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A childcare support policy was implemented as part of gender equality and countermeasures to the falling birthrate in Japan. One of the childcare support policies was provided preschool service free of charge in October 2019.

In this paper, we analyze whether this childcare cost reduction policy was effective or not. Especially, we focus on whether this childcare support policy contribute to accelerate female labor force participation or not. As a result of our analysis, we show childcare cost reduction policy is ineffective of female labor force participation.

Keywords

EBPM, causal inference, female labor force participation

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A childcare support policy was implemented as part of gender equality and countermeasures to the falling birthrate in Japan. One of the childcare support policies was provided preschool service free of charge in October 2019.

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JEL Classification: *J08, J13, H44,*

1. Introduction

In Japan, where the birthrate is steadily decreasing, childcare support has become a major issue. In October 2019, the consumption tax rate was increased from 8% to 10%, and a portion of the additional revenue was allocated to implement a policy that waived fees for childcare services such as nursery schools and kindergartens for preschool children aged three and above. This policy, hereinafter referred to as the "Free Childcare Policy[2]" was designed to alleviate the burden on women whose labor supply is limited by childcare responsibilities, thereby fostering an environment conducive to entrusting their children to these institutions. In response to the challenges associated with the allocation of time for childcare, the government has primarily adopted two policy approaches. The first approach is to expand access to childcare services, which is intended to substitute parental care with professional childcare services, thereby freeing up mothers' time spent on childcare. The second approach is to subsidize either a portion or the entirety of the fees paid for childcare services.

Research on the correlation between the expansion of access to childcare services and the supply of female labor has yielded different findings. Goux and Maurin (2010) demonstrated that in France,

1 This study is supported by Chuo University Joint Research Grant.
2 The child and childcare support act went into effect 2019 in Japan. This law was designed for the purpose of support for preschool children and parents, was seen to free of charge for preschool childhood education and care as a means of support policy. We call a series of policies "Free Childcare Policy".
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the expansion of access to childcare services for children aged 2-3 years led to an increase in the labor supply from families with a single earner. Similarly, Nollenberger and Rodriguez-Planas (2015) observed that in Spain, a country characterized by low female employment rates, offering public childcare services increased maternal employment rates. By contrast, the findings presented by Fitzpatric (2010) as well as Havnes and Mogstad (2011) indicated that the expansion of access to public childcare services in the United States and Norway did not yield an increase in maternal employment. They posited that this phenomenon could be attributed to the substitution of informal childcare services, such as babysitting, with public childcare services, which did not significantly affect labor force participation decisions. In Japan, this issue has garnered significant attention, leading to numerous studies investigating the potential of expanding access to childcare services as a catalyst for women's employment. Unayama and Yamamoto (2015) noted that while the expansion of access to childcare services positively influences both the rate of women's labor force participation and the total fertility rate, the impact is somewhat limited and falls short of providing a comprehensive solution to the declining birthrate issue. Furthermore, Asai, Kambayashi, and Yamaguchi (2016) demonstrated that although there exists a positive correlation between expanding access to childcare services and women's employment rate, when the percentage of nuclear families was used as a manipulated variable, it was revealed that informal childcare services were contributing to an increase in woman's employment rate. This suggests that enhancing public childcare services does not necessarily guarantee an increase in women's employment rate.

The correlation between childcare expenses and labor supply has long been a subject of research. It has been traditionally postulated that higher childcare fees act as a deterrent to women's employment (for instance, see Connelly (1992), Kimmel (1995)). In contrast, Brink, Nordblom, and Wahlberg (2007) demonstrated that reduced childcare fees in Sweden exerted minimal impact on the labor supply of women. Similarly, in the United States, Blau and Tekin (2007) showed that while the overall impact was negligible, there was a slight effect on the employment of mothers in the low-income bracket. Lefebvre and Merrigan (2008) analyzed the impact of Canada's dual approach of concurrently reducing childcare fees and expanding access to childcare services. Their findings indicated an impact on middle-income families but not on the low-income ones. The lack of impact on the low-income families was attributed to the pre-existing assistance measures and subsidies they were utilizing from prior to the implementation of this policy, rendering them largely unaffected by it. Furthermore, Gathmann and Sass (2018) examined the impact of subsidy policies targeted at households who do not utilize public childcare on women's labor supply. Their findings revealed a minimal impact on the labor supply. Thus, it becomes evident that a reduction in childcare fees does not necessarily translate into a straightforward increase in women's labor supply.

Despite the varying impacts of reducing childcare fees, substantial budgets are being allocated towards this measure. The demand for Evidence-Based Policy Making (EBPM) is increasing, particularly in budget assessments, underscoring the growing importance of research that elucidates causal relationships. However, there is a noticeable lack of research on the policy effects of childcare support measures. This paper aims to fill this gap by examining whether the Free Childcare Policy has boosted women's willingness to work, thereby assessing the presence or absence of policy effects intended to stimulate women's employment.

2. Data extraction and survey

The 2019 Free Childcare Policy was applicable to all children aged between 3 and 5 who were enrolled in kindergartens, licensed nursery schools, and certified centers for early childhood education. To infer the causal relationships pertaining to the policy impact, we adopt the following strategy for data extraction.

First, we define the group that reaps the benefits of the Free Childcare Policy as the treatment group. The challenge lies in establishing a control group. There are primarily two subgroups within the group that does not benefit from the policy. These include the subgroup that will not (or is highly unlikely to) receive benefits in the future, and the subgroup that may potentially receive benefits in the future. Given that the Free Childcare Policy is targeted at preschoolers aged between 3 and 5, it is highly probable that preschoolers aged between 0 and 5 will benefit from this policy in the future. Furthermore, both married individuals without children and unmarried individuals stand a chance to benefit from this policy in the future.

Based on the outlined strategy, an online survey was conducted from May 14 to 18, 2022, targeting the registered participants of RJC Research, Inc., yielding responses from 2,100 individuals. The survey employed a questionnaire similar to that used in the study by Kawasaki and Kamada (2023).

The survey focused on women aged between 18 and 47 residing in Tokyo, excluding island areas. This was to control for policy variations across different residential areas, given that policies implemented by the Tokyo Metropolitan Government, such as the provision of free pediatric healthcare irrespective of income levels, are implemented uniformly across Tokyo. Furthermore, given that this was an online survey, data was collected in a manner that reflects the population distribution across municipalities, thereby preventing any bias towards specific municipalities. By selecting groups with closely aligned attributes, considerations were made for potential sample selection bias. It is noteworthy that while the survey was conducted amidst the restrictions imposed due to the COVID-19 pandemic, this factor is applicable to all households and hence does not influence the measurement of policy impact assessment.

The collected data was used to classify households into the treatment and control groups. The treatment group comprised households that were beneficiaries of the Free Childcare Policy. More specifically, this group included households with preschool children aged between 3 and 6 who were enrolled in an eligible institution. The control group, on the other hand, consisted of households that did not benefit from the Free Childcare Policy. This group can be further divided into several subgroups. The first subgroup, denoted as I, includes households that are less likely to benefit in the future. These are households where the youngest child is of elementary school age or older and the mother is 40 years or older. The next subgroup, denoted as II, includes households that are likely to benefit in the future. This subgroup can be further divided into several subsets. The first subset, denoted as II-(1), includes married households without children where the mother is under 40 years old. This subset is highly likely to reap the benefits of the Free Childcare Policy in the future. The second subset, denoted as II-(2), comprises single individuals under the age of 30. This subset represents individuals who are likely to marry and have children in the future, which makes it an important group in terms of observing potential behavioral changes induced by the Free Childcare Policy. The third subset includes households with preschool children aged between 0 and 2. This, denoted as III, group is most likely to benefit significantly from the Free Childcare Policy in the near future. Thus, we have classified the households, with consideration given to the potential future eligibility of those that are not currently covered the Free Childcare Policy.

3. Data distribution and analysis results

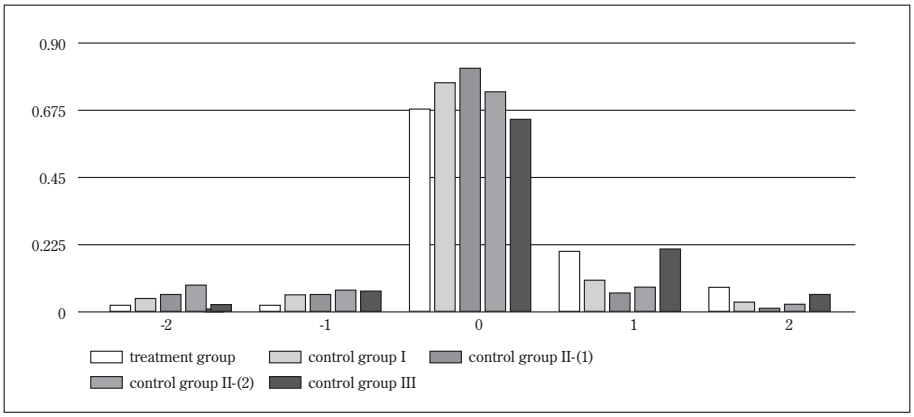
Given that the data for this study were gathered through a questionnaire-based survey, the scope of possible responses was inherently limited. We sought to ascertain whether the Free Childcare Policy influenced respondents' willingness to work, employing a five-point scale as follows:

How has the Free Childcare Policy impacted your motivation to work? (Please select one answer.)

1. Increased sifnificantly
2. Somewhat increased
3. Remained unchanged
4. Somewhat decreased
5.Decreased sifnificantly

The survey responses were scored based on the scale of +2 for "increased," +1 for "somewhat increased," 0 for "remained unchanged," -1 for "somewhat decreased," and -2 for "decreased." This data X was then subjected to statistical testing; the distribution of the data is shown in Figure 1.

Figure 1. Motivation for work



Statistical testing was conducted using a straightforward and basic approach. First, we examined whether the mean is zero, which would indicate the presence of statistical sifnificant policy impact. Specifically, the mean is denoted as "μ," the standard deviation as "s," and the sample size as "n." The hypothesis under scrutiny is as follows:

$$H_0 : \mu = 0, H_1 : \mu > 0$$

The t-values were derived as follows, which were then used to conduct a hypothesis test.

$$t = \frac{\bar{X}}{\frac{s}{\sqrt{n}}}$$

Here, "s" denotes the standard deviation of the sample, while $\bar{X}$ represents the mean of the sample.

Based on this conceptual framework, the presence or absence of policy impact was examined using the collected data. The question of whether the Free Childcare Policy increased willingness to work among women in the treatment group was addressed by conducting t-tests for both the treatment and control groups. The results of these tests are presented in Table 1.

Table 1. the result to policy impact test

	t-value
treatment group	5.816
control group Ⅰ	0.464
control group Ⅱ-(1)	-1.978
control group Ⅱ-(2)	-2.658
control group Ⅲ	3.741

The null hypothesis, which posits a mean of zero across all groups except control group 1 at a significance level of 5%, were rejected. This suggests that the implementation of Free Childcare Policy had a positive impact on the treatment group willingness to work. What is interesting for us is that ensuring groups benefit from the Free Childcare Policy at present or near future show positive response, though a group of single individuals or no child family show negative response.

Subsequently, we scrutinized the presence of a statistical significant difference between the means, in order to examine causality. More specifically, we tested the null hypothesis that posits no difference, i.e., a difference of zero, between the means of the treatment and control groups. Here, "μ_1" represents the mean of the treatment group, while "μ_2" stands for the mean of the control group.

$$H_0 : \mu_1 = \mu_2$$
$$H_1 : \mu_1 > \mu_2$$

Let the treatment group be denoted as 1 and the control group as 2. The sample sizes for each group are represented by "n_1" and " n_2," while the sample means are denoted by $\bar{X}_1$ and $\bar{X}_2$, respectively. Furthermore, the sample standard deviations are represented by "s_1" and "s_2." The corresponding t-value is derived as follows.

$$t = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}}$$

If the null hypothesis is rejected in both of these hypothesis tests, it can be inferred that the policy is not only effective but also conducive to boosting employment. The results of the test examining the presence of disparity between the treatment and control groups, based on the data from this survey, are presented in Table 2.

Table 2. Test of significant difference from treatment group

	mean	variance	the number of observation	degree of freedom	t-value	p-value
treatment group	0.302	0.535	199			
control group Ⅰ	0.025	0.456	163	360	3.710	0.000 ***
control group Ⅱ-(1)	-0.087	0.379	195	392	5.702	0.000 ***
control group Ⅱ-(2)	-0.118	0.586	296	493	6.089	0.000 ***
control group Ⅲ	0.209	0.553	177	374	1.214	0.225

***p<0.001 **p<0.01 *p<0.05

In the comparison between the treatment group that benefits from the Free Childcare Policy and the control group, a significant difference was established with no beneficiary or uncertain groups. On the other hand, there is not difference with ensuring beneficiary group. As a result of these analysis, we could find the Free Childcare Policy is effective for households with small children. But it is not effective for no beneficiary or uncertain groups. In this sense, we evaluate childcare cost reduction policy is limited effect of female labor force participation.

4. Conclusions

The Free Childcare Policy, implemented using the financial resources accrued from the consumption tax increase, aims to alleviate childcare expenses. However, its impact on women's employment decisions remains unclear, both theoretically and empirically, as evidenced by prior studies. In this study, we employed causal inference techniques to statistically ascertain the presence or absence of the impact. Our analysis revealed that reducing childcare fees influence women with small children employment decisions. This finding aligns definitely with the findings presented by Connelly, R.,(1992), as well as with those reported by Kimmel, J.,(1995). Notably, observable differences were discerned between the group with a high likelihood and those with a low likelihood of benefiting from the policy. Therefore, we can suppose the possibility that the Free Childcare Policy may enhance the employment aspirations of households with small children.

Given that this analysis is based on a cross-sectional survey, it precludes the possibility of conducting a difference-in-difference analysis. Furthermore, there will be households that will reap the benefits of the Free Childcare Policy over the course of the next three years. These households will constitute a group that has been extensively impacted by the Free Childcare Policy, thereby enabling potential analysis of differences with the findings of the present study. These considerations present avenues for future research endeavors.

The findings of this survey might lead to the conclusion that the policy is effective. Without evidence-based policy debates, there is a risk of substantial funds being allocated to areas that yield negligible impact. Therefore, we posit that there is a growing need for research of this nature.

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