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Abstract

Using a difference-in-differences estimator, we find the Canadian Universal Child Care Benefit (a demogrant paid to families with children under age 6 that was introduced in July 2006) has significant negative effects on the labor supply of legally married mothers but significant positive effects on the labor supply of single mothers. The positive effect for single mothers is concentrated among divorced mothers, with results suggesting divorced mothers' likelihood of participating in the labor force rises by 2.8 percentage points when receiving the benefit. This contrasts with a reduction in the likelihood of legally married mothers participating in the labor force by 1.4 percentage points. Further, the effects for single moms primarily represent entry to employment and the labor force (extensive margin) and not an increase in hours among those who would have been working without the benefits. The estimated effects for common-law married mothers and single never-married mothers are not statistically significant.

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1. Introduction

All developed countries offer child benefits. While varied in design and delivery – as demogrants, mean-tested benefits, or tax credits - the common goal of these programs is to improve child well-being by making more resources available to parents. The effects of means-tested child benefits on the labor supply of parents has been studied extensively in Canada, the United States and elsewhere, with results showing that wage subsidies and welfare programs have significant impacts on labor supply (see Bingley and Walker 1997, Lemieux and Milligan 2008, Milligan and Stabile 2007, Meyer 2010, Meyer and Rosenbaum 2000, Hotz and Scholz 2003, Chetty et al. 2012, Moffit 2002, and Immervoll et al. 2007 for examples).

There have been few studies, however, that have examined the effects of more universal programs, particularly demogrants that are expected to have pure income effects, on the labor market behavior of parents. González (2013) studied the response of Spanish mothers to a generous birth grant, finding that mothers were less likely employed in the first year after childbirth when eligible for the grant. There have been a few studies examining tax rebates distributed in the United States as economic stimulus (Shapiro and Slemrod 2003, 2009 and Taylor 2011), finding these demogrants have small effects on spending but large effects on the repayment of debt. These studies of economic stimulus did not examine labor supply.

In Canada, parents of young children have received the Universal Child Care Benefit (UCCB) since July 2006, providing parents with young children $100 per month per child aged 0 to 5.[1] In 2015, the benefit will be expanded to offer $160 per month per child aged 0 to 5 and $60 per month per child aged 6-17.[2] Schirle (2015) offered evidence that the demogrant had significant negative effects on the labor supply of married mothers, particularly those with lower education. She found that the introduction of the UCCB reduced the likelihood of lower-educated mothers to participate in the labor force by 3.2 percentage points and median hours worked was reduced by 1.9 hours. The study does not, however, examine the response of unmarried mothers.

There is little reason to expect single and married mothers to respond the same way to child benefits. For example, Meyer (2010) reviews evidence of the effects of the Earned Income Tax Credit on labor supply and notes the differential response of single mothers and couples: while single mothers appear to respond positively to the wage subsidy offered in the program, couples appear to reduce their labor

[1] All benefits are stated in Canadian dollars. In July 2006, the Canada-US exchange rate was between 0.876 and 0.904.

[2] Although benefits are introduced for January 2015, the first benefits payment is planned for July 2015 which will include a retroactive payment for the first half of the year.

supply.[3] More generally, we should expect single and married mothers to often face very different constraints in their decision-making and opportunities for the labor market.

In this study, we follow Schirle (2015) and use a differences-in-differences estimator to compare the labor market activity of mothers whose youngest child is aged 0-5 to mothers whose youngest child is aged 6-17 before and after the introduction of the UCCB in July 2006. Our analysis separately assesses the activities of legally married, common-law, never-married, and divorced/separated mothers, using the Canadian Labour Force Survey (LFS) monthly data from 2003-2009. Our results present an interesting puzzle: while legally married mothers are likely to reduce their labor supply on extensive and intensive margins when receiving the UCCB, divorced and separated mothers are likely to increase their participation in the labor force when receiving the UCCB and any positive response on the hours margin is not statistically significant. The labor supply of mothers in common-law relationships and never-married mothers does not appear affected by UCCB receipt. We suggest the differential response across mothers may relate to differences in each household's reliance on formal child care, the nature of intrahousehold bargaining, and potential labeling effects of child benefits.

The paper proceeds as follows. In the next section we offer an overview of Canadian child benefits over the period 2003-2009, emphasizing the most sizeable benefit programs and the small extent to which child benefit programs changed over time and affect children of different age groups. In section 3 we discuss the framework for thinking about the labor supply decisions of married and single mothers. In section 4 we describe our data and further offer some descriptive statistics in section 5. In section 6 we describe the empirical strategy used to identify the effect of the UCCB on mothers' labor supply. The results are presented in section 7, and in section 8 we offer a discussion to reconcile the results with theory. Finally we offer some concluding remarks.

2. Child Benefits in Canada

In Canada there is wide array of child benefits available to parents. Some child benefits changed over the 2003-2009 period of interest for this study, however, with the exception of the UCCB, the changes were fairly uniform for families with older and younger children. Schirle (2015) offers a more complete discussion of Canadian benefits; a brief review is provided in this section.

Introduced July 2006, the UCCB provides parents of young children with a benefit of $100 per month per child aged 5 or younger. UCCB recipients must be the primary caregiver of the child and a resident of Canada. For married couples, the benefit is paid to mothers and is reported as taxable income for the parent with the lowest taxable income (noting Canada defines the individual as the unit of

[3] Meyer (2010) refers to evidence in Eissa and Hoynes (2004) and Heim (2006), and suggests couples are likely to have enough income to be subject to benefit clawbacks.

taxation). For divorced couples, only one parent could receive the benefit until 2010. Provisions to allow each parent in a shared custody arrangement to evenly split the benefit were introduced in 2011. To note, until April 2007 the UCCB would be included as income for the purposes of determining spousal support in a divorce settlement (using federal guidelines) but would not be included as income for the purposes of determining child support.[4] Until 2010, unmarried parents receiving the benefit would have claimed the income for tax purposes.[5] The UCCB is not clawed back against provincial social assistance payments.

It is rare that eligible families do not take up the benefit. According to federal government estimates, 99 percent of eligible families received the UCCB in 2009-2010 (HRSCD 2010). This is not surprising as families eligible for the Canada Child Tax Benefit (CCTB, a means-tested benefit for low and middle-income families with children aged 17 and under) are automatically enrolled for the UCCB and all families are provided with the relevant forms and information by hospital staff after the birth of their child. The costs of application were very low when the UCCB was first introduced and more recently are nearly zero as birth registrations completed online will automatically send the registration information to the Canada Revenue Agency for UCCB registration. In cases where parents apply late, UCCB payments can be made retroactively for up to 11 months.

The largest federal child benefit programs remained mostly unchanged over the 2003-2009 period.[6] The CCTB and the National Child Benefit Supplement represent the other major federal child benefits (for children age 17 and under) and were introduced in 1998. Employment Insurance (EI) benefits offering up to one year of maternity and parental leave have been available for parents of children born December 31, 2000 or later. For the purposes of this study, one notable change was the introduction of the Quebec Parental Insurance Plan in January 2006, which replaced the federal EI program for residents of the province of Quebec and offers more generous benefits than that available to other Canadians. In later sections we offer robustness tests to demonstrate this program is not driving our results.

Child care policies, which vary by province, also remained largely unchanged over the 2003-2009 period. Notably, Quebec's subsidized child care (at $5 per day) was fully phased in by 2000, though

[4] Spousal support formulas defined in the guidelines (at http://www.justice.gc.ca/eng/rp-pr/fl-lf/spousal-epoux/spag/toc-tdm.html) are not legally binding but are generally followed for typical cases.

[5] Beginning with the 2010 tax year, unmarried parents could transfer the income to an 'eligible dependent' (which is most often their dependent child) for tax purposes.

[6] Smaller benefits were introduced during this period, including the children's fitness tax credit (January 2007), a child disability benefit (July 2006), and a non-refundable child tax credit (2007), however these benefits applied to all children age 17 and under.

rates were increased (to $7 per day) in 2004. In Ontario, the introduction of full-time kindergarten for 4 and 5 year olds began in 2010 and was complete in 2014.

3. Theoretical discussion

A standard model of labor supply is typically used to describe individuals' choices between consumption goods and services purchased in the market and non-market time. As a demogrant with a pure income effect, we expect individuals that treat non-market time as a normal good to reduce the number of hours they work in the paid labor market. Furthermore, the addition of a demogrant to one's budget is expected to raise an individual's reservation wage and result in some individuals leaving the labor force. The results in Schirle (2015) align well with this standard model, as married mothers are found to reduce their labor supply on extensive (participation) and intensive (hours) margins when receiving the UCCB.

When considering child benefits, labeling effects are important to consider. Kooreman (2000) presents evidence to suggest parents treat child benefits differently from other income, as though they have a moral obligation to spend the resources on child-related goods as per the benefit's label. Given the UCCB's label and policy goals refer directly to supporting a family's child care choices (HRSDC 2010), mothers may feel obligated to use the money to cover child care costs. With respect to Canada's broader package of (largely means-tested) child benefits, Jones et al. (2015) have found that low-income families increase spending on education and basic household needs such as food, transportation, and child care when benefits increase. In contrast, Blow et al (2012) found UK child benefits are spent much the same as other income sources. Moreover, Blow et al. (2012) found unanticipated changes in child benefits were spent on goods associated with parents, not their children.

In making the distinction between married and unmarried mothers, we should consider the potential for mothers to independently determine how the child benefits are used. For example, Lundberg et al. (1997) have shown that giving child benefits to mothers in the UK increases expenditures on women's and children's clothing relative to men's clothing. Dooley et al. (2005) have offered modest evidence that the cognitive and behavioural/emotional outcomes of children are associated with mother's share of income (though they found little significant effect on other child outcomes). Woolley (2004) has suggested that women make most spending decisions about food, household supplies and children's clothing. However, the case for paying benefits to mothers appears weaker if policy goals include savings as a use for the funds. In the case of the UCCB, benefits are paid to mothers. Married mothers will need to negotiate the use of these funds with a partner. Unmarried mothers, however, are more likely to make these decisions independently.

In making the distinction between married and unmarried mothers, we should also consider the extent to which each faces different constraints with respect to child care. Married mothers may have the option of taking jobs with flexible schedules and working while the child's father is able to take responsibility for child care, thus avoiding the direct costs of child care. Unmarried mothers are less likely able to avoid the direct costs of child care and may view child care as a fixed cost of work. Similarly, the quality of nonmarket time may differ substantially between married and unmarried mothers, as unmarried mothers may hold less bargaining power when negotiating daily child care and household production responsibilities with a second parent.

4. Data

The main data source for this study is the Canadian Labour Force Survey (LFS) 2003-2009 confidential microdata files.[7] The LFS is a large-scale monthly survey that is the official source for regional unemployment statistics in Canada.[8] It is a longitudinal survey in that every month a set of dwellings are sampled and then re-interviewed for six consecutive months. The files allow for children (whose age is updated monthly) to be linked to their parents as long as the parent is identified as the household's reference person, which is "normally an adult with responsibility for the care or support of the family" (Statistics Canada 2012) and the child usually resides in that household.

Measures of labor market activity refer to individuals' activities in the reference week of the survey, which is usually the week containing the 15th day of the month. For hours work, we refer to actual hours worked at all jobs rather than using measures of 'usual hours' or restricting ourselves to hours at the person's main job. This allows us to capture hours worked in temporary or informal employment with flexible hours.

We are not able to directly observe in the LFS whether a family receives the UCCB. Rather, we create an indicator for the expectation the individual is eligible, setting the indicator equal to one if they have at least one child (by birth, marriage, or adoption) age 5 or younger in the household and are observed after July 2006. I falsely identify eligibility in cases where mothers have shared custody of a child and the child is considered a household member, but the mother has not been designated as the primary caregiver for the purposes of receiving the UCCB.[9] I falsely identify ineligibility in cases where an

[7] These files provide more detail than the public use microdata files and are accessed through the Statistics Canada Research Data Centres Program.

[8] The survey uses a complex survey design to ensure accurate estimates of unemployment rates in relatively small regions with low population density. The unemployment rates are used in the administration of Canada's EI system, whose benefit parameters depend on local unemployment rates.

[9] Children of divorced parents are only included as part of the household in the LFS if the child spends most of their time living in that household. In cases of shared custody with equal time across parent's households, the child is considered a usual resident if they are living there during the survey week. In

individual has primary custody of a young child but is not he child's parent. Within a sample of mothers this false ineligibility is not expected to occur frequently. Schirle (2015) had investigated this issue further using Canada's Survey of Labour and Income Dynamics; errors in UCCB assignment are not more frequent among families headed by a divorced or separated parent, or married individuals who have married more than once.

The core sample used in this study represents mothers aged 25-49. In Canada, the average age of mothers at the time of their first child's birth was 28 years (Milan 2011). The fertility rates of Canadian women age 20 to 24 has declined steadily (from 233.6 per 1000 women in 1960 to 53 per 1000 women in 2008) while education investments have increased, so that the fertility rates of women aged 25-34 are substantially higher than for women age 20-24 by the late 2000s. The fertility rate of 40 to 44 year olds has been climbing since the early 1980s – from 3.1 per 1000 women in 1980 to 8.4 per 1000 women in 2008 (Milan 2011).

With respect to marital status, the LFS allows us to distinguish between mothers who are legally married, living in common-law unions, never-married, divorced, separated, or widowed. Given the small number of widows with young children, we do not attempt to assess their labor supply in this study and exclude them from the analysis.

In the analysis that follows, we restrict the sample to mothers whose youngest child is aged 0-5 (as our treatment group that will receive the UCCB after July 2006) and mothers whose youngest child is aged 6-17 (as our control group that will not receive the UCCB). Among mothers with children aged 0-17, 71 percent are legally married, 15 percent live in common-law unions, 6 percent have never been married, and 9 percent are divorced or separated. Several other control groups are tested to ensure the robustness of results. First, I restricted the control group to only include mothers whose youngest child is aged 8-14. Second, I expanded the control group to include mothers whose youngest child is aged 6-24. Third, I use a control group of women who do not have any of their own children living in the household (they are "childless" in that their children are over age 24, their children do not usually live with them, or they have never had children). Finally, I pool together all women in the sampled age group (25-49) as a control group.

5. Descriptive Statistics.

Descriptive statistics for mothers aged 25-49 by marital status over the 2003-2009 period are provided in Table 1. From Table 1 we can see marked differences in labor supply across different groups of mothers. Divorced and separated mothers tended to work the most, with 84 percent in the labor force

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2011, 9 percent of separated or divorced parents indicated child living arrangements with equal living time between parents' homes (Sinha 2014)

and median hours worked at 31 hours. Mothers in common-law relationships worked slightly less, but substantially more than mothers who were legally married. Notably, actual hours worked for common-law mothers were 14 hours at the 40th percentile and only 10.5 for legally married mothers. Single never-married mothers tended to work the least, with employment rates that were 7 percentage points lower than legally married moms. Single mothers and legally married mothers are not entirely differentiated, however, as the median and 75th percentile of hours worked were identical for these two groups.

An important difference between the groups of mothers in Table 1 was their age and the ages of their children. Divorced and separated moms were least likely to have children under age 5 and on average are oldest (39.7 years), while common-law mothers (despite working only slightly less than divorced moms) were most likely to have young children at home and were much younger themselves (an average 35.6 years). Legally married moms were quite a bit older than never-married moms (38.4 and 35.1 years respectively), and only slightly more likely to have children under age 5 (42 percent vs. 37 percent).

Despite the similarities between legally married and never-married mothers, and their lower labor supply than common-law and divorced mothers, legally married mothers were substantially more educated than all other mothers. Shown in the first column of Table 1, 29 percent of legally married mothers had a university degree (BA or above). This was nearly triple the likelihood of never-married mothers to have a university degree, who in turn were the most likely to leave high school before graduation.

In Figure 1 we can see some similarities in the labor market behavior of mothers with partners relative to the behavior of single mothers presented in Figure 2, when their children were youngest. Single mothers' employment rate was quite low when their youngest is still an infant (age 0, Figure 2), at 45.4 and 46.7 percent among divorced/separated and never married mothers, respectively. The employment rate for legally married mothers with an infant was much higher at 65.7 percent and even higher for common-law mothers at 72.9 percent (Figure 1). While the hours worked by married and common-law mothers increased substantially once a child turns one, the median hours of divorced mothers remained at zero until age one and the median hours of never-married mothers remained at zero until age 2. With this delayed entry to the labor market after children are born, single mothers' employment profiles (over the age of their youngest child) appeared much steeper in Figure 2 than the profiles of mothers with partners in Figure 1. For all mothers, hours of work are lower when children were youngest, generally suggesting a tendency toward part time employment or jobs with flexible hours. Overall, it is important to note the experience of mothers differs greatly by marital status.

In Figure 3 we characterize the labor market activity of mothers when their children are aged 0-5 and 6-17, before and after the introduction of the UCCB in July 2006. First, consider the labor force

participation rates of legally married mothers. The participation rate of legally married mothers with a child aged 0-5 remained steady at 72 percent before and after the introduction of the UCCB. The participation rate of legally married mothers with older children (6-17) increased by one percentage point over this period, from 83 to 84 percent. The differential increase in participation suggests that the participation rates of legally married mothers with young children may have been slightly higher had the UCCB not been introduced. The participation rates of divorced mothers increased over time, but more so for those with children aged 0-5. In contrast to legally married mothers, the differential increase in participation rates for mothers of younger and older children would suggest that the participation rates of divorced/separated mothers with young children may have been substantially lower had the UCCB not been introduced. The patterns in participation and employment for common-law mothers appear to most closely match that of legally married mothers, and the patterns for never-married mothers appear to most closely match that of divorced/separated mothers. For average hours worked (in the bottom panel of Figure 3), the patterns for legally married and common-law mothers are similar, suggesting that the introduction of the UCCB reduced the hours worked by mothers. For single mothers, however, an increase in hours worked appears similar for those who do and do not have young children, suggesting the UCCB did not affect labor supply on this margin.

Overall, it is clear that the four groups of women are very different. On some dimensions (such as overall participation rates or education), divorced and separated mothers appear most similar to mothers in common-law relationships. On other dimensions (such as age or their labor supply when children are age 0-1) divorced and common-law mothers are quite different. Legally married mothers appear substantially more educated than never-married mothers, yet their participation and hours worked are somewhat similar. When we narrow our focus to how labor supply changes before and after the introduction of the UCCB, it appears legally married mothers are most similar to those in common-law relationships while never-married mothers are most similar to divorced/separated mothers. In the analysis that follows, we will examine these four groups separately.

6. Methods

We use a standard differences-in-differences estimator to identify the effects of the UCCB on mothers' labor supply, closely following the work of Schirle (2015). Specifically, the estimating equation takes the form

$$Y_{it} = \beta_0 + \beta_1 UCCB_{it} + \beta_2\, Under6_{it} + \beta_3\, PostJuly2006_{it} + X_{it}\gamma + Z_{it}\delta + e_{it} \quad (1)$$

which is estimated separately for each group of mothers by marital status. The outcome Y_{it} represents either employment, participation or hours worked for individual *i* in month *t*. The variable *Under6* indicates the individual's youngest child is aged 0-5 and *PostJuly2006* indicates the individual is observed in a months after the introduction of the UCCB. The variable *UCCB* is then an interaction of *Under6* and *PostJuly2006*, indicating the presence of a child aged 0-5 in a month after the UCCB was introduced, so that β_1 represents the treatment effect of the policy. We include control variables (X)

for the number of children in household by age group (age 0, 1-2, 3-5, 6-12 and 13-17), the age of the mother (in five year age groups), and a set of indicators for the educational attainment of the mother. We also include time and province effects in the vector *Z*. Specifically there is a full set of province fixed effects, month fixed effects, province-specific month fixed effects (to allow for provincial variation in seasonality), a year trend and province-specific trends.[10]

For participation and employment outcomes, we use a probit model to estimate the effects of the UCCB on labor supply. We also provide estimates based on linear probability models. Furthermore, we employ the two-step method developed by Donald and Lang (2007) to address concerns that the use of conventional standard errors is not appropriate for differences-in-differences estimates. Following Schirle (2015), and similar to the strategies taken by Rossin-Slater et al. (2013) and Baker and Milligan (2008), we first calculate regression-adjusted differences in outcomes between those with children aged 0-5 and those with children aged 6-17 in each of the *t*=84 survey months. Specifically, we estimate the equation

$$Y_{it} = \phi_t + Under6_{it}\pi_t + X_{it}\gamma + Z_{it}\delta + e_{it} \quad (2)$$

using OLS. The vector *X* includes the number of kids in each age group, indicators for the age of the mother, and indicators for the education of the mother, and *Z* includes province effects and province-specific trends. The coefficients for the effect of having a child aged 0-5 now vary by month, so that the vector π_t contains the estimated differences between the treatment group and control group in each survey month *t*. For the second stage, the data is collapsed into the 84 survey month cells and used to estimate the equation

$$\hat{\pi}_t = \rho_0 + \rho_1 PostJuly2006_t + u_t. \quad (3)$$

The coefficient ρ_1 then represents the effect of the UCCB on labor supply. As equation (3) is estimated using only 84 observations, the student's t-distribution with 82 degrees of freedom is used for inference.

For hours worked, we estimate two models. We do not use OLS, as it is not an appropriate strategy given the large portion of women that are not employed, particularly at younger ages. We use a Tobit model to estimate equation (1) when the outcome of interest is hours worked. Given various objections to the conceptual use of this model (see for example Angrist and Pischke 2009, p. 100), however, we prefer to use an unconditional quantile (UQ) regression (following Firpo et al. 2009) to estimate the effect of the UCCB on median hours worked, within groups of mothers by marital status.

Presented in the following section, we begin by estimating the effects of the UCCB on the labor supply of single mothers for comparison with Schirle's (2015) results for married mothers. We then disaggregate the data further and estimate the models for sub-samples of legally married, common-

[10] Note that Schirle (2015) found the results for various specifications of time and province effects were quite robust for a sample of married mothers.

law, never-married, and divorced/separated mothers. We then provide several robustness tests to investigate the relevance of the most recent recession (which started in Canada in September 2008), changes to Quebec's parental leave programs in 2006, the provision of parental leave and job protection throughout the period studied, and concerns regarding the purity of our control group. We also consider alternative controls groups.

7. Results

In Table 2, we present the baseline results for a sample of all single mothers (never-married, divorced and separated) that are comparable to the baseline results for married mothers (legally and common-law) that were presented in Schirle (2015, Table 2). In Table 3, we present the baseline results for a sample of legally married mothers. In Tables 2 and 3, the first set of estimates is the probit estimates for participation in the labor force and the second set is the unconditional quantile estimates for median actual hours worked per week. To begin, consider the marginal effects presented in Tables 2 and 3 for the participation equation. The effects of having additional children on the likelihood of participation for single moms (Table 2) are quite similar in magnitude to the effects for married mothers in Table 3 and in Schirle (2015): as one has more children, particularly younger children, mothers are less likely to participate in the labor force. The effects of education on the participation of single mothers are also quite similar to that for married mothers, with more educated mothers being much more likely to work.

The effect of the UCCB on mothers' participation in the labor force clearly differs across single and married mothers. The estimates in Table 2 suggest that a single mother increases her likelihood of participation in the labor force by 2 percentage points when receiving the UCCB. In contrast, the estimates in Table 3 show that the UCCB reduces the likelihood of married mothers to participate in the labor force by 1.4 percentage points. For median hours, the introduction of the UCCB appears to have a positive, though statistically insignificant effect for single mothers. This again lies in contrast with the results for legally married mothers in Table 3, for whom we see a statistically significant negative effect at the median of almost 1 hour per week.

In Table 4, we examine these results more closely, presenting the effect of the UCCB on labor force participation (A), employment (B), and hours (C), estimated using separate samples of mothers by marital status: those who are legally married, in common-law relationships, never-married, and divorced/separated. As was suggested by the simple differences in means in Figure 3, the response of mothers to the UCCB differs by marital status. In Panel A of Table 4 we consider how the UCCB affects the likelihood of participation. For legally married mothers, the probit estimates in the first row suggest the UCCB reduces their likelihood of participation by 1.4 percentage points. The estimated effect for common-law mothers is also negative, but much closer to zero and not statistically significant. The probit's estimated effect of the UCCB on never-married mothers' participation is

positive but statistically insignificant. The estimated effect on divorced/separated is large and positive, suggesting the UCCB increases the likelihood of divorced/separated mothers to participate in the labor force by 2.8 percentage points. For all four groups, the effect of the UCCB on participation appears similar when the models are estimated using a linear probability model (LPM) or the Donald and Lang (2007) two-step methods.

In the second panel of Table 4 we examine the UCCB's effects on the employment of mothers by marital status. Again, we see large negative effects of the UCCB on the likelihood of employment among legally married mothers (by 1.4 percentage points) and large positive effects on the likelihood of employment for divorced/separated mothers (1.8 percentage points). These results demonstrate that the UCCB has very different effects on the extensive margin of labor supply for legally married and divorced/separated mothers.

In the bottom panel of Table 4 we examine the UCCB's effects on actual total hours worked in a week. At the median, hours worked are reduced by 0.9 hours for legally married mothers. Using a Tobit model offers similar results, with the UCCB reducing hours worked by 2/3 of an hour for legally married mothers. The UCCB appears to have a large negative (and significant) effect on the hours worked by mothers in common-law relationships as well. Overall then, the UCCB appears to affect the extensive and intensive margins of labor supply for mothers with partners. However, the UCCB does not appear to significantly affect the intensive margin of labor supply for never-married or divorced/separated mothers.

In Tables 5 and 6 we explore the robustness of our results for the participation and employment of mothers, respectively. In the first row of Table 5, we repeat the probit estimates for the participation equation from the first row of Table 4 for ease of comparison. First, we consider that the onset of the recession in 2008 may have had differential effects on mothers with younger and older children and exclude all observations after September 2008 from the sample. This has no substantial effect on any of the results, thought the effect of the UCCB on never-married mothers moves even closer to zero. Second, we estimate the participation probit excluding all mothers who reside in Quebec to account for changes to their parental leave benefits in January 2006. The effect of the UCCB on divorced/separated mothers is unaffected. The effect of the UCCB on the participation of legally married mothers appears slightly lower but remains statistically significant.[11] Note the exclusion of Quebec mothers is also important as Quebec mothers are much more likely than other mothers in Canada to live in common-law relationships. In Quebec in 2006, 45 percent of mothers whose child was under age 18 was legally married and 36 percent lived in common-law relationships. In the rest of Canada, 75 percent of mothers whose youngest child was under age 18 was legally married, and only 9

[11] When the participation equation is estimated using only a sample of mothers in Quebec, the effect of the UCCB on participation is much larger. For legally married mothers, the marginal effect of the UCCB is -0.04. For divorced/separated mothers, the marginal effect of the UCCB is 0.04.

percent lived in common-law relationships.[12] Third, we exclude all new parents from the sample to ensure the results are not entirely driven by parents taking advantage of paid parental leave and the results are not affected.

Fourth, in Table 5 we address concerns regarding the purity of the control group. As the LFS is a 6 month panel, there are some parents whose children were age 5 at the beginning of the panel and age 6 by the end of the panel. These parents will end up in both the treatment and control groups. To account for this, all mothers with children turning 6 over the 6 month period are removed from the sample. Following Schirle (2015) the sample is then reweighed so that the distribution of the youngest children's ages is preserved. The resulting estimates are nearly identical to the baseline results.[13]

Finally, in the remaining rows of Table 5 we consider various other options for control groups. Narrowing the control group to only include mothers whose youngest child is aged 8-14 results in the slightest reduction in the effect of the UCCB on mothers' participation.[14] The estimated effect of the UCCB on never-married mothers' labor supply turns negative but is still statistically insignificant. Using a broader control group of mothers whose youngest child is aged 6-24 offers results quite similar to the baseline results. When "childless" women are used as the control group, the results are slightly different in that the effect on legally married mothers moves slightly closer to zero (to -0.9 percentage points) and the positive effect on divorced/separate mothers is larger (4.6 percentage points). As noted earlier, however, this control group is not easily characterized as it includes young women who have not had children yet, women who will never have children, and women whose children are no longer residing in the household or are over age 24. Finally, the broadest possible control group is used, including all women aged 25-49 who are "childless" or have a child aged 6-24. The results are quite similar to the baseline results. The robustness tests in Table 5 are repeated for the employment probit in Table 6 with very similar results and for hours worked in Table 7.

Overall then, there are two strikingly different results to consider. First, we see that the UCCB has a negative and significant effect on the labor supply of legally married mothers. The UCCB has effects on both intensive and extensive margins of married mothers' labor supply. Second, we see the UCCB has a positive and significant effect on the participation and employment of divorced/separated mothers. The UCCB does not appear to affect divorced/separated mothers on the intensive margin. The first set of results for legally married moms aligns well with standard models of labor supply. However, the

[12] Authors' tabulations from the LFS public use micro data file for 2006.

[13] An alternative approach is to reduce our sample and only use a single month of the panel. Results differ slightly across months as statistical significance of the estimates is reduced, but the same general conclusions hold. These estimates are available from the authors upon request.

[14] We estimated the equation with a range of control groups and results were much the same, narrowing the control group to include mothers whose youngest child was aged 6-12, 7-13, 8-14, 9-15, 10-16, or 11-17. These are available upon request from the authors.

results for divorced/separated mothers appear to be at odds with standard models of labor supply. In the next section, we expand our discussion of these conflicting results to understand why we might see such different responses by different groups of mothers.

8. Discussion

Overall the UCCB appears to have very different effects on mothers with different marital status. Why might the UCCB reduce the labor supply of legally married mothers yet increase the labor supply of divorced/separated mothers? It seems unreasonable to assume that divorced and separated mothers treat their time away from the paid labor market as an inferior good. As such, standard models of labor supply are of limited use in characterizing this puzzling result.

The first consideration is that single mothers, unlike married mothers, do not typically need to negotiate with fathers over the use of child benefits. With the potential for labeling effects in mind, suppose single and married mothers are equally interested in ensuring the extra funds are used to improve the quality or quantity of child care for their children. Fathers, however, may have stronger preferences toward the use of parental over non-parental child care. For example, when asked whether a "working mother can establish just as warm and secure a relationship with her children as a mother who does not work", Canadian fathers are much less likely to strongly agree (16 percent) than Canadian mothers (28 percent).[15] For married mothers, intrahousehold bargaining may well result in the additional child care being offered by the mothers, represented by time taken away from the paid labor market. For divorced and separated mothers, however, the additional funds may afford them greater opportunity to purchase higher quality child care services, enabling them to enter the labor market.

The greater reliance of single mothers on formal child care services is a second consideration. In extreme cases, a single parent is the only parent responsible for the care of young children. If the single parent chooses to work in the paid labor market, they must incur direct costs associated with child care. A legally married mother has the option of organizing work schedules to accommodate the availability of a second parent for parental child care, which may be viewed as lower-cost since we expect parents to enjoy time with their children. Such greater flexibility with child care explains why we see working single mothers more likely to use non-parental child care when working. For example, from the 1998-9 Canadian National Longitudinal Survey of Children and Youth, we found that 77 percent of working single mothers used child care whereas 62 percent of working mothers with a

[15] Tabulations based on the 2003 CRIC-Globe and Mail Survey on 'The New Canada'. Similar results can be found in Fortin (2005), which is based on the World Values Survey.

spouse used child care.[16] This difference in the flexibility of time use between married and divorced mothers also helps us understand why we might see less of an effect of the UCCB on the intensive margin (hours worked) for divorced mothers.[17]

Finally, it is worth noting that the quality of non-market time may differ between married and single mothers. Among divorced parents, it is most likely that children live primarily with their mothers (representing 70% of cases in 2011, Sinha 2014). In many cases, children of divorced parents spend little time with the second (non-resident) parent – 18% of non-resident parents spent no time in a year with their child and 44% spent some time but less than 3 months (Sinha 2014). It is not clear from the available Canadian data whether there are differences in the quality of time that married and single mothers spend outside the paid labor market.[18] We should expect, however, that legally married mothers have greater bargaining power with a second parent in negotiating how non-market time is allocated to leisure, child care, and other household responsibilities, such that there is greater potential for pure leisure time.

Overall then, we can consider various reasons why married and divorced mothers may respond differently to the receipt of the UCCB. To understand the contrasting effects on labor supply, however, we needs to rely heavily on the importance of labeling effects for child (care) benefits, which warrants further research.

9. Concluding remarks

The UCCB has significant effects on the labor supply of mothers, however the effect varies by mothers' marital status. Legally married mothers appear to reduce their likelihood of labor force participation by 1.4 percentage points when receiving the UCCB and median hours are reduced by 0.9 hours per week. In contrast, divorced and separated mothers increase their likelihood of participating in the labor force by 2.8 percentage points when receiving the UCCB, and median hours of work per week are not significantly affected. Mothers in common-law relationships and never-married mothers appear relatively unaffected by the UCCB in terms of their labor supply, although the hours worked by common-law mothers appears slightly reduced.

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[16] Based on the public use files of the NLSCY, using a sample of mothers with a child aged 0-17. Marital status was not observed directly. We marked mothers whose spouse was recorded as male as those with a spouse and mothers for whom the sex of the spouse was not applicable as single.

[17] Meyer (2010) also noted a puzzling lack of an hours effect of the EITC in the literature where a negative effect was expected.

[18] We spent some time investigating the time use of single and married mothers in the 2005 General Social Survey. However, once samples of mothers with comparable work habits are chosen, samples are too small to offer any significant differences in behavior.

To reconcile these differences between married and divorced mothers, we point to labeling effects that might encourage parents to use the UCCB for child care, the importance of intrahousehold bargaining for married mothers, and what may be father's greater preference for parental over non-parental child care. The relative importance of each factor, however, requires further study.

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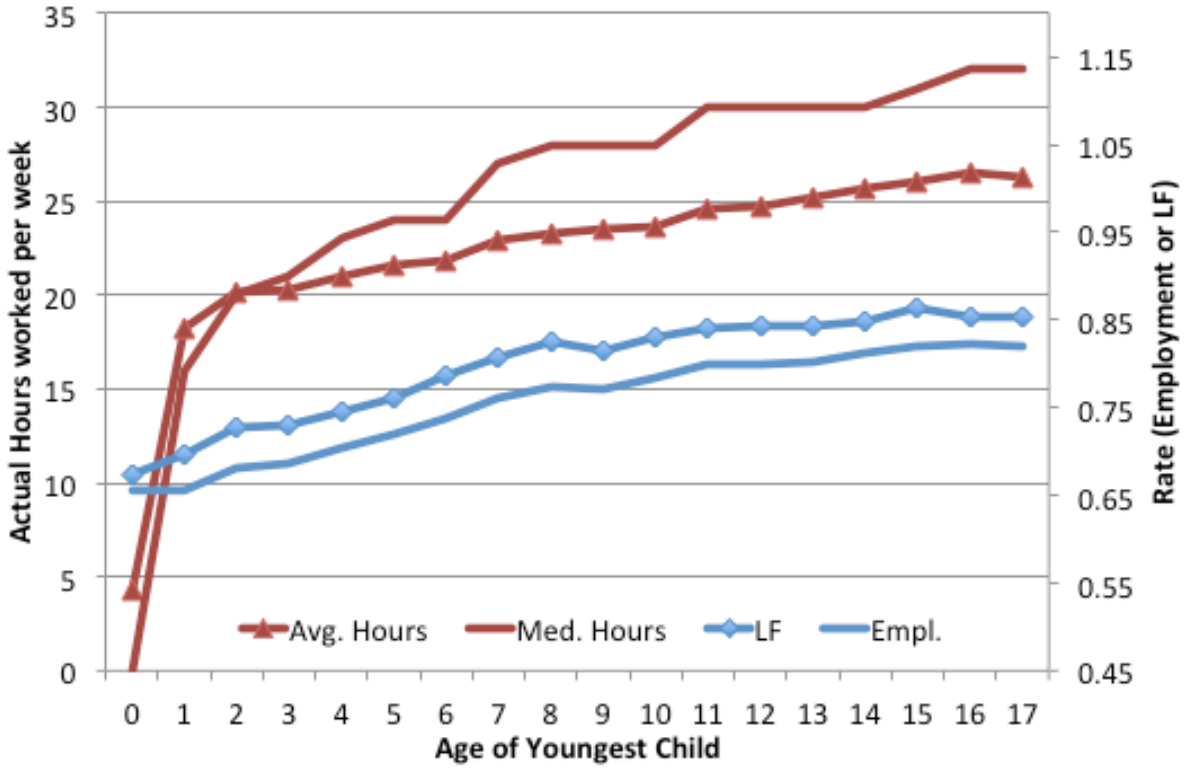
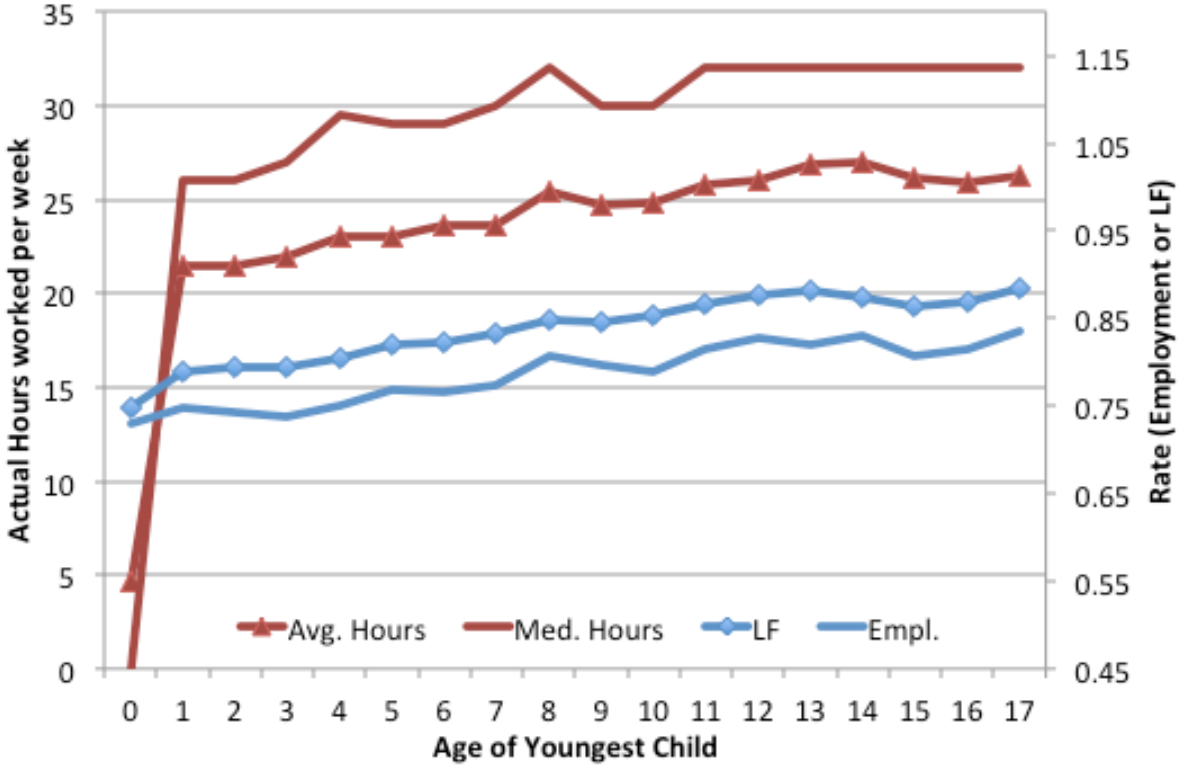
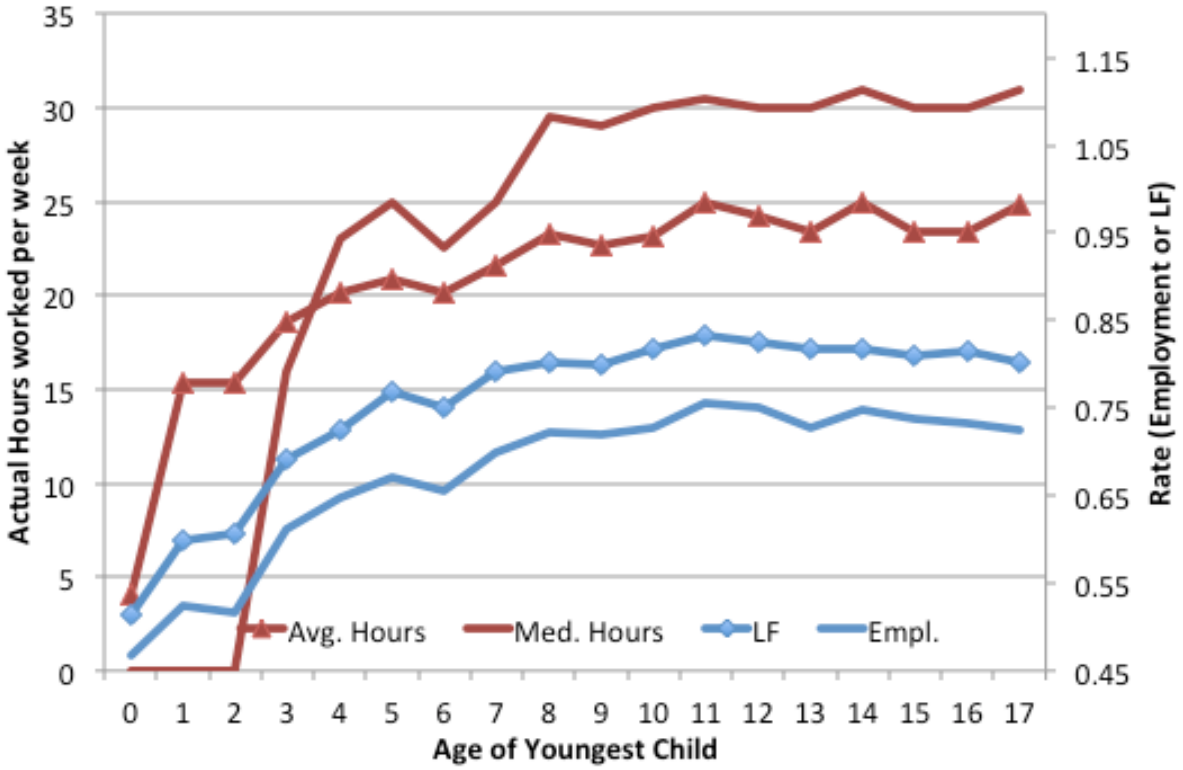


A. Legally Married Mothers

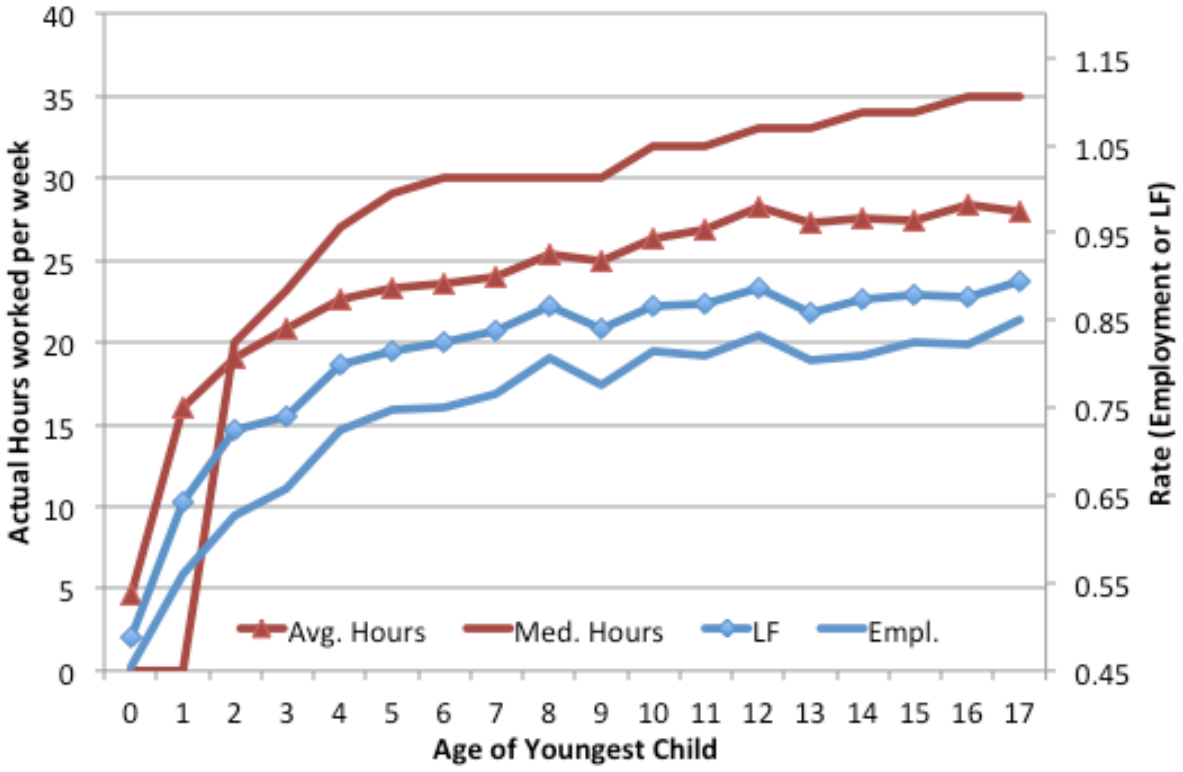


B. Common-law married mothers

Figure 1. Labour Market Activity of Married Mothers, by age of youngest child, 2003-2009.
Note: Sample includes married mothers aged 25-49.



A. Single, Never Married Mothers



B. Single, Divorced/Separated Mothers

Figure 2. Labour Market Activity of Single Mothers, by age of youngest child, 2003-2009.
Note: Sample includes unmarried mothers aged 25-49.

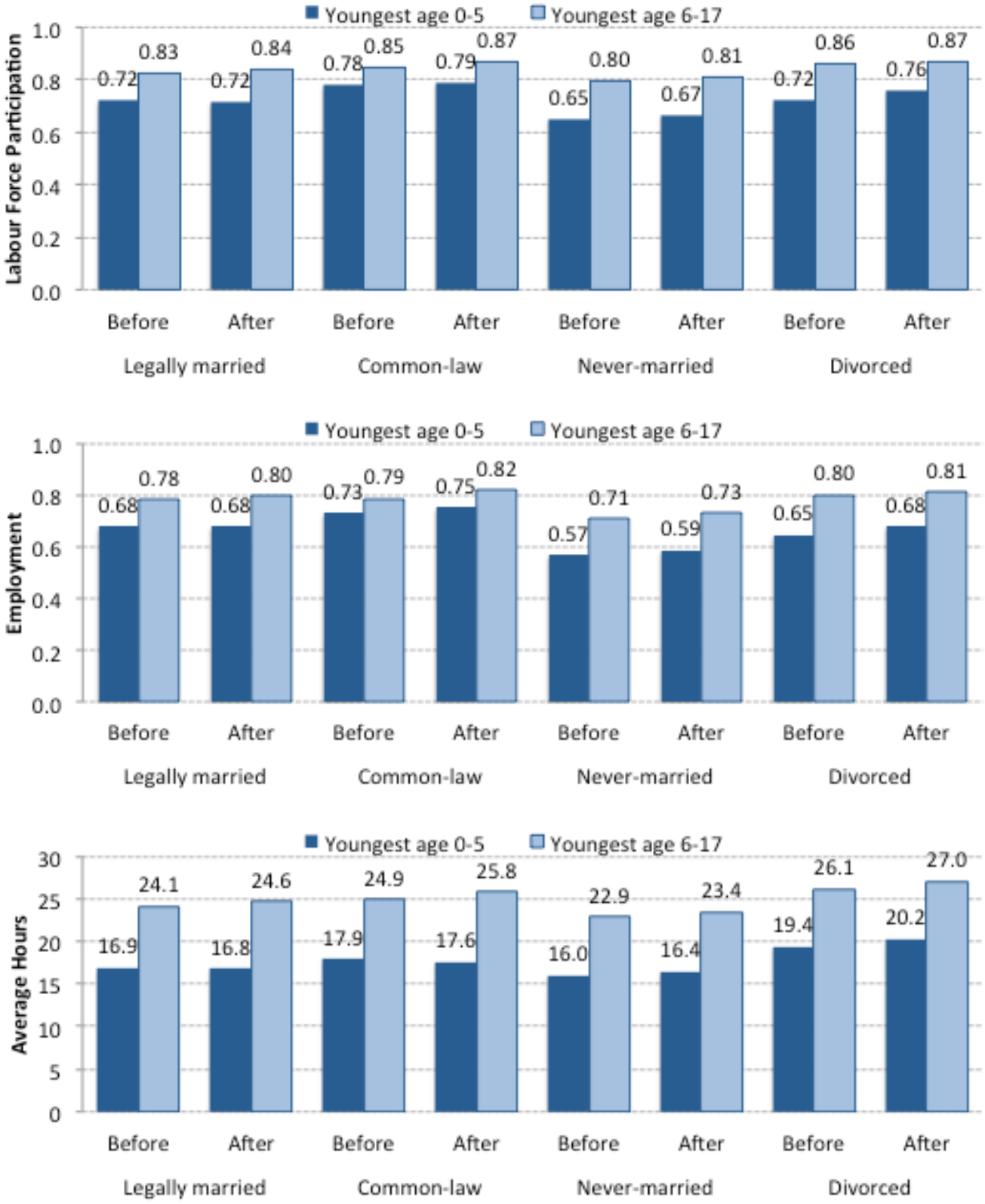


Figure 3. Labour market activity of mothers, age 25-49, 2003-2009

Notes: Before and After refer to the introduction of the UCCB in July 2006. Sample includes mothers aged 25-49 whose youngest child is aged 0-17. Divorced includes separated mothers. Average hours calculated including observations with zeros.

Table 1. Summary Statistics

	Legally Married	Common Law	Single - Never Married	Single - Divorced/Sep.
In labour force	0.78	0.82	0.75	0.84
Employed	0.74	0.77	0.67	0.78
Hours				
Average	21.2	21.5	20.6	25.1
40th percentile	10.5	14.0	0.0	24.0
45th percentile	20.0	21.0	16.5	28.5
Median	24.0	26.0	24.0	31.0
75th percentile	37.5	37.5	37.5	40.0
Youngest age 0-5	0.42	0.50	0.37	0.21
Number of kids				
Age 0	0.09	0.13	0.05	0.02
Age 1-2	0.19	0.23	0.13	0.06
Age 3-5	0.30	0.30	0.26	0.18
Age 6-12	0.77	0.70	0.73	0.78
Age 13-17	0.53	0.39	0.39	0.69
Age	38.4	35.6	35.1	39.7
25-29	0.09	0.21	0.24	0.06
30-34	0.20	0.25	0.25	0.14
35-39	0.26	0.25	0.23	0.25
40-44	0.28	0.20	0.18	0.32
45-49	0.18	0.10	0.09	0.23
Education				
Grade 8 or less	0.02	0.02	0.03	0.02
Grade 9-10	0.03	0.06	0.09	0.05
Grade 11-13, non-grad	0.02	0.04	0.07	0.04
Grade 11-13, graduate	0.20	0.19	0.20	0.19
Some post-secondary	0.06	0.07	0.11	0.09
Trades	0.08	0.13	0.12	0.11
CEGEP, Comm. Coll.	0.27	0.27	0.26	0.28
University below BA	0.03	0.03	0.02	0.03
Bachelor's	0.21	0.14	0.08	0.13
Above BA	0.08	0.04	0.02	0.05
N	747383	154068	74214	101758

Source: Authors' tabulations based on Labour Force Survey confidential files.
Note: Sample includes mothers aged 25-49 whose youngest child is aged 0-17, 2003-9.

Table 2. Model Results, single mothers aged 25-49

	Participation Probit ME	Median Hours U-Quantile		Participation Probit ME	Median Hours U-Quantile
UCCB	0.020	0.617	Grade 8 or less	-0.297	-11.837
	(0.005)	(0.337)		(0.011)	(0.475)
Under 6	-0.028	-3.089	Grade 9-10	-0.217	-10.103
	(0.007)	(0.427)		(0.007)	(0.326)
Post-July 2006	-0.009	0.876	Grade 11-13, non-grad	-0.124	-6.872
	(0.005)	(0.323)		(0.007)	(0.351)
# Kids age 0	-0.189	-17.153	Some post-secondary	-0.067	-4.055
	(0.007)	(0.385)		(0.005)	(0.300)
Age 1-2	-0.120	-5.888	Trades	0.026	0.111
	(0.006)	(0.337)		(0.004)	(0.290)
Age 3-5	-0.062	-2.639	CEGEP, Comm. Coll.	0.082	2.740
	(0.005)	(0.300)		(0.003)	(0.229)
Age 6-12	-0.036	-2.796	University below BA	0.082	3.159
	(0.002)	(0.109)		(0.006)	(0.503)
Age 13-17	-0.022	-1.442	Bachelor's	0.089	3.531
	(0.002)	(0.135)		(0.004)	(0.309)
Age 30-34	0.033	2.422	Above BA	0.089	5.304
	(0.004)	(0.271)		(0.006)	(0.469)
35-39	0.044	3.087	Constant		778.6
	(0.004)	(0.280)			(188.7)
40-44	0.043	3.083			
	(0.004)	(0.294)			
45-49	0.039	3.011			
	(0.005)	(0.328)			

Source: Authors' tabulations based on Labour Force Survey confidential files.

Notes: Robust standard errors are in parentheses. Models closely follow Schirle (2015). Probit marginal effects are evaluated at the mean. Sample includes mothers aged 25-49 who were never-married, divorced or separated. Specifications include province effects, year trend, province-specific trends, month effects and province-specific month effects.

Table 3. Model Results, legally-married mothers aged 25-49

	Participation Probit ME	Median Hours U-Quantile		Participation Probit ME	Median Hours U-Quantile
UCCB	-0.014	-0.927	Grade 8 or less	-0.208	-10.873
	(0.003)	(0.221)		(0.006)	(0.418)
Under 6	-0.039	-4.710	Grade 9-10	-0.124	-7.526
	(0.003)	(0.267)		(0.004)	(0.333)
Post-July 2006	0.008	1.251	Grade 11-13, non-grad	-0.065	-4.387
	(0.003)	(0.239)		(0.004)	(0.358)
# Kids			Some post-secondary		
Age 0	-0.116	-33.137		0.017	-0.377
	(0.003)	(0.198)		(0.003)	(0.247)
Ages 1-2	-0.098	-7.050	Trades	0.061	2.721
	(0.002)	(0.180)		(0.002)	(0.223)
			CEGEP, Comm.		
Ages 3-5	-0.069	-4.515	Coll.	0.089	4.614
	(0.002)	(0.160)		(0.002)	(0.161)
			University below		
Ages 6-12	-0.053	-4.876	BA	0.074	4.942
	(0.001)	(0.073)		(0.003)	(0.343)
Ages 13-17	-0.020	-2.015	Bachelor's	0.074	3.238
	(0.001)	(0.097)		(0.002)	(0.177)
Age 30-34	0.044	3.119	Above BA	0.090	5.316
	(0.002)	(0.213)		(0.002)	(0.244)
35-39	0.049	4.235	Constant		259.2
	(0.002)	(0.222)			(130.2)
40-44	0.037	3.039			
	(0.003)	(0.243)			
45-49	0.010	0.820			
	(0.003)	(0.266)			

Source: Authors' tabulations based on Labour Force Survey confidential files.

Notes: Robust standard errors are in parentheses. Models closely follow Schirle (2015). Probit marginal effects are evaluated at the mean. Sample includes mothers aged 25-49 who were never-married, divorced or separated. Specifications include province effects, year trend, province-specific trends, month effects and province-specific month effects.

Table 4. Model results – Effect of UCCB on mothers' labour supply

	Legally Married	Common-Law	Never-Married	Divorced/ Separated
A. Participation				
Probit ME	-0.014	-0.005	0.009	0.028
	(0.003)	(0.005)	(0.008)	(0.006)
LPM	-0.012	-0.002	0.013	0.040
	(0.003)	(0.005)	(0.008)	(0.008)
Donald-Lang	-0.012	-0.002	0.010	0.039
	(0.003)	(0.004)	(0.008)	(0.009)
B. Employment				
Probit ME	-0.014	-0.008	0.005	0.018
	(0.003)	(0.005)	(0.010)	(0.008)
LPM	-0.012	-0.003	0.007	0.026
	(0.003)	(0.005)	(0.009)	(0.009)
Donald-Lang	-0.012	-0.004	0.004	0.024
	(0.003)	(0.004)	(0.008)	(0.010)
C. Hours per week				
UQ - Median	-0.927	-1.748	1.577	0.056
	(0.221)	(0.543)	(0.964)	(0.433)
Tobit	-0.666	-0.723	1.004	0.830
	(0.177)	(0.350)	(0.626)	(0.559)

Source: Authors' tabulations based on Labour Force Survey confidential files.
Note: Robust standard errors in parentheses. See Table 2 notes for sample and specification details. Sample for estimating hours includes those with zero hours. Donald-Lang estimates refer to the two-step method developed by Donald and Lang (2007) and follows Schirle (2015), see text for details.

Table 5. Probit Model Estimates – Robustness checks, marginal effects of the UCCB on mothers' participation

	Legally Married	Common-Law	Never-Married	Divorced/ Separated
Baseline	-0.014	-0.005	0.009	0.028
	(0.003)	(0.005)	(0.008)	(0.006)
1. Pre-Sept. 2008	-0.014	-0.008	0.008	0.030
	(0.003)	(0.006)	(0.010)	(0.007)
2. Exclude Quebec	-0.008	-0.003	0.018	0.023
	(0.003)	(0.007)	(0.009)	(0.007)
3. Exclude new parents	-0.016	0.002	0.014	0.027
	(0.003)	(0.005)	(0.008)	(0.006)
4. Purity of control group	-0.014	-0.005	0.008	0.029
	(0.003)	(0.005)	(0.009)	(0.006)
5. Control: Youngest age 8-14	-0.012	-0.004	-0.006	0.024
	(0.003)	(0.006)	(0.010)	(0.007)
6. Control: Youngest age 6-24	-0.015	-0.006	0.007	0.024
	(0.002)	(0.005)	(0.008)	(0.006)
7. Control: "Childless" women	-0.009	-0.001	0.011	0.046
	(0.003)	(0.004)	(0.005)	(0.007)
8. Control: All other women	-0.012	-0.003	0.011	0.031
(childless, youngest age 6-24)	(0.002)	(0.003)	(0.005)	(0.005)

Source: Authors' tabulations based on Labour Force Survey confidential files.
Note: see table 3 notes and text for details.

Table 6. Probit Model Estimates – Robustness checks, marginal effects of the UCCB on mothers' employment

	Legally Married	Common-Law	Never-Married	Divorced/ Separated
Baseline	-0.014	-0.008	0.005	0.018
	(0.003)	(0.005)	(0.010)	(0.008)
1. Pre-Sept. 2008	-0.014	-0.011	0.000	0.019
	(0.003)	(0.006)	(0.011)	(0.009)
2. Exclude Quebec	-0.010	-0.010	0.015	0.020
	(0.003)	(0.008)	(0.011)	(0.008)
3. Exclude new parents	-0.015	0.001	0.010	0.017
	(0.003)	(0.006)	(0.010)	(0.008)
4. Purity of control group	-0.014	-0.007	0.005	0.019
	(0.003)	(0.005)	(0.010)	(0.008)
5. Control: Youngest age 8-14	-0.014	-0.010	-0.007	0.012
	(0.003)	(0.006)	(0.011)	(0.009)
6. Control: Youngest age 6-24	-0.016	-0.007	0.003	0.015
	(0.003)	(0.005)	(0.010)	(0.007)
7. Control: "Childless" women	-0.007	-0.001	0.012	0.039
	(0.003)	(0.004)	(0.006)	(0.008)
8. Control: All other women	-0.012	-0.004	0.011	0.024
(childless, youngest age 6-24)	(0.002)	(0.004)	(0.006)	(0.007)

Source: Authors' tabulations based on Labour Force Survey confidential files.
Note: see Table 3 notes and text for details.

Table 7. Unconditional Quantile Estimates – Robustness checks, effects of the UCCB on mothers' median actual total hours worked.

	Legally Married	Common-Law	Never-Married	Divorced
Baseline	-0.927	-1.748	1.577	0.056
	(0.221)	(0.543)	(0.964)	(0.433)
1. Pre-Sept. 2008	-0.917	-1.092	1.779	0.785
	(0.257)	(0.629)	(1.116)	(0.513)
2. Exclude Quebec	-0.591	-0.712	1.836	0.594
	(0.228)	(0.757)	(1.093)	(0.483)
3. Exclude new parents	-0.886	-0.303	1.732	0.045
	(0.317)	(0.305)	(0.962)	(0.434)
4. Purity of control group	-0.958	-1.673	1.817	0.057
	(0.224)	(0.548)	(0.980)	(0.441)
5. Control: Youngest age 8-14	-1.292	-1.783	1.646	0.266
	(0.312)	(0.652)	(1.200)	(0.514)
6. Control: Youngest age 6-24	-1.011	-1.271	1.130	0.118
	(0.211)	(0.433)	(0.966)	(0.412)
7. Control: "Childless" women	-0.262	0.046	0.587	1.590
	(0.318)	(0.263)	(0.359)	(0.526)
8. Control: All other women	-0.794	-0.228	0.707	0.571
(childless, youngest age 6-24)	(0.222)	(0.223)	(0.355)	(0.409)

Source: Authors' tabulations based on Labour Force Survey confidential files.
Note: see Table 3 notes and text for details.