ESRI Discussion Paper Series No.387

Access to Formal Childcare for Toddlers and Parental Employment and Earnings

Taiyo Fukai
Ayako Kondo

March 2024

Economic and Social Research Institute
Cabinet Office
Tokyo, Japan

Access to Formal Childcare for Toddlers and Parental Employment and Earnings*

Taiyo FUKAI‡ Ayako KONDO§¶

February 16, 2024

Abstract

This study examines the effect of availability of accredited childcare centers, the most popular category of publicly licensed childcare centers in Japan, on mothers' employment and earnings. We focus on mothers with children less than two years old, most of whom are returning from parental leave to full-time work under excess demand for center-based childcare. We construct an instrument from the first-round assignment process of April enrollment and find that the enrollment to an accredited childcare center increases the employment rate of mothers of zero- and one-year-old children by 40.3 and 18.8 percentage points, respectively. The effect of such enrollment on mothers' annual salary is mostly explained by the extensive margin.

Keywords: *Childcare demand; Childcare cost; Maternal labor supply.*
JEL Classification: *J13; J22; H40.*

*This research was conducted as a part of the Economic and Social Research Institute (ESRI) research project. We would like to thank the anonymous city that provided the administrative data and allowed us to conduct a supplemental survey, and Hiroshi Nomura from ESRI who helped in our negotiations with the city. Comments from Hitoshi Shigeoka, seminar participants at Kindai University and Tohoku University are appreciated.
†Assistant Professor, Institute of Humanities and Social Sciences, University of Tsukuba
‡Visiting Researcher, Economic and Social Research Institute, Cabinet Office, Government of Japan
§Professor, Institute of Social Science, the University of Tokyo
¶Visiting Senior Researcher, Economic and Social Research Institute, Cabinet Office, Government of Japan

1 Introduction

Limited access to formal childcare for young children is one of the major obstacles to gender equality in the labor market. Given that mothers tend to spend disproportionately more time on parenting than fathers, better access to reliable childcare at affordable price is argued to increase female labor supply. Therefore, policymakers have sought to expand publicly subsidized childcare, especially in countries with low labor force participation rate of women with children. However, previous empirical studies present mixed results for the causal effect of increased supply of publicly subsidized childcare. These findings suggest that the effectiveness of such policy depends on various factors such as the availability of alternative options and the age of the child covered by the policy. Given the financial cost to expand childcare subsidy, exploring the conditions under which the policy is effective is crucial.

We investigate the effect of enrollment in heavily subsidized center-based care on employment and earnings for mothers with children less than two years old under substantial excess demand for such care. To identify the causal effect of being accepted for mothers at the borderline, we exploit the explicit assignment rule of accredited childcare centers, the most popular category of publicly licensed childcare centers in Japan. Since most are planning to return to full-time work before the legally guaranteed parental leave expires after the birth of their first child, the availability of affordable full-day care is critical for them to continue their career. Given the huge income loss associated with permanent leave from a regular job upon childbirth in Japan, such mothers are an important policy target.[1] Although the enrollment is highly endogenous, administrative data from an urban municipality allows the comparison of applicants whose ex-ante probability of acceptance in the first round of the assignment process is almost equal. Thus, the acceptance in the first round can be used as an instrument for the actual enrollment.

Existing literature has examined the effect of better access to formal childcare on maternal labor supply. However, most studies focus on the expansion of kindergarten for children older than

[1] In Japan, opportunities for a regular full-time job for mothers of young children are limited, and many mothers end up taking part-time jobs with lower wages. According to the White Paper on the National Lifestyle 2005, the loss of life-time earnings by quitting the regular job upon birth of the first child can be as large as 82.2% if the mother starts a part-time job after the child enters elementary school.

three.[2] This contrasts with the growing policy interest in exploring the effectiveness of early childcare provision, as many developed countries have already achieved near universal coverage of preschool programs for children just below the school entry age. Several recent studies on the expansion of public childcare coverage for two- or three-year-old children under excess demand for formal childcare typically find a statistically significant positive effect for mothers' employment (Bauernschuster and Schlotter, 2015; Nollenberger and Rodríguez-Planas, 2015; Carta and Rizzica, 2018). Concurrently, they find that the increase in mothers' employment rate is substantially smaller than that in enrollment rate. Evidence for children younger than two is even more scarce. In a relevant study, Eckhoff Andresen and Havnes (2019) reports that the increased supply of public childcare for one- and two-year-old children in Norway significantly increased mothers' labor supply. We add evidence for mothers of zero- and one-year-old children in Japan. Focusing on borderline mothers with children less than two years old, this study presents a plausible estimate for the effect of full-day formal care availability after the legally guaranteed parental leave expires. The effect can be different between mothers who return to their previously held jobs after parental leave and those who quit a job upon childbirth and start a new one a few years later. On the one hand, mothers returning from parental leave already have a job and are more likely to be employed than those searching for a new job when formal childcare is available. On the other, because quitting the current job may also lower their future earnings, they may try to continue their job even in the absence of formal care. This study contributes to the literature by adding evidence on the former group, while existing studies on mothers of older children are likely to cover the latter.

Furthermore, the present study differs from existing literature as its research design explicitly focuses on mothers who are affected by a marginal increase in the capacity. The sample is limited to the applicants for accredited childcare centers who were ranked at the same priority score by

[2]Studies on the extended Kindergarten coverage for five- or four-year-old children in the United States tend to document that the effect on labor supply is insignificant or significant only for single mothers (Cascio, 2009; Fitzpatrick, 2010, 2012). Interestingly, Goux and Maurin (2010) establish a similar pattern for two-year-old children in France, suggesting that two-parent families may have better access to alternative options. Havnes and Mogstad (2011) also reveal that the expansion of subsidized childcare for three-to-six-year-old children in Norway did not increase labor supply of mothers but crowded out informal care. By contrast, studies on childcare reform in Quebec typically identify sizable effects (Baker et al., 2008; Lefebvre and Merrigan, 2008). This reform covers children aged zero to five, but existing studies have not paid much attention to how the effect varies with the child's age.

the city government. Among them, the probability of acceptance is determined by the competition ratio of centers they listed on the application and taxable income for the previous year. Under tolerable assumptions, the acceptance is quasi-random conditional on observed characteristics. We can identify the local average treatment effect for the marginal household who would be newly enrolled to an accredited childcare center when another slot became available, namely, mothers returning to pre-birth job after having their first child. By contrast, most existing studies identify the effect by exploiting either regional differences in the timing of expansion or discontinuity in the eligibility based on birth date of the child. Mothers induced to use childcare as a result of a large expansion may be quite heterogeneous, including those who would have been out of the labor force before the expansion.

The enrollment to an accredited childcare center significantly increases mothers' employment and salary income, without affecting father's employment and income. In our preferred specification, such enrollment increases the employment of a mother of a zero- and one- year-old child by 40.3 and 18.8 percentage points, respectively. Given that more than 90% of mothers of enrolled children are employed, this estimate should be interpreted as the fraction of mothers who would resign if they could not use accredited childcare centers. While the effect is substantial, this result also implies that the remaining 60-80% manage to work using other childcare options.

The average effect on mothers' annual salary income is 1.41 million yen (12,589USD) and 0.91 million yen (8,125USD) for a zero- and one-year-old, respectively.[3] The effect on the salary income of mothers is close to the decline in employment times average income before birth, which suggests that the effect on labor supply through the intensive margin is negligible.

Since mothers of zero-year-old children may extend parental leave and apply for next year's April enrollment, we examine the effects of being declined at age zero on employment and income in the next year. Although effects are much smaller than those on the outcomes in the same year of decline, 18.9% of such mothers had no salary income in the next year. We further explore records of their application at age one to provide suggestive evidence that about 40% of this effect derives from those who permanently quit their pre-birth job upon decline at age zero, and the remaining

[3]Calculated based on 1USD=112JPY, the average exchange rate in 2017, the last year of our income data.

60% is attributable to those who extended the childcare leave and declined again at age one.

Compared to existing studies in Europe, our estimates are on the larger side. There are two reasons for this. First, the substantial excess demand for accredited childcare centers. Existing research in Europe documents that expansion of programs with substantial excess demand, such as ECC in Germany and public childcare in Norway before the 2002 reform, also had a significant positive effect on maternal employment (Bauernschuster and Schlotter, 2015; Eckhoff Andresen and Havnes, 2019). By contrast, Kleven et al. (2020) find that large expansion of nursery care in Austria did not increase maternal employment. Although Kleven et al. (2020) do not emphasize this, the supply of nursery care after expansion seems to have exceeded the demand. Furthermore, the rationing rule of accredited childcare centers gives priority to mothers with full-time jobs. Existing studies often find that enrollment rate after expansion exceeds maternal employment rate (Kleven et al., 2020; Nollenberger and Rodríguez-Planas, 2015; Goux and Maurin, 2010). This cannot occur in Japan because it is difficult for unemployed mothers to obtain a slot. In contrast, the large expansions studied in the extant research induce some mothers to start searching for a new job.

The second reason is limited availability of alternative care. Studies that identify negligible effects of childcare expansion on maternal employment tend to find crowding out of alternative care (Kleven et al., 2020; Goux and Maurin, 2010). The availability of informal care by grandparents and relatives is limited in urban areas in Japan because most households are nuclear families, and many grandparents are still working.[4] The market for other kinds of paid childcare services for children under three is relatively small because the accredited childcare centers are so attractive. [5]

Earlier studies using Japanese data also exploit the regional differences in the capacity per population of preschool children. Nishitateno and Shikata (2017) find that the improvement in

[4]Informal care provided by grandparents used to be a popular alternative in Japan. Asai et al. (2015, 2016) demonstrate that the effect of childcare expansion in the 1990s was offset by the crowding out of informal care by grandparents. According to the Basic Survey on People's Life 1998, approximately 30% of infants under the age of two whose mothers were working were primarily taken care of by their grandparents. However, the same figure decreased to 8% in the 2019 survey, and according to the Labour Force Survey, the labor force participation rate of women aged 65-69 rose from 26.5% to 39.0% during the same period.

[5]area total of two separate preschool systems exist in Japan: One is daycare centers for children whose parents are working or unavailable for some other reasons, and the other is kindergartens as an educational institution. Kindergartens are an important option for three- to six-year-old children but irrelevant for those younger than two. See Nishitateno and Shikata (2017) and Yamaguchi et al. (2018) for more details.

daycare accessibility increased maternal employment during the period between 2000 and 2010. However, owing to the data availability, they are unable to distinguish the effect by child's age, and they reveal that an increase in enrollment to accredited childcare centers substantially exceeds that in maternal employment, which suggests crowding out of other options for older children such as kindergartens. Yamaguchi et al. (2018) establish that the effect is heterogeneous and negatively correlated with the tendency to use childcare. According to their estimates, the treatment effect is stronger for those with a smaller chance to enroll under the current rationing rule. Although the estimates of the present study are not directly comparable to the aforementioned research, if the same pattern holds in an urban area and for children younger than two, the current estimates can be viewed as a lower bound of the effect of increased childcare capacity on maternal employment in Japan.

The remainder of this paper is organized as follows. Section 2 describes institutional background such as assignment process of accredited childcare centers. Section 3 explains the identification strategy and section 4 describes data. Section 5 presents ordinary least squares (OLS) and IV results. Section 6 presents the preliminary conclusion.

2 Institutional Background

This study investigates the application process of accredited childcare centers in an anonymous large city in the Kanto region, Japan. Accredited childcare centers, which account for approximately 90% of the center-based services in Japan, are the most popular category of publicly licensed childcare centers in Japan. Accredited childcare centers must meet certain operational requirements and provide full-day care for preschool children. Owing to the strict regulations and substantial government subsidies, such centers are relatively inexpensive but high quality from the viewpoint of users. Thus, most parents prefer these to other center-based childcare options.[6]

[6]The fee schedule of accredited childcare centers is set by the municipality government. In most municipalities, including our study site, the fee is set by an increasing function of the municipality resident tax imposed on the parents or households, reflecting the ability-to-pay principle. Even for households in the highest bracket, the fee is cheaper than other options. This implies that households who were declined by accredited childcare centers may have incentive to increase labor supply to afford more expensive childcare options, and such effect can be included in the estimated effects on earnings.

Allocation of the vacant slots in accredited childcare centers is centralized at the municipality level and managed by the local government. Similar to other large cities in Japan, the demand for these centers exceeds the supply capacity in the city under study.[7] Thus, finding a vacant slot is difficult in months other than April, when all six-year-old children leave childcare centers to enter elementary school. Furthermore, most slots for children aged two and older are filled by incumbent children who continue to be enrolled from the previous year. Therefore, we focus on applications for the classes of zero- and one-year-old children starting in April. Although this timing is best for application, more than 20% of the applications are declined owing to limited capacity.[8]

In Japan, the mandated parental leave is one year post childbirth, which can be extended for another year (six months until 2016) in the case the child cannot be enrolled to accredited childcare centers due to limited capacity. Additionally, public Employment Insurance pays childcare leave benefits[9] to insured employees during the mandated parental leave, including the extended period owing to the unavailability of childcare slot. Hence, most mothers who return to the same company after parental leave prefer to start using childcare centers in April when their child is zero or one years old.

The application and assignment process of April enrollment in the city under study is as follows. First, each applicant submits an ordered list of childcare centers according to their preference. If a household is accepted in one of the listed centers but decides not to use it, they will be penalized in future applications. Thus, the best strategy is to list all centers that the household would prefer. The number of centers on the list is not limited.[10] The application document also specifies the reason the household needs subsidized childcare from nine options, and certification for the designated reason must be enclosed.[11]

[7] As Fukai (2017) notes, the supply and demand for childcare centers is particularly tight in urban areas in Japan.

[8] Note that those who end up with other childcare options are not counted as "waiting children (*taikijido*)" in official statistics.

[9] The replacement rate is 67% (upper limit is about 300,000 JPY/month) for the first six months and 50% (upper limit is about 230,000 JPY/month) thereafter. The benefit from Employment Insurance is tax exempt.

[10] In the case the list contains more than 30 centers, the top 30 centers are considered in the first round, and the remaining centers are considered only if they have a vacancy at the end of that round.

[11] Each applicant has to specify one or more reasons from the following list: "work," "childbirth," "disease/disability," "caregiving for a sick family member," "natural disasters," "job search," "schooling," "to avoid child abuse and domestic violence," or "other". For each reason (except for "other"), the applicant must submit certification for the situation;

Next, based on the application document, the city government determines whether the applicant satisfies the eligibility conditions. At this stage, the capacity is not considered, and all applicants who satisfy the conditions are acknowledged as "eligible." [12] Thereafter, the city government calculates a priority score for each eligible applicant based on details related to the designated reason (e.g., days and hours of work per week for households who chose "work" as their primary reason to use the subsidized childcare), family structure, and current caretaker of the child.

Available slots at each childcare center are allocated to applicants based on the ordered list of preferred childcare centers and the priority score. Applicants with the highest priority score are assigned first, and the preference order is used for allocation for those with the same score. Specifically, for each level of the priority score, each applicant is assigned to a childcare center in their ordered list. If slots are available at more than one center, the higher ranked ones in the ordered list are assigned first. In case no slot is available in any centers listed by the applicant, the application is declined.[13] Among those with the same priority score and listed for the same childcare center, the city government ranks the applicants based on the designated reason to use the childcare center. Between those with the same priority score and rank, the ones with lower taxable income in the last year are given priority.

In practice, among the applicants with the same priority score, the probability of acceptance primarily depends on the availability of remaining slots in the centers listed. The chance of being accepted increases with the number of centers listed. This implies that households who are willing to use centers that are less of an exact match are more likely to be accepted. Furthermore, as most households choose childcare centers near their home, those living in areas with excess demand are comparatively more likely to be declined. We control for the endogenous choice of the listed centers and residential sorting by including the propensity score of acceptance constructed from each applicant's complete list of preferred centers.

for example, a copy of the employment certificate issued by the employer for "work."

[12] Those who were acknowledged as eligible but declined owing to the limited capacity can claim an extension of parental leave and benefits until the child's second birthday. The certification of eligibility is also required in application for subsidy to fill the gap between the fee for accredited childcare centers and other childcare options.

[13] For example, suppose there are two applicants, A and B. A's priority score is 63 and childcare center Z is her third choice. B's priority score is 62 and childcare center Z is her first choice. In the application process, A is assigned first, thus it is possible that A is accepted at childcare center Z while B is declined. Using the terminology in the literature of matching, the rationing rule of our setting is the Deferred Acceptance (Gale and Shapley, 1962).

Most applicants are from households with both parents working full-time. A typical example is as follows: one child, who is zero or one year old. The father works full-time, the mother is on childcare leave and expected to restart full-time work from April, and no grandparent lives with them. The priority score of this typical household is 62, which is the median and mode of the distribution of priority score, and its share among all applications is 28.2%. If the mother has already restarted work using other childcare services, the priority score becomes 63. If the child has an older sibling and wants to attend the same childcare center, 3 is added to the priority score. Other, relatively minor, adjustments can be made (see Appendix C). Finally, the share of the score of 63–67 among the applications is 40.3%.[14]

The proportion of being accepted in the first round and enrollment in April over the priority score is plotted in Figure 1. The vertical line corresponds to 62. The acceptance rate is approximately 0.4 for those with priority score less than 62, and then jumps to 0.6 at 62. That is, the borderline cases are concentrated to applications whose priority score is 62. Thus, the empirical analysis focuses on such households.

The aforementioned selection process is labelled "the first round," and those who were declined in this round may apply for the second round and wait for cancellations or new vacancies. Thus, the proportion of households using the childcare center is higher than that of those accepted in the first round. The process of assignment of the remaining and canceled slots after the first round is unclear and likely to be affected by unobserved factors such as access to alternative childcare options and parents' labor force attachment. Thus, the actual enrollment status is treated as an endogenous variable, and acceptance at the first-round as an exogenous instrument. According to Figure 1, applicants whose priority score is higher than 64 are almost always accepted and enrolled, suggesting that the take-up rate of accepted applications is close to 100%.

[14] A histogram of priority score in our data is presented in Figure A1.

3 Empirical Model

3.1 The Treatment Effect of Interest

This study identifies the causal effect of access to the accredited childcare center on the parents' employment and earnings. The treatment of interest is whether the child is enrolled to an accredited childcare center. As detailed in section 2, even in cases where the sample is limited to those who applied for accredited childcare centers, the actual enrollment status is affected by many unobserved factors. Thus, the first-round assignment process is used as the exogenous instrument for the actual enrollment status.

Let D_i denote the treatment dummy that takes 1 if the child is enrolled to an accredited childcare center, and 0 otherwise. Let Y_{1i} and Y_{0i} be the outcome of household i under and without the treatment, respectively. Then, the treatment effect of the enrollment to an accredited childcare center for household i is defined as $\Delta_i \equiv Y_{1i} - Y_{0i}$. Note that we can observe either Y_{1i} or Y_{0i} for each household, and the outcome we observe can be written as $Y_i = D_i Y_{1i} - (1 - D_i)Y_{0i} = D_i \Delta_i + Y_{0i}$.

Δ_i cannot be identified by a simple regression of Y_i on D_i unless $\{Y_{1i}, Y_{0i}\}$ and D_i are independent. In the current case, Δ_i and D_i are likely to be positively correlated because the households who would benefit more from using an accredited childcare center would be more eager to be accepted. Since $\{Y_{1i}, Y_{0i}\}$ and Δ_i are unlikely to be independent, $\{Y_{1i}, Y_{0i}\}$ and D_i are unlikely to be independent either. Hence, we introduce an exogenous instrument.

3.2 The First Round Assignment Process

Let Z_i be an indicator for the first-round acceptance of household i; that is, Z_i takes 1 if accepted in the first round and 0 if declined. Recall the assignment process in section 2. Applicants with the highest priority score are assigned first, and the preference order of childcare centers is used for allocation of applicants with the same score. Between the applicants with the same priority score,[15] the one with lower taxable income in the last year is given priority. This implies that Z_i is

[15]Strictly speaking, among those with the same priority score and that listed the same childcare center, the city government ranks these based on the designated reason to use the childcare center and some other factors, and this rank overrides the taxable income in the last year. We ignore this ranking because the reason to use is unavailable for those who are not enrolled. Since 98.9% of new users with $S_i = 62$ specify the reason as "work" and most other reasons are

determined by the priority score (S_i), the list of childcare centers that household i is willing to use (C_i), and the previous year's city income tax imposed on the parents (T_i).

Let $c \in C_i$ mean that childcare center c is included in the list of acceptable childcare centers in which household i is willing to enroll. Then, for each childcare center, borderline $\bar{S}_c$ and a cut-off $\bar{T}_c$ exist such that

$$Z_i^c = 1[c \in C_i] * \{1[S_i > \bar{S}_c] + 1[S_i = \bar{S}_c] * 1[T_i \leq \bar{T}_c]\} \tag{1}$$

In other words, applications that listed childcare center c are accepted if $S_i > \bar{S}_c$ or, $S_i = \bar{S}_c$ and $T_i \geq \bar{T}_c$. Summing up for each applicant,

$$Z_i = max_{c \in C_i} Z_i^c \tag{2}$$

3.3 Identification of LATE at the Borderline

Let D_{1i} and D_{0i} be the treatment status of household i under $Z_i = 1$ and $Z_i = 0$, respectively. The applicants can be divided into three groups. First, the majority is "complier" who would be enrolled if accepted in the first round, that is, $D_{1i} = 1$ and $D_{0i} = 0$. Second, some "always-taker" with $D_{1i} = D_{0i} = 1$ always exist, that is, households who would eventually use an accredited childcare center even if they are declined in the first round. Third, households who leave the city or lose eligibility between the period of application in December and enrollment in April are classified as "never-taker" with $D_{1i} = D_{0i} = 0$. We assume there is no defier, that is, $D_{1i} \geq D_{0i} \forall i$. The observed treatment status is written as $D_i = Z_i D_{1i} - (1 - Z_i) D_{0i}$.

It is known that, if Z_i were randomly assigned, the average treatment effect for compliers would be identified by using Z_i as an instrument for D_i (Imbens and Angrist, 1994). However, as described above, Z_i is not randomly assigned but determined by S_i, C_i, and T_i. Rather, among those with $S_i = \bar{S}_c$ and $c \in C_i$, Z_i^c is discontinuously determined by T_i. Since $\bar{T}_c$ cannot be predicted, in advance, T_i cannot be manipulated to barely exceed $\bar{T}_c$. Thus, if we could retrieve $\bar{T}_c$ from the data, we would be able to identify the local average treatment effect for those who were at the borderline, in the spirit of the regression discontinuity design (RDD).

those with higher than "work," we believe it is tolerable to assume all households at the borderline specified "work" as their reason to apply.

However, in addition to the full information on C_i, information on the accepting center for each accepted application is necessary to retrieve $\bar{T}_c$. Owing to privacy concerns, the identifier of the accepting center is not available. Therefore, as a second-best strategy, we control for the set of control variable included in the equation 1, that is, the priority score (S_i), the wish list of childcare centers (C_i), and the previous year's city income tax imposed on the parents (T_i). Now, our key identification assumption is as follows:

$$(Y_0, Y_1, D) \perp\!\!\!\perp Z | S, C, T. \tag{3}$$

The assumption 3 claims that passing the first-round screening is random after controlling for factors such as priority score, wish list of facilities, and previous year's taxation.

In summary, following Abadie (2003), we identify the local average treatment effect of childcare utilization, $\tau_{LATE} = \mathbb{E}[Y_1 - Y_0 | D_1 > D_0]$, by imposing the following assumptions:

Assumption 1 (Independence of the instrument) *:* $(Y_0, Y_1, D) \perp\!\!\!\perp Z | S, C, T$.

Assumption 2 (Exclusion of the instrument) *:* $P(Y_{1d} = Y_{0d} | S, C, T)$ *for* $d \in \{0, 1\}$ *a.s.*

Assumption 3 (First stage) *:*
$0 < P(Z = 1 | S, C, T) < 1$ *and* $P(D_1 = 1 | S, C, T) > P(D_0 = 1 | S, C, T)$ *a.s.*

Assumption 4 (Monotonicity) *:* $P(D_1 \geq D_0 | S, C, T) = 1$ *a.s.*

3.4 Słoczyński et al. (2023)'s Normalized Weighting Estimator of LATE

To estimate the local average treatment effect of childcare utilization, we employ a normalized weighting estimator as our preferred specification. To ensure identification, our instrument is deemed random only after controlling for explanatory variables; therefore, controlling for such variables is essential. However, owing to the severity of bias stemming from model misspecification, the conventional estimation of the LATE with covariates via two stage least squares (TSLS) with commonly controlled explanatory variables in a linear manner has recently been debated (Blandhol et al., 2022). Hence, we adopt the estimator proposed by Słoczyński et al. (2023),

which builds upon the discussions by Abadie (2003) and extends the proposed estimator by Uysal (2011).[16] We estimate τ_{LATE} by,

$$\hat{\tau_u} = \frac{\left[\sum_{i=1}^{N} \frac{Z_i}{p(X_i)}\right]^{-1} \sum_{i=1}^{N} \frac{Y_i Z_i}{p(X_i)} - \left[\sum_{i=1}^{N} \frac{1-Z_i}{1-p(X_i)}\right]^{-1} \sum_{i=1}^{N} \frac{Y_i(1-Z_i)}{1-p(X_i)}}{\left[\sum_{i=1}^{N} \frac{Z_i}{p(X_i)}\right]^{-1} \sum_{i=1}^{N} \frac{D_i Z_i}{p(X_i)} - \left[\sum_{i=1}^{N} \frac{1-Z_i}{1-p(X_i)}\right]^{-1} \sum_{i=1}^{N} \frac{D_i(1-Z_i)}{1-p(X_i)}}, \tag{4}$$

where $p(X_i) = P(Z_i = 1|S_i, C_i, T_i)$ and estimated by logit.

Note that our sample is limited to households with a priority score of 62; thus, the priority score (S) is automatically controlled for. For the estimation of $p(X)$, the previous year's city income tax (T) are flexibly controlled using a third-order polynomial, and for childcare choice (C), dummy variables are created for each facility, taking a value of 1 if a household applies it and controlled accordingly. Furthermore, to enhance estimation accuracy, we control for the age of parents related to employment and income using third-order polynomials. Owing to the constraint of a small sample size, we control for each variable separately. Additionally, in the analysis, we check whether the results are not so sensitive when each variable is linearly controlled.

Prior to estimation using data, let us note several limitations regarding the estimation and their corresponding remedies. First, the inherent inability to fully control for the wish list of childcare facilities must be acknowledged. From the data, among households with a priority score of 62, we observed choices for 106 facilities for infants aged zero and 223 facilities for infants aged one. Additionally, the number of facilities listed by each applicant varies from one to 30. Hence, the sample size is too small to reliably estimate $p(X)$ using logistic regression while controlling for all choices. Therefore, to ensure stable estimation, we needed to narrow down the control to approximately 40 representative facilities. In practice, for infants aged zero, childcare facility choices were controlled by focusing on 43 facilities where more than 20 individuals selected a particular facility, while for those aged one, the control was narrowed down to 44 facilities where more than 35 individuals selected a specific facility. Although facilities with minimal selections were excluded, popular or representative facilities across locations were retained, thus minimizing their impact on the estimation results. Furthermore, we conduct robustness checks using linear TSLS to check

[16] The estimation of the estimator (4) and standard errors are performed using the `kappalate` command developed by Słoczyński et al. (2023) in Stata.

the consistency of results between controlling for all facility dummies and controlling for selected facility dummies (Columns (1)-(4) of Tables B2 and B3). In addition, we also check how the results change by excluding households that invariably select facilities where admission is guaranteed, which is inferred from the data as facilities with all applicants with $S_i \geq 62$ are accepted (Columns (7)-(8) of Tables B2 and B3).

Second, some concerns exist regarding negative correlation between Z_i and mother's earnings capacity. Women with strong labor force attachment tend to live in particular parts of the city (e.g., neighborhood of a commuter train station); thus, the supply and demand is particularly tight in such areas. Since these women tend to have larger earnings capacity, such residential sorting generates a negative correlation between a mother's pre-birth income and Z_i. In fact, estimated $p(X)$ is significantly negatively correlated with the mother's pre-birth income (Figure A2).

Women who had higher income before birth tend to earn more after parental leave; thus, such residential sorting is likely to bias the effect of childcare use on the mother's earnings downward. The same argument could be applied for father's earnings. Just controlling for C_i seems not to be able to eliminate the correlation between parents' pre-birth income, although it substantially weakens the correlation. Since fine regional information is not available in our data and our control for potential earning capacity is likely to be imperfect, we also control for past earnings prior to birth of both parents in a flexible manner in our estimation.

3.5 OLS and TSLS

Our primary estimate is given by Equation (4); however, we also conduct estimation using conventional TSLS:

$$Y_i = \beta_0 + \beta_1 D_i + \text{other controls} + \varepsilon_i \tag{5}$$

$$D_i = \gamma_0 + \gamma_1 Z_i + \text{other controls} + \mu_i \tag{6}$$

where other controls include age of parents, childcare facility choice, the previous year's city income tax, and past earnings prior to birth for both parents.

Finally, before presenting the IV results, we check how the correlation between D_i and Y_i is

affected by the sample selection and confounding factors such as pre-birth earnings. Specifically, we estimate the following equation with different samples and different sets of control variables.

$$Y_i = \beta_0 + \beta_1 D_i + \text{othercontrols} + \varepsilon_i \tag{7}$$

4 Data

This study combines administrative records of applications for accredited childcare centers, users of such centers, and data on the tax records augmented with household structure. The three datasets are merged using an anonymous household identifier provided by the city government, which enables us to track the same household over time.

The data regarding the applications for accredited childcare centers cover all applications for April enrollment from 2015 to 2018. The unit of observation is application; that is, if two children from the same household apply, they are counted as two observations. The available information includes the priority score calculated by the city government based on the application, the complete list of preferred childcare centers, age of child as of April 1st, and the application acceptance status in the first round. The designated reason that the child needs childcare is available only for those who actually enrolled in April.

The data on the users of accredited childcare centers cover all children enrolling in any accredited childcare centers as of April 1st from 2015 to 2018. The unit of observation is child, and the available information includes the age of child as of April 1st and the fee category based on the city income tax. This dataset covers not only newly enrolled children, but also incumbent children from the previous year.

The dataset of tax records covers the population of households with preschool children living in the city at the beginning of 2018.[17] The available information includes a selected part of the tax record, such as pre-tax salary income and taxable income from 2014 to 2017, the month and year of birth, sex, and the relationship to the household head with each household member at the

[17] This is the same dataset as that used in Fukai and Kondo (2021). For details of the data cleaning process, see Fukai and Kondo (2021).

beginning of 2018.[18] Note that tax records include income in each calendar year (from January to December), and not the Japanese fiscal year, which starts in April. Unfortunately, pre-tax income other than salary income is not available, but the total amount of taxable income and deductions are. Thus, we can calculate the city income tax that determines the acceptance at the borderline.

Our data set has an important limitation. Since the tax records of each year are available only for individuals who lived in the city at the beginning of the corresponding year, the prior information concerning those who moved into the city after 2015 is unavailable. We use each parent's income in the year prior to child's birth as a control variable in the data analysis. Specifically, income in calendar year 2015 is used as "income before birth" of parents of zero-year-old children in 2017, who were born between April 2016 and March 2017. Similarly, income in 2014 is used as pre-birth income of zero- and one-year-old children in 2016 and 2017, respectively. This implies that the sample of zero-year-olds consists of those who lived in the city for three consecutive years (2014 to 2016 or 2015 to 2017) and that of one-year-olds consists of those who lived in the city for four years 2014 to 2017.[19] Since many couples moved into the city when they married or had a child, about one-third of households with zero or one-year-old children are dropped from the main analysis sample (Table B1). In the next section, we confirm that excluding these cases does not change the correlation between the enrollment in accredited childcare centers and parents' income or employment.

Another important limitation is that as childcare leave benefits are not included in the taxable income, the payment of such benefits from the public Employment Insurance cannot be observed in the tax records. Therefore, distinguishing mothers who are on childcare leave holding the same job before the child's birth, and those who quit the job permanently is difficult. Additionally, this implies that the taxable income in the year prior to the application is mostly determined by father's income.

The descriptive statistics of our sample of households with children at age zero are presented in Table 1. Column (1) of Table 1 includes all households with zero-year-old children as of April 1st

[18]Since the municipality resident tax is imposed on the income in the previous year, the data as of 2018 contain income information up to 2017.

[19]Furthermore, since the original database includes households who lived in the city as of April 1st in 2018, those who moved out of the city before January 2018 are not included.

in 2017 or 2016. A total of 46% of mothers earned a positive salary income while only 20% used the accredited childcare centers. A total of 95% of fathers had a positive salary income. Since the city under study is an urban municipality with a relatively higher price and wage level, the average salary income of fathers is higher than the national average.[20] Column (2) excludes households whose income before birth is not available, that is, those who moved to the city after 2015 for the 2017 cohort and after 2014 for the 2016 cohort. No notable difference is observed between the two columns, and 64% of mothers had a positive salary income in the year prior to the birth of their child. The sample used in Column (3) is limited to those who applied for the accredited childcare center. Not surprisingly, more than 90% of mothers were employed before the birth of their child, and about 90% were employed in the outcome year as well. A total of 80% were accepted by an accredited childcare center in the first round, and approximately the same fraction actually used the center. Other characteristics including parents' age and fathers' earnings do not differ significantly from Columns (1) and (2). In Column (4), the sample is further limited to those whose priority score is 62. Most are nuclear families with one child and both parents having a full-time job. Thus, almost all parents were employed before the birth of their child, and mothers' average income was higher than that listed in Column (3). [21] As expected, the fractions of accepted in the first round and those who used the childcare centers are lower, because 62 is the borderline score for most childcare centers. Other characteristics are similar to Column (3).

The same statistics of households with children at age one in 2017 are reported in Table 2. A notable difference from Table 1 is the statistics regarding the use of accredited childcare centers. The percentage of households using such centers in the first two columns is higher than Table 1, because this is the sum of households who started to use at age zero and one. In contrast, when the sample is limited to those who applied, both the percentage accepted in the first round and that using the childcare center become substantially lower than those in Table 1, which implies severer competition for one-year-old children. Nevertheless, mothers' employment rate and income do

[20] According to the Basic Survey of Wage Structure 2017, the average annual earnings of male full-time employees aged 30-39 was 5,181,000 JPY. Population average including unemployed, self-employed, and part-time workers should be even lower.

[21] Note that existence of older siblings yields a few bonus points in the priority score. Thus, Column (3) includes many households with older siblings, and some were on childcare leave for the older sibling in the year prior to the birth of the child. The lower pre-birth income of mothers in Column (3) than (4) is partly attributable to this.

not decrease. Regarding other characteristics, both the level and differences between columns are similar to those of Table 1.

5 Result

5.1 OLS

Before estimating the LATE for borderline users, let us check how the correlation between D_i and Y_i changes with the sample selection and control variables. β_1 of simple OLS estimates of equation (7), the coefficients of an indicator of using accredited childcare centers, for households with children at age zero and one are presented in Tables 3 and 4, respectively. Each row corresponds to the following outcome variable: mother's employment (a dummy variable indicating positive salary income), mother's salary income (including zero), father's employment, and father's income. Each column presents estimates with different sample and control variables.

Column (1) of Table 3 indicates that, in households whose child is enrolled to an accredited childcare center, mother's employment rate is 52.7 percentage points higher, and mothers earn by 1.15 million yen more while fathers earn 0.62 million yen less than households not using such centers. Column (2) limits the sample to those whose pre-birth salary income is observed. Excluding households who recently moved in does not alter the result significantly. Column (3) includes controls for cubic functions of last year's taxable income of the household and mother and father's income before birth. The correlation between childcare use and mother's outcome is substantially weaker in Column (3) than in Column (2). This implies that past income is negatively correlated with the probability of using childcare. Intuitively, mothers with weak labor force attachment are unlikely to use childcare and also tend to have lower earnings before birth.

In Columns (4)-(6), the sample is limited to those whose priority score is available, that is, those who applied for accredited childcare centers. Column (4) does not control for past income, but compared to Column (2), the differences in mothers' outcomes between users and non-users smaller. This is because mothers with weak labor force attachment are unlikely to apply for childcare centers and are excluded from the sample in Column (4). However, according to Column (5),

within the sample of those who apply for childcare centers, adding controls for past income boosts the estimated coefficient of the childcare use dummy on the mother's salary income. This finding implies that, conditional on the intention to use childcare centers, women's earnings capacity is negatively correlated with the probability of their actual use of childcare centers. Lastly, Column (6) limits the sample to those whose priority score was 62, that is, the borderline applicants. This does not change the coefficients much.

The estimated coefficients from the sample of one-year-olds in 2017 is presented Table 4. The relative sizes of coefficients between columns are similar to those in Table 3 except for the following two points. First, coefficients in Column (5) are smaller than those in Column (3), probably because households who start to use childcare centers at age zero are included only in Column (3). Second, limiting sample to applicants whose priority score was 62 substantially weakens the correlations between childcare use and mothers' outcomes. This may be because first-time mothers with strong labor force attachment tend to apply at age zero to maximize the chances of enrollment; thus, those who wait until age one are negatively selected in terms of potential earnings. An alternative explanation is that mothers whose priority score is 62 know that they are at the borderline; thus, they tend to prepare for fallback options.

The coefficients of father's outcomes are also presented in Tables 3 and 4. Overall, father's salary income and childcare use are negatively correlated. Adding controls for past income makes this negative correlation weaker, which suggests that men with smaller earnings capacity tend to have wives who continue to work after their child's birth. When the sample is limited to applicants and past income is controlled (Columns 5 and 6), the coefficient becomes statistically insignificant, which suggests that the negative correlation between father's income and childcare use is attributable to the selection into childcare use rather than the causal effect of childcare use.

5.2 IV

Our results thus far indicate that the use of childcare centers enables mothers to continue working, but we still cannot rule out the possibility of bias owing to endogenous decision-making in the use of childcare centers. Therefore, we utilize a centralized system of rationing the use of childcare

centers by the local government. Specifically, as explained in section 3, we limit our sample to households whose priority score is 62 (i.e., nuclear families with only one child, where both parents are working full-time), control for the list of preferred centers, and use the acceptance in the first round as an instrument for the actual use of childcare centers. Through this method, we compare parents with the same need for childcare, who applied for similar childcare centers, but who were selected by chance and could use the center, with those who were not selected and could not use the center.

First, we verify graphically how our instrumental variable works. Figure 2a demonstrates, for each priority score, how the utilization rate of childcare centers differs between those who were accepted and declined in the first-round screening. The analysis focuses on households with a priority score of 62, highlighted by red circles, revealing a notably higher utilization rate of childcare centers when comparing Z=1 to Z=0. This suggests that in the first stage estimation, our instrumental variable induces sufficient variation. Figure 2b illustrates the maternal employment rate, corresponding to the reduced-form. While not as pronounced as childcare utilization, it is evident that maternal employment increases with acceptance in the first-round screening. These graphs indicate that childcare availability influence maternal employment.

Our estimates, which control for information about preferred childcare centers, allow us to compare households with similar neighborhoods and preferences for childcare centers. However, we note that it is critical to pay attention to differences in households' potential earning capacity. Reflecting the residential sorting of high-income couples to areas with greater excess demand for formal childcare, the correlation between the prenatal father's and mother's income, and the propensity score based on information about the list of preferred childcare centers exhibited a strong negative correlation (Figure A2). As explained in section 3, the current specification cannot perfectly control for the correlation between the probability of acceptance and pre-birth income of the parents. Thus, we also control for past earnings prior to birth in our following estimations.

Relatedly, the distribution of the estimated $p(X_i)$ in equation 4 is examined separately for households with Z=1 and Z=0 in Figure A3. From the figure, the distribution of $p(X_i)$ evidently varies significantly depending on the actual acceptance status in the first-round screening, which

suggests the importance of correcting for the differences in distribution of covariates appropriately in our weighting estimator.

We begin by confirming the first stage; that is, the effect of acceptance in the first-round screening process on the actual use of childcare centers. γ_1 in equation (6), the coefficients of acceptance in the first round on the enrollment to an accredited childcare center, are reported in Table 5. The estimated coefficients can be interpreted as the differences in the enrollment rate between those who were accepted and those who were not in the first round of screening. Columns (1) and (2) present the results for zero- and one-year-old children, respectively. If the child is accepted in the first round, the probability of using a childcare center increases by 50 percentage points. The estimation is highly precise, and the F-values exceed 150, which indicates that the instrumental variable is sufficiently strong.

Using the initial screening results as the instrumental variable, the effects of childcare center use on maternal employment and other outcomes are summarized in Tables 6 and 7. Each table presents OLS and the reduced form estimates of the effect of 1st round acceptance, and then estimated LATE from conventional TSLS and Słoczyński et al. (2023)'s normalized weighting estimator tau_u on parents' employment status and salary income. Note that each estimation controls for taxable income at the time of application and the salary income of the parents prior to the birth in a flexible manner.

The results for the use of childcare centers for children at age zero are reported in Table 6.[22] For maternal employment, the conventional TSLS result reveals that the use of childcare centers raises maternal employment by 26.2 percentage points, which is statistically significant. Słoczyński et al. (2023)'s normalized weighting estimator tau_u, our preferred specification, is 40.3 percentage points. The difference between LATE(τ_u) and the conventional TSLS is interpreted as bias stemming from model misspecification in explanatory variables in the conventional TSLS estimator.

The results also indicate that the use of childcare centers increases the salary income of mothers by 1.41 million yen in a statistically significant manner. The estimated effect is somewhat smaller than what would be expected from the effect on employment. Given that the average salary income

[22]Specification checks corresponding to this table are presented in Table B2.

earned by mothers with a priority score of 62 points before having children is about 4.1 million yen (Column 4 of Table 1), an increase in maternal employment by 40.3 percentage points would imply that average earnings would increase by 1.65 million yen, while the corresponding estimate is 1.41 million yen. Although the gap is smaller than the standard error of the estimated coefficient, this may imply that mothers with higher salary are more likely to switch to alternative options and resume work when they are declined in the first round.

The estimated effects on the father's employment and salary income are not statistically significantly different from zero in any specifications, and standard errors are small. Therefore, we confirm the negative relationship between childcare use and father's income in Table 3 reflects the selection mechanism whereby the households with lower paternal incomes are more likely to use childcare centers. Furthermore, the lack of positive effect on earnings implies that fathers do not increase labor supply to compensate for the loss of mother's earnings nor the higher fee of alternative childcare options.

The results of childcare use for children at age one are presented in Table 7.[23] The estimated LATE from our preferred specification implies that using a childcare center raises maternal employment by 18.8 percentage points with statistical significance and also raises mothers' salary income by 0.91 million yen in a statistically significant manner. The positive effects of childcare center usage on mothers' employment and earnings are smaller for one-year-old than for zero-year-old children. One potential explanation is the existence of better availability of alternative childcare options for one-year-old children. Although we do not have accurate information, anecdotally, finding a slot for a one-year-old child is easier than a zero-year-old at other kinds of childcare centers (e.g., daycare center operated by the mother's employer).[24]

Another potential reason is that parental leave can be extended only for children at age zero. In Japan, the compensated parental leave can be extended until the child turns two (1.5 in 2016), in cases where the child is not accepted for accredited childcare centers owing to the limited capacity.

[23] Specification checks corresponding to this table are presented in Table B3.

[24] There are two reasons for this. First, the national regulation allows a larger baby-to-sitter ratio for older children; thus, the same number of nursery staff can take care of a larger number of one-year-old children than zero-year-olds. Second, some zero-year-old users move to accredited childcare centers in the April, so they do not fill the slot in the class of one-year-olds.

Therefore, if a mother fails to obtain an accredited childcare center slot at age zero, she is more likely than mothers with one-year-old children to extend parental leave instead of resuming work using other childcare options. This possibility is further discussed in the next subsection.

Furthermore, in contrast to the results for age zero, the estimated effect on mothers' salary income is slightly larger than the change in salary income expected from the effect on employment. Given that the average salary income before having children is about 4.1 million yen (Column 4 of Table 2), an increase in maternal employment by 18.8 percentage points would imply an increase of income by 0.77 million yen, while the corresponding estimate is 0.91 million yen. No change is observed in fathers' employment and income by use of childcare centers in the case of one-year-olds.

Finally, it is worth mentioning that the differences between the OLS and TSLS estimates are not statistically significant in both Tables 6 and 7. Thus, the availability of childcare centers can be considered almost random if the sample is limited to nuclear families with only one child and both parents working full-time, with controls for preferred childcare centers and past income.

5.3 Long-term effect: Childcare leave extension or permanent separation?

As previously explained, a parent can extend their childcare leave until their child's second birthday if they cannot find any available slots in accredited childcare centers. Furthermore, since the childcare leave benefit is tax exempt, we cannot distinguish a parent on childcare leave and one who permanently left the pre-birth job. Therefore, those who extended childcare leave after being declined are included in those who gave up to work in the year of application in Table 6.

However, policy implication is quite different depending on whether mothers of children declined at age zero can keep their job by extending the childcare leave or have to quit permanently. To explore this point, the effect of childcare use on employment and income in the next year are presented in Table 8. While both the normalized weighting and conventional TSLS estimates of the effects on mothers' employment remain statistically significantly positive, the point estimates decrease substantially. Focusing on LATE(τ_u), our preferred specification, while the use of accredited childcare at age zero increases maternal employment of the same year by 40.3 percentage points,

the effect fades to 18.9 percentage points in the next year. If the difference is attributable to childcare leave extensions, although this assumption is too strong, approximately 53% of those who "gave up to work" were able to retain their pre-birth jobs.

Furthermore, the effect on mother's income fades to less than half and is no longer statistically significant. The greater decline of the effect on income implies that, among mothers who chose not to work in the year when their child was not able to enroll to accredited childcare center at age zero, those with higher potential earnings are more likely to restart work by the next year.

As supportive evidence, we investigate the detailed status of those declined at age zero in the next year. Although the small sample size makes it difficult to conduct rigorous econometric analysis, information from their application in the next year implies that some mothers actually extend their childcare leave and return full-time work in the next year. At the same time, many mothers restart work before the next year's application, and they are more likely to be accepted in that application because their priority score increases to 63.

First, the next year's application results of those who were declined at age zero is illustrated in Figure 3. Among 191 mothers of zero-year-old children declined in the first round and were not enrolled in April, 16 managed to start using accredited childcare centers later in the same fiscal year. Among the remaining 175, a total of 123 mothers applied for April enrollment in the next year. Among them, 76 were accepted in the first round, and 66 were actually enrolled to accredited childcare centers in April at age one.[25] In addition, among 47 who were declined in the first round, 11 managed to enter in the second round. Adding them all, approximately half of those who could not use accredited childcare centers in 2017 were able to do so in the next year.

A total of 52 did not apply for April enrollment of the next year. Among them, 43 (83%) mothers had positive salary earnings in the year they were declined, which suggests that they managed to restart working during the year, rather than giving up work. Furthermore, the average earnings in 2017 is more than 300 million yen for those who were declined in 2016 and did not apply

[25]We cannot determine why 10 mothers who were accepted did not use accredited childcare centers. Perhaps some compared the center where they were accepted and alternative services they were already using (e.g., childcare provided by their employer and decided to continue the alternative options. Others may have had unexpected events that prevented them from enrollment, such as forced relocation caused by husband's job rotation. For six mothers who were accepted but did not use in 2017, all had positive salary income in 2017.

in 2017, which implies that most worked full-time full-year in 2017. Although our data do not include information on alternative childcare options, we speculate that they started to use such alternative options and decided to continue using these. The remaining nine mothers seem to have permanently quit.

Regarding those who applied for April in the next year, approximately half restarted work by using alternative childcare options. The priority score for the application becomes 63 if both parents work full-time and use alternative childcare services (except for care by other family members) at the time of application. A total of 62 households among the 123 had a priority score of 63 in their second time. Since they were given priority over applications with priority score 62, most of those who restarted work before the second application were accepted.

If a mother extended her childcare leave until the April the next year, her priority score in the second time is again 62. Approximately 30% of the second-time applications with priority score of 62 are accepted, [26] and some of those declined again find a slot in non-accredited childcare centers and restart work.[27] Recall that Table 8 indicates that a mother's employment rate in 2017 decreases by 18.9 percentage points if she was not able to use an accredited childcare center in April 2016; tabulations above suggest that about 40% of this effect derives from those who permanently quit in 2016, and the remaining 60% is attributable to those who extended the childcare leave and declined again in 2017.

Incidentally, the average annual salary income in 2016 is less than half of that in 2017 for the those whose priority score for the second application is 63. This means that the majority restarted work in the second half of 2016 instead of April. We speculate that they extended childcare leave until they were able to find a slot in the alternative childcare options. In this sense, the current rule to allow mothers to extend childcare leave upon decline by accredited childcare centers is useful for mothers to keep their job.

We also tried the same calculations for mothers of one-year-old who were declined in 2016,

[26] According to Table 2, 42% of all applications for age one with priority score 62 are declined. Compared to this average, the second-time application with priority score of 62 are much more likely to be declined, probably because they tend to live in areas with excess demand for childcare.

[27] Among 23 mothers who were declined in both 2016 and 2017, approximately 63% had positive salary earnings in 2017.

although they were not used in the regressions because pre-birth income is not available for them. Since there is no option to extend childcare leave for them, a larger fraction did not apply for the next year. However, the acceptance rate of those who applied in the next year is higher because most have restarted work by then; thus approximately 43% of those declined when their children are at age one are able to enroll at an accredited childcare center in the next year. In terms of the fraction who can enroll in the next year, the difference between one and zero years old seems to be small, although we cannot draw strong conclusion owing to the limited sample size.

6 Conclusion

This study examines the causal effect of availability of publicly subsidized center-based childcare on the employment and earnings of mothers of zero- and one-year old children. We utilize the administrative records provided by a large urban municipality in Japan and construct an instrument using specific rules for the first- round assignment process of April enrollment. We focus on households with only one child with both parents working full-time, as they are at the borderline of being accepted in the first round. The findings reveal that the enrollment to an accredited childcare center increases zero- and one- year-old children's mothers' employment rate by 40.3 and 18.8 percentage points, respectively. The effect of such enrollment on mothers' annual salary income is 1.41 million yen and 0.91 million yen for zero- and one-year-old children, respectively. No statistically significant effect on father's employment or earnings was observed.

We also compare the coefficient of childcare use on parent's employment and earnings in simple regressions with different sample criteria and different set of control variables. Our findings confirm that mother's earning capacity, proxied by income before birth of the child, is correlated with the probability of using childcare. By contrast, father's salary income is negatively correlated with the childcare use. We deal with these selection issues by limiting our sample to those who applied for April enrollment with the same priority score, and control for past income and the choice of centers listed on the application.

The estimated effects are smaller for mothers of one-year-old children than zero-year-old children. In case of mothers with a priority score of 62, income before the birth of their child was

similar between mothers of zero- and one-year-old. Hence, this difference is not attributable to the differences in the potential earnings of the population. Rather, this may imply the differences in the outside options. For mothers of zero-year-old children, some choose to extend the parental leave for another year. Since the parental leave benefit is tax exempt, their salary income in the data is zero. Given the maximum length of this compensated parental leave is two years (1.5 years until 2016), very few mothers of one-year-old children can extend the leave. Instead, more mothers may restart work using other childcare services, which results in weaker effects.

References

Abadie, Alberto, "Semiparametric Instrumental Variable Estimation of Treatment Response Models," *Journal of Econometrics*, 2003, *113* (2), 231–263.

Asai, Yukiko, Ryo Kambayashi, and Shintaro Yamaguchi, "Childcare Availability, Household Structure, and Maternal Employment," *Journal of the Japanese and International Economies*, 2015, *38*, 172–192.

_ , _ , and _ , "Crowding-out effect of subsidized childcare," *Available at SSRN 2634283*, 2016.

Baker, Michael, Jonathan Gruber, and Kevin Milligan, "Universal Child Care, Maternal Labor Supply, and Family Well-Being," *Journal of Political Economy*, 2008, *116* (4), 709–745.

Bauernschuster, Stefan and Martin Schlotter, "Public child care and mothers' labor supply—Evidence from two quasi-experiments," *Journal of Public Economics*, 2015, *123*, 1–16.

Blandhol, Christine, John Bonney, Magne Mogstad, and Alexander Torgovitsky, "When Is TSLS Actually LATE?," 2022.

Carta, Francesca and Lucia Rizzica, "Early kindergarten, maternal labor supply and children's outcomes: Evidence from Italy," *Journal of Public Economics*, 2018, *158*, 79–102.

Cascio, Elizabeth U., "Maternal Labor Supply and the Introduction of Kindergartens into American Public Schools," *The Journal of Human Resources*, 2009, *44* (1), 140–170.

Eckhoff Andresen, Martin and Tarjei Havnes, "Child care, parental labor supply and tax revenue," *Labour Economics*, 2019, *61*, 101762.

Fitzpatrick, Maria Donovan, "Revising Our Thinking About the Relationship Between Maternal Labor Supply and Preschool," *Journal of Human Resources*, 2012, *47* (3), 583–612.

Fitzpatrick, Maria Donovan, "Preschoolers Enrolled and Mothers at Work? The Effects of Universal Prekindergarten," *Journal of Labor Economics*, 2010, *28* (1), 51–85.

Fukai, Taiyo, "Childcare Availability and Fertility: Evidence from Municipalities in Japan," *Journal of the Japanese and International Economies*, 2017, *43*, 1 – 18.

_ and Ayako Kondo, "Households' Responses to Childcare Fees: Childcare Usage and Parental Labor Supply," *Economic Analysis*, 2021, *202*.

Gale, D. and L. S. Shapley, "College Admissions and the Stability of Marriage," *The American Mathematical Monthly*, 1962, *69* (1), 9–15.

Goux, Dominique and Eric Maurin, "Public school availability for two-year olds and mothers' labour supply," *Labour Economics*, 2010, *17* (6), 951–962.

Havnes, Tarjei and Magne Mogstad, "No Child Left Behind: Subsidized Child Care and Children's Long-Run Outcomes," *American Economic Journal: Economic Policy*, May 2011, *3* (2), 97–129.

Imbens, Guido W. and Joshua D. Angrist, "Identification and Estimation of Local Average Treatment Effects," *Econometrica*, 1994, *62* (2), 467–475.

Kleven, Henrik, Camille Landais, Johanna Posch, Andreas Steinhauer, and Josef Zweimüller, "Do family policies reduce gender inequality? Evidence from 60 years of policy experimentation," Technical Report, National Bureau of Economic Research 2020.

Lefebvre, Pierre and Philip Merrigan, "Child-Care Policy and the Labor Supply of Mothers with Young Children: A Natural Experiment from Canada," *Journal of Labor Economics*, 2008, *26* (3), 519–548.

Nishitateno, Shuhei and Masato Shikata, "Has Improved Daycare Accessibility Increased Japan's Maternal Employment Rate? Municipal Evidence from 2000–2010," *Journal of the Japanese and International Economies*, 2017, *44*, 67–77.

Nollenberger, Natalia and Núria Rodríguez-Planas, "Full-time universal childcare in a context of low maternal employment: Quasi-experimental evidence from Spain," *Labour Economics*, 2015, *36*, 124–136.

Słoczyński, Tymon, S. Derya Uysal, and Jeffrey M. Wooldridge, "Abadie's Kappa and Weighting Estimators of the Local Average Treatment Effect," 2023.

Uysal, S. Derya, "Three Essays on Doubly Robust Estimation Methods," 2011. PhD dissertation, University of Konstanz.

Yamaguchi, Shintaro, Yukiko Asai, and Ryo Kambayashi, "Effects of subsidized childcare on mothers' labor supply under a rationing mechanism," *Labour Economics*, 2018, *55*, 1–17.

List of Figures

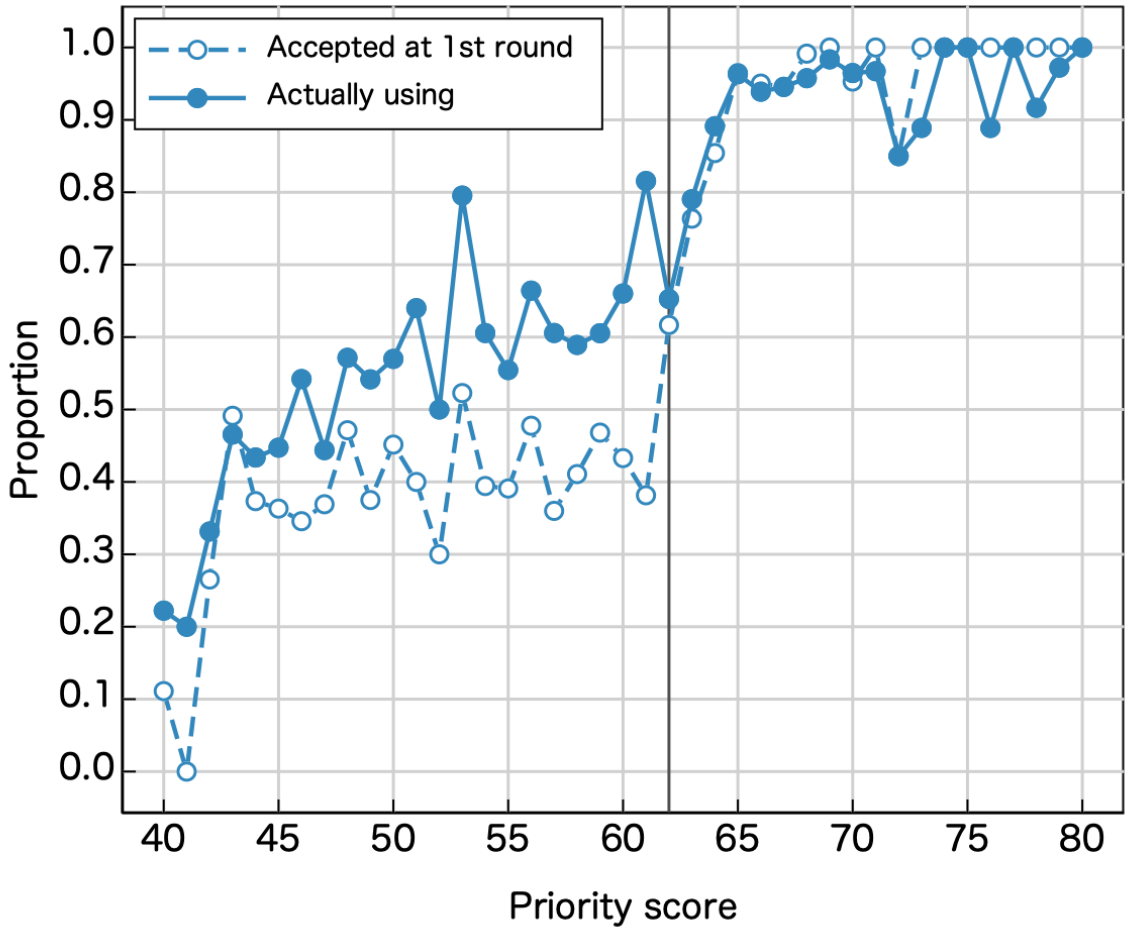
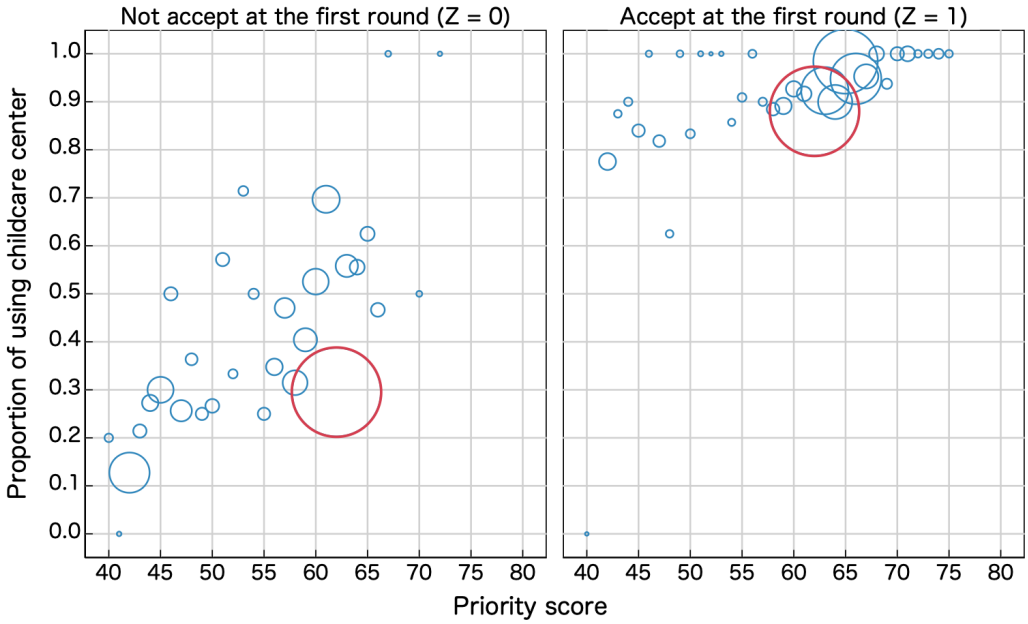
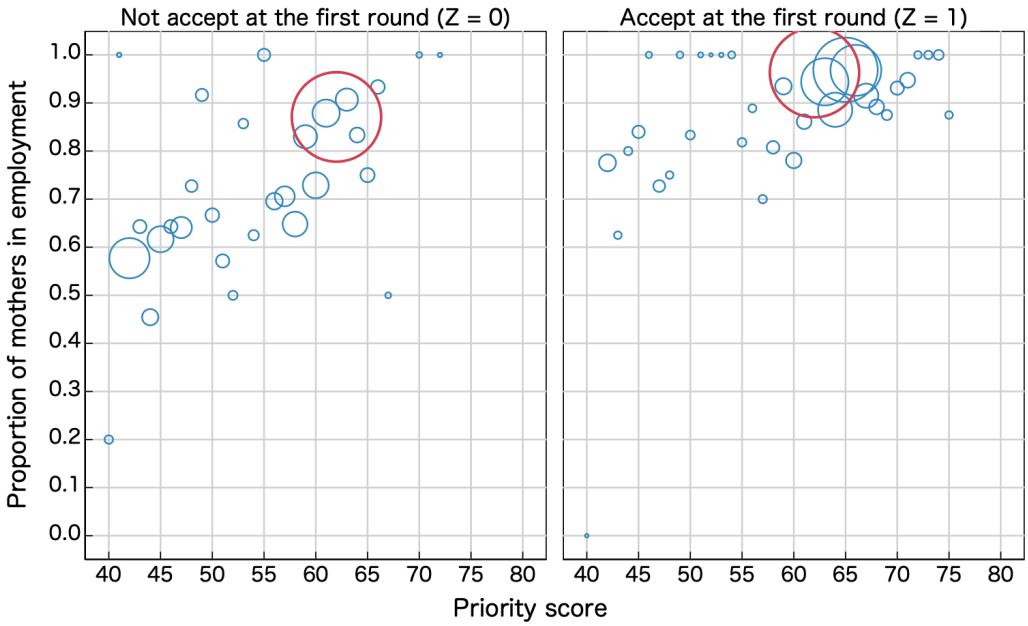


Figure 1: Priority score and proportion of accepted/using childcare centers

Note: This figure illustrates the proportion of households with first round acceptances (dotted line) and the proportion of households actually using the accredited child- care center (actual battle) by the priority score in the first round of screening. The sample used is households with a zero-year-old child in 2016-2017 or with a one-year-old child in 2017 that applied for accredited childcare centers.



(a) Childcare use



(b) Mothers in employment

Figure 2: Priority score and proportion of childcare use/mothers in employment

Note: This figure presents the proportion of households using accredited childcare centers (panel (a)) and mothers in employment (panel (b)) as a result of the first-round screening. The size of each point indicates the number of households for each priority score. The sample used is households with a zero-year-old child in 2016-2017 or with a one-year-old child in 2017 that applied for accredited childcare centers.

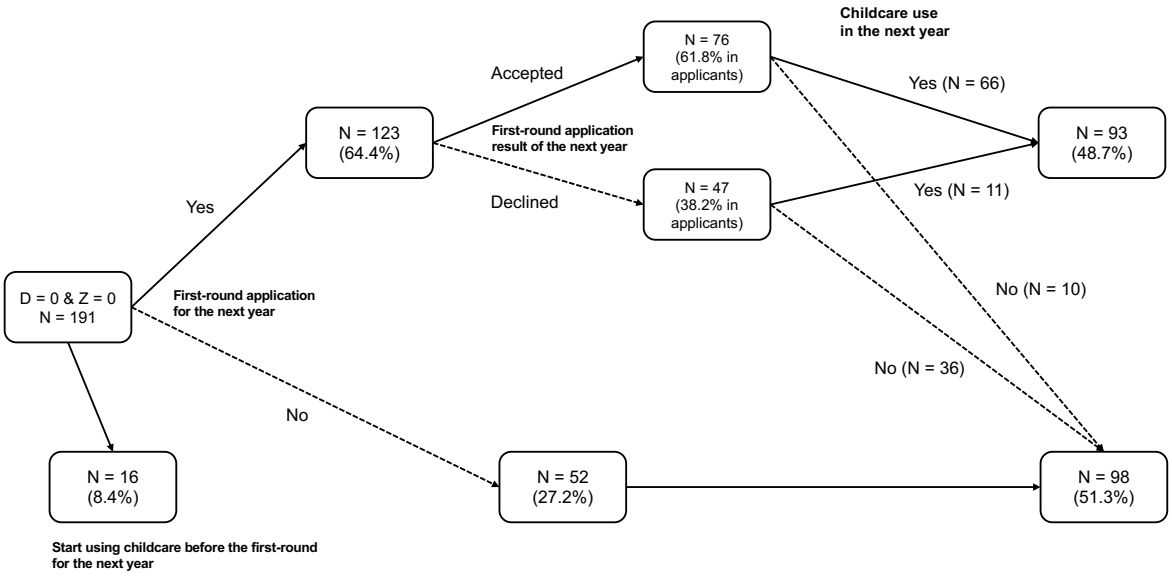


Figure 3: Next year's application status

List of Tables

Table 1: Summary statistics: Child age = 0

	Child's age = 0			
	(1)	(2)	(3)	(4)
% 2016 cohort	50.9	53.8	49.9	51.9
	[50.0]	[49.9]	[50.0]	[50.0]
% accepted in the 1st round			80.3	76.3
			[39.8]	[42.5]
% using the childcare center	20.3	22.2	80.5	72.1
	[40.2]	[41.6]	[39.6]	[44.9]
Previous year's city income tax (10k JPY)		13.2	18.8	20.5
		[19.5]	[14.3]	[11.8]
Mother's characteristics				
Age (as of April 1 in the outcome year)	32.7	33.2	33.5	32.8
	[4.7]	[4.5]	[4.3]	[4.3]
Salary income before birth (10k JPY)		172.2	311.5	412.5
		[208.3]	[207.0]	[166.5]
% non-zero salary income before birth		63.5	91.9	98.4
		[48.2]	[27.4]	[12.6]
Salary income in the outcome year (10k JPY)	58.5	61.1	179.9	185.8
	[124.1]	[129.0]	[143.6]	[124.0]
% non-zero salary income in the outcome year	45.9	46.6	90.0	93.1
	[49.8]	[49.9]	[30.0]	[25.3]
Father's characteristics				
Age (as of April 1 in the outcome year)	34.6	35.1	35.1	34.4
	[5.6]	[5.4]	[5.2]	5.2]
Salary income before birth (10k JPY)		514.6	515.3	513.3
		[316.0]	[232.5]	[199.8]
% non-zero salary income before birth		90.7	96.4	97.7
		[29.1]	[18.6]	[15.0]
Salary income in the outcome year (10k JPY)	584.4	591.5	561.6	562.3
	[348.4]	[355.9]	[252.8]	[217.5]
% non-zero salary income in the outcome year	95.0	95.1	96.5	97.3
	[21.8]	[21.5]	[18.3]	[16.1]
Sample restriction				
Salary income before birth		Y	Y	Y
Priority score & childcare choice			Y	Y
Priority score = 62				Y
N	19,193	15,097	2,579	1,048

Note: This table presents descriptive statistics for households in which the youngest child was 0 years old in 2016-2017. Standard deviations are in parentheses.

Table 2: Summary statistics: Child age = 1

	Child's age = 1			
	(1)	(2)	(3)	(4)
% accepted in the 1st round			68.9	58.0
			[46.3]	[49.4]
% using the childcare center	31.3	32.6	74.2	66.7
	[46.4]	[46.9]	[43.8]	[47.2]
Previous year's city income tax		11.0	15.9	17.2
		[20.4]	[13.4]	[10.6]
Mother's characteristics				
Age (as of April 1 in the outcome year)	33.8	34.3	34.2	33.4
	[4.7]	[4.5]	[4.2]	[4.2]
Salary income before birth (10k JPY)		182.6	301.5	407.4
		[211.2]	[199.3]	[152.1]
% non-zero salary income before birth		66.4	90.4	98.2
		[47.2]	[29.2]	[13.1]
Salary income in the outcome year (10k JPY)	120.1	125.6	219.5	209.1
	[183.3]	[187.7]	[163.3]	[123.3]
% non-zero salary income in the outcome year	51.1	52.1	90.6	93.5
	[50.0]	[50.0]	[29.2]	[24.6]
Father's characteristics				
Age (as of April 1 in the outcome year)	35.6	36.2	36.0	35.3
	[5.5]	[5.4]	[5.3]	[5.2]
Salary income before birth (10k JPY)		541.1	514.2	517.8
		[308.2]	[230.6]	[215.7]
% non-zero salary income before birth		95.2	95.4	97.5
		[21.3]	[20.9]	[15.5]
Salary income in the outcome year (10k JPY)	613.2	619.7	585.5	593.7
	[417.3]	[437.6]	[274.0]	[235.0]
% non-zero salary income in the outcome year	94.8	94.8	95.1	97.4
	[22.3]	[22.1]	[21.5]	[16.0]
Sample restriction				
Salary income before birth		Y	Y	Y
Priority score & childcare choice			Y	Y
Priority score = 62				Y
N	9,837	7,541	1,620	571

Note: This table presents descriptive statistics for households in which the youngest child was 1 years old in 2017. Standard deviations are in parentheses.

Table 3: OLS coefficients of childcare use on parental labor market outcomes: Child age = 0

Outcome variables	(1)	(2)	(3)	(4)	(5)	(6)
Mothers in employment	0.527***	0.526***	0.341***	0.245***	0.260***	0.236***
	(0.007)	(0.007)	(0.008)	(0.021)	(0.020)	(0.027)
Mother's salary income (10k JPY)	115.448***	112.136***	89.476***	77.911***	114.630***	104.908***
	(2.495)	(2.704)	(2.452)	(7.361)	(5.921)	(8.065)
Fathers in employment	0.003	0.002	0.008**	-0.024***	0.003	0.004
	(0.004)	(0.004)	(0.004)	(0.007)	(0.007)	(0.007)
Father's salary income (10k JPY)	-62.954***	-60.518***	-34.089***	-105.367***	-9.391	3.594
	(5.315)	(5.948)	(3.200)	(12.470)	(5.864)	(7.744)
Past income						
observed		X	X	X	X	X
observed and control			X		X	X
Priority score						
observed				X	X	X
observed and = 62						X
Observations	19,193	15,097	15,097	2,579	2,579	1,048

Note:This table shows the results of a regression analysis of childcare use regressed on various outcomes such as maternal employment. Heteroskedasticity robust standard errors are in parentheses. In each analysis, the age of the parents are controlled for in a flexible functional form of cubic functions. Also, the regression controlling for past income uses a flexible functional form of cubic functions. $*p < 0.10$, $**p < 0.05$ and $***p < 0.01$

Table 4: OLS coefficients of childcare use on parental labor market outcomes: Child age = 1

Outcome variables	(1)	(2)	(3)	(4)	(5)	(6)
Mothers in employment	0.636***	0.634***	0.377***	0.238***	0.229***	0.167***
	(0.007)	(0.008)	(0.011)	(0.022)	(0.021)	(0.029)
Mother's salary income (10k JPY)	204.094***	209.723***	119.576***	96.122***	104.603***	65.935***
	(3.665)	(4.186)	(4.179)	(8.993)	(7.263)	(10.211)
Fathers in employment	0.004	0.001	0.025**	-0.007	0.001	0.016*
	(0.005)	(0.005)	(0.006)	(0.0122)	(0.010)	(0.009)
Father's salary income (10k JPY)	-80.533***	-76.862***	-32.807***	-34.188**	-11.768	-0.812
	(7.348)	(8.728)	(5.631)	(15.679)	(7.379)	(10.255)
Past income						
observed		X	X	X	X	X
observed and control			X		X	X
Priority score						
observed				X	X	X
observed and = 62						X
Observations	9,837	7,541	7,541	1,620	1,620	571

Note: Heteroskedasticity-robust standard errors are in parenthesis. This table shows the results of a regression analysis of childcare use regressed on various outcomes such as maternal employment. Heteroskedasticity robust standard errors are in parentheses. In each analysis, the age of the parents are controlled for in a flexible functional form of cubic functions. Also, the regression controlling for past income uses a flexible functional form of cubic functions. $*p < 0.10$, $**p < 0.05$ and $***p < 0.01$

Table 5: First stage estimation results: Coefficients on childcare use

	Child' age = 0	Child's age = 1
Priority score	62	62
	(1)	(2)
Accept in the 1st round	0.534***	0.506***
	(0.035)	(0.041)
F-statistics	234.7	151.0
Observations	1,048	571

Note: This table shows the results of the first stage regression described in Equation (6). Heteroskedasticity robust standard errors are in parentheses. In each analysis, the age of the parents, the previous year's income tax at the time of application and the salary income of the fathers and mothers before childbirth are controlled in a flexible functional form of cubic functions. $*p < 0.10$, $**p < 0.05$ and $***p < 0.01$

Table 6: IV estimates: Child's age = 0 & Priority score = 62

Dependent variables	Mother's emp	Mother's income	Father's emp	Father's income
	(1)	(2)	(3)	(4)
OLS				
Childcare use	0.234***	103.590***	0.005	8.981
	(0.027)	(8.273)	(0.008)	(7.871)
Reduced form				
Accept in the 1st round	0.139***	61.995***	0.007	-3.915
	(0.027)	(9.401)	(0.010)	(8.361)
TSLS				
Childcare use	0.262***	116.982***	0.013	-7.388
	(0.048)	(15.483)	(0.019)	(15.336)
LATE (τ_u)				
Childcare use	0.403***	141.109***	0.112	209.288
	(0.134)	(38.163)	(0.117)	(66.975
Mean	0.984	412.5	0.977	513.3
Observations	1,048	1,048	1,048	1,048

Note: This table shows the results of the second stage regression described in Equation (5) along with OLS and reduced form coefficients. Heteroskedasticity robust standard errors are in parentheses. In each analysis, the age of the parents, the previous year's income tax at the time of application and the salary income of the fathers and mothers before childbirth are controlled in a flexible functional form of cubic functions. We also controlled for the selected lists of childcare choice. $*p < 0.10$, $**p < 0.05$ and $***p < 0.01$

Table 7: IV estimates: Child's age = 1 & Priority score = 62

Dependent variables	Mother's emp (1)	Mother's income (2)	Father's emp (3)	Father's income (4)
OLS				
Childcare use	0.174***	72.384***	0.016*	-1.149
	(0.031)	(10.920)	(0.009)	(10.771)
Reduced form				
Accept in the 1st round	0.109***	42.505***	0.011	5.239
	(0.027)	(9.526)	(0.012)	(11.136)
TSLS				
Childcare use	0.211***	82.292***	0.021	53.333
	(0.048)	(16.980)	(0.022)	(44.984)
LATE (τ_u)				
Childcare use	0.188***	91.090***	0.006	10.143
	(0.054)	(22.879)	(0.020)	(20.398)
Mean	0.982	407.4	0.975	517.8
Observations	571	571	571	571

Note: This table shows the results of the second stage regression described in Equation (5) along with OLS and reduced form coefficients. Heteroskedasticity robust standard errors are in parentheses. In each analysis, the age of the parents, the previous year's income tax at the time of application and the salary income of the fathers and mothers before childbirth are controlled in a flexible functional form of cubic functions. We also controlled for the selected lists of childcare choice. $*p < 0.10$, $**p < 0.05$ and $***p < 0.01$

Table 8: IV estimates using outcome variables one year after application: Child's age = 0 & Priority score = 62

Dependent variables	Results one year after application for childcare center			
	Mother's emp	Mother's income	Father's emp	Father's income
	(1)	(2)	(3)	(4)
OLS				
Childcare use	0.115***	73.186***	0.013	-13.019
	(0.028)	(15.089)	(0.008)	(12.623)
Reduced form				
Accept in the 1st round	0.087***	30.933*	0.013	-22.585*
	(0.029)	(17.016)	(0.009)	(13.353)
TSLS				
Childcare use	0.163***	57.786*	0.024	-42.192*
	(0.051)	(29.546)	(0.016)	(23,647)
LATE (τ_u)				
Childcare use	0.189**	45.012	-0.001	-105.587
	(0.085)	(45.322)	(0.014)	(91.038)
Observations	525	525	525	525

Note: This table shows the results of the second stage regression described in Equation (5) along with OLS and reduced form coefficients. Heteroskedasticity robust standard errors are in parentheses. In each analysis, the age of the parents, the previous year's income tax at the time of application and the salary income of the fathers and mothers before childbirth are controlled in a flexible functional form of cubic functions. We also controlled for the selected lists of childcare choice. $*p < 0.10$, $**p < 0.05$ and $***p < 0.01$

Appendix

A Figures

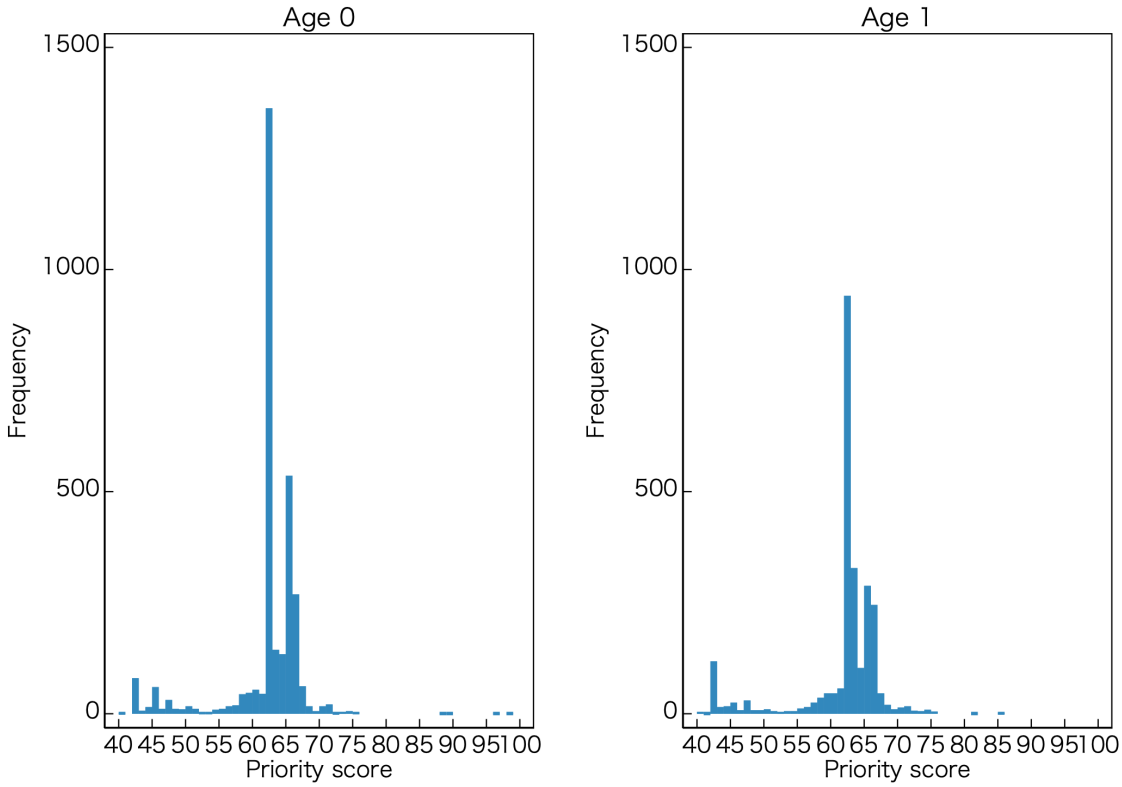


Figure A1: Distribution of priority score

Note: This figure presents histograms of priority score by ages at the application. The sample used is households with a zero-year-old child in 2016-2017 or with a one-year-old child in 2017 that applied for accredited childcare centers.

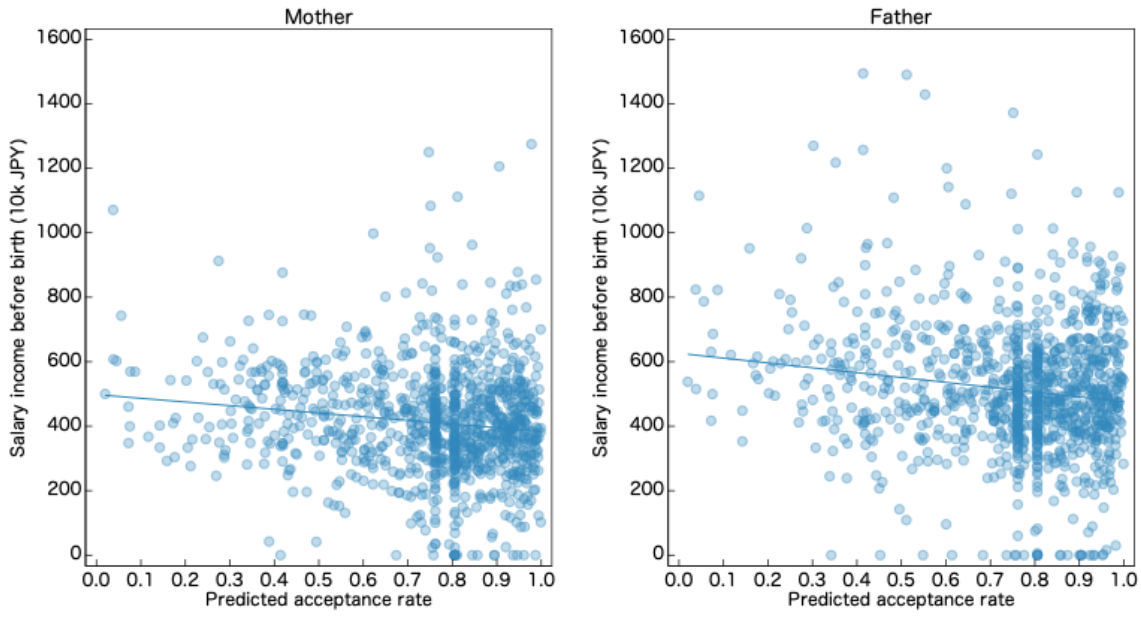
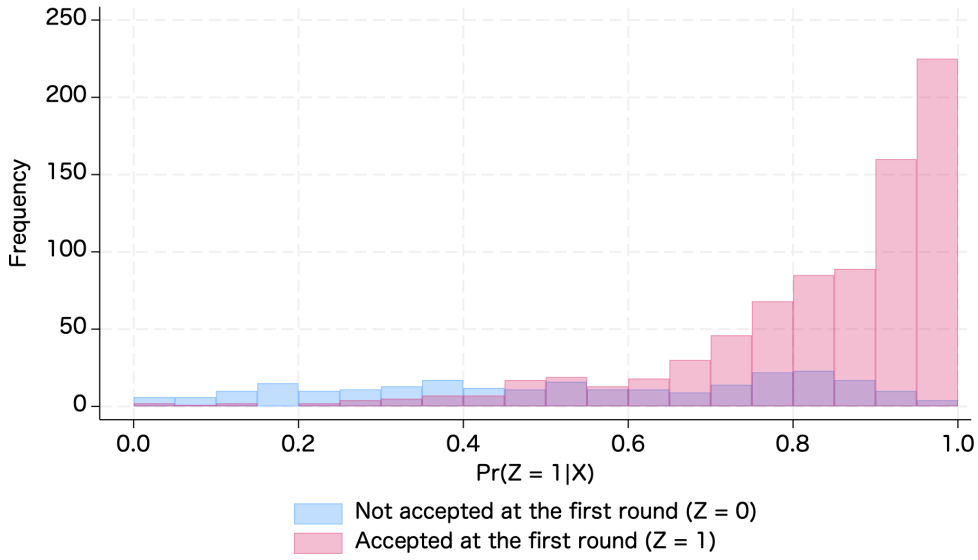
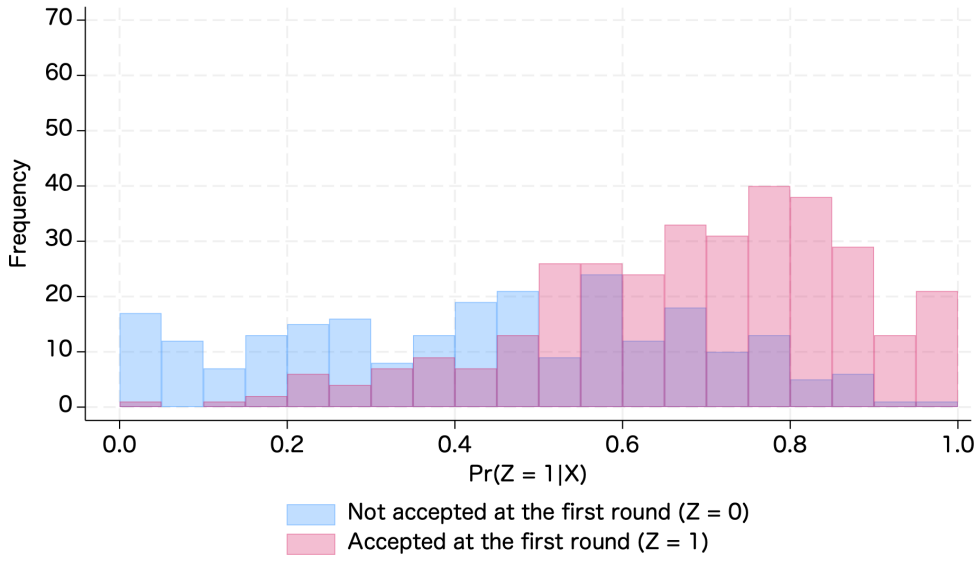


Figure A2: Correlation between income and predicted acceptance rate: Child age = 0 & Priority score = 62

Note: This figure provides correlations between predicted acceptance rates and past incomes of parents. The sample used is households with a zero-year-old child in 2016-2017. We restricted our sample to households with priority score = 62.



(a) Age 0



(b) Age 1

Figure A3: Distribution of predicted acceptance rate by the instrument variable

Note: This figure illustrates the distribution of the predicted acceptance rates by the first-round acceptance status, our instrumental variable. The sample used is households with a zero-year-old child in 2016-2017 or with a one-year-old child in 2017 that applied for accredited childcare centers. We restricted our sample to households with priority score = 62.

B Tables

Table B1: Percentage of Parents Who Lived in the City in the Past Three Years by Age of Child

		Percentage by year		
Age of child in April 2018	Obs.	2017	2016	2015
0	7,594	84.4	67.8	53.0
1	10,414	90.6	76.1	62.0
2	10,917	92.9	84.2	71.3

Note: This table shows, for each child's age as of April 2018, the percentage of the household that lived in the city under analysis between 2015 and 2017. Note that the unit of observation of this table is children rather than households, while the unit of observation in other tables and figures are households.

Table B2: Specification checks for IV estimates: Child's age = 0

Outcome variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Mothers in employment	0.284***	0.275***	0.271***	0.262***	0.401***	0.403***	0.332***	0.390***
	(0.047)	(0.048)	(0.047)	(0.048)	(0.137)	(0.137)	(0.090)	(0.113)
Mother's salary income (10k JPY)	120.482***	117.108***	122.035***	116.982***	166.575***	141.109***	132.486***	96.641***
	(15.290)	(15.143)	(15.742)	(15.483)	(50.198)	(38.163)	(30.662)	(31.293)
Fathers in employment	0.047*	0.018	0.034	0.013	0.123	0.112	0.077	0.063
	(0.024)	(0.022)	(0.021)	(0.019)	(0.127)	(0.117)	(0.055)	(0.061)
Father's salary income (10k JPY)	-0.514	-2.285	-5.765	-7.388	50.421	29.288	-53.08	-48.946
	(16.641)	(16.732)	(15.519)	(15.336)	(80.370)	(66.975)	(40.387)	(51.108)
Method	TSLS	TSLS	TSLS	TSLS	τ_u	τ_u	TSLS	TSLS
Specification	linear	cubic	liner	cubic	linear	cubic	linear	cubic
Trimming	No	No	No	No	No	No	Yes	Yes
Childcare choice	Full	Full	Selected	Selected	Selected	Selected	Selected	Selected
Obs.	1,048	1,048	1,048	1,048	1,048	1,048	342	342

Note: Heteroskedasticity robust standard errors are in parentheses. In each analysis, the age of the parents, the previous year's income tax at the time of application and the salary income of the fathers and mothers before childbirth are controlled in a linear or a flexible functional form of cubic functions. We also controlled for the full or selected lists of childcare choice. $*p < 0.10$, $**p < 0.05$ and $***p < 0.01$ $*p < 0.10$, $**p < 0.05$ and $***p < 0.01$

Table B3: Specification checks for IV estimates: Child's age = 1

Outcome variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Mothers in employment	0.204***	0.184***	0.223***	0.211***	0.221***	0.188***	0.202***	0.181***
	(0.059)	(0.059)	(0.048)	(0.048)	(0.063)	(0.054)	(0.063)	(0.063)
Mother's salary income (10k JPY)	56.649**	51.173**	80.692***	82.292***	88.546***	91.090***	57.352**	68.774**
	(23.196)	(22.961)	(17.310)	(23.394)	(27.148)	(22.879)	(23.394)	(24.112)
Fathers in employment	0.062*	0.049	0.018	0.021	0.030	0.005	0.012	-0.012
	(0.033)	(0.030)	(0.025)	(0.022)	(0.032)	(0.020)	(0.045)	(0.035)
Father's salary income (10k JPY)	26.179	40.801	-2.863	10.143	212.682	54.334	-7.857	-4.860
	(26.616)	(25.485)	(22.071)	(20.398)	(338.986)	(44.984)	(29.872)	(27.858)
Method	TSLS	TSLS	TSLS	TSLS	τ_u	τ_u	TSLS	TSLS
Specification	linear	cubic	liner	cubic	linear	cubic	linear	cubic
Trimming	No	No	No	No	No	No	Yes	Yes
Childcare choice	Full	Full	Selected	Selected	Selected	Selected	Selected	Selected
Obs.	571	571	571	571	571	571	356	356

Note:Heteroskedasticity robust standard errors are in parentheses. In each analysis, the age of the parents, the previous year's income tax at the time of application and the salary income of the fathers and mothers before childbirth are controlled in a linear or a flexible functional form of cubic functions. We also controlled for the full or selected lists of childcare choice. $*p < 0.10$, $**p < 0.05$ and $***p < 0.01$ $*p < 0.10$, $**p < 0.05$ and $***p < 0.01$

C Calculation of Priority Score

The priority score is a sum of the following points.

1. Each parent's status (separate points for mother and father)
   (a) Employed: sum of basic points based on working hours and bonus points
      - Basic points based on working hours per day: 20 points if 8h or more, 19 if 7-8h, 18 if 6-7h, 17 if 5-6h, 16 if 4-5h, 15 if less than 4h, 15 if expected to be employed, 16 if piece work done at home.
      - Bonus points: 3 if works 5 or more days per week, 1 if works 5 or more days per week and 8 or more hours per day, 2 if working out of home

   (b) Unemployed searching for a job or preparing for own business
      - Basic points: 10
      - Bonus points: 5 if involuntary job loss, 3 if bread earner

   (c) Expectant mother: 33

   (d) Disease
      - Basic points: 20
      - Bonus points: 13 if hospitalized, 13 if designated intractable disease or bedridden, 6 others

   (e) Disability
      - Basic points: 20
      - Bonus points: 13 if physical disability rank 1 or 2, 10 if physical disability rank 3, 6 if other physical disability, 13 if mental disability rank 1, 10 if mental disability rank 2, 6 if mental disability rank 6, 13 if intellectual disability A or B, 10 if intellectual disability C

   (f) Caregiving for a sick person
      - Basic points: 20
      - Bonus points: 10 if caring for a bedridden relative, 10 if taking the person to hospital for five or more days per week, 8 if four days, 4 others

   (g) Caregiving for elderly
      - Basic points: 20 (18 if using service covered by Long-term Care Insurance three days or more per week)
      - Bonus points: 10 if nursing care level 3-5, 8 if nursing care level 2, 4 if nursing care level 1

   (h) Victims of natural disaster: 50

   (i) Student
      - Basic points: 18 if already in school, 11 if planning to go to school
      - Bous points 4 if undergoing vocational training

   (j) Not living in the same house: 24, bonus point 20 if in process of divorce or in detention

   (k) Non-existing (divorced or dead): 60

2. Additional points depending on who is taking care of the child now
   - Other accredited childcare centers 5
   - Kindergarten, babysitters or privately operated childcare service, or nursery room operated by the employer: 7
   - Orphanage etc.: 15

- By parents, at home: 2
- By parents, out of home: 3
- A parent is on parental leave: 6
- Older siblings who have withdrawn from accredited childcare centers because the mother has taken maternity leave: 11
- By grandparents or other relatives: 3
- By friends or other non-relatives: 4
- At workplace: 5

3. Additional bonus points
   - Users of a certain kind of childcare service for children younger than three who must leave because of the age limit: 5
   - Moving because of relocation, switching to the same center as other siblings, etc.: 2
   - Welfare recipient: 5
   - One of the parents is living apart temporarily due to job transfer: 4
   - Siblings bonus
     - Disabled: 3
     - Preschool: 3 if applying for the same center, 2 if not
     - No preschool siblings, but at least one sibling in 1st-4th grade of elementary school: 1
     - 1 point per additional siblings exceeding 3
   - For each grandparent, 1 if unavailable owing to work or not living together

Example: The father is working full-time, the mother is on maternal leave and returning to full-time work from April, an only child in the family, and no grandparent lives with them.

1. Each parent's status (separate points for mother and father): 52
   - Father's points: 26
     - Basic points based on working hours per day: 20 points,
     - Bonus points: 3 if works 5 or more days per week, +1 if works 5 or more days per week and 8 or more hours per day, +2 if working out of home
   - Mother's points: 26
     - Basic points based on working hours per day 20pt,
     - Bonus points: 3 if works 5 or more days per week, +1 if works 5 or more days per week and 8 or more hours per day, +2 if working out of home
2. Additional points depending on who is taking care of the child now: 6
   - A parent is on parental leave 6
3. Additional bonus points: 4
   - For each grandparent, +1 if unavailable due to work or not living together * 4

⇒ **Total 62 points (= 52 + 6 + 4)**