0.142	0.507	-0.280	0.779
Extended family ×Rented houses, n.e.s.	-6.761	0.305	-22.190	0.000
Unearned income	0.000	0.000	-1.760	0.079
Unearned income squared	0.001	0.001	0.690	0.490
Age of the youngest child (control: zero years old)				
1 years old	0.558	0.119	4.680	0.000
2 years old	0.863	0.120	7.180	0.000
3 years old	1.219	0.123	9.910	0.000
4 years old	1.266	0.130	9.730	0.000
5 years old	1.197	0.132	9.030	0.000
Number of preschool children	0.205	0.064	3.200	0.001
Day nursery fees collection rate (% of national standard)	-0.003	0.003	-1.060	0.290
Intercept	-2.465	0.981	-2.510	0.012
rho	-0.294	0.153		
sigma	9745.866	479.522		
lambda	-2868.233	1597.978		
Number of obs =	3417			
Censored obs =	2877			
Uncensored obs =	540			
Log likelihood =	-6961.783			

Note: z and P>|z| are the test of the underlying coefficients being 0.

ing too little of the participation effect to our nursery fees (e.g. much of the reason for the low participation rate of mothers with children younger than age 3 is higher nursery fees, and age dummies of the youngest child might obscure this). To address this tension, we estimate three models, some of which have very limited controls, and some of which have more elaborate controls. We think that this in some sense bounds the true impact of the nursery fees.

The first specification in Table 9 (Model 1) assumes that there exists specific age effect of the youngest child that cannot be captured by nursery fees. The second and the third specifications (i.e. Model 2 and Model 3) assume that the age of the youngest child affects mother's labor supply only through nursery fees. Model 3 is estimated to see how results change if housing status and household types are excluded. Note that labor force participation here includes self-employment. To compare effects of each regressor, results are shown in marginal effects evaluated at the mean values of the regressors.

The impact of nursery fees on mothers' labor force participation differs from specification to specification.

Table 9 Employment Probit Results using Entire Sample

	Model (1)			Model (2)			Model (3)		
	dF/dx	z	P>|z|	dF/dx	z	P>|z|	dF/dx	z	P>|z|
Estimated log wage	0.585	29.19	0.000	0.622	32.54	0.000	0.632	33.23	0.000
Estimated day nursery fees	0.093	3.48	0.000	-0.072	-5.25	0.000	-0.073	-5.40	0.000
City size (control: Metropolitan area)									
150000 residents or more	0.108	3.43	0.001	0.159	5.13	0.000	0.166	5.42	0.000
50000 to 150000 residents	0.157	4.54	0.000	0.209	6.11	0.000	0.231	6.90	0.000
Less than 50000 residents	0.153	2.84	0.004	0.221	4.13	0.000	0.242	4.58	0.000
Rural area	0.273	7.44	0.000	0.335	9.30	0.000	0.377	11.19	0.000
Household's net financial assets	0.000	-2.59	0.010	0.000	-2.85	0.004	0.000	-1.30	0.194
Housing status (control: Owned houses)									
Rented houses owned privately	0.066	2.12	0.034	0.049	1.61	0.108			
Issued houses	-0.027	-0.50	0.620	-0.037	-0.71	0.477			
Rented houses owned by public corporations	0.109	2.54	0.011	0.095	2.24	0.025			
Rented houses, n.e.s.	0.187	2.38	0.017	0.171	2.22	0.026			
Household type: extended family	0.160	5.30	0.000	0.158	5.25	0.000			
Extended family ×Rented houses owned privately	-0.121	-1.06	0.289	-0.120	-1.07	0.287			
Extended family ×Issued houses	0.233	1.07	0.284	0.245	1.04	0.300			
Extended family ×Rented houses owned by public corporations	0.256	1.31	0.192	0.240	1.30	0.193			
Extended family ×Rented houses, n.e.s.	-0.185	-0.96	0.336	-0.183	-0.98	0.326			
Unearned income	-0.001	-7.25	0.000	0.000	-3.47	0.001	0.000	-3.30	0.001
Unearned income squared	0.003	6.65	0.000	0.002	3.73	0.000	0.002	3.81	0.000
Age of the youngest child (control: zero years old)									
1 years old	0.066	1.84	0.066						
2 years old	0.096	2.63	0.008						
3 years old	0.327	5.99	0.000						
4 years old	0.394	6.67	0.000						
5 years old	0.418	6.89	0.000						
6 years old	0.357	3.55	0.000						
Number of preschool children	0.153	3.91	0.000	-0.087	-3.91	0.000	-0.091	-4.09	0.000
Pseudo R-square	0.397			0.383			0.374		
Log-likelihood	-1341.137			-1372.626			-1393.641		
Number of obs	3417			3417			3417		

Note: dF/dx is for discrete change of dummy variables from 0 to 1.
z and P>|z| are the test of the underlying coefficients being 0.

For models without age dummies for the youngest child, the results are uniformly supportive of an important role for childcare costs in determining labor force participation. There are consistently negative and significant coefficients on nursery fees and on the number of preschool children. An increase in the number of preschool children lowers mothers' probability of participation, as expected by the theory. The elasticity of the probability of participation due to the changes in the average nursery fees is about -0.60 for the two cases excluding the age dummies for the youngest child. It is a little higher at -0.72 for the two cases of samples excluding households with self-employed husbands (Table 10), which indicates wives of salaried workers are more sensitive to the changes in nursery fees. These elasticities are much smaller than the ones estimated by Komamura (1996) or Niimi (2002) which range from -2.6 to -4.3.

When, alternatively, age dummies for the youngest child are included, the effect of nursery fees and the number of children turn into positively significant, while the coefficients for other variables are essentially invariant to the inclusion of age dummies. The estimates of the

Table 10 Employment Probit Results excluding Self-employed Households

	Model (1)			Model (2)			Model (3)		
	dF/dx	z	P>|z|	dF/dx	z	P>|z|	dF/dx	z	P>|z|
Estimated log wage	0.582	26.77	0.000	0.620	29.80	0.000	0.629	30.44	0.000
Estimated day nursery fees	0.080	2.65	0.008	-0.082	-5.39	0.000	-0.082	-5.41	0.000
City size (control: Metropolitan area)									
150000 residents or more	0.139	3.89	0.000	0.185	5.24	0.000	0.195	5.58	0.000
50000 to 150000 residents	0.181	4.57	0.000	0.230	5.91	0.000	0.252	6.58	0.000
Less than 50000 residents	0.186	3.05	0.002	0.250	4.10	0.000	0.276	4.55	0.000
Rural area	0.315	7.45	0.000	0.371	8.88	0.000	0.414	10.55	0.000
Household's net financial assets	0.000	-2.57	0.010	0.000	-2.94	0.003	0.000	-1.18	0.238
Housing status (control: Owned houses)									
Rented houses owned privately	0.097	2.75	0.006	0.082	2.38	0.017			
Issued houses	-0.008	-0.14	0.886	-0.018	-0.32	0.747			
Rented houses owned by public corporations	0.085	1.77	0.077	0.076	1.60	0.109			
Rented houses, n.e.s.	0.222	2.72	0.007	0.207	2.57	0.010			
Household type: extended family	0.183	5.24	0.000	0.185	5.31	0.000			
Extended family ×Rented houses owned privately	-0.132	-1.06	0.291	-0.129	-1.01	0.310			
Extended family ×Issued houses	-0.071	-0.49	0.627	-0.107	-0.88	0.378			
Extended family ×Rented houses owned by public corporations	0.257	1.28	0.200	0.225	1.20	0.229			
Extended family ×Rented houses, n.e.s.	-0.192	-1.07	0.285	-0.199	-1.15	0.248			
Unearned income	-0.001	-6.58	0.000	0.000	-3.26	0.001	0.000	-3.47	0.001
Unearned income squared	0.003	5.33	0.000	0.001	2.78	0.005	0.002	3.34	0.001
Age of the youngest child (control: zero years old)									
1 years old	0.044	1.11	0.269						
2 years old	0.083	2.05	0.040						
3 years old	0.323	5.18	0.000						
4 years old	0.374	5.46	0.000						
5 years old	0.419	5.97	0.000						
6 years old	0.346	2.94	0.003						
Number of preschool children	0.116	2.69	0.007	-0.118	-4.68	0.000	-0.119	-4.81	0.000
Pseudo R-square	0.438			0.424			0.413		
Log-likelihood	-1011.003			-1036.005			-1056.224		
Number of obs	2822			2822			2822		

Note: dF/dx is for discrete change of dummy variables from 0 to 1.
z and P>|z| are the test of the underlying coefficients being 0.

age dummies display a distinct pattern rising through age six with the sharp rise at age three and smaller rise at age four. One possibility is that these dummies are capturing an age-specific pattern of participation that is due to non-linear changes in the mother's taste for leisure with the youngest child's age, or institutions such as kindergartens that are not otherwise captured in our model.

Let us move to the effects of other variables. As the theory predicts, wages are significantly positive in every model, indicating that higher wages raise the probability of participation. Living in smaller cities and rural areas has a positive effect on the probability of participation. This result is also persuasive in the light of the fact that almost no waiting children are found in the rural areas.

The probability of participation is significantly higher for households who live in rented houses than those who live in owned houses. At the same time, net financial assets have negative and mostly significant impacts. These results suggest that fewer household assets lower the reservation wage of mothers. On the other hand, high income of other household member has negative effect because it raises the reservation wage of mothers, but the marginal effect is decreasing because square term of the other household member has positive and significant coefficient.

The dummy variable for extended family (three-generation household) has significantly positive effects on participation, which is consistent with the results of past studies.

3.4 Simulations

To check the impacts of the nursery fees of day-care centers on the labor force participation of mothers, two simulations were done, as shown in Table 11, as to (1) the case in which free childcare service is available to everyone (i.e. Simulation 1), and (2) the case in which the monthly nursery fees are fixed to 60,000 yen regardless of the household income (i.e. Simulation 2)[11]. Note that these simulations were done based on the estimation result of Model 2. Also note that the household income figures in the table are those of actual household income at the time of the survey, and are not those of potential household income if mothers are employed, like those calculated when estimating the nursery fee function.

First, the impact of the free childcare service is larger for the households with annual income of 7 million yen or more, because rich households who are currently paying higher nursery fees can benefit more from the reform. The increase in the participation rate for the income bracket of 10 million yen a year or more is 15 percent relative to the base case, while the absolute increase for the income bracket of less than 3.5 million yen a year is 12 percent.

Second, the fixed fee reform has markedly different impact on high- and low-income households. As shown in Table 11, low-income households with annual income of less than 3.5 million yen see their mothers' participation rate drop by 20 percent. In contrast, the highest income brackets with annual income of 10 million or more

Table 11 Simulation Results

	Total	By Household Yearly Income				By Estimated Wage Level			
		Less than 3.5 Million	3.5 to 7 Million	7 to 10 Million	10 Million or more	Less than 0.9 Million	0.9 to 1.3 Million	1.3 to 3 Million	3 Million or more
Number of samples	3417	499	1690	742	486	2534	274	453	156
Participation rate (actual)	0.356	0.367	0.279	0.396	0.551	0.188	0.518	0.976	0.994
(0) Participation rate (estimated)	0.359	0.446	0.284	0.371	0.513	0.196	0.617	0.904	0.986
(1) Simulation 1	0.494	0.563	0.417	0.512	0.660	0.347	0.779	0.969	0.998
(2) Simulation 2	0.239	0.242	0.165	0.278	0.434	0.081	0.378	0.790	0.963
(1)-(0)	0.134	0.117	0.133	0.141	0.147	0.151	0.162	0.066	0.012
(2)-(0)	-0.121	-0.204	-0.120	-0.093	-0.080	-0.115	-0.239	-0.114	-0.024

Notes: Simulation 1 refers to the case where each household's nursery fees are set to zero.
Simulation 2 refers to the case where the nursery fees are uniformly set to 60 thousand yen/month irrespective of the household

see their mothers' participation rate drop by 8 percent. This is because the present ability-to-pay system that plays a redistribution role is eliminated in Simulation 2. Unless subsidized by the government, most of the mothers in low-income households are unable to work.

Third, as seen from the estimated wage levels of mothers, labor participation for annual income bracket of 0.9-1.3 million yen is most sensitive to changes in the nursery fees. The probability of participation for this bracket rises by 16 percent if there were free childcare services available and falls by 24 percent if nursery fees were fixed to 60,000 yen a month. Labor participation of the higher wage group is not elastic toward nursery fees, especially that of the income bracket of 3 million yen or more.

To summarize, lowering of nursery fees is inefficient because it greatly induces labor supply of mothers who could earn less than 1.3 million yen a year, bringing no additional revenues to tax and social security. At the same time it is not desirable from the viewpoint of equity because rich household can benefit more and those who take care of their children at home can enjoy no such benefits. On the other hand, raising nursery fees discourages mothers' labor participation of low-income households and expands income disparities among the childrearing households.

4. Conclusion and Policy Implications

Using micro data from the *Basic Survey on People's Life* for 1998, this paper first investigated (1) the childcare situation of preschoolers and (2) the economic situation of the households using licensed day-care centers. Then it analyzed (3) the impact of nursery fees on the labor force participation of mothers with preschool children.

Our main findings are as follows. First, households using licensed day-care centers are not always low-income households. Considering the fact that a large amount of subsidies is granted to licensed day-care centers, the question of fairness arises, because there are households that take care of children at home. Second, in most cases, mothers who use licensed day-care centers earn less than 1.3 million yen a year, so that they pay neither taxes nor social security premiums. Advocators of expansion in public childcare services often emphasize that it would promote women's economic independence and would ultimately lead to higher tax and social insurance premium revenues[12]. But, it is doubtful that providing public childcare services has actually contributed to the full-scale employment of women. Third, nursery fees have significantly negative effects on the labor force participation of mothers, and its elasticity is about -0.60. Labor supply of mothers who would earn low wages is more elastic to the changes in nursery fees than those who would earn high wages.

These results show that existing childcare systems are neither efficient as tools of redistribution among the childrearing households nor effective as tools for promoting women's economic independence. Additional measures are needed to achieve these political goals.

One such policy measure is, as proposed by Zhou and Oishi (2002), to charge flat fees regardless of income levels, while substantially increasing Childcare Allowances (5,000 yen per child/month at present) that are set regressively according to household income. This measure will allow mothers to compare the wage they would earn if they worked with the nursery fee, and to choose to purchase childcare services with cash benefits (Childcare Allowances) or to take care of their children themselves. It would therefore be fair to both the users of childcare services and to those taking care of children at home, and would make it possible to efficiently distribute childcare resources.

Another measure is to reform the taxation and social security systems, which have a bias toward the labor supply of married women. The current systems favor women's part-time work or low-income jobs, which is one of the reasons for large wage gaps between males and females in Japan. If the "tax wedge" for women's labor supply were eliminated, more women would have been working fulltime and paying more taxes and social security premiums. As often pointed out, social systems need to be as neutral to the work choices of women as possible.

Notes

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[1] Blau (2000, 2001).

[2] In the 19 wards of central Tokyo, the licensed day-care centers charge 57,500yen per month at most, while some private-run centers charge around 100,000yen.

[3] For children below 3 years of age, the enrollment rate is 16 percent. Kindergartens, that are available for children aged 3 years and older, care for 25 percent of the preschool children. The exact number of children cared for in non-licensed day-care centers is not known, but according to the estimates of the Imperial Gift Foundation Boshi Aiiku Kai, the number was 143 thousand children, or 1.8 percent of preschool children in 1998.

[4] The inhabitant tax will be levied if the annual salary exceeds one million yen.

[5] All residents in Japan between ages of 20 to 60 are eligible and required to become a subscriber of the *Basic Pension*. Whereas regular employees automatically enroll in the Basic Pension when they subscribe to the *Employees' Pension Insurance*, the Basic Pension for non-regular employees and non-employed persons is called the *National Pension*. For further details on the Japanese public pensions, see http://www.ipss.go.jp/English/Jasos2001/Jasos2001.html.

[6] Including a premium for the *National Pension*.

[7] The collection rates used in the estimation were obtained from the *1998 White Paper on Childcare* of the Childcare Research Institute.

[8] The collection rates differ from municipality to municipality, even in the same prefecture. But the lists of nursery fees for prefectural capitals were used for all samples from the prefecture concerned because (1) no municipalities can be identified from the questionnaires of the survey and (2) differences in collection rates between municipalities are smaller than those between prefectures.

[9] As seen in Michalopoulos, et al. (1992), Kimmel (1998) and Anderson and Levine (2000), analyzing single mothers is important from the viewpoint of policy-making. But, the samples were limited to households having both parents, because the number of fatherless households in the samples is not large.

[10] Active opening ratio=active job openings / active applications.

[11] In Simulation 2 we set the nursery fees to 60,000 yen because most municipalities set the maximum nursery fees to be 57,000-63,000 yen.

[12] One example is Niimi (2002).

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Akiko S. Oishi
(National Institute of Population and Social Security Research)