

The Impact of After-School Care on Maternal Labor Market Outcomes

Ailin He¹
McGill University

Laëtitia Renée[°]
McGill University

Nagham Sayour*
Zayed University

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Abstract

This paper explores provincial variations in the pricing and provision of after-school care in Canada to study the effects of after-school care on maternal labor market outcomes. In 1998, the province of Quebec introduced a \$5 per day subsidized before- and after-school care program for primary school children. Using the Canadian Survey of Labour and Income Dynamics (SLID), we adopt a triple-difference approach to compare the labor market outcomes before and after 1998 of mothers with primary school aged children versus childless women aged 50 and above who are ineligible for the program, in Quebec versus the Rest of Canada. Our results show that the reform effectively promotes maternal employment on the extensive margin but has no significant effect on employment intensity. In particular, maternal labor force participation and employment increased by 4.25 and 7 percentage points, respectively. These positive effects are driven by mothers with college degree and above, who increase their labor force participation and employment rates by 9.9 and 12 percentage points, respectively. Although the provision of low-cost pre-school childcare options has received much attention from policy makers, our findings indicate that low-cost after-school care is also important in promoting women labor force participation.

Keywords: after-school care, maternal labor supply, employment outcomes, triple difference

JEL Codes: J22, J13, J18

¹ McGill University, Montreal, Quebec, Canada. Email: ailin.he@mail.mcgill.ca.

[°] McGill University, Montreal, Quebec, Canada. Email: laetitia.renee@mail.mcgill.ca.

* Corresponding author: Zayed University, Dubai, United Arab Emirates, P.O.Box: 19282. Email: nagham.sayour@zu.ac.ae.

1 Introduction

Maternal labor supply has been on a worldwide rise for the past few decades (Ortiz-Ospina, Tzvetkova and Roser, 2018). Many factors could have contributed to this trend, such as changes in fertility, social and cultural transformations and changes in the economic and labor market conditions. Among the drivers of maternal labor supply, childcare options have received much attention from both policy makers and researchers. Childcare and other family-oriented policies are commonly launched by governments around the world to promote maternal employment especially after childbirth. The majority of the current research focuses on labor market decisions of mothers with pre-school children aged 0-5 years old, whereas the decisions of mothers with older children, especially mothers of primary school aged children, are often understudied.

In this paper, we study the effects of providing low-cost before and after-school care (hereafter after-school care) on maternal labor market outcomes of mothers with children in primary school. To identify causal effects of childcare provision on maternal employment, we exploit a reform implemented in the Canadian province Quebec (hereafter QC) in 1998. This policy gradually increased the provision of after-school care for primary school-aged children and decreased its cost to \$5/day. No similar policy was launched by other provincial governments in the rest of Canada (hereafter ROC) during the same time period, which provides us with a potential comparison group. This increase in the provision of low-cost childcare is likely to affect childcare options and subsequently mother's labor supply behavior. In a static labor supply model, the opportunity cost of providing maternal care is the mother's foregone earnings net of childcare cost per unit of time. Our policy of interest affects maternal employment by changing mother's budget constraint. On the one hand, we expect the program to encourage labor force participation by

providing the option of a highly subsidized after-school care. On the other hand, the policy could impose an ambiguous effect on labor supply intensity, as measured by number of hours worked or full-time versus part-time work, since the income and substitution effects of the subsidy could have opposing effects.

Using the Canadian Survey of Labour and Income Dynamics (SLID), we estimate the effect of the after-school care policy on different dimensions of maternal labor market outcomes, including labor force participation, employment, full-time work, hours of work and wages. We apply a triple difference approach where we compare the labor market outcomes of mothers with primary school-aged children in QC before and after the policy to those of mothers with primary school-aged children in the ROC, relative to women aged 50 years old and above who do not have any children and are thus unaffected by the program in the past or in the future. We find that after the implementation of the after-school care policy, mother's labor force participation and employment rates increase by 4.25 and 7 percentage points respectively. No significant effects were found on the intensive margin, whether it is measured by the likelihood of having a full-time (versus a part-time) job, or the number of hours worked during the reference year. As robustness checks, we run some placebo tests using the triple difference method on mothers with children aged 12 years or above who were not affected by the policy. We find no significant policy effects on the maternal labor market outcomes of these control groups. Examining heterogeneous effects by maternal education reveals that the policy induces more educated mothers to enter the labor market and increases their employment rate. We do not find significant differences in the response of mothers in different family income groups.

While there is extensive research on childcare policy effects for preschool children and their mothers (e.g. Baker and Milligan 2008; Lefebvre and Merrigan 2008; Hanratty and Trzcinski

2009), little is known about labor supply behavior of mothers with school-aged children. Among the few empirical studies tackling this topic, the majority finds an increase in maternal labor force participation as a result of after-school care availability with the exception of Felfe, Lechner and Thiemann (2016). In addition, the results for the intensity of work measured through full-time versus part-time work and number of hours worked per week are mixed.

The impact of these policies depends on their generosity and the population coverage. For example, Felfe et al. (2016) examine a policy in Switzerland that increased the availability of after-school care without changing its price. They use cantonal variation in the provision of after-school care to study the effect of availability of after-school care, in a setting where this type of care is scarce, on the extensive and intensive margins of maternal employment. Performing a difference-in-differences analysis and an instrumental variable approach, they show that increasing the availability of after-school care without changing its price affects maternal employment on the intensive margin only, where mothers increase their full-time employment. Nemitz (2015) uses variations in a policy that lengthened primary school care to full day in Germany. He only finds an increase in maternal labor force participation but no effect on the intensive margin. Contreras, Sepúlveda and Cabrera (2010) study a policy lengthening the school day in Chile. They find positive effects of the policy on maternal labor force participation and employment but negative effects on the number of hours worked. Berthelon, Kruger and Oyarzun (2015) examine the same policy and find that the results are mainly driven by older women, low educated mothers, mothers with no preschool children and those married or living with a partner.

Empirical evidence on the policy effects of childcare subsidies also varies widely. Lundin, Mörk and Öckert (2008) study a policy in Sweden that imposes a price ceiling on childcare providers. They find no significant effects of afterschool care prices on full-time employment of mothers.

Lastly, Martinez and Peticara (2014) show that providing free after-school care in Chile increases maternal labor force participation and employment.

Our paper is the first to examine the effects on maternal labor market outcomes of the unique after-school care program in QC that combines both a decrease in price and an increase in childcare availability. Our findings on the policy impacts are in line with those from the existing literature. Our study provides important policy implications since QC's childcare policies have always been treated as leading examples for the rest of Canada.

The paper continues as follows. Section 2 introduces QC's after-school care policy, followed by the methodology used detailed in Section 3. In Section 4, we describe the dataset, sample selection and provide descriptive statistics. We present our main results in Section 5. In Section 6, we study heterogeneous effects by maternal education and non-maternal household income. Section 7 concludes.

2 Policy

The before- and after-school childcare program is a non-for-profit program initiated on September 1998 by the Ministry of Education in the province of Quebec. The establishment of this program was followed by Quebec government's adoption of a new education Act (Bill 180) which came into law at the beginning of 1998, supporting the creation of governing boards in schools. Governing boards played several significant roles in the roll-out of after-school care programs. They evaluate the demand for after-school care services in public schools. If sufficient demand exists, they request the school board to implement after-school care programs. All school childcare

projects with governing board supports are considered admissible and eligible to apply for fundings to set up the projects (Mainville, 2006).

With the subsidies from the government, this program dedicated for primary school children is provided at a fee of \$5/day,¹ which was later raised to \$7/day starting in 2004. Care services opens from 7:00am until school hours, during lunch time and after-school until 6:00p.m. (Tougas 2002, Lefebvre and Merrigan 2005). All primary school children are eligible for the after-school program as long as they attend a minimum of 2 sessions per day for 3 days a week, but limited spots are offered on a first-come-first-served basis. Schools usually serve their own students, however, in some special cases, students from other schools may be allowed to register.

According to the Ministry of Education, the program significantly lowered the fee for after-school care paid by parents, although the exact cost prior to the policy implementation was not well-documented as there was no regulated after-school care program implemented prior to 1998. With the increase in the availability of subsidized after-school services, which has almost doubled from 1997-1998 to 2004-2005 (an increase from 811 to 1613 providers), the demand, as expected, increased drastically as well. Funding injected into this program increased from CA\$ 64 million in 1998-1999 to CA\$ 116 million in 2004-2005. By then, over 230,000 students in QC (an increase from 92,664 students in 1997-1998) were enrolled in the after-school care program (Figure 1). Meanwhile, although after-school care was available in other Canadian provinces, no government subsidies were offered except in QC.

¹ The fees were split equally among the ministry and the parents when the after-school care program was initiated (Mainville, 2006).

3 Methodology

The introduction of the program increased after-school care take-up among primary-school-aged children by 6 to 10 percentage points (He and Sayour, 2020). With such increase in the use of after-school care, mothers, as the primary care takers may have more flexible schedules to get involved in other activities, which could in turn affect labor supply patterns. To study whether the increase in the use of after-school care induced an increase in maternal employment, we first considered a difference-in-differences (DID) methodology where we compare program-eligible and ineligible mothers, before and after the policy. The treatment group consists of mothers with a primary school-aged child residing in QC after 1998, who are compared to mothers with children of the same age group residing in QC before 1998. Since this before-after analysis does not control for cohort, macroeconomic effects and time trends, we use mothers with primary school-aged children in ROC as an additional control group. For this DID methodology to yield unbiased results, the common time trend assumption, stating that the treatment and the control groups should follow the same trend before the treatment, should hold. Unfortunately, this crucial assumption does not hold in our dataset.² Thus, we resort to a triple difference instead, where we use an additional group that is ineligible for the program. Specifically, we use women aged 50 and above who do not have any children as an additional control group. These women are not currently affected by the program and since they are already aged 50 and above, they are highly unlikely to be affected in the future. In this case, the key assumption is that the difference in outcomes between the mothers with primary aged children and childless women aged 50 and above in QC would, in

² Not only does the parallel pre-trend assumption fail to hold for ROC as a whole, it fails for most individual provinces such as ON and BC. We also attempt to construct balanced cohort between QC and ROC using propensity score matching (PSM), but the pre-trends on most labor market outcomes still diverged substantially from 1993 to 1995.

the absence of the reform, follow the same trend as the difference between the two groups in ROC.³

We run the following triple difference regression:

$$\begin{aligned} y_{itpg} = & \beta_0 + \beta_1 QC_p + \beta_2 Post_t + \beta_3 Wkid6to12_g + \beta_4 Post_t \times QC_p \\ & + \beta_5 Post_t \times Wkid6to12_g + \beta_6 QC_p \times Wkid6to12_g \\ & + \beta_7 Post_t \times QC_p \times Wkid6to12_g + \theta X_{itpg} + u_{itpg} \end{aligned}$$

where y_{itpg} is the outcome of interest (maternal labor market outcomes) for women i , living in province p , observed at year t , and belonging to group g . QC_p is a dummy variable equal to 1 if the individual lives in QC, 0 otherwise. $Post_t$ is a dummy variable that is equal to 1 if the mother is observed after 1998, 0 otherwise. $Wkid6to12_g$ is a dummy variable equal to 1 for mothers with primary school children.⁴ It is equal to 0 for women aged 50 and above who do not have any children. $Post_t \times QC_p$ isolates women observed in QC after 1998. $Post_t \times Wkid6to12_g$ isolates women with primary school aged children after 1998. $QC_p \times Wkid6to12_g$ isolates women with primary school aged children in QC. The variable of interest $Post_t \times QC_p \times Wkid6to12_g$ isolates mothers with primary school aged children in QC and observed after 1998. X_{itpg} is a set of control variables including mother's age, years of schooling, marital status, immigration status, number of children in different age groups, the size of the residential region, province fixed effects and provincial male unemployment rate.⁵ u_{it} is the error term. We cluster the standard errors at the province-year level (Bertrand, Duflo and Mullainathan, 2004).⁶ Our coefficient of interest is

³ We will provide evidence in Section 4 about the validity of this additional control group.

⁴ Additional sample restrictions apply in terms of child's age across reference year. See Section 3 for more details.

⁵ All the control variables, except male unemployment rate, are discretized.

⁶ We also try clustering on the province only. Main results do not differ significantly and are available from the authors upon request.

β_7 which measures the intent-to-treat effect, i.e., the effect of the policy on mothers with primary school-aged children regardless of actual after-school care take-up.

3 Data Set and Descriptive Statistics

To study the effect of subsidized after-school care on maternal labor market outcomes, we use the Survey of Labour and Income Dynamics (SLID) introduced in 1993 by Statistics Canada. as a rotating panel. Individuals are sampled from the Labour Force Survey (LFS) and are interviewed for six consecutive years. A new panel is introduced every three years. Therefore, in a given year starting 1996, the dataset consists of two active panels. The survey provides detailed information on income and labour market status of adults in Canada. It is usually conducted from January to mid-March and ask questions about the previous calendar year which is referred to as the reference year. Sampling weights are provided to ensure that the survey is nationally representative of the population aged above 16 years old.

Our sample consists of mothers aged 18 to 55 with at least one child aged 6-11 years old from 1993 until 2003. We exclude the observations in 1998, the year of the program's introduction, in order to cleanly separate the pre- and post-policy periods. We restrict the sample to two-parents' families and exclude single mothers whose labour force participation could be affected by a change in 1998 to the National Childcare Benefit paid to low-income families as shown in Milligan and Stabile (2007). In addition, we exclude mothers with children exposed to the universal childcare introduced in QC in 1997,⁷ since this policy has been shown to affect maternal employment in the short-run (Lefebvre and Merrigan 2008, Baker, Gruber and Milligan 2008) and the long-run

⁷The universal childcare provided subsidized childcare at \$5/day for children aged 4 years old in 1997, 3 years old in 1998, 2 years old in 1999 and all children aged 0-4 years in 2000.

(Lefebvre, Merrigan and Verstraete 2009). This excludes mothers with children aged 0-5, as well as mothers with children aged 6 in 1999, 6-7 in 2000, 6-8 in 2001, 6-9 in 2002 and 6-10 in 2003. The sample ends in 2003 since all primary school aged children in 2004 onwards were eligible for the universal childcare. However, since the number of observations in 2003 is very low, we also drop the year 2003. As an additional control group, we also use women aged 50 and above who do not have children. The final sample consists of 26,498 individual-year observations.

Table 1 provides the descriptive statistics of our sample of interest. The means and standard deviations are presented in Column 1. 76.9 percent of women in our sample are in the labor force and 72.7 percent are employed. Mothers in our sample are on average 39.5 years old. 22.6 percent have a high school degree and 20 percent are immigrants. 43.8 percent have a degree between high school and university. The majority lives in urban areas and 20.7 percent live in rural areas. Columns 2 and 3 of Table 1 provide the means and standard deviations for QC before and after the policy, for mothers of primary school-aged children who were not eligible for the universal childcare. The one for the same group in ROC are shown in columns 4 and 5. Similar descriptive statistics are presented for the childless women aged 50 and above in columns 6 to 9.

To study the effect of providing and subsidizing after-school care on maternal employment, we consider different variables that measure maternal labor supply on both the extensive and intensive margins. Among the rich set of labor market related variables available in the SLID, we choose the following to reflect different perspectives of labor market outcomes:

- Labor market participation (LFP): a binary variable equal to 1 if the mother was in the labor force at any time during the reference year, and 0 otherwise;⁸

⁸ We also use the labor force participation in specific months in the reference year, specifically we consider the months of April and August as in Lefebvre and Merrigan (2008). The results echo those of the labor force participation during the reference year.

- Employment status (Employed): a binary variable equal to 1 if the mother was employed at any time during the reference year, and 0 otherwise;
- Job status (Full-time Job): a binary variable equal to 1 if the job is full-time 0 otherwise. This variable is only available for women who ever were employed during the reference year.
- Total hours worked at all jobs during reference year, conditional on ever being in the labor force during the reference year (Hours Worked).⁹
- Hourly wages at all jobs during the reference year, in constant 2002 dollars (Hourly wage).¹⁰ This is set to zero for non-working mothers, as well as working mothers with zero paid hours.

Theoretically speaking, the provision of low-cost after-school care is expected to increase maternal labor market participation and employment by lowering the cost of working, or the reservation wage. However, if after-school care exclusively crowds out other types of non-parental care that is usually provided to children after school time, then the policy should not affect maternal labor force participation. On the intensive margin, we focus on two measures—the number of hours worked in the reference year conditional on labor force participation and having a full-time job conditional on being employed. If we use unconditional hours and assign a 0 to non-working mothers, the mere fact of finding an effect on maternal employment would lead to an increase in hours worked. However, the effect of the policy on conditional measures of the intensive margin

⁹ For more information on how the hours of work are calculated in the SLID, please refer to Bartman and Garneau (1998). The results for the unconditional hours are available from the authors upon request.

¹⁰ We use “imphw1”, implicit hourly wage at end of job or end of reference year as the hourly wage variable. The amount includes tips, bonuses and commissions. For workers who reported hourly wages, the value is taken as is. For those who reported wages at other frequencies, the value is imputed by the amount reported divided by the number of weeks/months worked.

of maternal labor supply are ambiguous. On the one hand, given that most regular full-time jobs require long hours that extend beyond school hours, the availability of after-school care may enable some mothers to switch to full-time jobs. On the other hand, since the spaces are highly subsidized, and assuming that leisure is a normal good, some mothers might decide to reduce labor supply after the policy due to prevailing income effects. Lastly, we expect a positive effect of the policy on the unconditional hourly wage if the after-school care were to increase labor force participation. Using the conditional hourly wage instead might be plagued with selection bias due to the mother's decision to join the labor force. In addition, we do not expect to find any effects on the conditional hourly wage unless the policy induces general equilibrium effects, or the quality of jobs taken by mothers changes after the policy.¹¹

Figure 2 plots the difference in the rate of the dependent variables between women with primary school aged-children and childless women aged 50 and above in QC and ROC over time from 1993 to 2002. The main assumption of the DID methodology is the common time trend assumption, which states that the treated and control groups should share similar trends before the policy. With the triple difference method, we expect the difference in the rates of the dependent variables between these two groups of women to move in parallel before 1998 between QC and ROC. A visual examination of Figure 2 shows that this assumption holds for most of our dependent variables. A formal test is also provided in the next section.

¹¹ We find no significant effect of the after-school care policy on the conditional hourly wage when estimating this relationship using a Heckman selection model. Results available from the authors upon request.

4 Results

4.1 Main Results

Our main results are presented in Table 2. The first column reports the estimates on the effects of the provision and subsidization of after-school care on maternal labor outcomes using the triple difference methodology. Given that we examine multiple labor market outcomes that might be affected by the after-school care program, we control for the familywise error rate (FWER) in all our subsequent analysis,¹² using the Romano-Wolf correction procedure. We report the adjusted p-values in Column 2. The last column reports the number of observations. Relative to childless women aged 50 and above, mothers with a youngest primary school-aged child in QC compared to ROC experience an increase in labor force participation and employment by 4.25 and 7 percentage points, respectively. These results remain significant after correcting for multiple outcomes as shown in column 2. The effects on the full-time job status and the conditional hours worked are not statistically significant. Although we find a positive effect on the unconditional hourly wage, it is not statistically significant.

As discussed in Section 2, the increase in subsidized after-school spots and take-up was gradual. Thus, we expect the effects of after-school care to manifest over time. To test this hypothesis, we perform an event study analysis to incorporate year-specific policy effects. We run the following regression that includes interaction terms of QC, the *Wkid6to12* and year dummy variables for each year in our sample from 1993 until 2002 with 1997 being the reference year

¹² We correct for the familywise error rate rather than false discovery rate as the p-values for the different outcomes variables might be correlated.

$$\begin{aligned}
y_{itpg} = & \alpha_0 + \alpha_1 QC_p + \alpha_2 \sum_{t=1993}^{2002} Year_t + \alpha_3 Wkid6to12_g + \alpha_4 \sum_{t=1993}^{2002} Year_t \times QC_p \\
& + \alpha_5 \sum_{t=1993}^{2002} Year_t \times Wkid6to12_g + \alpha_6 QC_p \times Wkid6to12_g \\
& + \alpha_7 \sum_{t=1993}^{2002} Year_t \times QC_p \times Wkid6to12_g + \delta X_{itpg} + e_{itpg}
\end{aligned}$$

Figure 3 reports the event study results for the different variables of interest. For the labor force participation, the effect is positive for all the post reform years though marginally significant in 1999 and 2001. The effect on employment is positive and significant in 1999 and lasts over the whole period considered. On the intensive margin, we do not find any significant effects on job status in terms of women switching between full-time and part-time jobs. For the number of hours worked, results are mixed with a significant negative effect in 2000 and a positive significant effect in 2002. Lastly, for the hourly wage, all the effects are positive and significant except for the one in 2002. To sum up, our results suggest immediate long-lasting effects on labor force participation, employment and wages. The graphs also report the event study results for the years before 1998 which provide evidence for the common time trend as the vast majority of the estimates are statistically insignificant. Specifically, all the estimates for the labor force participation and full-time jobs are insignificant. We find very few significant effects for the other three variables — employed in 1996, hours worked in 1995 and hourly wage in 1993 and 1994 are significant. Although most of these pre-trends become insignificant after correcting for the FWER, the results for hourly wage should be taken with caution.

4.2 Falsification test

To provide additional support for our triple difference methodology, we perform a falsification test where we replace mothers with eligible primary school aged-children in our sample with women with youngest child older than 12 years old who were not affected by the after-school care policy when they were in primary school.¹³ Since those kids were not eligible for the policy, we do not expect their mothers' labor market outcomes to change differently from those of childless women aged 50 and above. As can be seen in Table 3, none of the coefficients is significant even before correcting for the FWER, providing additional support for the triple difference methodology.

5 Heterogeneous Effects

The after-school care policy could induce heterogeneous responses to maternal labor supply and employment outcomes depending on mother's characteristics. In this section, we study heterogeneous effects by maternal education and non-maternal household's income.

5.1 Maternal Education

The after-school care policy could potentially generate heterogeneous effects on mothers with different levels of education. On the one hand, since the cost of maternal care is the foregone earnings minus alternative care costs, assuming the cost of alternative care is uniform across the population, the more educated mothers might be more likely to respond to the policy than the low educated ones, because they have higher opportunity cost of staying at home and caring for children. On the other hand, the subsidy might constitute a much larger share of the wage for low

¹³ These are mothers with youngest child above 12 in 1999, above 13 in 2000, above 14 in 2001, etc...

educated mother than the more educated ones, and as such, the low educated mothers might have a larger response. Such differential impacts were found in Lefebvre et al. (2008) who show that QC's universal childcare, the highly subsidized childcare for children aged 0-5 years old, mainly affected the labor market outcomes of the more educated mothers. We divide our sample into mothers with at most a high school degree and those with a degree (or equivalent certificate) above high school. The results are reported in Table 4.¹⁴ The effects on labor force participation and employment are mainly driven by mothers with an education above high school degree. The policy induces this group to increase its labor force participation by 9.3 percentage points and its employment by 12 percentage points. The results are significant at 5 percent level even after correcting for the FWER. For mothers who have a high school degree or less, we do not find significant effects on any of the labor market outcomes considered. Thus, the effects on labor force participation and employment are solely driven by higher educated mothers. These results are in line with the ones found in Lefebvre et al. (2008), showing that educated mothers are more likely to respond to changes in childcare.

5.2 Non-maternal household income

Since mother's labor supply decision is closely related to the household income and its economic status, this policy could induce differential behavior on mothers from a wealthier as opposed to a poorer household. However, household income could be endogenously affected by the policy as well. So, we first run a triple difference regression model on non-maternal income and find no significant policy effect on this variable,¹⁵ which enables us to divide our sample by median non-maternal household income into low-income and high-income groups. Table 5 reports the results

¹⁴ We also report the dynamic effects from the event-study estimation in Table A1 and A2. The dynamic results are consistent with the canonical estimates. However, they are noisy and should be taken with caution.

¹⁵ Results available from the authors upon request

with columns 1 and 2 for families with non-maternal household income below the 50th percentile and columns 3 and 4 for those with non-maternal income equal or above the median.¹⁶ We find that both groups of mothers respond to the policy by increasing their employment by 8.2 and 7.8 percentage points, respectively. We also find a significant effect on the wages of mothers from low non-maternal income households; however, this result becomes insignificant after correcting for the FWER.¹⁷

6 Conclusion

This paper studies the response in maternal labor supply and employment outcomes to changes in child-care options. We exploit a unique policy introduced in QC in 1998, which increased the provision of low-cost after-school care for primary school-aged children, to study the impact of after-school care on maternal labor market outcomes. We use the Canadian Survey of Labour and Income Dynamics (SLID) and employ a triple difference methodology, where we compare mothers with primary school-aged children in QC before and after the policy to mothers of children in similar age groups in ROC, relative to childless women aged 50 and above who were not affected by the policy at all. We find that the policy has significant effects only on the extensive margin of mother's labor supply. In particular, the availability of low-cost after-school care increases maternal labor force participation and employment rates by 4.25 and 7 percentage points respectively, but it does not have any significant effects on full-time participation or total hours of work in the reference year conditional on being in the labor force. Further investigation on the heterogeneous sample reveals that these results are exclusively driven by educated mothers.

¹⁶ We also report the dynamic effects from the event-study estimation in Table A3 and A4. The dynamic results are consistent with the canonical estimates. However, they are noisy and should be taken with caution.

¹⁷ The appendix reports the event study results for the different group of mothers. These are in line with results reported in this section.

Besides, mothers from lower non-maternal income families do not respond differently than those from higher income families.

By focusing on the impact of after-school care on maternal labor market outcomes, our paper offers several insights to child-care policy makers. QC's after-school care policy did not particularly aim at increasing maternal employment. As a matter of fact, the aim of the policy was to prevent the latchkey phenomenon (children left home alone) and to promote child development. However, we show that the policy significantly affected several aspects of maternal labor market outcomes, especially labor force participation and employment. Thus, mothers' responses to child-care options should be taken into consideration in the cost and benefit analysis of such policies. What is particularly interesting is that this policy has induced educated mothers to enter the labor market.

Research on the relationship between child-care options and labor market responses for mothers with school-aged children is still scarce. Although our empirical analysis adds to this literature, it relies on a specific policy introduced in QC, which may or may not be applicable to other provinces and/or other countries. Future research could consider devising a structural model that builds on mother's behavioral choices of child-care options and labor supply which might prove helpful for policy analysis.

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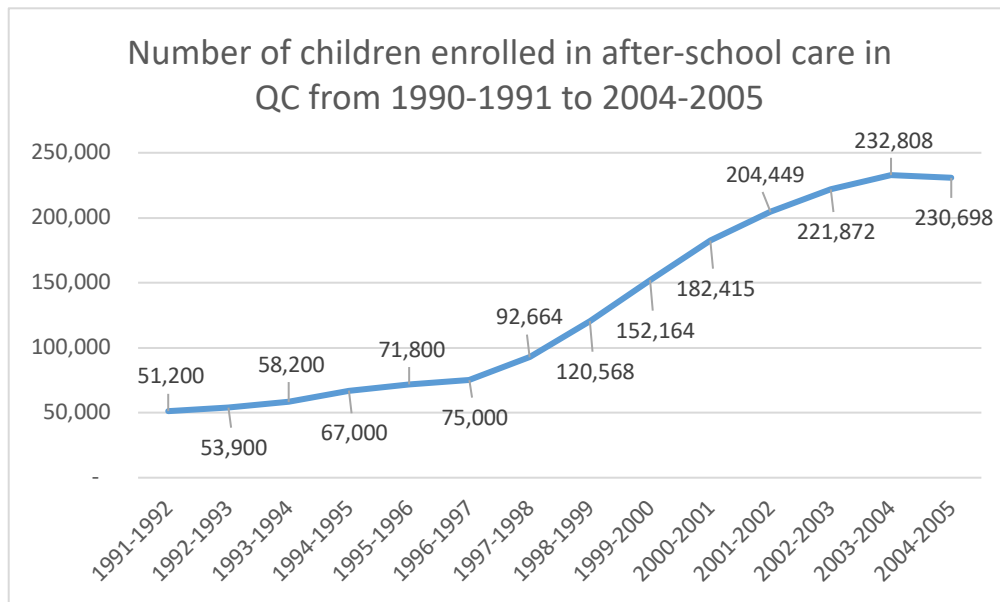
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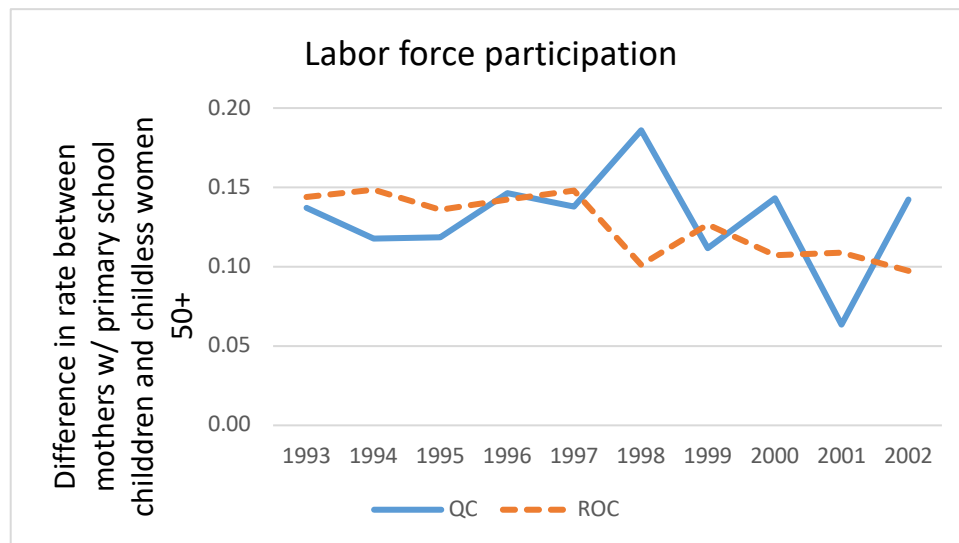
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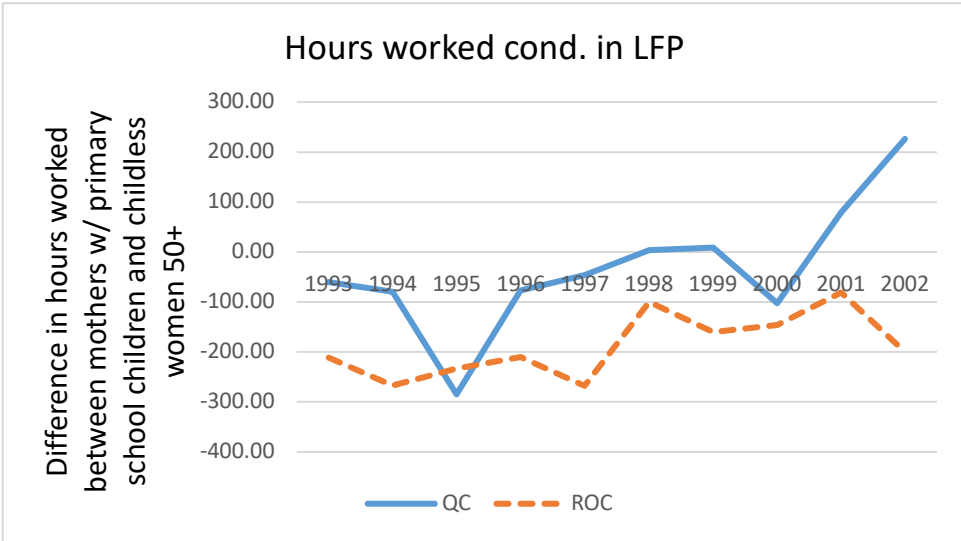
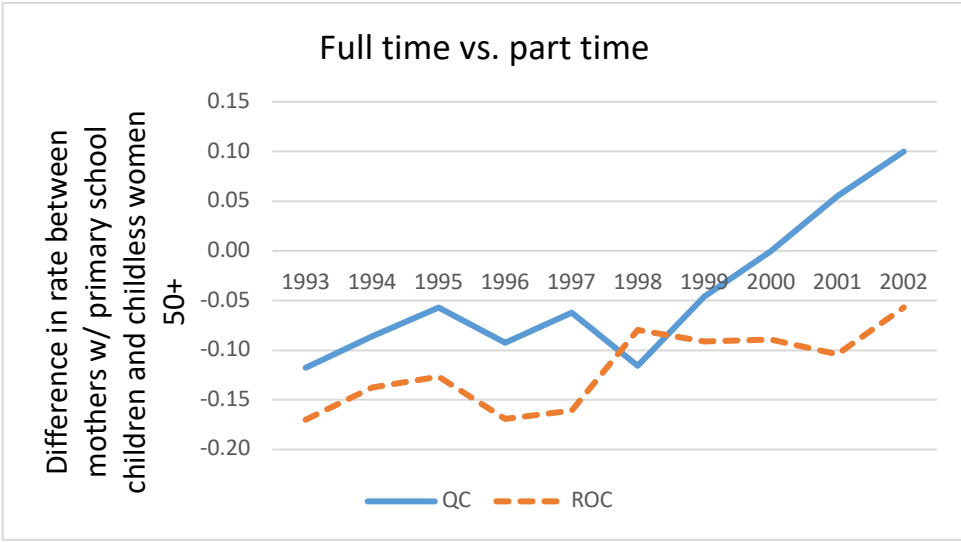
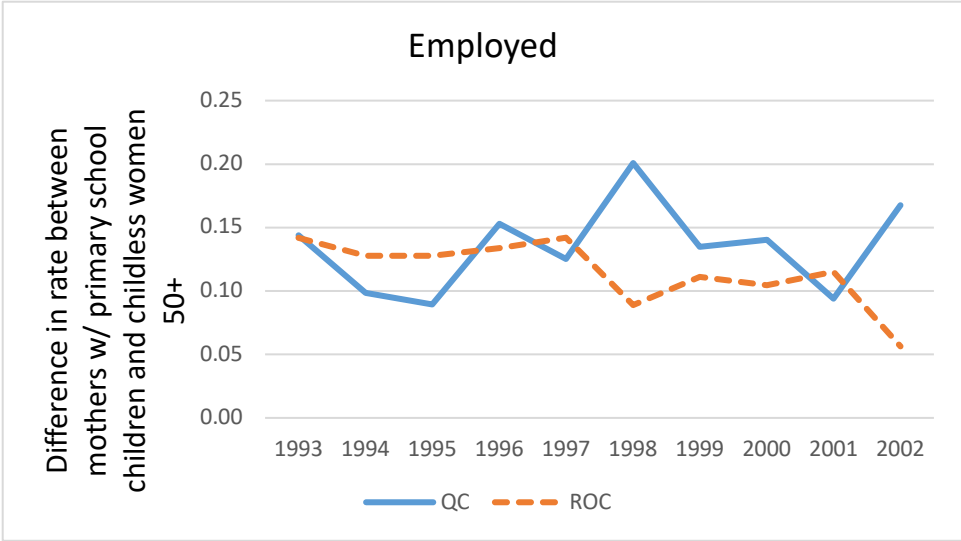
Tables and Figures



Sources: ASGEMSQ (2003), MEQ (2003e), MELS, Déclaration des clientèles scolaires (DSC) and Mainville (2006)

Figure 1: After-school care slots from 1991 to 2004





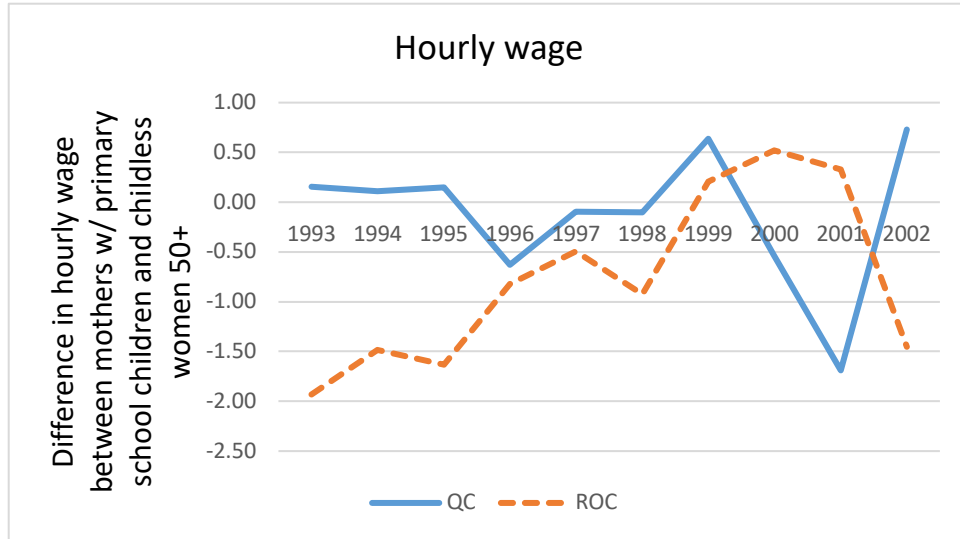
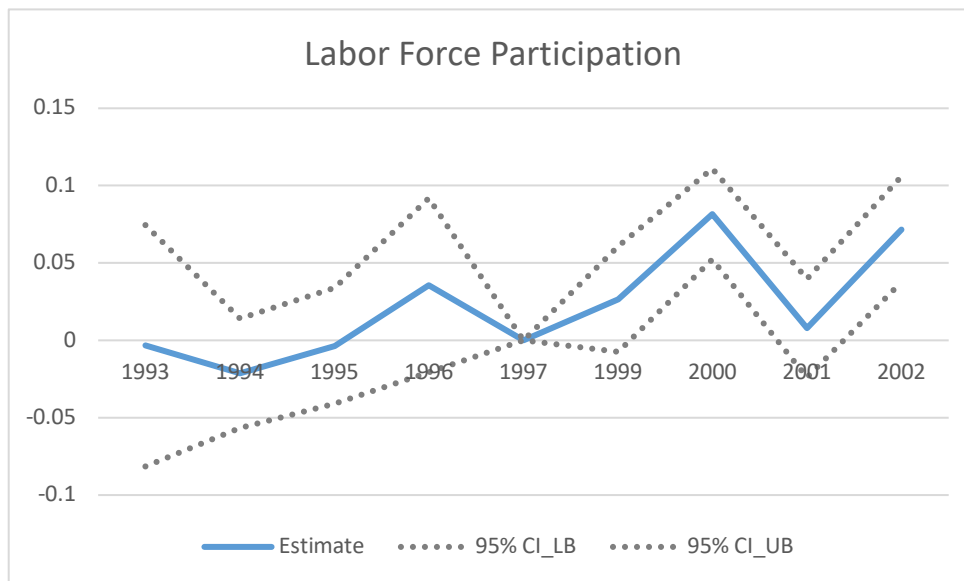
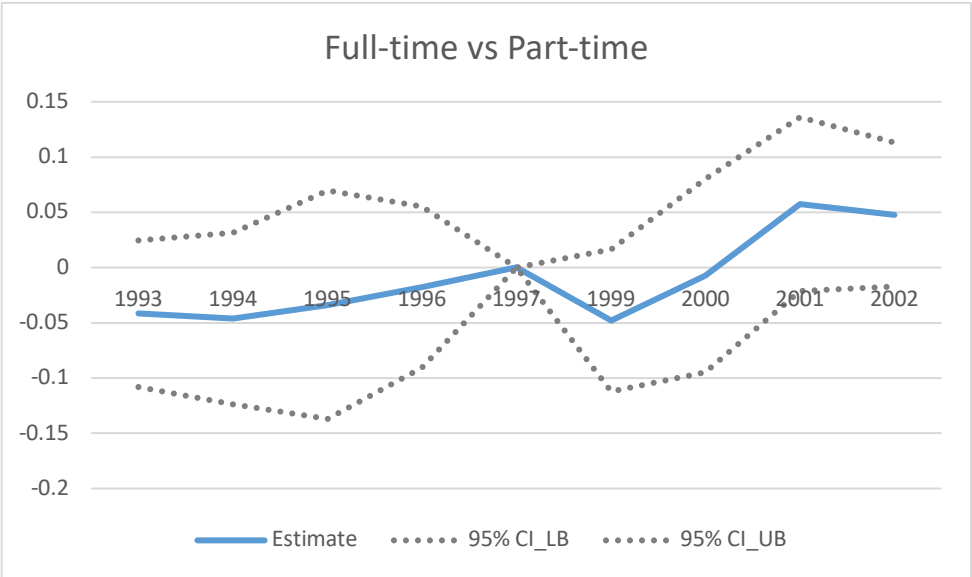
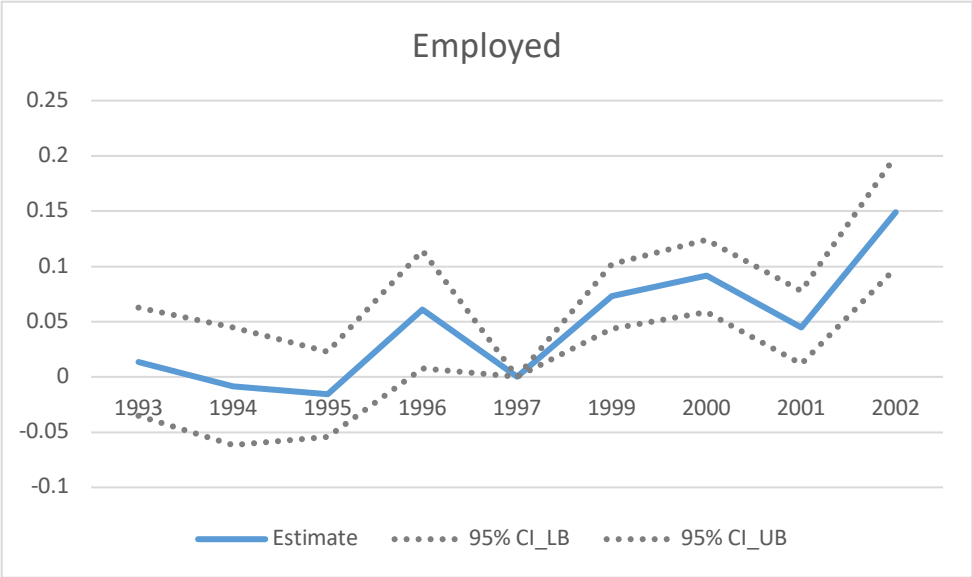


Figure 2: Trends in the difference in the variable rate between mothers with primary school aged-children and childless women aged 50 and above from 1993 until 2002





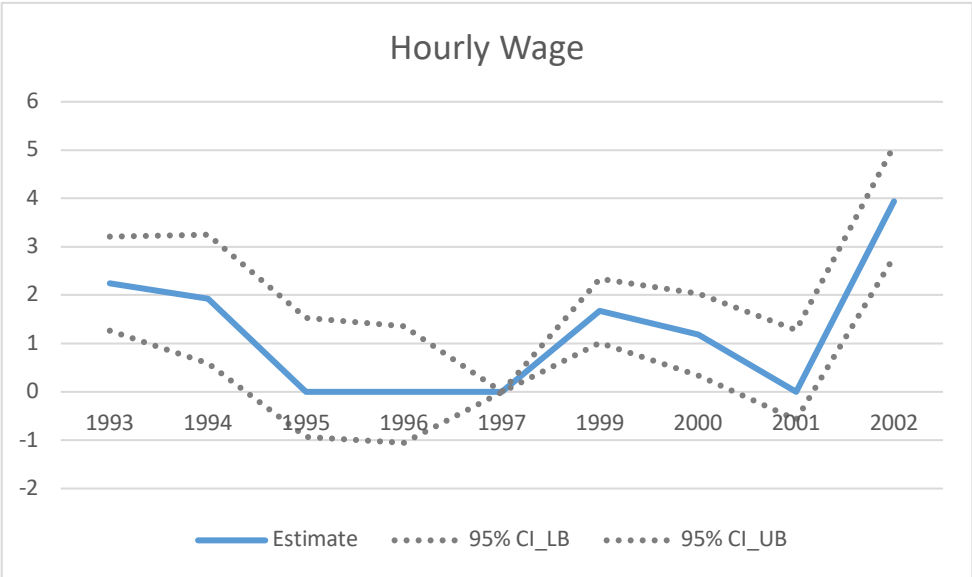
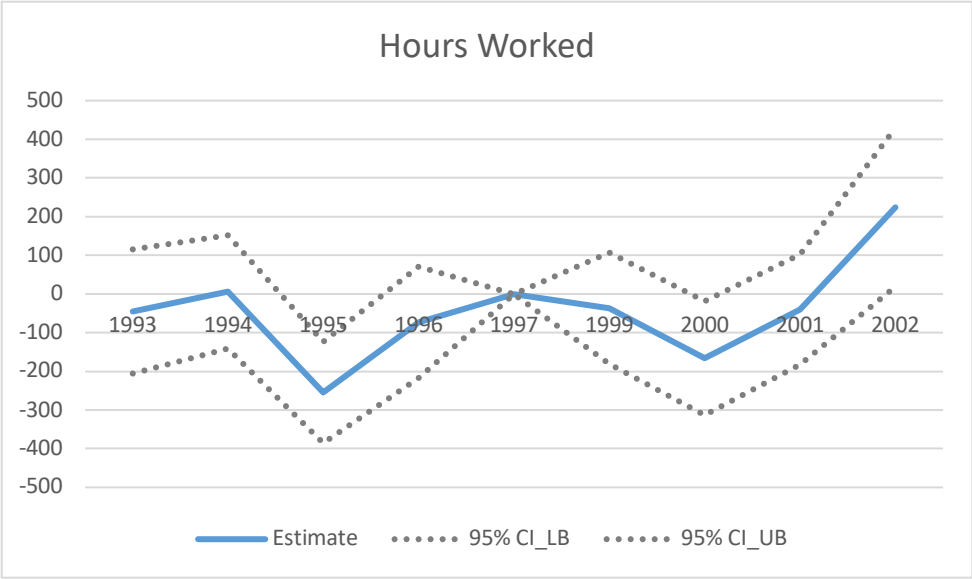


Figure 3: Event Study Results

Table 1: Descriptive Statistics

	Full Sample	Mothers of primary school-aged children				Childless women aged 50 and above				N
		QC		ROC		QC		ROC		
		1993-1997	1999-2002	1993-1997	1999-2002	1993-1997	1999-2002	1993-1997	1999-2002	
Labor Force Participation	0.769 (0.422)	0.795 (0.404)	0.745 (0.436)	0.849 (0.358)	0.846 (0.361)	0.687 (0.464)	0.612 (0.488)	0.742 (0.438)	0.702 (0.457)	26498
Employed	0.727 (0.446)	0.754 (0.431)	0.670 (0.470)	0.817 (0.387)	0.802 (0.398)	0.629 (0.483)	0.545 (0.498)	0.718 (0.450)	0.668 (0.471)	26498
Full-time Job (cond. on being employed)	0.701 (0.458)	0.748 (0.434)	0.674 (0.469)	0.689 (0.463)	0.62 (0.485)	0.726 (0.446)	0.756 (0.430)	0.779 (0.415)	0.773 (0.419)	19473
Hours Worked (cond. on LFP)	1490.6 (788.9)	1504.4 (720.3)	1332.03 (779.7)	1526.2 (735.8)	1377.8 (795.3)	1464.9 (763.8)	1441.6 (826.6)	1671.3 (757.9)	1617.2 (817.1)	19988
Hourly Wage Unconditional	10.169 (10.649)	11.161 (11.438)	8.922 (9.774)	11.659 (11.096)	11.034 (10.067)	9.356 (11.732)	7.046 (9.392)	10.309 (11.155)	9.347 (10.580)	26498
Age	45.07 (7.913)	39.835 (5.012)	37.943 (4.678)	40.126 (4.892)	38.387 (5.047)	52.719 (1.642)	52.717 (1.677)	52.649 (1.686)	52.565 (1.707)	26498
Below High School	0.225 (0.418)	0.193 (0.395)	0.209 (0.407)	0.122 (0.327)	0.144 (0.351)	0.349 (0.477)	0.517 (0.500)	0.244 (0.429)	0.279 (0.449)	26498
High School Degree	0.213 (0.409)	0.249 (0.433)	0.284 (0.451)	0.226 (0.418)	0.214 (0.410)	0.198 (0.399)	0.139 (0.347)	0.215 (0.411)	0.186 (0.389)	26498
Between High School and University	0.438 (0.496)	0.439 (0.497)	0.446 (0.497)	0.476 (0.499)	0.491 (0.500)	0.358 (0.480)	0.267 (0.443)	0.411 (0.492)	0.444 (0.497)	26498
University	0.123 (0.329)	0.119 (0.324)	0.06 (0.238)	0.176 (0.381)	0.151 (0.358)	0.094 (0.293)	0.077 (0.266)	0.13 (0.336)	0.091 (0.288)	26498
Married	0.852 (0.355)	0.958 (0.200)	0.989 (0.103)	0.985 (0.121)	0.991 (0.097)	0.638 (0.481)	0.649 (0.478)	0.717 (0.450)	0.712 (0.453)	26498
Immigrant	0.188 (0.391)	0.098 (0.297)	0.115 (0.319)	0.212 (0.409)	0.221 (0.415)	0.055 (0.229)	0.052 (0.222)	0.238 (0.426)	0.230 (0.421)	26498
Number of kids 6-11	0.739 (0.799)	1.287 (0.540)	1.392 (0.593)	1.238 (0.466)	1.437 (0.592)					26498
Number of kids 12-17	0.386 (0.657)	0.761 (0.758)	0.657 (0.719)	0.803 (0.757)	0.685 (0.755)					26498
Rural Area	0.207 (0.405)	0.27 (0.444)	0.245 (0.43)	0.219 (0.413)	0.195 (0.396)	0.194 (0.396)	0.184 (0.387)	0.218 (0.413)	0.185 (0.388)	26498
Urban Area	0.388 (0.487)	0.472 (0.499)	0.441 (0.497)	0.397 (0.489)	0.345 (0.475)	0.555 (0.497)	0.493 (0.500)	0.352 (0.478)	0.335 (0.472)	26498
Male Unemployment Rate	8.108 (2.777)	8.035 (0.286)	11.525 (0.701)	5.839 (2.37)	8.446 (2.471)	7.987 (0.247)	11.57 (0.716)	5.984 (2.381)	8.376 (2.399)	26498

Notes: The mean for the full sample is reported in the first column. The means for the mothers with school aged children who were not affected by the universal childcare, in QC pre- and post-policy and in ROC pre- and post-policy are reported in Columns (2) to (5). Similar results are reported for the childless women aged 50 and above are reported in columns (6) to (9). Standard deviations are reported in parentheses. The last column reports the number of observations. Column 6 reports the difference-in-differences estimates with the t-test in brackets.

Table 2: Triple difference results for labor market outcomes

	(1) Coefficient (std errors)	(2) Adjusted p-values	(3) N
LFP	0.043** (0.019)	[0.078]*	26,498
Employed	0.070*** (0.019)	[0.008]***	26,498
Full-time Job (cond. on being employed)	0.038 (0.032)	[0.212]	19,473
Hours Worked (cond. on LFP)	51.08 (74.81)	[0.393]	19,988
Hourly Wage (\$)	0.607 (0.618)	[0.252]	26,498

Notes: Each row corresponds to an outcome variable. Column 1 reports the triple difference estimates. Controls include mother and family characteristics and province fixed effects. Standard errors clustered on the province year level are reported in parentheses. The corresponding p-values adjusted for FWER are reported in brackets in column 2. The number of observations is reported in column 3. ***, ** and * denote significance at the 1, 5 and 10 percent levels, respectively.

Table 3: Falsification test. Effects of the policy on mothers of ineligible children

	(1) Coefficients (std errors)	(2) Adjusted p-values	(3) N
LFP	-0.009 (0.028)	[0.920]	24,675
Employed	-0.019 (0.028)	[0.824]	24,675
Full-time Job	0.008 (0.036)	[0.920]	17,931
Hours Worked	-67.91 (103.6)	[0.824]	18,450
Hourly Wage	-1.300 (0.868)	[0.311]	24,675

Notes: Each row corresponds to an outcome variable. Column 1 reports the triple difference estimates with standard errors clustered at the province year level (in parentheses). Column 2 reports the corresponding p-values adjusted for FWER [in brackets]. The last column reports the number of observations. The control group consists of mothers with children older than 11 years old that were not eligible for the after-school care. ***, ** and * denote significance at the 1, 5 and 10 percent levels, respectively.

Table 4: Heterogeneous effects by maternal education

	(1) High School Degree or Less	(2) Coefficients [adjusted p-value]	(3) Above High School	(4) Coefficients [adjusted p-value]	(5) Difference	(6) Coefficients [adjusted p-value]
LFP	-0.013 (0.034)	[0.898]	0.099** (0.041)	[0.039]**	-0.116* (0.060)	[0.187]
Employed	0.017 (0.034)	[0.898]	0.120** (0.050)	[0.039]**	-0.104 (0.073)	[0.381]
Full-time Job	0.041 (0.044)	[0.767]	0.047 (0.045)	[0.517]	-0.002 (0.062)	[0.974]
Hours Worked	86.12 (86.34)	[0.767]	33.41 (99.71)	[0.681]	55.30 (108.7)	[0.776]
Hourly Wage	0.172 (0.644)	[0.898]	1.022 (0.944)	[0.517]	-0.804 (1.070)	[0.774]

Notes: Each row corresponds to an outcome variable. Columns 1 and 2 report the triple difference estimates with standard errors clustered at the province year level (in parentheses) and the corresponding p-values adjusted for FWER [in brackets] for mothers with at most a high school degree (N= 11,459). Columns 3 and 4 report the results for mothers with a degree above high

school (N = 15,039). Column 5 reports the estimated difference with adjusted p-values in column 6. ***, ** and * denote significance at the 1, 5 and 10 percent levels, respectively.

Table 5: Heterogeneous effects by non-maternal household income

	(1)	(2)	(3)	(4)	(5)	(6)
	Below median		Median and above		Difference	
	Coefficients (std errors)	[adjusted p-value]	Coefficients (std errors)	[adjusted p-value]	Coefficients (std errors)	[adjusted p-value]
LFP	0.050 (0.039)	[0.325]	0.034 (0.032)	[0.641]	-0.005 (0.053)	[0.964]
Employed	0.082** (0.034)	[0.056]*	0.078*** (0.029)	[0.044]**	-0.011 (0.049)	[0.964]
Full-time Job	0.058 (0.063)	[0.325]	0.017 (0.067)	[0.940]	0.039 (0.109)	[0.964]
Hours Worked	114.5 (100.5)	[0.325]	24.17 (110.7)	[0.940]	79.79 (136.9)	[0.908]
Hourly Wage	2.217* (1.003)	[0.056]	-0.391 (0.896)	[0.938]	2.376* (1.382)	[0.242]

Notes: Each row corresponds to an outcome variable. Columns 1 and 2 report the triple difference estimates with standard errors clustered at the province year level (in parentheses) and the corresponding p-values adjusted for FWER [in brackets] for mothers in households with non-maternal household income below the median (N= 13,246). Columns 3 and 4 report the results for mothers with a non-maternal household income above median (N = 13,252). Column 5 reports the estimated difference with adjusted p-values in column 6. ***, ** and * denote significance at the 1, 5 and 10 percent levels, respectively.

Appendix

Table A1: Event study analysis for low educated mothers

	(1)	(2)	(3)	(4)	(5)
	LFP	Employed	FT job	Hours worked	Hourly wage
1999xQCxWkid6to12	-0.064 (0.046)	-0.027 (0.045)	-0.032 (0.030)	22.19 (70.24)	-0.063 (0.668)
2000xQCxWkid6to12	0.012 (0.023)	-0.012 (0.032)	0.028 (0.039)	-54.87 (87.99)	-0.776 (0.578)
2001xQCxWkid6to12	-0.033 (0.045)	0.021 (0.042)	0.111*** (0.033)	207.2** (81.83)	-0.253 (0.656)
2002xQCxWkid6to12	0.061* (0.035)	0.123*** (0.041)	0.044 (0.055)	140.2 (84.44)	2.225** (1.040)

Notes: Each column corresponds to an outcome variable. Standard errors clustered at the province year level are reported in parentheses. The sample consists of mothers with at most a high school degree (N= 11,459). ***, ** and * denote significance at the 1, 5 and 10 percent levels, respectively.

Table A2: Event study analysis for high educated mothers

	(1)	(2)	(3)	(4)	(5)
	LFP	Employed	FT job	Hours worked	Hourly wage
1999xQCxWkid6to12	0.131*** (0.037)	0.170*** (0.049)	0.011 (0.038)	89.60 (93.69)	2.069*** (0.755)
2000xQCxWkid6to12	0.149*** (0.035)	0.165*** (0.045)	0.035 (0.053)	-118.5 (86.89)	1.269 (0.973)
2001xQCxWkid6to12	0.063* (0.036)	0.065 (0.049)	0.061 (0.051)	-86.14 (77.90)	-0.786 (0.920)
2002xQCxWkid6to12	0.059 (0.036)	0.115** (0.056)	0.109** (0.049)	370.9*** (132.3)	2.758*** (0.732)

Notes: Each column corresponds to an outcome variable. Standard errors clustered at the province year level are reported in parentheses. The sample consists of mothers with a degree above high school (N = 15,039). ***, ** and * denote significance at the 1, 5 and 10 percent levels, respectively.

Table A3: Event study analysis for mothers from low non-maternal income households

	(1)	(2)	(3)	(4)	(5)
	LFP	Employed	FT job	Hours worked	Hourly wage
1999xQCxWkid6to12	0.041 (0.045)	0.083** (0.034)	-0.006 (0.047)	99.25 (86.44)	2.562*** (0.794)
2000xQCxWkid6to12	0.084*** (0.028)	0.065** (0.030)	0.051 (0.049)	-59.29 (50.82)	2.179** (1.029)
2001xQCxWkid6to12	-0.017 (0.034)	0.036 (0.037)	0.053 (0.046)	91.11* (54.09)	1.086 (0.843)
2002xQCxWkid6to12	0.137*** (0.047)	0.211** (0.099)	0.173*** (0.063)	425.3** (194.4)	2.976* (1.719)

Notes: Each column corresponds to an outcome variable. Standard errors clustered at the province year level are reported in parentheses. The sample consists of mothers in households with non-maternal household income below the median (N= 13,246). ***, ** and * denote significance at the 1, 5 and 10 percent levels, respectively.

Table A4: Event study analysis for mothers from high non-maternal income households

	(1)	(2)	(3)	(4)	(5)
	LFP	Employed	FT job	Hours worked	Hourly wage
1999xQCxWkid6to12	0.023 (0.033)	0.076** (0.030)	-0.020 (0.068)	55.39 (115.4)	-0.214 (0.631)
2000xQCxWkid6to12	0.096*** (0.030)	0.133*** (0.027)	-0.011 (0.080)	-101.3 (118.2)	-0.660 (0.695)
2001xQCxWkid6to12	0.001 (0.037)	0.035 (0.034)	0.112 (0.074)	0.004 (109.9)	-1.767** (0.751)
2002xQCxWkid6to12	0.038 (0.031)	0.115*** (0.033)	-0.013 (0.069)	196.0* (108.3)	3.198*** (0.924)

Notes: Each column corresponds to an outcome variable. Standard errors clustered at the province year level are reported in parentheses. The sample consists of mothers with a non-maternal household income above median (N = 13,252). ***, ** and * denote significance at the 1, 5 and 10 percent levels, respectively.