A Longitudinal Study of the Effect of Subsidized Child Care on Maternal Earnings

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Abstract

The effect of subsidized child care on maternal employment has been widely studied focusing primarily on the extensive margin response. However, subsidies can affect earnings of mothers who do return to work after giving birth. To reconcile work with child care, a mother can reduce working hours or choose "mother-friendly" work in response to high child care costs. This can decrease maternal earnings in the short term, and in the long term by negatively effecting accumulation of human capital. Using a unique panel database on actual subsidy receivers in Israel, estimates show that subsidized care for working mothers with children up to age 3 increases earnings in the short run (years of subsidy receipt), but has no significant effect on future earnings of mothers. The results suggest that reducing hours worked or choosing "mother-friendly" work in the years of treatment do not harm human capital accumulation to the extent that affects later earnings, and other explanations should be sought for the motherhood wage gap in the long run.

Keywords:
Child Care Subsidies, Maternal Employment, Difference-in-Differences

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1. Introduction

Mothers with young children are less involved in the labor market and earn less than other women. One of the explanations for this in the literature is child care cost which increases the cost of working for mothers and makes it less worthwhile. The effect of child care cost on the maternal employment decision has been widely studied. There is a high variation in magnitudes of estimated elasticity across the studies; however, the majority of the studies finds a significant negative effect of child care cost on female labor supply and hours worked (Connelly 1992, Ribar 1995, Kimmel 1998, Ribar 1995, Anderson and Levin 1999).[2]

In order to support maternal employment, there has been an increase in implementation of policies designed to reduce the negative effect of child care. Many countries subsidize child care in order to decrease child care cost and improve child care provision (Canada, Germany, Norway, Netherlands, Spain, USA, Israel, France and more). To evaluate the effects of this policy, a rich literature of the effect of child care subsidies on maternal employment has developed.

The policy of subsidizing child care may be categorized into two main types: universal and targeted. The first is common in Continental and Nordic European countries where it is implemented primarily through wide public reforms that include an increase in child care subsidy (for example in Norway) and the expansion of the capacity of high standard public child care centers (for example, in Spain and Germany). These reforms provided an opportunity to explore the variation in child care cost based on exogenous factors by using the experimental and quasi-experimental approaches. The existing studies primarily apply two methods: the Instrumental Variable method on the basis of exogenous aspects such as date-of-birth cut-off rules that define eligibility for public child care (Bauernschuster and Schlotter 2015, Gelbach 2002); and the Differences-in-Difference method on the basis of the regional differences in the expansion of the reforms (Lefebvre and Merrigan 2008, Schlosser 2005, Landin et al. 2008).

Most of the findings of this literature show a positive effect of the subsidies on mothers' labor force participation. The positive effect was found in Germany

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[2] For a broad literature survey on child care effect on female labor supply see Anderson, P., Levine P. (2000) and Gong et al (2010).

(Bauernschuster and Schlotter, 2013), Spain (Nollenberg and Rodrigues-Planas, 2011) and Canada[3] (Lefebre and Merrigan, 2008). However, studies in some other countries with high female employment rates found little or no evidence of the effect of universal child on mothers' employment (Norway, Havnes and Mogstad, 2011; Sweden, Lundin at el. 2008), or the effect was found only for a specific group such as single mothers (for example, in France, Goux and Maurin, 2010).

The second type of subsidized child care policy is more common in Anglo-American countries, where child care support for young children up to 5 years old, is provided by social programs targeting specific population groups, mainly low-income working families, single mothers or welfare recipients. On the one hand, eligibility for the subsidy is mean-tested, based on specific individual characteristics and this makes it more difficult to find exogenous variation in child care cost. On the other hand, the social programs, targeted at the group of interest with regard to employment outcomes, provide unique data about individuals who actually receive the subsidies and whose employment behavior would be affected by it. Literature on the effect of child care subsidy on maternal employment of actual recipients of subsidy has been limited. This is probably due to the lack of appropriate data. Berger and Black (1992) use data from two social programs which provided the child care subsidies for low-income families in the US. They solve the endogeneity problem by comparing the labor supply of single mothers who received child care subsidies with those who were on the subsidy waiting list. Blau and Tekin (2007) use the subsidy rationing policies of different counties as identifying instruments under the assumption that the employment status does not depend on how the subsidies are rationed.[4]

The current study supplements the limited existing literature on subsidized child care for actual subsidy receivers, using data from Israel where the care for children up to age 3 is subsidized for low-income families only. Exploiting the fact that slots in subsidized child care centers in Israel are severely rationed - approximately one quarter of eligible mothers are given a slot for their children (Shachar 2012) - this study compares the outcome of actual subsidy receivers (treatment group) with

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[3] In Canada, as in US, subsidized child care is very small. As an exception, in 1997 Quebec province initiated a new child care policy. Under this policy, all eligible children received a slot in highly subsidized child care centers.
[4] For detailed overview of the actual subsidy studies see Blau (2003), Blau and Currie (2004)

eligible mothers who do not receive a subsidy (control group), assuming that the primary reason for not receiving the subsidy is the severe lack of slots.

Unlike most previous research which primarily investigates the effect of subsidy on participation, this study focuses only on working mothers and analyzes how child care cost affects mothers' earnings. Because of the potential high child care costs, a working mother can adjust her work by reducing working hours, choosing work with flexible hours, on-site care or close proximity to child care. According to the compensating wage differential theory, utility from employment includes pecuniary and non-pecuniary benefits and a worker will trade-off desirable non-pecuniary job amenities with wage. A mother can substitute the job's convenience for child care with wage (Felfe 2006). When choosing work, a mother may assign greater importance to convenient child care conditions than to professional or wage considerations. Reduction in working hours and moving to "mother-friendly" work because of high child care costs, may explain the lower earnings of mothers (Felfe 2012). Subsidizing child care decreases child care cost and thus may reduce the negative effect of the cost of child care on maternal earning.

According to extensive empirical research on the motherhood wage gap, work interruptions and a decrease in working hours can cause depreciation in human capital and may affect the long-term earnings of mothers (Mincer and Polacheck 1974, Becker 1985, Polachek 1995). Also, giving priority to "mother-friendly" conditions rather than to professional considerations may harm the professional work experience of a mother and may affect her future earnings as well. Other sources of "motherhood gap" that are listed in this literature are differences in productivity, whether real or perceived (statistical discrimination by employers) and selection (women with children may differ from childless women in ways that are correlated with earnings) (Sigle-Rushton and Waldfogel, 2006; Waldfogel 1998A).

It was found that the implementation of family policies may narrow the motherhood gap in the long-term. For example, maternity leave coverage raises women's retention over the period of childbirth, and thus works to raise women's wages by increasing work experience and job tenure and by allowing them to maintain good job matches (Waldfogel 1998B). The current study examines whether

mother supporting policies, such as child care subsidies decrease the negative effect of child care cost on future maternal earnings.

The current study uses rich longitudinal data that allows us to follow the actual subsidy receivers and a valid control group over several years. Its major contribution is the estimation of the subsidy effect on actual subsidy receivers in the long term and not only in the short term. Finding a significant subsidy effect in the long term would mean that the choice of "mother-friendly" work and/or reducing working hours because of child care cost, do indeed affect the human capital accumulation of working mothers in early years of motherhood, and this decreases future maternal earnings as well as current earnings. Receipt of subsidy may reduce this negative effect.

This study investigates these questions using the Difference-in-Differences approach, comparing earnings of benefiting mothers with children up to 3 years old with earnings of subsidy-eligible mothers who do not receive the subsidy.

I find that subsidizing child care for women with children up to 3 years old has a positive effect on maternal earnings. In the three years of treatment (the years in which the child is in a subsidized child care facility), the earnings of actual subsidy receivers was 5.9% higher (standard error 0.017) in the first year of the treatment, 8% (standard error 0.028) in the second year and 3.6% (standard error 0.018) in the third year. This shows that the child care subsidy decreased the negative effect of child care cost in the first years of child raising. The results of the estimation prove the validity of the control group: the treatment and control group have the same pre-treatment trend and they are similar after controlling for observables. Additional robustness checks confirm the findings.

However, there is no significant evidence on the effect of subsidy after the treatment period. The earnings of mothers after the treatment period are similar for the treatment and control groups. The results suggest that for working mothers, reducing hours worked and/or choosing "mother-friendly" work in the years of treatment do not negatively affect human capital accumulation to an extent that affects later earnings. Therefore, for working mothers, child care cost in the first three years after giving birth has only a temporal effect. It seems that in the later period other factors are

responsible for the "motherhood wage gap", such as selection, differences in productivity or statistical discrimination.

The rest of the paper is organized as follows: Section 1 provides an overview of child care policy in Israel. Section 2 presents the methodology; section 3 describes the dataset in detail. Section 4 presents and discusses the empirical results. Specification checks are presented in Section 5. Section 6 is the conclusion.

2. Subsidized Child Care in Israel

In Israel, child care for children up to age 3 is provided by public child care centers which are supervised by the Ministry of Economy. The primary acceptance criterion to these centers is the parents' employment status. The fees in these centers are high –approximately 25-30% of female mean earnings in Israel, but low-income working families are eligible for a subsidy. The sum of the subsidy is dependent on the family income and is calculated according to the per capita working income of a nuclear family. The highest subsidy goes to families with a very low income, whose per capita income is only 15%-18% of the mean per capita working income of a family in Israel. Such a family receives a subsidy equal to 72% of the monthly child care fees (Table 1). The subsidy decreases as family income per capita increases, so families whose income per capita is higher than 73% of the mean per capita working income of an Israeli family, pay full fees. Despite relatively high fees in these child care centers, low-income families eligible for the subsidy enjoy significant support - on average subsidy receivers pay only 50% of full monthly fees.

However, only few of the eligible working families manage to get a slot in the supervised child care centers because these are severely rationed; - approximately only a quarter of eligible mothers in Israel are fiving a slot for their children (Shachar 2012). Because of the severe shortage of slots in subsidized care, the Ministry of Economy organizes appoints a special committees to decide who will be accepted into the supervised child care centers. The Ministry of Economy established a set of criteria which are uniform for all the centers. The main priority criterion during the research period was the number of children in a family while all other characteristics of the eligible mothers were similar.

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Table 1

Subsidy as a percentage of child care fees according to family income.

Income level of a family (Per capita working income in a family as a % of mean per capita working income of a family in Israel)	Percentage of a subsidy (Subsidy as a % of monthly fees in the child care center)
15% - 18%	72%
19% - 28%	68%
29% - 36%	60%
37% - 40%	52%
41% - 44%	43%
45% - 48%	35%
49% - 52%	25%
53% - 56%	17%
57% - 60%	10%
61% - 72%	5%
73% - and more	0%

3. Methodology

The effect of subsidized care on earnings is evaluated by the Difference-in-Differences approach which estimates the child care subsidies' effect on maternal earnings by comparing changes in the earnings of the treatment group with a valid control group over the short and long term. The treatment group includes eligible mothers with a child up to one year old in the first year of the treatment (2006), who received subsidized care. The treatment period covers the years when a child is in subsidized care, up to 3 years old. The control group includes mothers with a child up to age one in 2006, who were eligible for the subsidy, but did not receive it. Eligibility for subsidized care is based on the eligibility criteria set up by the Ministry of Economy. These criteria are uniform countrywide.

The main concern of the estimation is a possible correlation of maternal earnings with the geographical spread of child care centers. However, historically the vast majority of subsidized child care centers were built independently of the employment situation in the municipalities. Subsidized child care centers in Israel are usually established when new neighborhoods are built. According to the pre 2004 standards, for every 1,000 new housing units, one center with three classrooms was

built. In 2004 this was changed to 1,650 housing units. Building a subsidized center in an existing neighborhood is an extremely complex bureaucratic process with financing and land allocation problems. To receive financing from the government for a new subsidized center in an existing neighborhood, the local authority has to find appropriate land in the area, get a permit from the Israel Land Administration and be able to finance part of the project. This process often takes many years.

For example, in January 2012, the government approved construction of 700 subsidized child care centers during the next 5 years and allocated the necessary funds. In the first three years, only 5% of the planned centers were built due to the cumbersome bureaucratic process. As a result, at the end of 2014 the formal procedure for establishing new subsidized centers was simplified. Due to this bureaucratic complexity, the geographic distribution of the existing centers primarily reflects the historical urban development, which is unrelated to the labor market situation or is adjusted to it with a large delay, if at all. However, to ensure that the estimation is not biased by endogeneity in the form of an omitted variable bias (availability of subsidized child care by municipalities), the regression includes municipality-fixed effect.

The key identification assumption of this Difference-in-Differences estimation strategy is that the treatment and control groups have the same trend in earnings development and that there are no unobserved variables that change differently over time and affect the earnings of both groups differently. The common trend assumption may be tested in the pre-treatment years using the panel data for treatment and control groups. Regression estimation in Section 6 includes controls for each pre-treatment year in order to assess the common trend assumption.

Another requirement for unbiased estimation is no change in composition of treatment and control groups during the research period. In order to test whether the estimation results are influenced by a change in the composition of the groups, an additional estimation is provided in Section 6 which includes only persons appearing in the panel during the entire period of the study (2003-2011).

According to theory, child care cost can negatively affect mothers' earnings in the short and long term. The long term effect may be explained by lower accumulation of human capital during child-raising years due to a decrease in hours worked, a choice of "mother friendly" work or of time out. The child care subsidy may decrease the negative effect of child care cost on employment and thus on human

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capital accumulation and earnings. The time period covered by the data allows for testing the theory over the short and long term as well, by controlling for treatment effect in each year of the treatment period (2006-2009, short term effect) and after the treatment period (2010-2013, long term effect).

The estimation of the treatment effect on earnings is expressed in the following equation:

$$Y_{it} = \beta_1 + \beta_2 T_{it} + \beta_3 D_{it} + \beta_4 Z_{it} + \beta_{5j} \sum_{j=2003}^{2013} (T_{ij} x D_{ij}) + \varepsilon_{it}$$

Where Y is the outcome variable (ln of mean monthly earnings in a year), i indexes individuals and t indexes time. T is a year fixed effect which captures time effect common to the treatment and control groups. D is a group fixed effect which captures constant differences in earnings between the two groups. Z is a vector of socio-economic individual characteristics (such as family status, place of residence, number of persons in a family and spouse's earnings) and municipality variables. The interaction term between year and treatment variables measures the change in earnings between the two groups during the years and ε is the error term.

4. The Data

The dataset used in the research is a panel of administrative earning records of the Tax Authority for 2003-2013. It includes a representative 10% sample of employed women, and contains annual data on employment such as earnings, months worked, deductions, sector of employment and spouse's earnings. The data contains a unique individual identifier which allows it to merge with two other administrative registers: the Ministry of Interior data which includes demographic information (age, year of immigration, number and age of children, family status, place of residence) and the Ministry of Economy data which includes individual information on all children in subsidized care in 2006-2007 regarding the size of the subsidy, care provider, location of center and child's characteristics. This data is based on care providers' reports which contain detailed information on each child. The Ministry of Economy, which finances the subsidized care, decides who will receive the subsidy and the amount based on these reports.

The sample includes working mothers with children up to one year old in the first year of treatment (2006) who are eligible for the child care subsidy. The main challenge of the data is an absence of educational information. To deal with this, the sample was restricted to women who were 23 years old at the beginning of the panel - this is the usual age for women to complete a Bachelor degree in Israel. Therefore in the beginning of the panel, the group fixed effect captures the differences in education level between treatment and control groups.[5] Educational changes during the panel period are controlled through the Tax Authority information on tax benefits for completed post-secondary education that is granted for one year after completion.

The final data limits the sample to those working women who had a child up to one year old at the beginning of the treatment (2006), and who were eligible for the subsidized tariff in the subsidized child care centers. The eligibility for the subsidy was calculated according to the uniform rules of the Ministry of Economy, which include parents' employment status and a means test (per capita working income of the nuclear family). The calculation is based on the parents' earnings in the year prior to the treatment (2005).

Because of the long period covered by the panel – 11 years – the study focuses on women who were employed for most of the period, at least 2/3 of the studied period (mothers who worked 8 years and longer between 2003-2013). Tightening this restriction does not change results of the study). The final database contains 30,960 observations for the years 2003-2013. In the first year of the treatment there are 424 eligible mothers who benefited from the subsidized care and 2,255 eligible mothers who did not. Table 2 presents baseline summary statistics for the treatment and control groups.

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[5] Due to the obligatory two years of military service for women, the age of completing education is higher in Israel then in other countries.

Table 2

Baseline descriptive statistics.*

| Variables	Group		p-value of difference
	Treatment	Control	
Age	31.9	31.8	0.682
Months worked	9.4	8.9	0.680
Immigrants	0.11	0.18	0.001
Single mothers	0.08	0.12	0.013
Arabs	0.06	0.08	0.095
Ultra-orthodox	0.12	0.06	0.000
Working in the public sector	0.50	0.37	0.000
Spouse's monthly earnings in 2005	4,229	4,487	0.290
Children up to 3 years old	1.83	1.40	0.000
Children up to 18 years old	3.31	2.48	0.000
Spouse is employed in 2005	0.67	0.64	0.188
Family income in 2005	9,057	8,727	0.234
Persons in a family in 2006	5.23	4.35	0.000
Per capita working income in family, 2005	2554	3321	0.000
The monthly subsidy's sum of eligibility, NIS	747	736	0.585
Mother's monthly earnings in 2003	4,524	4,472	0.756
Mother's monthly earnings in 2004	4,772	4,903	0.485
Mother's monthly earnings in 2005	5,158	5,413	0.086
Mother's monthly earnings in 2006	5,138	5,280	0.392
Mother's monthly earnings in 2007	5,655	5,505	0.442
Mother's monthly earnings in 2008	5,712	5,813	0.613
Mother's monthly earnings in 2009	5,591	5,750	0.488
Mother's monthly earnings in 2010	5,895	6,184	0.170
Mother's monthly earnings in 2011	6,285	6,491	0.344
Mother's monthly earnings in 2012	6,574	6,718	0.535
Mother's monthly earnings in 2013	6,848	6,911	0.806
Number of observations in 2006	424	2,555	
Number of observations in the panel			

* The treatment group includes mothers with a child up to one year old who were eligible for subsidized child care and received it in 2006. The control group includes mothers with a child up to one year old who were eligible for subsidized child care in 2006 but did not receive it.

The work characteristics of the two groups are relatively similar - there are no significant differences in the months worked and the earnings of mothers and spouses. As a result, the family income is similar in the two groups but child care subsidy recipients are much more likely to have a lower family income per person. This is consistent with giving priority to subsidized care to families with more children, when all other eligibility characteristics are similar. In the treatment group the number of

young children and children in general is larger. The share of immigrants is lower in the treatment group. It is probably because immigrants are less informed about subsidies and criteria for eligibility. Single mothers use less subsidized care as well, while around 30% of the single mothers in the sample are immigrants.

Figure 1 shows the average monthly earnings by year from 2003 up to 2013 for mothers who received subsidized care (treatment group) and those eligible who did not (control group). The graph shows that while earnings of women in the control group before the intervention were higher than these of women in the treatment group, the earnings of both groups evolved very similarly over time - they had a common trend. During the first years of the treatment the initial gap in earnings narrowed and eventually almost closed. The gap reappeared later and remained open until the end of the research period. The results of regression estimations assess the significance of changes in the gap.

Figure 1

Earning of women with young children
Treatment and comparison group, panel 2003-2013
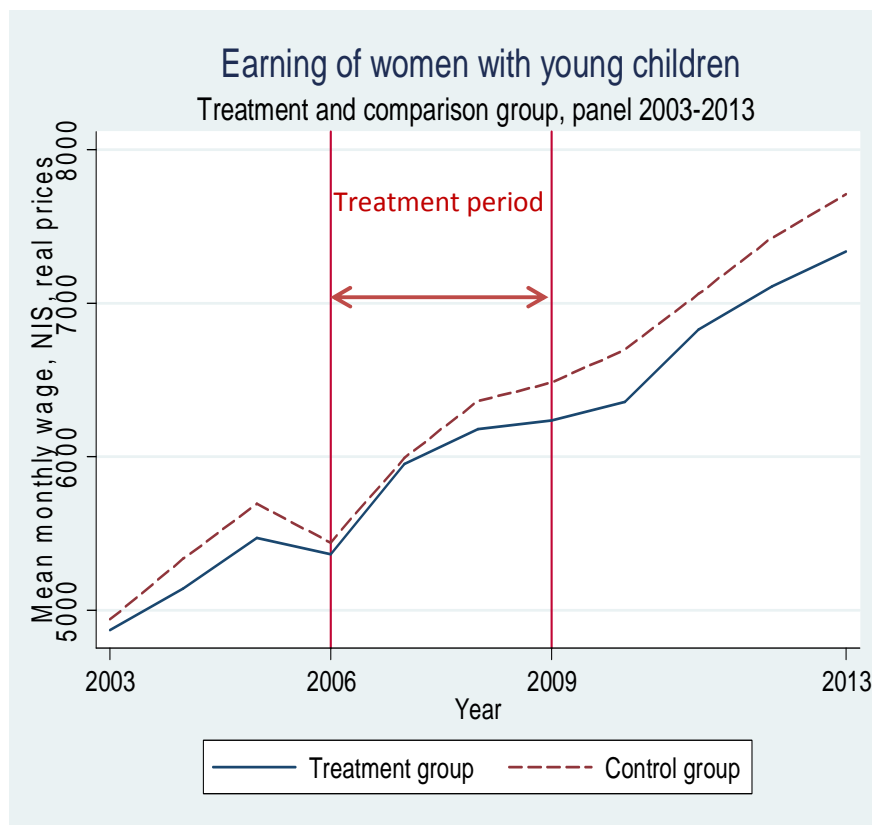
5. Results

Table 3 presents the main results of the estimations. The results show a significant positive effect of the subsidy on the earnings of mothers in the years of treatment. The baseline regression includes only the dummy variables for time and treatment and their interactions (Table 3, column 1). The next two models control for the mothers' individual (column 2) and local characteristics (column 3). The last specification (column 4) also in addition includes a fixed effect of place of residence in order to control for the variation in availability of the subsidized child care centers between municipalities. Controlling for additional covariates does not significantly change the results. The estimated effect of the individual characteristics is consistent with standard finding in the analysis of earnings growth: the presence of young children decreases maternal earnings growth, and weaker social groups such as single mothers, immigrants and Arabs were less likely to increase their earnings in the years of the panel.

The regression results show that there are no significant differences between the treatment and control groups, since the treatment variable was estimated as insignificant. The regression results also confirm the key identifying assumption of common pre-treatment trend for treatment and control groups, since the interaction of the treatment term and term of pre-treatment year(Treatment*2003, Treatment*2004) were estimated to be insignificant.

The interpretation of the main results is that subsidized care increases maternal earnings only while the subsidy is received (during the treatment period). In the first year of treatment mothers in the treatment group earned 5.9% (standard error 0.017) more than mothers in the control group, in the second year the gap widened to 8% (standard error 0.028) and then narrowed again to 3.6% (standard error 0.018) in the third year. The results show that subsidies reduce the negative effect of the child care costs on maternal employment and that the earnings of the subsidy recipients grow faster.

Table 3 Effect of subsidized care on maternal earnings

Variables	Model 1	Model 2	Model 3	Model 4
Treatment	-0.0282	-0.0286	-0.0013	0.0195
	(0.0241)	(0.0233)	(0.0227)	(0.0234)
Treatment*2003	0.0277	0.0231	0.0236	0.0269
	(0.0262)	(0.0263)	(0.0264)	(0.0266)
Treatment*2004	0.0096	0.0072	0.0084	0.0110
	(0.0244)	(0.0244)	(0.0244)	(0.0245)
Treatment*2006	0.0626***	0.0567***	0.0599***	0.0587***
	(0.0174)	(0.0167)	(0.0166)	(0.0170)
Treatment*2007	0.0754***	0.0789***	0.0808***	0.0803***
	(0.0285)	(0.0281)	(0.0284)	(0.0284)
Treatment*2008	0.0323*	0.0407**	0.0373**	0.0362*
	(0.0182)	(0.0183)	(0.0188)	(0.0187)
Treatment*2009	0.0181	0.0214	0.0197	0.0174
	(0.0276)	(0.0292)	(0.0291)	(0.0289)
Treatment*2010	0.0057	0.0097	0.0113	0.0063
	(0.0282)	(0.0289)	(0.0295)	(0.0290)
Treatment*2011	-0.0051	-0.0089	-0.0088	-0.0133
	(0.0340)	(0.0363)	(0.0365)	(0.0369)
Treatment*2012	0.0314	0.0325	0.0251	0.0214
	(0.0356)	(0.0363)	(0.0361)	(0.0362)
Treatment*2013	0.0131	0.0257	0.0065	0.0057
	(0.0281)	(0.0296)	(0.0301)	(0.0306)
Age		0.0784***	0.0680***	0.0675***
		(0.0053)	(0.0047)	(0.0044)
Age^2		-0.0007***	-0.0006***	-0.0006***
		(0.0001)	(0.0001)	(0.0000)
Single mother		-0.0595**	-0.0650**	-0.0558**
		(0.0287)	(0.0268)	(0.0269)
Ultra-orthodox		-0.0722**	-0.0839***	-0.1100***
		(0.0299)	(0.0230)	(0.0198)
Arab		-0.1516***	-0.1170***	-0.1108***
		(0.0235)	(0.0222)	(0.0226)
Immigrant		-0.1656***	-0.0232	-0.0843***
		(0.0340)	(0.0394)	(0.0261)
Works in Public Sector		0.1209***	0.1236***	0.1131***
		(0.0228)	(0.0216)	(0.0225)
Spouse's ln earnings		-0.0015	-0.0017	-0.0014
		(0.0018)	(0.0018)	(0.0018)
Children aged 0-5		-0.0283***	-0.0186*	-0.0169*
		(0.0090)	(0.0098)	(0.0098)
Children aged 6-9		-0.0131	-0.0218**	-0.0192**
		(0.0081)	(0.0088)	(0.0084)
Newborn in family after 2006		-0.0357***	-0.0393***	-0.0386***
		(0.0123)	(0.0123)	(0.0122)
Individual characteristics		+	+	+
Municipalities characteristics			+	+
Municipalities FE				+
N	30988	30961	30920	30920
r2	0.0353	0.1034	0.1240	0.1616

Standard errors in parentheses, *** p<0.01 ** p<0.05 * p<0.10

However, there is no significant evidence of a subsidy effect after the treatment period. The post-treatment earnings growth of mothers is similar for treated and control group. The results suggest that reducing working hours and/or choosing "mother friendly" work in the early years of motherhood does not have a significant negative impact on human capital accumulation of working mothers and thus does not affect later earnings. Therefore, child care cost has a temporary effect and it seems that other factors (such as differences in productivity/statistical discrimination or selection) are responsible for the "motherhood gap" later on.

6. Robustness checks
6.1 Restriction of time period

The study focuses on mothers who were significantly involved in the labor market during the research period. Therefore the main estimation includes mothers who worked at least 2/3 of this period: that is, at least 8 years during 2003-2013. To be stricter with the sample definition, an additional estimation was performed using a smaller sample that includes only mothers who worked during the entire period, to eliminate the effect of composition change. The number of observations was reduced almost by third, but the main findings were the same (Table 4).

6.2 Alternative eligibility definition

Eligibility for subsidized care in the current study is calculated based on the criteria of the Ministry of Economy: per capita working income of a family. To avoid behavioral effects, the study uses the pre-treatment income (2005), while the Ministry of Economy determines eligibility for subsidy based on the income in the year of receiving the subsidy (2006). Table 5 presents results of estimation where the eligibility identification is based on family income in the first year of the treatment (2006), to check whether using the income data of the year prior to treatment changes the results. The results are relatively similar to the findings in the baseline estimation, so the behavior of eligible women changes very slightly, if at all.

Table 4

Specification checks:

Alternative time definition of the sample: only mothers who worked the entre period of the panel 2003-2013

Variables	Model 1	Model 2	Model 3	Model 4
Treatment	-0.0307	-0.0179	0.0021	0.0302
	(0.0260)	(0.0240)	(0.0233)	(0.0241)
Treatment*2003	0.0413	0.0362	0.0363	0.0389
	(0.0276)	(0.0285)	(0.0285)	(0.0286)
Treatment*2004	0.0159	0.0172	0.0175	0.0185
	(0.0188)	(0.0190)	(0.0189)	(0.0191)
Treatment*2006	0.0542***	0.0524***	0.0537***	0.0530***
	(0.0138)	(0.0139)	(0.0139)	(0.0140)
Treatment*2007	0.0769***	0.0811***	0.0812***	0.0798***
	(0.0183)	(0.0179)	(0.0181)	(0.0180)
Treatment*2008	0.0320*	0.0381**	0.0357**	0.0342**
	(0.0163)	(0.0158)	(0.0158)	(0.0158)
Treatment*2009	0.0234	0.0270	0.0253	0.0223
	(0.0228)	(0.0230)	(0.0234)	(0.0233)
Treatment*2010	-0.0177	-0.0164	-0.0142	-0.0194
	(0.0294)	(0.0297)	(0.0300)	(0.0297)
Treatment*2011	0.0046	0.0035	0.0043	-0.0011
	(0.0283)	(0.0296)	(0.0298)	(0.0299)
Treatment*2012	-0.0140	-0.0111	-0.0166	-0.0219
	(0.0377)	(0.0387)	(0.0387)	(0.0389)
Treatment*2013	-0.0069	0.0020	-0.0117	-0.0112
	(0.0277)	(0.0284)	(0.0286)	(0.0288)
Individual characteristics		+	+	+
Municipalities characteristics			+	+
Municipalities FE				+
N	22012	21996	21976	21976
r2	0.0587	0.1195	0.1414	0.1937
rmse	0.5290	0.5120	0.5058	0.4923

Standard errors in parentheses, *** p<0.01 ** p<0.05 * p<0.10

6.3 Propensity score method

Another way to choose a control group is to use the propensity score matching method, using a model of probability to receive a subsidy that includes observable characteristics. The necessary assumption when using this method is that only observable characteristics affect the probability of getting a treatment. Based on mothers' individual and geographical characteristics, the similar control group was built. The results are presented in Table 6 and are similar to the baseline estimation

findings, with the exception that in this specification there is a significant subsidy effect only in the first two years of treatment.

Table 5

Specification checks:

Alternative eligibility definition: based on income in 2006

(mothers who worked the entire period of the panel 2003-2013)

Variables	Model 1	Model 2	Model 3	Model 4
Treatment	-0.0405	-0.0145	-0.0001	0.0234
	(0.0327)	(0.0303)	(0.0308)	(0.0318)
Treatment*2003	0.0495	0.0415	0.0424	0.0453
	(0.0340)	(0.0344)	(0.0345)	(0.0345)
Treatment*2004	0.0084	0.0076	0.0084	0.0086
	(0.0261)	(0.0262)	(0.0261)	(0.0260)
Treatment*2006	0.0592***	0.0558***	0.0578***	0.0564***
	(0.0210)	(0.0214)	(0.0214)	(0.0216)
Treatment*2007	0.0758***	0.0814***	0.0812***	0.0792***
	(0.0278)	(0.0277)	(0.0278)	(0.0278)
Treatment*2008	0.0433*	0.0511**	0.0482*	0.0457*
	(0.0255)	(0.0250)	(0.0252)	(0.0252)
Treatment*2009	0.0405	0.0462	0.0450	0.0427
	(0.0304)	(0.0303)	(0.0308)	(0.0310)
Treatment*2010	0.0014	0.0009	0.0036	0.0012
	(0.0344)	(0.0346)	(0.0348)	(0.0348)
Treatment*2011	0.0295	0.0251	0.0248	0.0239
	(0.0342)	(0.0352)	(0.0356)	(0.0358)
Treatment*2012	0.0134	0.0149	0.0057	0.0035
	(0.0405)	(0.0414)	(0.0411)	(0.0412)
Treatment*2013	0.0081	0.0147	-0.0028	-0.0006
	(0.0319)	(0.0319)	(0.0318)	(0.0312)
Individual characteristics		+	+	+
Municipalities characteristics			+	+
Municipalities FE				+
N	20564	20546	20529	20529
r2	0.0596	0.1333	0.1556	0.2077
rmse	0.5299	0.5091	0.5027	0.4891

Standard errors in parentheses, *** p<0.01 ** p<0.05 * p<0.10

Table 6

Specification checks:

Alternative eligibility definition: PSM

(mothers who worked the entire period of the panel 2003-2013)

Variables	Model 1	Model 2	Model 3	Model 4
Treatment	-0.1382***	-0.0792**	-0.0290	-0.0047
	(0.0371)	(0.0349)	(0.0333)	(0.0354)
Treatment*2003	0.0628**	0.0579**	0.0555*	0.0603**
	(0.0277)	(0.0281)	(0.0283)	(0.0281)
Treatment*2004	0.0277	0.0313	0.0316	0.0321
	(0.0210)	(0.0198)	(0.0200)	(0.0199)
Treatment*2006	0.0584***	0.0578***	0.0614***	0.0598***
	(0.0188)	(0.0189)	(0.0186)	(0.0189)
Treatment*2007	0.0648***	0.0797***	0.0778***	0.0746***
	(0.0229)	(0.0223)	(0.0222)	(0.0224)
Treatment*2008	0.0240	0.0401*	0.0333	0.0302
	(0.0228)	(0.0227)	(0.0223)	(0.0226)
Treatment*2009	0.0120	0.0230	0.0175	0.0138
	(0.0260)	(0.0265)	(0.0267)	(0.0269)
Treatment*2010	-0.0060	-0.0012	0.0021	-0.0018
	(0.0292)	(0.0283)	(0.0286)	(0.0285)
Treatment*2011	0.0040	0.0040	-0.0017	-0.0017
	(0.0291)	(0.0291)	(0.0298)	(0.0301)
Treatment*2012	-0.0137	0.0023	-0.0223	-0.0217
	(0.0360)	(0.0372)	(0.0367)	(0.0373)
Treatment*2013	-0.0122	0.0099	-0.0304	-0.0240
	(0.0294)	(0.0301)	(0.0304)	(0.0305)
Individual characteristics		+	+	+
Municipalities characteristics			+	+
Municipalities FE				+
N	35070	35063	35018	35018
r2	0.0553	0.1321	0.1633	0.2011
rmse	0.6366	0.6103	0.5995	0.5875

Standard errors in parentheses, *** p<0.01 ** p<0.05 * p<0.10

7. Conclusion

Maternal earnings are lower than earnings of other women. For working mothers this gap often referred to in the literature as the "motherhood gap", is a result of factors such as a decrease in working hours and a shift to "family friendly" works which are more convenient for child raising but pay less. In order to mitigate the negative effect of child care on mothers' earnings, a variety of family supporting policies were implemented. This study examines the effect of subsidized child care on mothers' earnings and whether such subsidies can decrease the negative effect of the cost of child care. The study uses the Difference-in-Differences approach on a sample of actual subsidy receivers and eligible non-receivers using fact that slots in subsidized child care centers in Israel are severely rationed - approximately only one quarter of eligible mothers are given a slot for their children. The major contribution of this study is an estimation of the subsidy effect on actual subsidy receivers in the long term using rich longitudinal data.

The results show that child care subsidies significantly increase the earnings of mothers in the years of treatment. I find that mothers who received the subsidy earned 5.9% (standard error 0.017) more in the first year of treatment, 8% (standard error 0.028) in the second year and 3.6% (standard error 0.018) in the third year.

However, there is no significant evidence of a post treatment subsidy effect. The earnings growth of mothers after the treatment period is similar in the treatment and control groups. The results suggest that a reduction in working hours or choosing "mother friendly" work in the years of treatment do not have a negative effect on human capital accumulation to an extent that affects later earnings. Therefore, for working mothers, child care cost in the first three years after giving birth has a temporary effect, and it seems that in the later period the possible explanation for the "motherhood gap" are other factors, such as differences in productivity/statistical discrimination and selection.

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