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Waitlisted!

A policy analysis on childcare reform and its effect on the female labour force

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Abstract

The municipality Yokohama in Japan implemented a new child care reform in 2010, which in 2013 managed to eradicate the long child care waiting list in the area. This paper focuses on how an increase in child care supply has affected the female labour force in the region Kanto, of which Yokohama is a part. We also focus on how the number of children enrolled in day cares in the prefecture Kanagawa, of which Yokohama is a part, is affected by the policy. To identify the impact of the child care reform, we use a difference-in-difference method that compares the female labour force in Kanto and the rest of Japan during the years before and after the policy was implemented. We also compare the number of children enrolled in day cares in Kanagawa with the rest of Japan during the same period. Our results show that the female labour force in Kanto has increased by 7% and the number of children enrolled in childcare has increased in Kanagawa by 10%. Due to data limitations we cannot be sure that the increase is solely due to the policy in Yokohama. However, as these increases have occurred during the same time frame, it is possible to draw the conclusion that the policy has had a positive effect in the area.

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1. Introduction

In many developed countries it's not unusual to see full time working mothers drop off their children at day care centres. However, this is seen much less frequently in Japan. In Japan women are quitting their jobs to tend to their children to a larger extent than in any other OECD-country. The lack of child care, strong social norms and other obstacles that discourage women from working have led to Japan's low female labour force participation (FLF) [1]. This has become a pressing issue since Japan's economy is suffering due to an increasing aging population that can no longer be sustained by the working population. (See figure 1 & 2 in Appendix). The population is aging throughout developed countries but with Japan's low population growth rate of -0.2 % per year as of 2013 the aging process is occurring much more rapidly in Japan. In 2010 23% of the Japanese population was over 65 years old, as compared to 13% in the U.S and 18% in Sweden.[2] This, in combination with the low population growth, creates a strained relationship between the labour force and the ageing population.[3]

Both academic researchers and policy makers agree that one way to handle this problem is by increasing the female labour force participation. Japan has a history of low FLF compared to other OECD countries.[4] Today Japan has the second lowest FLF (60% in 2010) in all of the OECD countries and is only outranked by Korea. Moreover, the Japanese female FLF is 25% lower than the male labour force participation. These figures indicate that Japan has a valuable resource in the form of women that can be utilized to help the labour force. It's estimated that if Japan raises the level of FLF to match the level of the other G7 nations[5] the GDP would permanently increase by 4%. If the increase in FLF reaches the same level as the Scandinavian countries, which are known to have a high FLF, the Japanese GDP would increase by 4%.[6] In 2012 the Prime Minister, Shinzo Abe, presented a new strategy to enable women to more easily participate in the labour force. An important part of this strategy was to increase the supply of child care. In 2012 60 % of women quit their jobs after giving birth to their first child[7], and due to lack of solid policies many women in Japan have found it hard to

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[1] Female labour force is employed and unemployed women aged 15 and over.
[2] Matsui, Suzuki, Akiba, Tatebe (2010), *Womenomics 3.0 the time is now*
[3] OECD http://data.oecd.org/japan.htm
[4] OECD raised distribution mean of FLF from 61,2% to 76,9% in 1985-2005 while Japan increased 60,3% to 68,8% at a slower rate.
[5] The members of the G7 countries are France, Italy, Japan, Canada, Great Britain, Germany, USA
[6] The difference is below 6% in the northern European countries according to Steinberg, Chad & Nakane (2012)
[7] Steinberg, Chad & Nakane, Masato, p.20

balance work and family life. Barriers such as a discouraging tax system, wage gaps[8] and demanding corporate culture that require lifelong commitment are also making it difficult for women to work. However, the issue of finding caretakers for children is regarded as one of the biggest obstacles for working mothers. The demand for day care is exceeding the supply, creating notorious waiting lists for public day care that have been steadily increasing along with the growing FLF. Many mothers who are seeking to find day care are dependent on extended family as an alternative to public care takers. Others face the alternative of placing their children in non-subsidized day care centres which, for many, are too expensive.

In this paper we investigate whether an increase in the supply of places in day care centres has had any (short-term) implications on women's decisions to work. Our focus area is the municipality of Yokohama which is located in the prefecture of Kanagawa and in the region of Kanto. We will analyse this effect using a Difference-in-Difference strategy, where we compare FLF and/or childcare in Kanto and Kanagawa with the rest of Japan before and after the policy was implemented in Yokohama. In particular, our paper aims to answer the following questions:

- Has the female labour force increased in Kanto due to Yokohama's policy to eradicate the child care waiting list?
- Did the number of children enrolled in childcare increase in Kanto or Kanagawa when the waiting list was reduced in Yokohama?

In order to carry out our analysis we've compiled our own dataset at the prefecture and regional level from different data sources. Our main findings suggest that the female labour force in Kanto has increased by 7% after the policy was implemented and that the number of children enrolled in childcare in Kanagawa prefecture has increased by 10%. Yet, because of data limitations we need to be cautious when interpreting these results as entirely driven by the policy. These are presented in more detail later on in the essay.

The second section of this paper is the Conceptual Framework where the day care system in Japan and the reform in the Yokohama area are more thoroughly described. We also present a literature review that sums up previous literature and research in the relevant areas. In section 3 the data sources as well as the variables are discussed. Section 4 presents the empirical strategy and in section 5 the results from the analysis are presented. Lastly, in section 6 the concluding remarks are presented in our conclusion.

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[8] Women in Japan earn 28.3% less than men

2. Conceptual Framework

2.1 Childcare in Japan

The demand for child care in Japan has been increasing gradually along with the growing FLF. The main issue is the lack of available day care centres for children between 0 to 5 years old. According to The Ministry of Health, Labour and Welfare the enrolment waiting list was 25,556 children for 2011 and has steadily been increasing to 44,118 children in 2013.

The public day cares are subsided by the government making them affordable for many Japanese families. Day care centres offer full day services for children between 0 to 6 years old. Kindergartens, on the other hand, are only open part of the day for children between 3 to 6 years old. The highest demand and the main issue are day care centres for children between 0 to 5 years old. This is the result of an increase in households where both parents are working and are in need of full day services.[9] This is also a reason why the kindergartens, with short opening hours, are still underutilized.

Day care policies are decided on municipality level and to qualify as a candidate to day care varies depending on which municipality you are part of. As the demand for public day care centres increases, the spots are more strictly allocated. In many areas such as Tokyo, however, public day care centres' spots are assessed based on a point-based system where the local authorities divide the few spots according to those with the greatest need of child care. Families who received the highest points, therefore, have the biggest chance of placing their children in day care services. The division of points is based on criteria such as parents' working hours, distance to grandparents, one parent household or whether the parents are still studying or have any disabilities.[10] Many families are classified as in great need of day care but due to the lack of spots; these families are placed on waiting lists. The cost of public day care services is adjusted to the family income, making it more accessible for low income families.

The government has made many attempts to meet the increasing demand for child care. The Angel Plan and the New Angel plan which were implemented in 1994 and 1997 introduced a wider range of child care services and also allowed for parents, instead of the local government, to choose which day care centre to place their children in. Until 2000 the

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[9] Steingberg, Chad & Nakane, Masato
[10] Tabuchi Hiroko (2013) *"Desperate Hunt for Day Care in Japan"* The New York Times
http://www.nytimes.com/2013/02/27/world/asia/japans-mothers-in-hokatsu-hunt-for-day-care.html?pagewanted=all&_r=0

industry was entirely under government control but with the increasing demand, the government started a deregulation of the market, which allowed privatised contributors to either manage publicly funded facilities or to establish entirely private day care centres. The deregulation also granted the local government more autonomy with child care decision making.[11] The most recent policy that has been introduced by the Japanese government is the "Plan to Accelerate the Elimination of Childcare Waiting List". The main purpose of the policy is to increase the capacity of nurseries so that 400,000 more children will be able to attend day care services by the year 2017.[12]

The biggest problem with the Japanese childcare market is that the market is not responding to demand. As many families are not able to enrol their children in day care centres, they are forced to do a trade-off between domestic work and the labour market. This usually means that in most cases the women have to stay at home.

The lack of government funding of public day care centres is contributing to the lack of child care. The share of the Japanese GDP that goes to child care is one of the lowest compared to other wealthy countries. In 2009 Japan spent only 1.48% of its GDP on child care and other family benefits while the U.K and France, both countries belonging to the highest family expenditures, spent 4.22% and 3.98% respectively.[13] Although the government has subsidized public day care making child care affordable, many private organizations are struggling to compete with the already very low market prices. For many families non-subsidized day care is not an option. [14]

The actual goal of eliminating the waiting list has also become an issue. Local authorities' definitions of the number of children in child care waiting lists differ. In many cases parents who want to enrol their children in day care but are unable to do so are not defined as being on the waiting list. Therefore many authorities are prone to define the waiting list in a more attractive way for the local government. Officially the waiting list for day care services is more than 44,000 children, but this number is not considering parents who have given up on enrolling their children. Many believe that the actual number is between 600,000 to 850,000 children.[15] Another issue is that the number of children on the waiting list might not reflect

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[11] JETRO, 2005, *Child Day Care Industry*
[12] Unayama, Takashi(2013), *"Validity of Zero Children on the waiting lists a policy"*
[13] OECD, *Public spending on family benefits in cash, services and tax measures, in per cent of GDP in 2009*
[14] Kato, M (2009) " Government day care falling short,"
[15] Funkakoshi, Minami (2013), *" Japan cries out for Daycare"*

the day care centres' capacity. If the possibility of enrolling your child in a day care is high, then more parents will want to enrol their children and therefore increase the waiting list. [16]

2.2 The Policy Implemented in Yokohama

In 2010 Yokohama had the highest number of children on waiting lists for day care centres in all of Japan.[17] But within three years the waiting list of 1552 children was eradicated.[18] The mayor of Yokohama, Fumiko Hayashi, had a reform of day care in mind for the budget of 2010. [19] Her "personal mission" was to get working mothers back in to the labour force.[20] Since then Hayashi has managed to increase the number of government-run day cares. But the majority of the increase in day care centres has either been from privately owned day care centres or from non-profit organizations and social welfare organizations.[21] Yokohama's new policies are to allow for private companies to enter the market and to extend the opening hours to meet the needs of working mothers.[22] Simply put, the mayor of Yokohama has met the child care demand by increasing the available options to accommodate working mothers and their needs.

The new day care centres are often located in non-conventional places in order to best accommodate the modern family. For example there are many day care centres located nearby or directly below freeways and subway stations. Due to lack of space and funding many centres utilize old shop-spaces and office buildings. The local government also cooperated with private companies to find available space. These more accessible locations meet the working mothers' needs to conveniently drop off their child on their way to work. Some day cares even offer a pick-up service where children are picked up by the day care staff at certain bus-stops. Yokohama also introduced "day care concierges" services. The staff help explain

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[16] Unayama, Takashi

[17] Cabinet Public Relations Office, Cabinet Secretariat, "*Speech on Growth Strategy by Prime Minister Shinzo Abe at the Japan National Press Club*" http://japan.kantei.go.jp/96_abe/statement/201304/19speech_e.html

[18] The Japan Times, "*Yokohama clears out nursery waiting lists*", http://www.japantimes.co.jp/news/2013/05/21/national/yokohama-clears-out-nursery-waiting-lists/#.U8P98vl_v4d

[19] Metropolis magazine, advertising special for Yokohama, "*Fumiko Hayashi, the mayor of Yokohama has her eye on the future*" http://metropolis.co.jp/specials/839/839_top.htm

[20] Wilson, Fiona. "*Taking Care – Yokohama*", The Monocle http://monocle.com/magazine/issues/70/taking-care/

[21] Maruko, Mami. "*Yokohama day care centers scramble to keep kids off waiting lists*", The Japan Times http://www.japantimes.co.jp/news/2013/06/18/national/day-care-centers-scramble-to-keep-yokohama-kids-off-lists/#.U8P8Yfl_v4d

[22] Maruko, Mami. The Japan times, http://www.japantimes.co.jp/news/2013/06/18/national/social-issues/day-care-centers-scramble-to-keep-yokohama-kids-off-lists/#.U844wfl_v4c

the different options to parents and together with them choose the day care that meets the needs of that specific family. [23]

The most recent numbers from 2014 have shown that although Yokohama had zero children on their waiting lists in 2013, the municipality hasn't been able to maintain this number. This is due to the increased demand for spots in day care centres that was brought on by the child care reform.[24] The initial number of children on the official waitlist was underestimated and this is seen in the rise in demand. The more that children are accommodated, the more families see day care as a real option. However, this thesis focuses on the years 2010-2013 when the waitlist amounted to zero so we won't elaborate on the increase in 2014 any further. The success of Yokohama to eradicate the waiting list within three years from 2010 has been acknowledged by the prime minister of Japan. He has spoken of the "Yokohama-method" as something to inspire the rest of Japan.[25]

2.3 Literature Review

The fact that FLF varies across regions and countries has many different explanations but one important factor is childcare. Childcare in connection to FLF is the focus of this thesis and here we present a summation of literature on the subject.

One assumption we need to stipulate is that we've made the assumption that a mother would work if child care was available. The waiting list for day care centres is therefore a barrier for women to work. This generalization is of course not always true as some working mothers would not use day care even if it was available, as Lokshin & Fong (2006) has established in research regarding mothers in Romania.

About 60% of mothers in Japan leave the labour force when they have a child and don't return until this child is independent, according to Steingberg, Chad, Nakane & Masato (2012). In an article in The Economist "*holding back half the nation*" (2014) they show that the FLF manifests the shape of an "M-curve" where there is a dip when women leave the labour force to tend to their children and then a rise when they return to the labour force. The lack of available childcare is one of the reasons that women leave the labour force in their childrearing years. When the waiting lists are long, the responsibility of child care is also resumed by the mother, as discussed by Matsui, Suzuki, Akiba & Tatebe (2010).

[23] Wilson, Fiona. The monocle, http://monocle.com/magazine/issues/70/taking-care/
[24] Hongo, Jun. "*How Yokohama Led the Way in Day Care*", Japan Realtime
http://blogs.wsj.com/japanrealtime/2014/05/23/how-yokohama-led-the-way-in-day-care/
[25] Cabinet Public Relations Office, http://japan.kantei.go.jp/96_abe/statement/201304/19speech_e.html

Female employment rates by age (2008),%
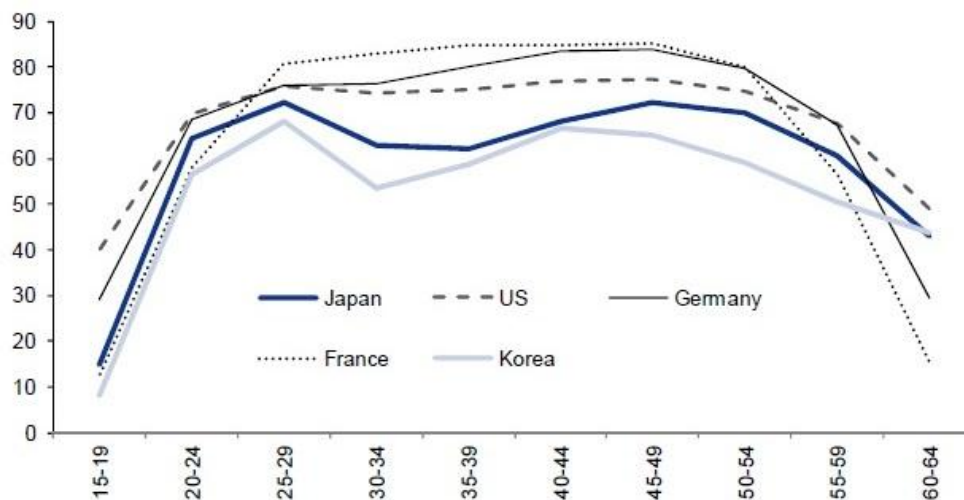
Source: OECD Database "LFS by sex and age"(Nov. 2009), MHLW.

Fig.3: The "M-curve" for year 2008

David Blau (2001) has provided extensive research in the area regarding childcare and he establishes that childcare is traditionally used to make it possible for the mother to work. Focus is often on the fact that if day care isn't available the mother needs to stay at home. According to Hotz & Miller (1988) the decisions regarding the use of childcare are made at the same time as when the family decides if the mother should work. Families make a decision as to whether the costs from non-maternal childcare are outweighed by the gains of the mother working. The number of children a woman has and their age affects her joining the labour force in a negative way. As soon as her children grow older and demand less time of her, the mother is more likely to seek employment opportunities. Blau (2001) explains this by drawing the conclusion that when children are in school and aren't in need of the same domestic care, mothers are able to return to the labour force.

These ideas are also described in more contemporary research where the Japanese woman's life cycle is described by Matsui, Suzuki, Akiba & Tatebe (2010). A Japanese woman leaves the labour force to care for her child and returns only after her child has become independent. In Japan women are very well educated yet they forgo employment, mostly, as explained above, because of family commitments. This can create a loss of human capital for women.

Ishii-Kuntz Makino, Kato Kuniko & Tsuchiya Michiko (2004) discuss the father's involvement in tending to the children, determining that his involvement depends on many factors such as the mother's employment and the number of children in the home. The larger the number of children, the more likely the father will assist around the house. Yet research

has shown this has no bearing on any increase in female labour force participation. However, traditionally the father has had the role of the provider of the family, making the mother responsible for children and housework. If the father identifies with a more liberal gender role it's more likely that he will tend to the children and the house. Thus it facilitates the mother's participation in the job market since her responsibilities at home are shared with the husband.

Nakamura & Nakamura (1994) show that married women with children are less likely to join the workforce than married women without children. Furthermore, there is a marked difference when married women with children are compared with non-married females, as a non-married female works considerably more weeks per year than a married woman with one or more children. Moreover, simply having children isn't the only factor to discourage women from joining the labour force as just being married also inhibits job involvement.

The availability of childcare is not the only problem for FLF as the cost of the available child care can also be an issue. Ribar (1992) has demonstrated a small but negative effect of childcare cost on FLF as the cost for mothers with young children. Similar conclusions have been drawn in Oishi & Gong (2002) and also in Breunig & King (2012), who all conclude child care charging is an important factor when women decide whether or not they should work. The effect of these costs varies depending on the income of the household. The cost aspect has been excluded for this thesis due to our research ideas encompassing only the "raw" effect of childcare on FLF after a specific policy.

Another factor that affects the FLF according to Mizuki (2012) is the availability of child care. If there is a desirable child care service, such as one with sufficient quality and within a reasonable distance, it could raise the FLF. The geographical location of the day care is important as it enables mothers to balance work and family life. Having a day care located near the work place would enhance the likelihood for women to have a desirable job, making them more motivated to remain in the labour force.

The Economist's "Holding Back Half the Nation" (2014) highlights a problem facing Japanese working mothers. They are discouraged by the fact that since higher job positions don't exist for many women in Japan, opportunities for female advancement are far fewer than for their male counterparts.

The quality of childcare is discussed by Blau & Hagy (1998). Their conclusion is that parents see quality and quantity as substitutes. Even though parents might find quality important, actually having a child enrolled in day care is seen as the most important factor. Quality in

this case is determined by group size, provider training and also the ratio between staff and children. The important conclusion from this research is that the act having a child enrolled in one of these establishments is more important than its quality of care.

This paper contributes to the literature by analysing a specific policy from the perspective that childcare has an established connection with the female labour force. As far as we know there is no research of the Yokohama method and its effect on the female labour force.

3. The Data

3.1 Data Source

The data is retrieved from the official portal site for government statistics in Japan.[26] The data originates from the Statistical Bureau which operates under the Ministry of Internal Affairs and Communication.[27]The Statistical Bureau is the organization that designs the surveys and then passes them on to local governments to be carried out. The results are then published on the E-stat website. We have used a selection of surveys in order to compile our data. The population and household data is taken from the survey "Surveys of Population, Population Change and the Number of Households based on the Basic Resident Registration". The education and kindergarten data are retracted from the "School Basic Survey" while the number of nurseries is from the "Survey of Social Welfare Institutions". For the data regarding labour force, marriage status, people who are working while housekeeping and also for the number of managers we turned to the "Labour Force Survey". The final survey we used was "Survey of Household Economy" which gave us data on household income and the amount of children in each household. The data for wages and day care waiting list was retrieved from the E-stat search engine.[28]

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[26] http://www.e-stat.go.jp/SG1/estat/eStatTopPortalE.do
[27] The E-stat website is run by the National Statistics Centre that receives data from the Statistical Bureau
[28] E-stat, *Regional Statistics Database,* http://www.e-stat.go.jp/SG1/chiiki/CommunityProfileTopDispatchAction.do?code=3,

3.2 Variable Description

The population of Japan via registered households is used in this paper. The data is divided into regional and prefectural level. Japan is divided into 3 different governmental levels which consist of 9 regions, 47 prefectures and 1719 municipalities. Our paper focuses on the region Kanto and on the prefecture Kanagawa, both of which the municipality of Yokohama forms a part.
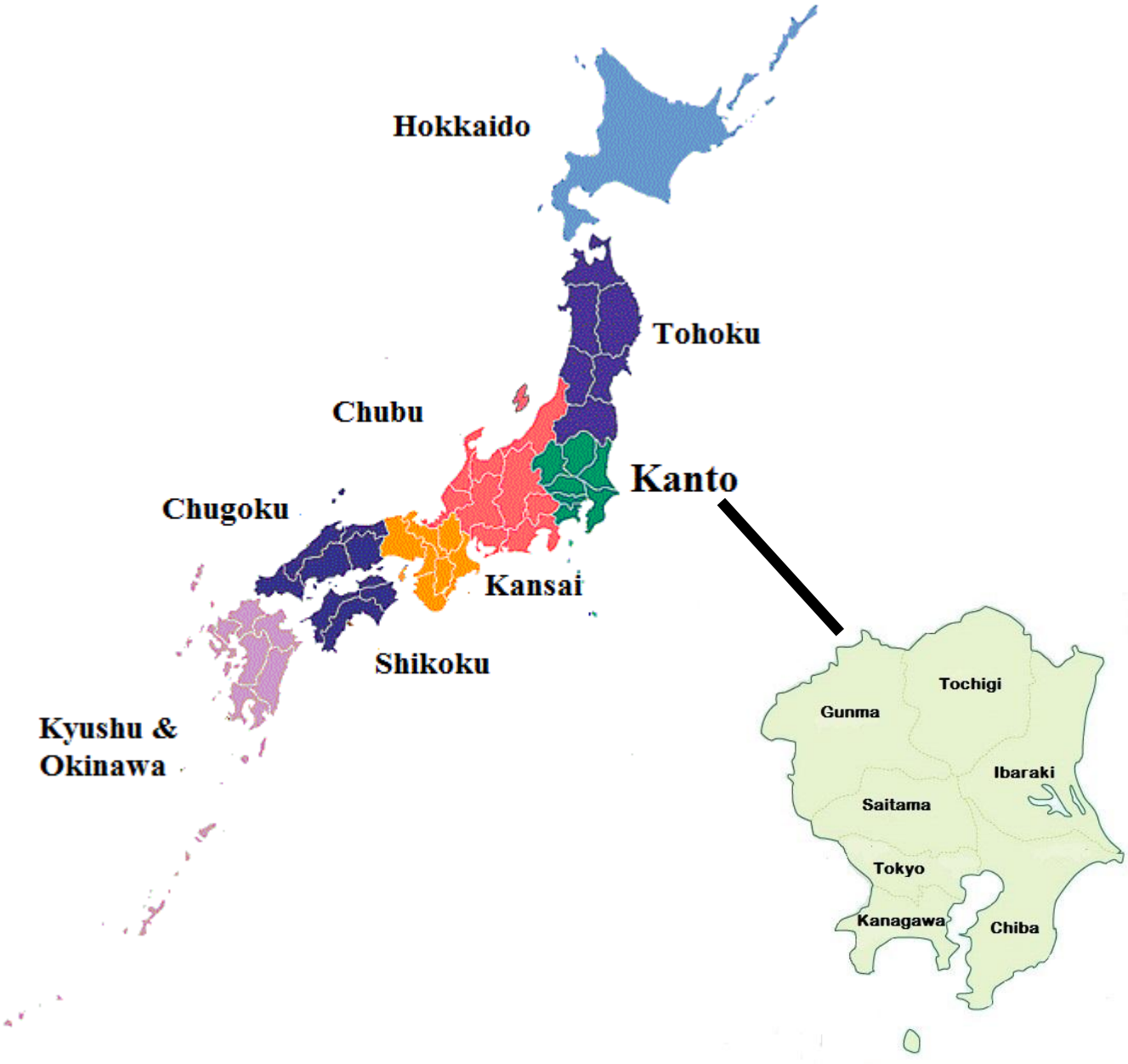

Fig.4 Map of Japan

At the regional level there are 35 observations for the regression on the female labour force. Kyushu and Okinawa are observed together while the Tohoku region is excluded making the total amount of regions 7, over 5 years. The observations for our childcare regressions are 28. For these regressions the year 2009 has been excluded due to missing values making the time period amount to 4 years. At the prefecture level we have 188 observations for the regression on childcare. There are 47 prefectures and the time period is 4 years due to 2009 being excluded, making the total number of observations 188.

3.2.1 Regional Level Regressions

The main dependent variables in the regressions at the regional level are the number of unemployed and employed women in the labour force aged 15 and over (logFLF) and the number of children aged 0-5 who are enrolled in day care (logchildcare). Our independent variables are the following: population in various constellations such as total population, amount of children, prime aged women and elderly. The variable for children is the age group between 0-4, that for the prime aged women is between the ages 20-44 and the elderly are people aged 70 and over. We also checked those women in the prime age bracket where we were looking to highlight a wage gap, which we defined as the female average wage as a percentage of the male average wage. The variable for education includes the number of males and females graduating with bachelor degrees for each year. One of our important control variables is the waitlisted children. We then ascertain the number of men in the labour force, this group constituting men who are employed or unemployed age 15 and over. The number of women who are managers is used as a variable to represent female role models. In the raw data this variable has two different definitions. In the data from 2008-2010 the variable is called "Managers & officials" while in the data from 2011-2012 it was changed to "Administrative & managerial worker". The variables for household income are divided into three groups depending on the yearly income for households which are "low" ¥0-4,999,000 (0-48,300 USD), "middle" ¥5,000,000-8,999,000 (48,300-86,900 USD) and "high" ¥9,000,000 to ¥15,000,000 and over (144,800 USD and over). We also check for the number of households with children in school. Our variable, male support, controls for how many men participate in household work while working outside the home. We also use a trend-variable that captures other effects or other policies that we can't control for and that might interact with the policy in our treatment region.

3.2.2 Prefecture Level Regressions

The dependent variable for prefecture level is the total number of children aged 0-5 who are enrolled in day care. The independent variables for prefecture level differ slightly from those on regional level. For prefecture level we are interested in how the policy has affected the number of children enrolled in day care. The variables are population, total number of children age 0 to 4 and total number of elderly who are people over 70 years of age. We've controlled for the number of women in in the prime age bracket between 20 to 44 as well as the wage gap. As in the regression at the regional level we've checked for education plus the waitlist for child care. The trend-variable for time fixed effects is used at the prefectural level as well.

The amount of data available is much more extensive for the regional level than it is for the prefecture level. Unfortunately data for the prefecture level was not obtained for: household income, male and female labour force, marriage status, male support and role models.

4. Identification Strategy

Our main strategy to see the effect of the policy is a Difference-in-Difference approach. This allows us to see differences between the outcomes of interest before and after the policy was implemented. Our goal is to see if the policy has had any impact on the FLF and child care availability on both regional and prefectural levels.

The first regressions are on female labour force in the Kanto region. Our second regressions are on child care also in the Kanto region. One issue with these regressions is that, due to lack of desegregated data, we are unable to perform the same regressions on the municipality level in Yokohama. The regressions on the regional level are likely to bias downward our estimates. Therefore we also perform similar child care regressions on a smaller geographical unit which is on the prefectural level.

Our dependent variables are female labour force and the number of children enrolled in child care. Female labour force is the number of women in the labour force aged 15 and over. Child care is the number of children aged 0 to 5 who are enrolled in day care. By using this variable we can observe the changes as to how many children are enrolled before and after the policy was implemented. Both our dependent variables are in log. Our regressions are as follows:

$$Y = \beta_0 + \delta_0\, after + \beta_1 treatment + \delta_1\,(after \times treatment) + \beta_2 X + \varepsilon$$

For our regression on the female labour force, Y is the female labour force in Kanto. In our regression on childcare availability, Y is the child care availability for Kanto. For our regressions on prefecture level, Y equals the child care availability in Kanagawa.

The childcare reform in Yokohama was implemented in 2010 and in 2013 the three year goal of eradicating the waiting list was reached. The "after" variable is therefore a binary variable that equals 1 for the post-policy period (2010-2012) and equals 0 for our pre-policy period (2008-2009). Due to lack of data for our regressions on child care, 2008 is our only pre-policy period.

"Treatment" is used as a dummy variable for the treatment area. Our treatment group is Kanto if the regression is on the regional level and Kanagawa if it is on the prefectural level. The control group should include regions that have not implemented any policy to eradicate the day care waiting list. Therefore, in this analysis the rest of Japan should act as our control group but due to missing data from 2011 in Tohoku our control groups are all the regions in Japan except Tohoku. The dummy variable is equal to 1 if it's Kanto or Kanagawa and 0 for the rest of Japan.

The focus of our analysis will be the dummy variable "policy x treatment", which is an interaction term between the policy variable and the treatment variable. The interaction term is crucial for our regression as it shows the effect of the policy after it was implemented in the treatment area which in this case is either Kanto or Kanagawa.

The variables "X" include all control variables that might change over time and affect the way women think about decisions regarding working and childcare such as: population, household income, male support, female role models, education, number of children on waitlist to day care, wage gap, number of households with children in school and amount of married women. All these variables have been described in the previous section.

Before we show our results we briefly discuss some issues regarding our estimation. It takes time for a policy of this kind to reach its full effect, since opening of day cares and enabling mothers to find jobs typically takes more than one year. However, the Difference-in-Difference method is yet considered an efficient method as to concluding the impact of a policy within a specific region between different time periods. The true effect of the policy would be lost by doing a simple cross-section analysis since these factors aren't considered within the simple cross-section model. Another useful feature of this method is that it has enabled us to increase our observations. As our regressions include the entire country, where

one unit consists of one region or one prefecture, lack of observations has been a constant issue for us. By using difference-in-difference analysis we were able to increase our observations compared to what a simple cross section analysis would have had.

One issue with our method is that other policies might interact simultaneously with this policy implemented in Yokohama. This might create a bias due to shocks that might affect the policy's outcome. For example while Yokohama is increasing the number of day cares larger companies might establish alternative day cares allowing their employed mothers to work while having small children. This could increase the FLF in Yokohama but it wouldn't be due to the policy implemented by the government. However, it would be an occurrence that affects the outcome of the policy. We've tried to control for this by including a trend-variable. The time trend allows us to identify if there is an underlying trend that causes the independent variables to move the in same or opposite directions. Due to the trend, the population might have different distributions between different time periods and by including a trend-variable we allow the intercept to shift the same amount for each time period. Also serial correlation is known to be an issue with Difference-in-Difference methods. As our regressions are on both regional and prefectural levels, we have clustered our standard errors to achieve robustness.

Another issue for this paper was the lack of data available for us on municipality level. The data used in the essay was easily retrieved for regional levels; however, we wanted data on municipality levels in order to see the effect of the policy implementation in the specific area of Yokohama. This type of data was unfortunately not available to us. The main issue when using regional data is that other areas that have not implemented the policy will affect our results. So to say that FLF has increased in the Kanto region is not evidence enough to say that the policy in Yokohama has had an effect in Yokohama. In order to both manage this problem with lack of data on municipality levels and to make our analysis on a more local level, we used prefecture level data on child care. If we can see an increase in child care in Kanagawa and find an increase in the female labour force in Kanto, we can assume that the policy has had some kind of effect also in Yokohama.

5. Results

5.1 Regional Level Results

5.1.1 Female Labour Force

In table 1 we show the relationship between FLF and the policy implemented in Kanto through a difference-in-difference analysis. In column 1 we show the main coefficients without any further controls. The main coefficient of interest is the interaction term between the "treatment" variable and the "after" variable. Column 2 shows the main coefficient when the control variables have been added. Finally in column 3 we've added a trend-variable to the regression.

Without control variables the interaction term is significant at the 5% level and the sign is positive, which is expected. This is interpreted as when the policy is implemented the FLF will rise by 0.83% in Kanto compared to the rest of Japan. Our R2 is 0,483 which means that our model explains 48.3% of the variation of the data. When including control variables the interaction term is significant at the 1% level, and the sign is positive which coincides with our expectations. The interpretation of the interaction term is that FLF will rise 7, 109% which is a larger increase than in the previous model without control variables. When controlling for other factors our R^2 is stronger at the 99.99% level. Without controlling for other factors one cannot claim a strong causality but when including control variables we establish a stronger relationship between the interaction term and FLF and we can hint causality. By controlling for the variables that changes over time, we can conclude that when all other factors remain equal FLF has increased. When including our trend variable, our significance rises to the 1% level and the increase in FLF only amounts to 6, 8877%. Since the trend variable is significant we conclude that there can be some other local effect that might interact with our policy. When including the trend variable our R^2 remains at the 99.99% level.

The increased FLF effect is easy to see when looking at the specific numbers of women in the labour force before and after the policy period. This is depicted in table A1 in the appendix. During the policy period the number of women of working age has decreased and this is explained by the fact that more women go into retirement than enter the labour force. This can be explained by the declining fertility which is a problem for Japan. The female population's working age is decreasing while the female labour force is increasing. This can let us draw the conclusion that the increase isn't from new people who enter the working age but rather from

women already in working age who previously weren't in the labour force. The effect just mentioned is seen for the year 2012 which shows how the policy might have affected the female labour force only after a couple of years. Women have also gained employment, since unemployment has gone down while those in employment have gone up, which shows that not only are more women participating in the labour force but they have also found employment.

5.1.2 Childcare

In table 3 we study how childcare has changed in Kanto during the post policy period where the independent variable for this estimation is the number of children in day care. Without controlling for other variables, in column 4, the interaction term is positive and significant at the 1 % level. The interaction term tells us that in the post policy period in Kanto, the number of children in child care has increased by 1, 431%. The positive increase is expected since our earlier regressions find that FLF has also risen during this period. Our R2 in this regression without controlling for other factors is 0,382. When only looking at the population one can see that the number of children has decreased while the number of children in childcare has increased, concluding that the ratio of children who attend day care has increased. These numbers are presented in table A.2. The ratio of children in day care is approximately 20% which means that an increase of 1, 4305% is a rather large magnitude.

When controlling for other factors, in column 5, the regression becomes insignificant but R2 becomes stronger at a 99.98% explanation of the variation. This might be due to the lack of observations since we don't have data for the entire population as we do for our regressions on FLF. There might also be excluded controls that are crucial to the choices regarding childcare. Childcare on a regional level might be in too wide a perspective as childcare is regulated via prefecture and foremost via municipality which might disturb the analysis on a regional level. If the post policy period includes several more years, there might be a significant result since it takes time to plan a baby. Still we can see that there is a difference between the pre and post policy period regarding the number of children in day care, but we cannot confirm that it's explicitly due to the policy. Childcare also isn't the only factor that determines whether or not a woman decides to work.

In column 6 we've also controlled for the trend variable in this regression. The significance worsens and the sign on the interaction term becomes negative which shows that this estimation isn't optimal at the regional level. Also our R2 is 99.99% in this regression.

One big issue with our data is that the data for Tohoku in 2011 is missing due to the tsunami and earthquake in 2011. This is a problem for our regressions as including Tohoku would imply that our post policy period for Tohoku would be 2010 and 2012 while for the other 8 regions the post policy period would be 2010, 2011 and 2012. In order to have the same post policy period for our data we have tried multiple combinations. When we try to exclude 2011 in all regions the regressions become statistically insignificant, telling us that 2011 is an important year for our regressions. Excluding Tohoku from our data makes our regressions become significant.

5.2 Prefecture Level Results

At the prefecture level our dependent variable is childcare and the results are shown in table 4. Without control variables the interaction term in column 1 is highly significant at a 1% level and has the expected positive sign. In the post policy period in Kanagawa period there is a 7.4% increase in the number of children who attend day care. For this regression the R^2 is 0,0016 thus the model explains 0.16% of the variation. When we control for other factors in column 2 we still have significance at a 5 % level but it's not as high as when we didn't control for other factors. The interaction term shows us an increase by 10 % in the children who attend day care, the sign is expected since the policy's aim is to eradicate the waiting list to day care. The R^2 becomes stronger with an 83.39% explanation ratio. The trend variable in column 3 is not significant when included in the model, leaving the treatment variables' significance unchanged at a 5% level. Although, when including the trend variable the R^2 becomes weaker and lands at a 0,04 explanation of the variation.

Once again since the percentage of children who attend day cares are very small in all of Japan this increase is seen as a rather big magnitude which can be seen in table A.3. Children aged 0 to 4 have shown a decrease over the years so the increase in children enrolled in day care is not connected to a proportional increase in children. The increase can therefore be explained by the introduction of the policy, which increased the amount of day cares and has made it possible for more children to enrol in day care. We also have more observations on prefecture level which has improved our significance.

5.3 General Interpretation of our Results

FLF has increased on the regional level in Kanto during the policy-period. As the results are on a regional level it is hard to see an isolated effect for Kanagawa. It is also not sure that the increase is solely due to child care policy as there are many aspects that affect women in their

choices regarding work; childcare is only one of these aspects. That said, our strongest conclusion from the regression is that more women are joining the labour force. We can also conclude that the increase in FLF is due to women who previously didn't work but have now decided to. This we know from the fact that the number of women who are not in the labour force has decreased while the female population of working age has declined, but the labour force has still increased. At the regional level the child care regressions are not significant when controlling for other variables. However, when increasing our observations from 28 to 188 as we are able to do at the prefectural level we see significant results. The prefectural results allow us to isolate Kanagawa from the rest of the Kanto region and by doing so; have a greater chance to see any effect of the policy on the area. The results tell us that the number of children in child care has increased by a rather great percentage during the policy period.

When investigating the "goodness-of-fit" for our model we use the R2 which shows us how well our estimated model explains the variation in our data. At the regional level our model only explains 48.3% of the variation without controlling for other variables. However, when including control variables our model predicts 99.99%. This implies that our model is almost a perfect fit with the data and has nearly no variation. Although a high R^2 is generally interpreted as a positive attribute of a model, it can also indicate that there is some kind of problem as models can very rarely predict human behaviour precisely. When each control variable is individually included in our regression, the regression produces a high R^2. The control variables "wage-gap" and "waiting list" had the lowest R^2 when included in the regression individually; however, the majority of our variables does produce a high R2 when individually included in the model. This confirms, once again, that we might have problems with our model. When looking at the regressions at the prefecture level our R2 is lower which is an expected outcome than the high R^2 at the regional level. This lower R^2 is more realistic especially because we have more observations at the prefecture level. The high R^2 on our regressions at the regional level indicate that our estimation model suffers from over fitting which is obviously a serious issue. However, our prefecture level regressions, with over 100 additional observations, show a lower R^2 which confirms that the main problem with our regressions are, yet again, the lack of observations at the regional level. Another issue with our model is that due to lack of data at the prefectural level, we are not able to see if FLF has had an isolated effect in Kanagawa. Instead we focus on finding an effect of the policy by investigating child care. By doing so, we can assume that if child care does increase on a prefectural level while female labour force increases on a regional level, the policy might

have had an effect on the FLF in Kanagawa. Even though the Kanto region has had an increase in FLF while Kanagawa has had an increase in child care, we still have to consider the fact that other areas could influence our data.

When looking at regional levels there are several prefectures that affect the result of the region and therefore we cannot see the isolated effect originated in Kanagawa. To investigate how these prefectures bias our results we've looked at the female population in each prefecture. Based on the "M-curve" we've divided the female population in to age groups and when analysing these tables (Table A4 to A10 can be found in Appendix) we make an assumption based on Matsui, Suzuki, Akiba & Tatebe (2010). This assumption is that the age where women return to the labour force after having children is roughly 40 to 54. This age group is therefore important to look at in the prefectures in order to analyse the direction of the bias. When this age group is large and increasing one can draw the conclusion that the amount of women entering the labour force would be greater and therefore also put an upward bias on the regression. However, if the age group is smaller and decreasing the bias will shift to a downward bias.

The prefectures Gunma, Ibaraki and Tochigi all have a decreasing female population in this age group implying a downward bias originating in these prefectures. The prefectures with an upward bias and therefore also an increasing female population aged 45-54 are Saitama, Tokyo, Kanagawa and Chiba. As Tokyo and Saitama account for nearly half the female population of Kanto they obviously have a stronger magnitude to their bias. The prefectures with the downward bias account for roughly 30% of the female population which shows that the magnitude of the downward bias is smaller than for the upward bias. In other words, the bias is dependent on the fact that we couldn't control for the weight each prefecture has put on the region via the different shares of female population scattered across the prefectures.

Also, we suspect the result to be biased due to the limited availability of control variables for the prefecture level. As there are many important variables we are not able to control for we suspect an upward bias that would overestimate the effect of the policy on childcare enrolment. The lack of variables would mean that the control variables that we have included would over-represent other control variables and would therefore give us an upward bias. Our aim has been to find control variables that might not be constant over time and that might affect the way women think about decisions regarding working and childcare. For our regressions on female labour force we find that education, flexible working hours, maternity

leave, sick leave, childcare cost, job-status, job market, family constellation and socio-economic background would have been appropriate variables. While on our regressions for child care we find that variables that would indicate childcare cost and how many child care facilities per square km would be useful.

Ideally we would have liked to specify our treatment and control group on a municipality level. In the sample we've used for this analysis there are people who are not affected by this policy but who might still weigh in on the results making us once again have an upward bias and overestimate the results. It's established from the regressions that women are joining the labour force, but it can be that mothers have been affected by the new policy as well as single graduate students who weren't affected at all. But the single graduate students would still be part of our result and will therefore affect our results and create an upward bias. Ideally the treatment group would only contain the subsample of mothers in Yokohama/Kanto/Kanagawa versus the control group of mothers in the rest of Japan.

Although our regression shows that the policy in Yokohama has had some effect on regional and prefectural level, we can still not be sure of the full magnitude of the policy. Our regression only shows the effects until 2012 and so far it's had the expected effect. But it takes time both to plan for a baby and to choose child care. Even if the option is there it's not certain that it's apparent for every woman to take this route in life. Although the statistics tell otherwise, many parents are aware of the fact that there are many unrecorded cases of children waiting to be enrolled. Until Yokohama city can prove that all children will be guaranteed a place in child care, many mothers might not want to take the risk of entering the labour force. In some cases there are strong barriers that need to be overcome before enrolling your child in day care becomes an option. A lot of these barriers are culturally sensitive and take time to change. Such barriers that make mothers choose to tend to their children at home instead of enrolling them in day care are also barriers to female labour force participation. However, even if our regressions are not on municipality level we can see that the policy has had an effect on childcare which we connect to the increase in labour force participation. To clarify this connection further: on the micro-level you look at the direct effect of the policy (more children in day care) while on the regional level you see an indirect effect of what this policy has done to female labour force. This indirect effect was the government wanted in the first place.

6. Conclusion

The goal of this paper is to see if there has been an increase in the female labour force at the regional level in Kanto, due to the eradicated waiting list in Yokohama. Our analysis is based on a dataset that we have compiled from the data retrieved from The Statistical Bureau of Japan. We have used a difference-in-difference model on both prefecture and regional levels to see the effects of the policy on the female labour force and the number of children in childcare.

Our estimations show that the female labour force in Kanto has increased by 7% after the policy was implemented in Yokohama. We cannot conclude that the increase is solely in Yokohama or that the increase is explicitly due to the policy in Yokohama. The number of children enrolled in childcare increased in Kanagawa by 10% after the policy to reduce the waiting list was introduced to Yokohama. As our results are not on the same geographical level as the implemented policy we cannot conclude that the results are limited to within the Yokohama municipality. However, we can see that there has been an increase in female labour force participation at the regional level while also seeing an increase in children attending child care on a smaller geographical level. This implies that more women are choosing to work when the number of children enrolled in day care increases. Unfortunately we cannot be sure that this is due to the policy in Yokohama; however, as these increases have occurred during the same time frame, one can draw the conclusion that the policy has had a positive effect on the regional level.

The prime minister of Japan has recently put the expansion of the day care industry on the Japanese political agenda. The problem has therefore been recognized by the government. However, increasing the day care capacity by opening more day care centres and making them more accessible is still a crucial matter that needs to be dealt with urgently. This has been an ongoing issue in Japan and although previous goals of increasing the child care capacity were met, the demand for child care is steadily increasing and will very likely keep increasing parallel to the increasing female labour force participation. Each day care centre must also provide services that are adapted to the modern Japanese family's needs where both parents are working full time. This means that the day care centres must provide longer opening hours and be located close to family neighbourhoods or to work places. Consistent high quality must also be sustained; for example being able to manage smaller groups of children with a well-educated staff, otherwise these centres risk losing credibility.

One issue with the Japanese welfare system is that most of the attention focuses on the aging population. The Japanese government is struggling with a strained economy and where a majority of voters are reaching retirement age, a large amount of the welfare funds are pressured towards the elderly. One solution, to tackle the demand of funding for child care, would be to allow for an even wider deregulation, thus allowing private companies to fund the new day care centres but such companies interested in participating must first overcome many obstacles and regulations. This makes the childcare industry unattractive for the private sector. Companies also face the general negative view from the public that private companies are less trustworthy. By guaranteeing a certain quality and assuring worried mothers those private companies must meet governmental standards, the reputation of the private sector should improve.

Even if the demand could be met by increasing the number of day cares, there is still the issue that mothers are not able to secure a spot on waiting lists if they are not already working. Many women are therefore discouraged to work if they cannot find alternative care takers. Mothers who are searching for jobs must therefore be eligible to allow their children to be enrolled in day care. There must also be a general change in attitude towards allowing children be taken care of by alternative care givers such as at a public day care. One of the biggest issues with the child care industry is not only the lack of day care centres, but also the low interest from the government and companies to ease the burden for working mothers. The traditional view of a woman being in charge of the household while the man is the economic provider is still very much engrained in Japanese society. It is therefore important to counteract these traditional norms and create marketing drives that promote day cares and how they could benefit every Japanese woman.

The main weakness of this paper is that there has been a lack of data on the geographical levels that we wanted. This has led to us restricting our models to the extent that the analysis on municipality level couldn't be carried out. For further research we therefore recommend that the policy analysis is made on the municipality level to highlight any isolated effect. The sample could also be revised in further research and be constituted by the subsamples that are affected directly by the policy. By having women with children in the labour force as the y-variable one might get a stronger connection to the policy. Most importantly the analysis should be re-done in a few years as the policy might need longer to show its true effect. Ideally one would need an even longer time-span after the policy implementation to see a strong and established effect.

7. Tables

Table 1 Variable Description

Table 1.1 Regional Level

logpop	Total population in Region x (in thousands) (in log)
logchild	Total number of children aged between 0-4 years (in thousands) (in log)
logelderly	Total population over 70 years (in thousands) (in log)
bachelorfem	Total number of women who graduated with a bachelor degree
bachelormale	Total number of men who graduated with a bachelor degree
logwaitlist	The number of children on the waitlist (in log)
wagegap	The female average wage as a percentage of male average wage (in percent)
loglabourmale	Total number of men in the labour force (in thousands) (in log)
loglabourfem	Total number of women in the labour force (in thousands) (in log)
logmanager	The number of female managers (in thousands) (in log)
loghouseholdmale	The number of men who help with household work while also working outside the household (in log)
loglowhouse	Total number of households that earn ¥0-4,999,000 per year (in log)
logmiddlehouse	Total number of households that earn ¥5,000,000-8,999,000 per year (in log)
loghighhouse	Total number of households that earn ¥9,000,000 to ¥15,000,000 and over per year (in log)
loghouseschool	The number of households with children in school (in log)
marriedfem	Total amount of women of prime age (20-44) who are married (in thousands)

Table 1.2 Prefectural Level

logpop	Total population in Region x (in thousands) (in log)
logchild	Total number of children aged between 0-4 years in Region x (in thousands) (in log)
logelderly	Total population over 70 years in Region x (in thousands) (in log)
bachelorfem	Total number of women who graduated with a bachelor degree during Year t and in Region x
bachelormale	Total number of men who graduated with a bachelor degree during Year t and Region x
logwaitlist	The number of children on the waitlist (in log)
wagegap	The female average wage as a percentage of the male average wage (in percent)
logprimeage	Total number of women of prime age (20-44) scaled by thousand

Table 2 Descriptive Statistics

Table 2.1 Regional Level

Variables	Mean	Standard Deviation	Minimum	Maximum
logpop	16.349	0.806	15.184	17.568
logchild	13.163	0.842	11.945	14.379
logelderly	14.610	0.713	13.579	15.721
bachelorfem	32.527	32.649	4.398	107.831
bachelormale	42.564	42.855	5.073	138.955
logwaitlist	7.161	1.519	4.499	9.654
wagegap	0.693	0.018	0.657	0.746
loghouseholdmale	10.907	0.872	9.210	12.301
loglabourmale	15.118	0.859	13.874	16.494
loglabourfem	14.810	0.806	13.676	16.107
logmanager	9.869	0.677	9.210	11.156
loglowhouse	8.741	0.709	7.644	9.922
logmiddlehouse	7.894	0.876	6.589	9.374
loghighhouse	6.504	1.049	5.146	8.358
loghouseschool	7.605	0.849	6.339	8.952
marriedfem	1463.714	1225.732	290	4140

Table 2.2 Prefecture level

Variable	Mean	Standard deviation	Minimum	Maximum
logpop	14.486	0.758	13.273	16.398
logchild	11.299	0.777	10.086	13.149
logelderly	5.92	0.717	4.762	7.84
primeage	466.098	519.525	78	2470
wagegap	0.690	0.028	0.623	0.777
bachelorfem	5.431	10.239	0.442	69.066
bachelormale	7.135	12.606	0.762	81.768
logwaitlist	4.008	4.008	0	9.040

Table 3 Regional Level Results

	Female Labour force			Child Care		
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Interaction term (treatment*after)	0.0084** (0.0025)	0.0711*** (0.0133)	0.0689*** (0.0150)	0.0143*** (0.0036)	0.0004 (0.0616)	0.0105 (0.0660)
treatment	1.4985*** (0.2968)	0.2528* (0.1188)	0.2438 (0.1375)	1.4779*** (0.3346)	-0.8616*** (0.1641)	-0.8110*** (0.2087)
after	-0.0036 (0.0037)	0.0036 (0.0129)	0.0068 (0.0142)	-0.0447*** (0.0072)	-0.0309 (0.0451)	0.0285 (0.0711)
Observations	35	35	35	28	28	28
R Squared	0.4381	0.9999	0.9999	0.3815	0.9998	0.9999
Controls	No	Yes	Yes	No	Yes	Yes
Trend	No	No	Yes	No	No	Yes

Notes: For Table 3 & 4: *** p<0.01, ** p<0.05, * p<0.1, no asterisk means not significant

Table 4 Prefecture Level Results

	Child Care		
	(1)	**(2)**	**(3)**
Interaction term (treatment*after)	0.0740***	0.1000**	0.102**
	(0.0.012)	(0.041)	(0.043)
treatment	0.0852	-1.1130***	-1.1151***
	(0.0904)	(0.1086)	(0.1096)
after	-0.0121	0.0161	-0.0187
	(0.0120)	(0.0275)	(0.0186)
Observations	188	188	188
R Squared	0.0016	0.8339	0.0404
Controls	No	Yes	Yes
Trend	No	No	Yes

Notes: For Table 3 & 4: *** p<0.01, ** p<0.05, * p<0.1, no asterisk means not significant

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Appendix

Table A1

Regional Data on Female Labour Force in Kanto

Year	Number of women in labour force	Number of women not in labour force	Number of women employed	Number of women not employed	Women aged 15 and over
2008	9,720,000	3,934,000	9,350,000	350,000	14,444,000
2009	9,810,000 (+)	3,722,000 (-)	9,310,000 (-)	450,000 (+)	14,345,000 (-)
2010	9,770,000 (-)	4,002,001 (+)	9,370,000 (+)	450,000 (=)	14,545,000 (+)
2011	9,760,000 (-)	3,969,000 (-)	9,370,000 (=)	430,000 (-)	14,489,000 (-)
2012	9,890,000 (+)	3,668,000 (-)	9,500,000 (+)	390,000 (-)	14,311,000 (-)

Table A2

Regional Data on Amount of Children and Childcare in Kanto

Year	Number of children 0-4	Number of children in childcare 0-5	Approx. percentage of children in day care
2008	1,749,000	379,766	21,7%
2010	1,742,000 (-)	371,449 (-)	21,3% (-)
2011	1,741,000 (-)	363,806(-)	20,9% (-)
2012	1,731,000 (-)	391,948 (+)	22,6% (+)

Table A3

Prefectural Data on Amount of Children and Childcare in Kanagawa

Year	Number of children 0-4	Number of children in childcare 0-5	Approx. percentage of children in day care
2008	388,000	26,523	6,8 %
2010	387,000 (-)	26,467 (-)	6,8 % (=)
2011	385,000 (-)	27,793 (+)	7,2 % (+)
2012	384,000 (-)	28,566 (+)	7,4% (+)

Notes: The signs in table A1, A2 & A3 indicate the change in number between time periods
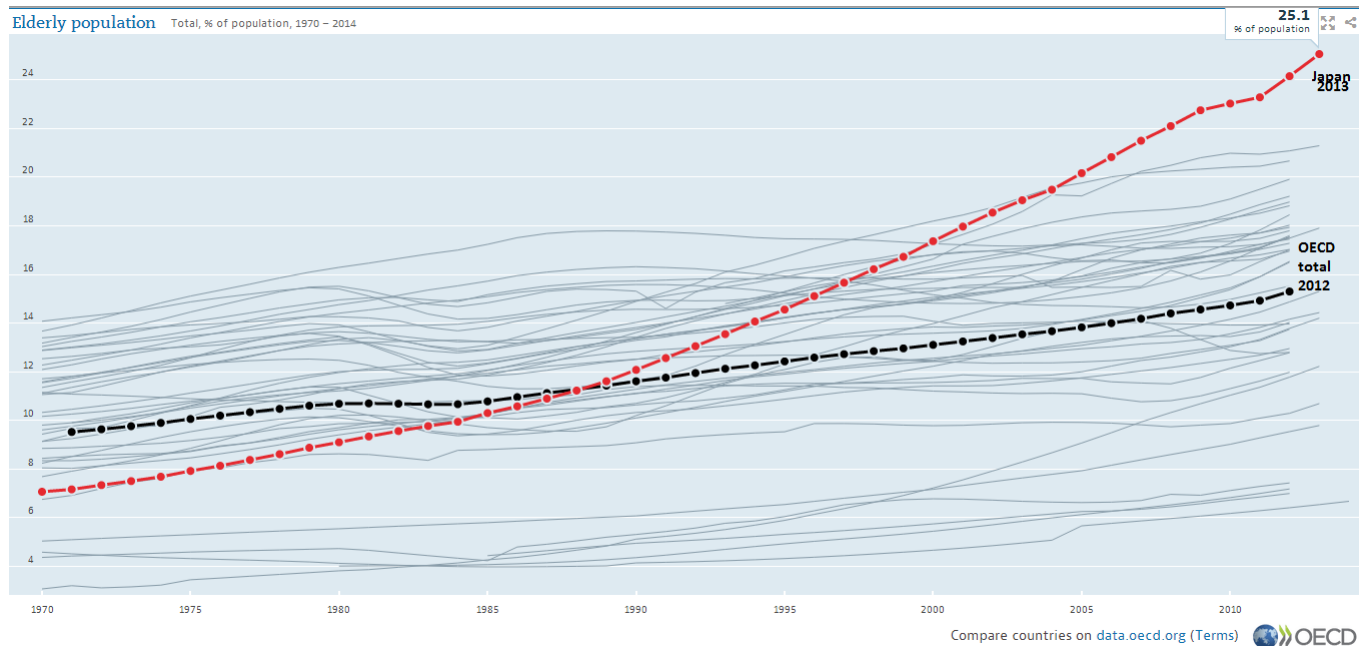
Fig.1 Elderly population in OECD
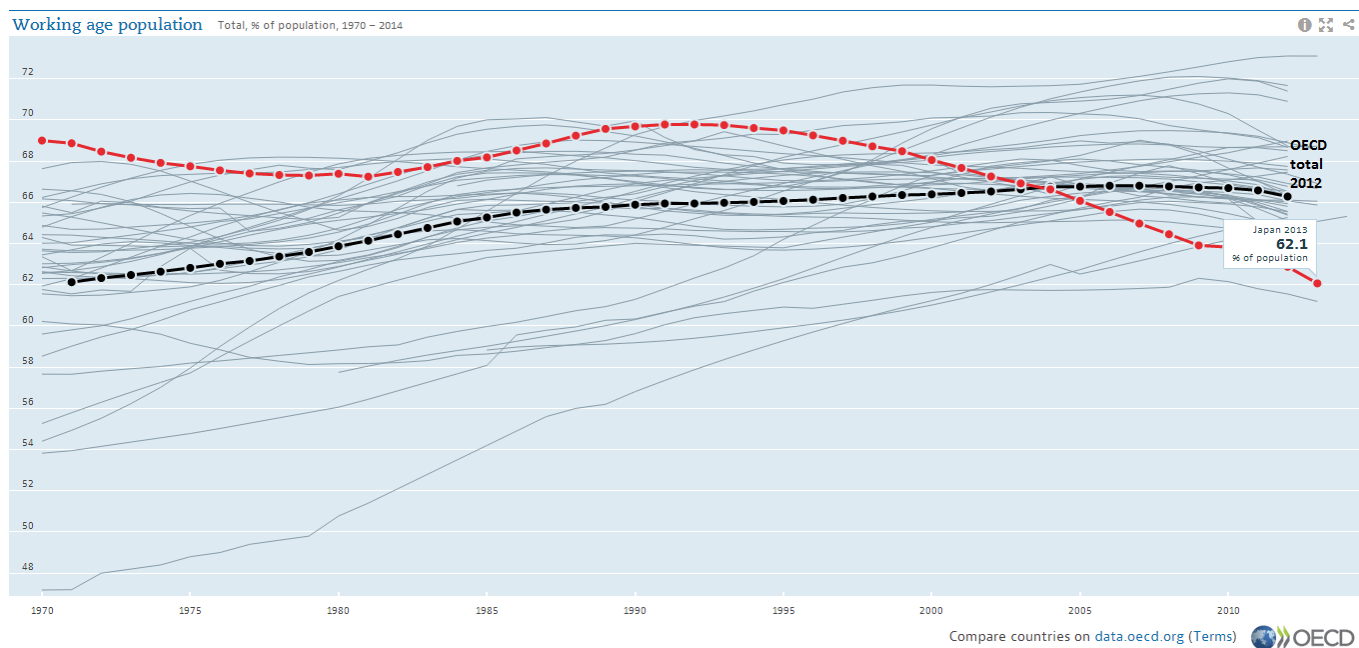
Fig.2 Working age population in OECD

Table A4 Gunma

Female population each year by age group

Age groups	2008	2009	2010	2011	2012
15-19	46,000	45,000	47,000	48,000	49,000
20-29	107,000	106,000	95,000	91,000	89,000
30-44	202,000	201,000	200,000	202,000	202,000
45-54	121,000	120,000	120,000	117,000	119,000
55-64	153,000	152,000	153,000	155,000	148,000
65 and over	257,000	263,000	269,000	271,000	281,000
Total age 15 and over	886,000	887,000	886,000	883,000	883,000

Table A4.1 Gunma

Female population as a share of the total in Kanto by age group

Age groups	2008	2009	2010	2011	2012
15-19	4,80%	4,67%	4,96%	5,14%	5,26%
20-29	4,34%	4,44%	3,90%	3,80%	3,79%
30-44	4,28%	4,27%	4,16%	4,20%	4,26%
45-54	4,89%	4,82%	4,66%	4,53%	4,47%
55-64	5,03%	5,10%	5,09%	5,15%	5,15%
65 and over	5,50%	5,43%	5,41%	5,36%	5,34%
Total age 15 and over	4,84%	4,82%	4,74%	4,70%	4,70%

Notes: The percentage is calculated by: (number of women in age group in Gunma) divided by
(number of women in that specific age group in the region Kanto)

Table A5 Ibaraki

Female population each year by age group

Age groups	2008	2009	2010	2011	2012
15-19	72,000	70,000	69,000	70,000	70,000
20-29	165,000	163,000	150,000	144,000	138,000
30-44	290,000	289,000	290,000	291,000	287,000
45-54	186,000	183,000	181,000	177,000	177,000
55-64	227,000	225,000	230,000	233,000	225,000
65 and over	355,000	365,000	373,000	376,000	389,000
Total age 15 and over	1,295,000	1,295,000	1,293,000	1,291,000	1,286,000

Table A5.1 Ibaraki

Female population as a share of the total in Kanto by age group

Age groups	2008	2009	2010	2011	2012
15-19	7,52%	7,26%	7,29%	7,50%	7,51%
20-29	6,70%	6,82%	6,15%	6,01%	5,87%
30-44	6,15%	6,14%	6,04%	6,05%	6,05%
45-54	7,52%	7,35%	7,03%	6,86%	6,65%
55-64	7,47%	7,55%	7,65%	7,74%	7,83%
65 and over	7,60%	7,54%	7,50%	7,43%	7,39%
Total age 15 and over	7,08%	7,04%	6,91%	6,87%	6,84%

Notes: The percentage is calculated by: (number of women in age group in Ibaraki) divided by

(number of women in that specific age group in the region Kanto)

Table A6 Tochigi

Female population each year by age group

Age groups	2008	2009	2010	2011	2012
15-19	50 000	49 000	46 000	47 000	47 000
20-29	106 000	103 000	100 000	97 000	94 000
30-44	200 000	199 000	200 000	200 000	197 000
45-54	128 000	125 000	125 000	121 000	121 000
55-64	151 000	151 000	155 000	158 000	153 000
65 and over	243 000	248 000	253 000	255 000	262 000
Total age 15 and over	878 000	875 000	879 000	878 000	874 000

Table A6.1 Tochigi

Female population as a share of the total in Kanto by age group

Age groups	2008	2009	2010	2011	2012
15-19	5,22 %	5,08%	4,86%	5,04%	5,04%
20-29	4,30%	4,31%	4,10%	4,05%	4,00%
30-44	4,24%	4,23%	4,16%	4,16%	4,15%
45-54	5,18%	5,02%	4,85%	4,69%	4,54%
55-64	4,97%	5,07%	5,16%	5,25%	5,33%
65 and over	5,20%	5,12%	5,09%	5,04%	4,97%
Total age 15 and over	4,80%	4,76%	4,70%	4,67%	4,65%

Notes: The percentage is calculated by: (number of women in age group in Tochigi) divided by

(number of women in that specific age group in the region Kanto)

Table A7 Saitama

Female population each year by age group

Age groups	2008	2009	2010	2011	2012
15-19	170 000	172 000	173 000	170 000	170 000
20-29	410 000	401 000	394 000	389 000	384 000
30-44	779 000	776 000	788 000	789 000	777 000
45-54	417 000	418 000	428 000	428 000	441 000
55-64	547 000	534 000	538 000	536 000	509 000
65 and over	735 000	770 000	800 000	819 000	862 000
Total age 15 and over	3 058 000	3 071 000	3 121 000	3 131 000	3 143 000

Table A7.1 Saitama

Female population as a share of the total in Kanto by age group

Age groups	2008	2009	2010	2011	2012
15-19	17,75%	17,84%	18,27%	18,22%	18,24%
20-29	16,64%	16,79%	16,15%	16,24%	16,35%
30-44	16,51%	16,48%	16,40%	16,40%	16,38%
45-54	16,86%	16,78%	16,62%	16,59%	16,57%
55-64	17,99%	17,93%	17,90%	17,81%	17,72%
65 and over	15,74%	15,90%	16,08%	16,19%	16,37%
Total age 15 and over	16,71%	16,69%	16,69%	16,65%	16,72%

Notes: The percentage is calculated by: (number of women in age group in Saitama) divided by

(number of women in that specific age group in the region Kanto)

Table A8 Tokyo

Female population each year by age group

Age groups	2008	2009	2010	2011	2012
15-19	280 000	286 000	271 000	261 000	258 000
20-29	814 000	778 000	862 000	853 000	841 000
30-44	1 548 000	1 555 000	1 608 000	1 616 000	1 602 000
45-54	745 000	762 000	807 000	820 000	855 000
55-64	857 000	836 000	839 000	839 000	802 000
65 and over	1 462 000	1 509 000	1 533 000	1 554 000	1 607 000
Total age 15 and over	5 706 000	5 721 000	5 920 000	5 943 000	5 965 000

Table A8.1 Tokyo

Female population as a share of the total in Kanto by age group

Age groups	2008	2009	2010	2011	2012
15-19	29,23%	29,67%	28,62%	27,97%	27,68%
20-29	33,04%	32,57%	35,34%	35,62%	35,80%
30-44	32,80%	33,02%	33,47%	33,58%	33,78%
45-54	30,13%	30,59%	31,34%	31,78%	32,12%
55-64	28,19%	28,06%	27,91%	27,88%	27,92%
65 and over	31,31%	31,15%	30,82%	30,72%	30,51%
Total age 15 and over	31,18%	31,09%	31,66%	31,61%	31,73%

Notes: The percentage is calculated by: (number of women in age group in Tokyo) divided by (number of women in that specific age group in the region Kanto)

Table A9 Kanagawa

Female population each year by age group

Age groups	2008	2009	2010	2011	2012
15-19	200 000	203 000	203 000	200 000	200 000
20-29	515 000	500 000	504 000	497 000	488 000
30-44	1 033 000	1 029 000	1 042 000	1 040 000	1 021 000
45-54	513 000	522 000	543 000	549 000	572 000
55-64	630 000	614 000	617 000	616 000	588 000
65 and over	943 000	984 000	1 012 000	1 033 000	1 079 000
Total age 15 and over	3 834 000	3 852 000	3 921 000	3 935 000	3 948 000

Table A9.1 Kanagawa

Female population as a share of the total in Kanto by age group

Age groups	2008	2009	2010	2011	2012
15-19	20,88%	21,06%	21,44%	21,44%	21,46%
20-29	20,90%	20,93%	20,66%	20,75%	20,77%
30-44	21,89%	21,85%	21,69%	21,61%	21,53%
45-54	20,74%	20,96%	21,09%	21,28%	21,49%
55-64	20,72%	20,61%	20,53%	20,47%	20,47%
65 and over	20,19%	20,31%	20,35%	20,42%	20,49%
Total age 15 and over	20,95%	20,93%	20,97%	20,93%	21,00%

Notes: The percentage is calculated by: (number of women in age group in Kanagawa) divided by

(number of women in that specific age group in the region Kanto)

Table A10 Chiba

Female population each year by age group

Age groups	2008	2009	2010	2011	2012
15-19	140 000	139 000	138 000	137 000	138 000
20-29	347 000	338 000	334 000	324 000	315 000
30-44	667 000	665 000	676 000	675 000	662 000
45-54	363 000	361 000	371 000	368 000	377 000
55-64	475 000	467 000	473 000	472 000	447 000
65 and over	675 000	705 000	734 000	751 000	787 000
Total age 15 and over	2 667 000	2 675 000	2 726 000	2 727 000	2 726 000

Table A10.1 Chiba

Female population as a share of the total in Kanto by age group

Age groups	2008	2009	2010	2011	2012
15-19	14,61%	14,42%	14,57%	14,68%	14,81%
20-29	14,08%	14,15%	13,69%	13,53%	13,41%
30-44	14,13%	14,12%	14,07%	14,03%	13,96%
45-54	14,68%	14,49%	14,41%	14,26%	14,16%
55-64	15,63%	15,68%	15,74%	15,69%	15,56%
65 and over	14,45%	14,55%	14,76%	14,84%	14,94%
Total age 15 and over	14,57%	14,54%	14,58%	14,51%	14,50%

Notes: The percentage is calculated by: (number of women in age group in Chiba) divided by (number of women in that specific age group in the region Kanto)