

Mothers' labor supply and conditional cash transfers: Evidence from Chile*

Oferta laboral materna y programas de transferencia condicionada de efectivo: Evidencia de Chile

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Abstract

Taking advantage of a reform that made Chile's most popular conditional cash transfer program substantially more generous, I study its impact on mothers' labor supply using a difference-in-difference strategy. Previous research has focused on these effects near the inauguration of CCTs, never before more than 20 years later. I find that older mothers respond to the reform by increasing their probability of working, but young mothers between 18 and 24 years old reduce their labor force participation. Meanwhile, intensive margin responses are always non-positive. This is policy-relevant information to many countries with CCTs today.

Key words: *Mothers, labor supply, conditional cash transfer, welfare.*

JEL Classification: *J22, J10, I38.*

Resumen

Aprovechando una reforma que aumentó sustancialmente la generosidad del programa de transferencia condicionada de efectivo más popular de Chile, estudio su impacto en la oferta laboral de madres usando una estrategia de diferencia en diferencia. Este es el primer trabajo que estudia esta respuesta a uno de estos programas más de 20 años después de su creación. Encuentro

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que la probabilidad de trabajar aumenta para las madres de mayor edad, pero disminuye para las más jóvenes (18-24 años). Las respuestas a la reforma en el margen intensivo nunca son positivas. Esta es información relevante para países que usan CCTs.

Palabras clave: *Madres, oferta laboral, CCT, subsidios.*

Clasificación JEL: *J22, J10, I38.*

1. INTRODUCTION

Conditional Cash Transfers (CCT) programs are immensely popular today in low- and middle-income countries as tools to improve investment in education and health of children. This is so because these programs have shown to be effective and efficient in achieving these goals. Although previous studies have generally concluded CCTs have no impact on maternal labor supply during their first years less is known about their effect on richer populations, likely less in need to be motivated to invest in their children's health and education. Research focused on this issue is important, as many of these programs are now moving into benefiting a second generation of children. Other effects of the program become more important in a scenario where these behaviors need not be motivated.

To answer this question, I take the case of Chile. World Bank (2018) data show that educational attainment progressed from six years to nearly ten years between 1981 and 2007. In part, this was the result of a successful CCT program called 'Unique Family Subsidy' (SUF, after its name in Spanish). In 2007 a reform to this program led to it reaching twice as many beneficiaries by 2010. At the same time, the government increased the real value of the transfer by 50%. However, it is not clear this program is raising schooling anymore, or if it is producing any important labor market distortion¹.

I find that the program has an effect on the labor supply of some mothers. Older mothers that live with another earner increase their labor supply. However, the youngest mothers become less likely to be working. Furthermore, there is a negative effect on working hours that concentrates on young and low educated mothers. The primary contribution of this paper is the analysis of a mature CCT program. At the time of its expansion, the SUF was 26 years old and the mothers benefiting from it had on average over eight years of schooling. In contrast, evaluations using randomized control trials have been done at the birth of the CCT program (within the first five years), when benefited mothers have on average

¹ Here and throughout the paper I speak in positive terms, a distortion may be desirable or undesirable, expected or unexpected.

very little schooling. Because these are rapidly changing countries, we would be wrong to think that a relatively rich country today, such as Chile, would have nothing of value to offer on this matter. The fact is that Chile's per capita GDP by PPP in 2007 (\$18,373) implies it is a better comparison for Mexico in 2017 (\$17,331) than even Mexico itself in 2000 (\$15,683). This is true not only for Mexico, but for many other countries that use CCT programs (Federal Reserve Bank of St. Louis, 2019).

The rest of the paper is organized as follows. Section II discusses the current state of knowledge on the effects CCTs have on labor supply. Section III is devoted to explaining thoroughly the SUF subsidy and its recent evolution, including the event that will provide me with an identification strategy. Section IV describes the data used, Section V defines treatment and control groups, and Section VI presents the difference-in-difference model. Section VII provides a discussion of the results obtained for several labor supply outcomes. Finally, Section VIII concludes and suggests ways forward.

2. BACKGROUND

2.1. Literature review: CCTs and labor supply distortions

Banerjee *et al.* (2017) review seven CCT evaluations using randomized controlled trials for four developing countries. Even though the authors conclude there are no statistically significant labor supply effects, their point-estimates are consistently negative and relatively large. One of these studies finds effects on employment for Honduras, Nicaragua, and Mexico that, even though not statistically significant, respectively represent reductions from the baselines of 5.2%, 11.3%, and 5.1%² (Alzúa *et al.*, 2013). Similarly, Skoufias and Di Maro (2008) find negative employment effects for young women in Mexico due to PROGRESA that represent a 10% reduction from its baseline, and positive effects for older women that are even larger (21% increase from the baseline for women older than 55), but can only statistically distinguish from zero the latter positive effect on the oldest group. These results are particularly interesting because their findings are consistent amongst themselves and with mine.

The studies considered in the review by Banerjee *et al.* (2017) include CCTs in Argentina, Brazil³, Cambodia, Colombia, Honduras, Mexico, Nicaragua,

² These are all ITT effects, for PROGRESA (Mexico) they report the ATE effect, which would represent a reduction of only 1.5%.

³ A standard CCT program relies on indirect measures of income, such that people's actual labor supply will not impact their chances of getting the benefit. Argentina and Brazil however use administrative data to include current income considerations. The discussion in this paper applies to the standard CCT program, not to the type used by these two countries, which will create substantially different incentives. (Brazil: De Brauw *et al.*, 2015; Ribas and Soares, 2011; Argentina: Garganta and Gasparini, 2015)

Pakistan, and Philippines. Notably, children health and educational outcomes in all of these countries at the time research was conducted were far below the same outcomes for these countries today (World Bank Open Data, 2018). This accelerated progress may well be attributed to the CCT programs themselves. Indeed, CCTs have been proven remarkably successful welfare programs on reducing poverty (Fiszbein and Schady, 2009), improving children's educational outcomes (Schultz, 2004; Maluccio and Flores, 2005) and their access to health services (Gertler, 2004; Attanasio *et al.*, 2005). However, this raises the concern that the beneficiaries are likely changing importantly over time. They probably have significantly higher educational attainment today than when the program was introduced, and their decision to work or not is most likely affected by this.

According to Hernández Licona (2019), household head schooling in moderately poor households in Mexico receiving the conditional cash transfer has increased from 4.6 in 1994, three years before the program started, to 7.1 in 2016. Furthermore, for those in extreme poverty schooling increased from 3 to 5.8 years in the same period. If the tendency to higher schooling of household heads remains, soon the beneficiaries of PROGRESA will have as many years of schooling as the beneficiaries of the Chilean SUF in 2007.

This is important because we can expect education to impact labor supply of mothers in several ways. Research shows that women that receive more schooling have less children (Schultz, 1993; Lam and Duryea, 1999), if they get at least eight years of education they become significantly more likely to work (Lam and Duryea, 1999), and invest more in their children's health and education (Strauss and Thomas, 1995). Additionally, number of children and the willingness to invest in their education without the assistance of a welfare program, will modify the relationship between the CCT and its beneficiaries in ways that could further impact their labor supply responses to it. Alzúa *et al.* (2013) suggest CCTs distort labor supply via three main sources: the transfer (-, income effect), by reducing child labor (+, need to replace lost income), and limiting the time spent caring for children (+, more available time). These evaluations have been taking all these effects together but as time goes by, is the transfer that should be taking center stage.

2.2. The Chilean Context

Chile's SUF was started in 1981, when only 34% of its adult population had at least completed lower secondary education (World Bank Open Data, 2018). The same was true in 1990 for the countries studied by Banerjee *et al.* (2017), except for the Philippines (46%) and Colombia (41%). Analyses of the labor supply effects of CCT programs have been done in these conditions. However, educational attainment today in Mexico, Brazil, Colombia, and the Philippines are closer to 70% (respectively by 2018: 63%, 60%, 54%, and 70%); which might make them more similar to Chile (75% in 2007) in their responses than to their old selves.

The changes experienced by these countries over the last two decades cannot be ignored by researchers, as they challenge the relevance of our work. Studies of these countries twenty or even ten years ago may be of questionable relevance today for a country that is so strikingly different from the country originally under study. In these circumstances, Chile can provide other countries with policy relevant information. This study, looking at Chile in the early 2000s, can provide useful information to many of the sixty countries using CCT programs, today or in the near future.

This is an important consideration because we can expect the distortionary costs of a CCT program to vary over time, specifically as a function of school enrollment levels. This is so because the distortions that tend to increase labor supply depend critically on the preponderance of schooling among children. We may expect positive labor supply distortions to partially or completely offset negative distortions if schooling is low, and net distortions to be small or zero. However, if schooling is high it would tend to eliminate the positive labor supply distortions we recognize in theory, leading to larger negative net distortions. Therefore, distortions would tend to become more negative over time, countries that started a CCT program fifteen to twenty years ago would want to know whether their CCT program creates distortions in their current state, not in their initial situation.

3. THE SUF PROGRAM

The SUF program was established with the explicit goal of increasing parents' investment in their children, and in 2015 reached about 15% of the country's households. It provides a monthly transfer per child and mother conditional on either health or educational investments. Children up to six have to be taken to regular medical controls. Older children have to attend school full time and be at most twenty-four years old. If a family qualifies for the program, the per capita amount is the same for everyone.

These conditions are easily controlled for by the authorities, making the system efficient and relatively simple to enforce. The SUF also requires families to be part of the poorest 40 percent. This was done by reference to past income declared by mothers, and by majors subjected to quotas (which meant no everyone who complied could receive it). However, a reform in 2007 changed this significantly. It eliminated the quotas and proxied income using a novel index called income generating capacity. This index is built using self-reported information, making it very manipulable (Herrera *et al.*, 2010; Irarrázabal *et al.*, 2010).

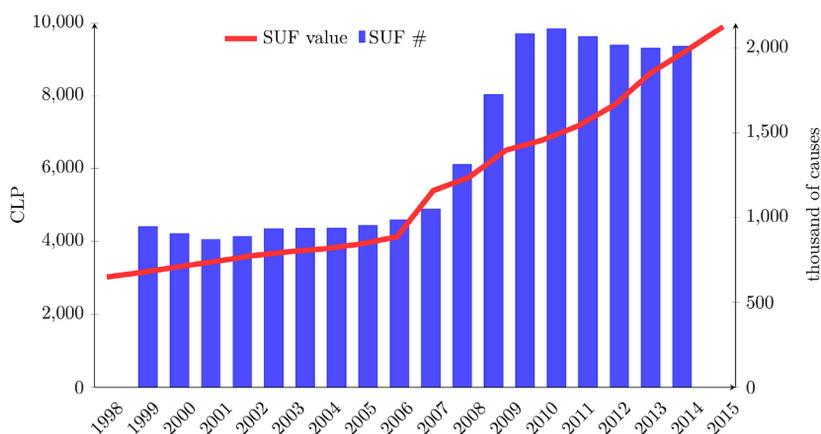
From 2007 to 2010, this subsidy was made more generous and expanded its reach. The former resulted from an increase in the transfer's value. The amount transferred in 2007 was 31% larger than the previous year, and its subsequent growth was increased as well. From 2006 to 2015 the nominal value of the SUF grew at an average annual rate of 10%, 2.5 times faster than during the period 1998-2006 (in real terms, annual growth exploded from 0.9% in the first period

to 6.6% in the second, see Figure 1). Turned into an entitlement the program doubled its reach by 2010 (Figure 1). The reason it took some time for the CCT to grow is that the authorities needed to estimate the income generating capacity of the beneficiaries in order to add them to the program, which requires interviewing each family.

Overall, this overhaul to the SUF program could have important unintended effects as long as the program also meets two other requirements: being big with respect to some generally definable universe; and important enough to have noticeable effects on people's budget constraint. Chile's SUF is exceedingly popular, reaching large sections of the country's families. It currently benefits over two million people in about 850 thousand different families, according to official data for 2016 (Subsecretaría de Seguridad Social, 2018). In a country with 18 million people, and 5.5 million households, this represents more than 10% of the population, and 15% of families. Furthermore, by decile of income, the SUF reached over 25% of the first two deciles and 17% of the third, according to survey data from 2015 (even with 30% undercount of SUF recipients).

On the second requirement, the SUF makes only a modest contribution to the budget of an average family. The transfer awarded to any particular *cause*⁴ would represent only 4.1% of the national minimum wage in 2015, and even less in previous years. However, the benefits received through the SUF can represent a very substantive proportion of some people's work income. In my sample the subsidy represents 7.5% of work income for those that receive it and have work income. However, for 25.6% of recipients the SUF represents

FIGURE 1
THE SUF BECOMES MORE GENEROUS



Source: Prepared by author using Subsecretaria de Seguridad Social (2018).

⁴ The benefit defines causes and beneficiaries. Causes are children or mothers entitled to the transfer, and beneficiaries are the adults perceiving the benefit.

at least twenty percent of their work income. The latter number goes to 45.8% for mothers that are between 18 and 24 years old.

Nevertheless, the SUF has a 'sister' program (the AF, 'Asignación Familiar') that may lead us to over-estimate the value of the SUF for some families. The AF requires beneficiaries to work and receive a low income, and is incompatible with the SUF. The transfer given by the two programs is the same for the lowest income workers but for workers earning over a threshold the SUF provides a higher transfer (the AF has three brackets, four if we count zero). Since the other brackets of the AF were not affected by the 2007 reform⁵, eligible workers will be affected differentially by this event. In essence this means that the value of the SUF will be over-estimated for some groups. For some workers moving from the AF to the SUF will at best add stability. However, moving up the income distribution we meet a group that can grow their transfer 60% by choosing the SUF, and further up another group that can multiply it by five. Meantime, at all levels there will be people who are not working that will receive the full benefit of the SUF becoming an entitlement.

While this was done to the SUF, the 'Subsidies' budget of the central government grew from 4.8% of GDP in 2007 to 6.7% in 2010, and 7.6% for 2015 (DIPRES, 2017) raising the concern of potential spillovers from other welfare policies being expanded. If other important subsidies saw similar reforms as that of the SUF, then I would be identifying the response of the treated to this welfare system expansion, rather than specifically their response to the CCT program being expanded. Furthermore, many programs rely on the same income generating capacity index used to select eligible households for the SUF. However, a review of the most sizable subsidies that use this measure to determine eligibility can help mitigate this concern.

Most programs run by the government at this time are not a concern. This is because they either are addressed to a different population (pensions, scholarships) or because they are too small to be of significance nation-wide. However, a few programs are large and can target the same population that the conditional cash transfer program targets. The most salient example being that of housing subsidies. However, this subsidy can be received by both treatment and control and running the model controlling for it does not alter my results, suggesting it is not a critical issue. However, there are other large programs that at the same time are addressed exclusively to mothers. One of them provides free childcare and preschool, and is about half the size of the SUF. However, this program only grew 11% in beneficiaries between 2007 and 2011 and would only benefit a fraction of the people that can benefit from the SUF. The program that is most likely to create an identification problem for us is food subsidies for children at school, which had a budget 65% larger than the SUF's in 2010. This subsidy even

⁵ People receiving the maximum transfer from the AF would experience the same accelerated growth experienced by SUF recipients, but the growth for the other two brackets remained unaffected. Between 2006 and 2015 the highest transfer grew 140% while the next two grew 51% and 46%, in descending order.

reaches a similar number of children as the SUF and was significantly expanded after 2006. Insofar families are able to monetize this transfer, it may have some impact in my results. This would lead me to overestimate the importance of the CCT, but it should not lead to changes in sign as both policies would practically be 'unconditional' cash transfers. However, I do not find noticeably smaller effects when I compare mothers of younger children to mothers of older children, which should be more similar to each other in regard to free meals (the former only have marginally more children on average). This suggest my results are driven by the CCT program, as desired.

4. DATA

The data used come from seven editions of a survey created to evaluate public policy in Chile, called Encuesta de Caracterización Socioeconómica Nacional (CASEN, 'national socio-economical characterization survey'), covering the period from 1998 to 2015. This is a household survey first conducted in 1987, meant to be nationally representative of the population, that in 2015 reached almost 270 thousand people in 84 thousand households and 100 thousand different nuclear families, effectively interviewing 1.5% of the Chilean population.

The survey's purpose is to measure poverty, describe the poor, and guide and evaluate public policy, which is why it contains detailed personal demographic information, sources of income and labor force participation, among other things. Because it is meant to be repeated indefinitely there is a substantive effort in making versions comparable and the survey trustworthy. By 1998 it has been repeated five times before, giving people no specific reasons to believe the survey would be used against them if they admitted to improper behavior.

The analysis is based upon four surveys before the 2007 policy change: 1998, 2000, 2003, and 2006; and three surveys after the SUF's modification: 2011, 2013, and 2015. There is a 2009 survey that will be excluded from the principal analysis, because the expansion of the program is still incomplete at this point. However, including the survey and treating that year as a post-reform year does not affect the findings significantly.

Our relevant population are women between 18 and 60 years old, with at least one child younger than 24 (and full-time student). This results in a sample of 319,298 observations for which some general statistics can be seen in Table 1. This table shows how the change in the SUF led to a sharp increase in the probability of having the SUF subsidy after 2006.

Table 1 also shows the same basic statistics for the subgroup that declares to receive SUF. These women are younger, less schooled, have more children, they have their first child sooner, are more likely to be single, work less and earn less than the overall population. However, their trends are those of the general population, and the table does not suggest a change in the composition of SUF beneficiaries. The biggest difference is as expected, a rather significant jump in schooling and work income, likely a result of expanding the subsidy's reach.

TABLE 1
SAMPLE GENERAL STATISTICS

Year	Obs.	Age	Years Educ.	# children	First mom	% Single	% SUF	LF partic.	Work income	Work hours
All										
1998	35,095	36.9	10.0	2.07	24.1	21.4	11.2	44.7	375,665	17.0
2000	46,677	37.0	10.3	2.02	24.1	22.2	11.0	47.3	359,984	18.5
2003	47,703	37.6	10.6	1.98	24.3	23.6	11.4	50.5	363,797	17.7
2006	48,479	38.3	10.7	1.94	24.6	26.5	10.5	54.0	378,013	20.1
2009	43,506	38.9	11.0	1.9	24.8	29.4	13.3	54.5	425,094	19.2
2011	54,256	38.8	11.2	1.83	25.1	33.6	19.7	57.8	418,994	20.4
2013	39,985	38.9	11.5	1.79	25.3	35.6	20.5	60.0	389,168	21.4
2015	47,103	39.0	11.8	1.77	25.4	35.9	18.8	62.6	412,486	23.2
SUF Recipients										
1998	5,851	33.9	7.2	2.46	22.5	24.7	100	30.4	123,739	9.5
2000	10,223	34.1	7.5	2.31	22.7	27.6	100	32.0	112,264	10.1
2003	10,844	34.4	7.8	2.23	22.8	28.9	100	34.7	128,147	8.9
2006	9,885	35.0	8.1	2.17	23.2	31.4	100	39.8	142,145	11.6
2009	9,110	35.0	9.1	2.02	23.2	35.7	100	41.7	202,609	11.6
2011	12,708	35.0	9.5	1.95	23.5	40.3	100	46.9	183,264	13.4
2013	9,686	35.6	9.6	1.92	23.8	41.4	100	47.2	181,434	14.2
2015	10,745	35.6	9.9	1.95	23.7	40.0	100	48.7	183,421	14.7

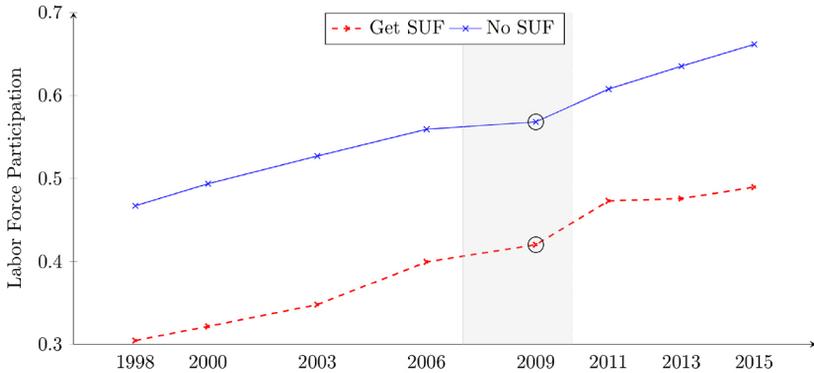
Samples averages. *Refers to real values in CLP for mothers working at least 1 weekly hour.

This observation maps perfectly to the selection mechanism for the subsidy, that rests heavily on declared schooling. Therefore, controlling for education among other observables should help control for this issue. Additionally, the survey data show that income considerations need not necessarily be an issue in this respect. Even after the reform, there is still households belonging to the first decile of income that are not receiving the subsidy (50%).

There is also one trend that seems to differ between the tables in a way that is not warranted, and that is labor force participation. Figure 2 shows how the labor force participation of the two groups (with SUF and without SUF) trend together only before the policy change. This figure also makes evident the smooth trend observed for non SUF recipients and should help alleviate concerns about group composition changes. The grey area in this graph is meant to signify the SUF expansion period.

The data also include detailed information about other outcomes related to labor supply that we will use to study the program's effects: labor force participation, average hours worked, and average hours worked by the spouse (attributing zero to those without a job), average hours worked by those with positive hours, probability of working extra hours, and hourly wages. These six outcomes allow me to identify how individuals choose to respond to the change in the CCT program.

FIGURE 2
MOTHER'S LABOR FORCE PARTICIPATION



Source: Prepared by author using the CASEN surveys.

4.1. Definition of Treatment and Control

Ideally, we could choose a random sample of mothers, and compare the labor supply of those that benefit from the reform to the supply of those that do not. However, we do not have a group of beneficiaries that could not benefit from the program being expanded. Since the program was expanded both in reach and value, we must find another group that shares some similitudes to the group affected by the reform but that is not eligible for the subsidy.

In determining labor supply choices, we may think some personal characteristics are particularly important: having or not children, educational attainment, income, age, being in a couple, are some examples. To choose control group we need to discriminate along the lines of at least one of these dimensions. An analysis of the sample by years of schooling shows that the probability of participating in the welfare program is a function of educational attainment. However, it also shows that for all education levels there is an increase in the probability of receiving the subsidy.

Modifications to the SUF could potentially affect any woman that has children eligible for the program. Nominally, this would be limited to mothers with eligible children in the first forty percentiles for income, as the SUF should not be received by wealthier people. However, there is evidence that recipients misrepresent their situation in order to improve their chances. Indeed, according to Herrera *et al.* (2010) the data used to determine eligibility to the SUF differs importantly to survey data for the same population. The head of household is older and more likely to be woman, and the family is smaller and much more likely to have someone with disability. Similarly, Irrázabal *et al.* (2010) show in their table 4.2.1 that according to the data used to determine SUF eligibility,

with two thirds of the country surveyed, 35% belong to the first decile of income. That would mean that at least 22% of Chilean population belong to the first income decile, which is only possible because the data is self-reported with the intent to improve chances of being eligible to the program.

Schooling does not provide a clean cut either. The survey data used shows that for all schooling levels mothers experience an important change in probability of receiving the subsidy after 2007. The probability of benefiting from the SUF are significant for any mother with 12 years of schooling or less (high school diploma) but are still relevant for 15 or 16 years of schooling, probably a consequence of a selection mechanism that relies on self-reported and unchecked personal information.

Although we could define treatment and control groups by distinguishing mothers more or less exposed to the subsidy⁶, there is a better option. There exists a group of women for whom the program is irrelevant, women with no eligible children. I will refer to them simply as 'not mothers', even though they could in principle have ineligible children (i.e., older than eighteen and working, or older than twenty-four). It turns out that this control group complies with the necessary conditions to be used successfully.

Previous literature has suggested that CCT programs may have effects on fertility decisions (Olson *et al.*, 2019; Todd *et al.*, 2012; Gulemetova-Swan, 2009). If the choice to become a mother is affected by the cash transfer itself, then this will make my identification strategy biased. However, the results from these papers suggest these women are having children later and adding space between them; not having more children but fewer. This means that women are not becoming mothers in order to get the transfer.

I will also be limiting my attention to the age range 18 to 50. The lower limit corresponds to the minimum age for mothers to benefit from the SUF, making this restriction a necessary one. The upper limit is made convenient due to characteristics of the data. The CASEN is a household survey that only started asking for total number of children after 2011. Therefore, limiting attention to women younger than 50 helps keep demographics between treatment and control more balanced, since older women typically no longer live with all their children. Nevertheless, the results are not overly affected by eliminating the latter age restriction (replacing it with 60, the retirement age for women in Chile).

Table 2 shows some general demographics for mothers and women without children. We can see here important differences between the groups: women without eligible children are on average younger, more educated, work more and are more likely to be single. These are all expected differences, but it makes salient the concern that these women may not be a good control for mothers.⁷

⁶ I did do this. In the appendix I define two alternative treatment/control definitions based one on the age of the youngest child and the other on number of children. The younger the children, the more children a mother has, the more she should value the transfer.

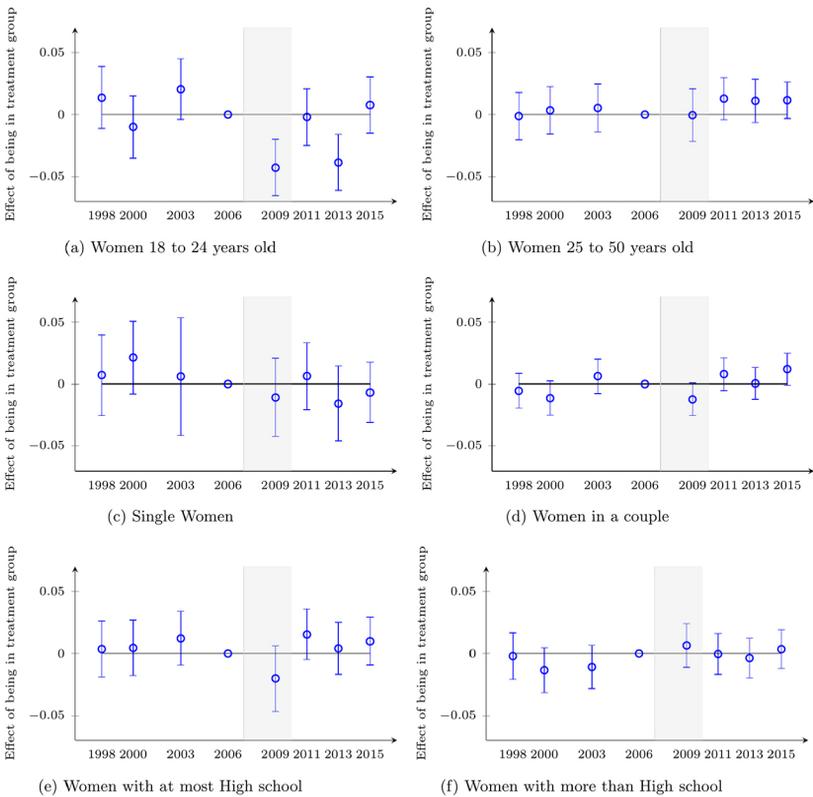
⁷ To address this concern, I have alternative specifications for treatment based on how exposed mothers were to the CCT program. The results proved robust to these tests and are included in the Appendix.

TABLE 2
DESCRIPTIVE STATISTICS FOR TREATMENT/CONTROL

Year	Obs.	Age	Years Educ.	# children	First mom	% Single	% SUF	LF partic.	Work income*	Work hours
Treatment										
1998	31,969	35.1	10.2	2.08	23.2	21.0	11.8	45.6	369,406	17.3
2006	43,159	36.3	10.9	1.96	23.7	26.5	11.2	54.7	366,155	20.2
2015	40,025	36.2	12.0	1.8	24.1	36.4	20.7	63.5	405,848	23.4
Control										
1998	3,495	34.4	11.0	-	-	35.4	0.7	62.8	481,270	25.2
2006	5,050	34.7	11.8	-	-	35.7	1.0	69.6	517,106	27.6
2015	7,109	34.5	13.1	-	-	35.5	1.4	75.8	534,704	29.2

Samples averages. *Refers to real values in CLP for mothers working at least 1 weekly hour.

FIGURE 3
TESTS FOR PARALLEL TRENDS FOR SUBPOPULATIONS -
LABOR FORCE PARTICIPATION



Source: Prepared by author using the CASEN surveys.

More importantly, Figure 3 tests for parallel trends on labor force participation for several subpopulations from 1998 to 2015. We can see here that even though there is a major difference in levels of labor force participation, trends prior to 2007 are comparable, which is the fundamental assumption that needs to hold for the difference-in-difference analysis I will describe later. Women without children are more likely to work, but do not seem to have reached a ceiling on labor force participation by 2015 either, which means there is no other reason for the series to separate after 2007. Furthermore, I assess the parallel trend assumption for several subpopulations in Figure 3 and do not find any violation of the assumption.

5. THE MODEL

I use a difference-in-difference methodology to identify labor supply effects attributable to the SUF program being reformed. The preferred specification controls for several relevant covariates parsimoniously. Every regression includes controls for whether mothers have work experience, whether she has a spouse (de facto, regardless of legal standing), is part of the primary family in the household (i.e. not the family of a son or daughter), and whether she is married; I also include dummies for year of survey (6), age and its square, family size, number of children, an index capturing the growth of housing subsidies, and fixed effects for municipality (359 dummies). Because housing subsidies are the largest welfare program aimed at both treatment and control groups, I expect this covariate will allow me to control for the effects of the overall welfare expansion. If the regression is conditional on working, I replace the dummy for work experience with a variable that records years in her current job. I also use heteroskedastic robust errors on estimation, given that difference-in-difference models are prone to underestimate them (Bertrand *et al.*, 2004). Below is the model in its equation form.

$$(1) \quad y_{it} = \beta_0 + \beta_1 mom_i + \beta_2 \cdot post_t \cdot mom_i + \gamma_t + \Gamma X_{it} + \varepsilon_{it}$$

Where y_{it} is one of several outcomes of interest: labor force participation, weekly working hours, weekly working hours of the spouse (declared couple regardless of legal standing), log of weekly working hours, work overtime, defined as working over 50 hours a week (in Chile the working week was reduced from 48 to 45 hours in 2005), and hourly wage. $post_t$ identifies the timing of treatment and is zero for data prior to 2007, and one for its complement. I also run this regression with three different interactions to evaluate possibly heterogeneous responses: whether the woman is single, whether she is younger (defined as in the age range 18 to 24), and whether she has a high school diploma (12 or more years of schooling).

As the results seem to be driven by all three characteristics, although with a clear distinction between the younger and the older groups, I run the regression combining two interactions. This allows me to closely identify the groups that are responding to the policy. It does not seem to be necessary to include more interactions to identify the groups reacting to the policy. Additionally, it may not even be wise as these additional subdivisions may not be supported by a valid pre-trend assumption.

I study the trends of the series in Figure 3. This figure analyzes trends for several subpopulations: young women (Figure 3a), older women (Figure 3b), single women (Figure 3c), women with a couple (Figure 3d), the less educated (Figure 3e), and those more educated (Figure 3f). The parallel trend assumption holds for all these populations. Furthermore, although the series for young women seems unstable, this is probably just a consequence of the small age range of the group.

6. RESULTS

I analyze the effect of the CCT reform on six different labor supply outcomes. Three of these outcomes are not conditional on working, with the first two utilizing the entire sample: labor force participation and hours worked attributing to those not working zeros; while the third, hours worked by spouses attributing zeros to non-working spouses, only considers couples. The other three only apply to working women: log of working hours, probability of working overtime (defined as working more than 50 hours a week), and hourly wage. Each table presents these six outcomes in columns (1) through (6), in the same order as I just presented them. Coefficients in each row represent the entirety of the effect for that group. Under the coefficients I report standard deviations calculated using the delta method (using *deltamethod* function in R), and under these I report sample means by 2006.

Table 3 shows the effect of treatment on the population as a whole. This table suggest that the transfer created some distortions, as evidenced by a significant increase in spousal unconditional working hours and women's wages, but it is not clear exactly on whom. Taken together these two effects are not particularly sensible. A more natural response to higher wages for women with a couple is for their labor to replace men's labor in the affected households. The effect on wages should lead to an increase in working hours by women, even those without a couple, yet we do not see a significant effect on the related outcomes. Furthermore, the effect on conditional hours and probability of working overtime are negative, even though not statistically significant. Nevertheless, this table confirms that the SUF is important enough to create distortions in the labor market.

The fact that we cannot make sense of them from Table 3 alone suggests heterogeneous responses. Heterogeneity has been suggested by previous studies on CCT programs. The results may sensibly vary by educational attainment, age, and being a single mother. Having a relatively low educational attainment and

TABLE 3
LABOR SUPPLY RESPONSE OVERALL

	Unconditional			Conditional		
	Labor force partic.	Hours worked	Hours worked others	Hours worked (logs)	Prob. overtime	Hourly wage
	(1)	(2)	(3)	(4)	(5)	(6)
treated	0.004	0.043	0.832+	-0.012	-0.010	0.040+
[s.e.]	[0.005]	[0.270]	[0.441]	[0.013]	[0.010]	[0.021]
mean	54.7%	20.2	33.5	40.8	13.1%	\$2,517
Observations	308,245		220,144		126,404	122,056

Significant at: ***0.1%, **1%, *5%, +10%

All regressions include demographic controls. Unconditional outcomes control for whether the subject has work experience while conditional outcomes control for time in current job. The means used correspond to the year 2006.

being young can predict low wages, making the cash transfer more important relative to income. Meantime, single mothers may be less responsive to treatment given that their work is indispensable to sustain them. I prepared a binary comparison for each of these characteristics. First, compare women that did not finish high school to others that did. The former should be more responsive to the policy because we can expect them to have lower wages and consider the transfer more important. Second, I compare women under 25 years of age to those 25 to 50 years old. The former group has the possibility to study and of living in their parental house, which in general should make them more willing to work less. Third, single mothers' labor supply is predicted to be less sensitive to the subsidy. On the one hand, labor markets are understood to be relatively inflexible (one cannot really choose working hours from a continuum)⁸. On the other, the transfer afforded by the CCT is small, which means single mothers will need to keep working.

Heterogeneity is considered in Tables 4 and 5 (tables with only one interaction are consistent with these two tables and are available in Appendix B). These two tables confirm that young mothers reduce their labor force participation in response to the program's reform. However, when it comes to labor force participation single/couple status appears to be the meaningful characteristic. Young mothers reduce their labor force participation by 4.1% in response to the reform if single, and older mothers increase theirs by 1.2% if in a couple. This last response may be the most surprising of the two, especially considering this group is less likely to be affected directly by the program (i.e., free their time from childcare or lose income from child labor). However, Cogan (1980)

⁸ However, if there is a large informal market, we may find larger intensive margin responses.

TABLE 4
LABOR SUPPLY RESPONSE BY AGE RANGE AND EDUCATIONAL ATTAINMENT

	Unconditional			Conditional		
	Labor force partic.	Hours worked	Hours worked others	Hours worked (logs)	Prob. overtime	Hourly wage
	(1)	(2)	(3)	(4)	(5)	(6)
treated						
18 to 24						
≤ High school	-0.021	-0.01	2.738	-0.194***	0.048	0.182+
[s.e.]	[0.015]	[0.718]	[18.69]	[0.054]	[0.039]	[0.104]
mean	40.5%	13.2	25.0	40.8	12.7%	\$1,333
> High school	-0.020**	0.351	3.306	0.019	0.010	0.102**
[s.e.]	[0.008]	[0.570]	[19.41]	[0.028]	[0.016]	[0.039]
mean	46.0%	13.6	14.6	36.8	6.4%	\$1,629
25 to 50						
≤ High school	0.006	-0.372	0.076	-0.025	-0.030	0.069
[s.e.]	[0.009]	[0.493]	[0.747]	[0.029]	[0.021]	[0.043]
mean	50.90%	18.9	34.7	40.9	15.3%	\$1,689
> High school	0.007+	0.168	0.064	-0.019+	-0.006	0.025+
[s.e.]	[0.004]	[0.694]	[0.371]	[0.011]	[0.006]	[0.014]
mean	74.1%	28.2	34.5	40.6	8.6%	\$4,592
Observations	308,245		220,144	126,404		122,056

significant at: ***0.1%, **1%, *5%, + 10%

All regressions include demographic controls. Unconditional outcomes control for whether the subject has work experience while conditional outcomes control for time in current job. The means used correspond to the year 2006.

showed that married women (a subset of those with couples) can increase their labor supply in response to a similar treatment in the presence of fixed costs. This could be a response to an increase in wages if these women have non-zero reservation hours (i.e., are not willing to work less than $x > 0$ hours a year). And, although we do not observe an increase in wages for the more educated women, we do observe a 4.4% increase on those with a couple. Further, the transfer itself could lead these women to lower their reservation hours, and in that way make them more likely to work. The second outcome, unconditional working hours, is almost always statistically indistinguishable from zero. However, the only result that is significant is that of older mothers in couples.

They lower their unconditional hours, although only by 1.6%. This may be reflective of the responses of these mothers on the intensive margin. They lower significantly both their conditional hours, by 2.6%, and their probability of working overtime, by 10%. In 2006 the probability a mother with a couple worked overtime was 14.7%, and these mothers worked on average 30 hours a week more than those not working overtime. A 1.5 percentage points decrease in this

TABLE 5
LABOR SUPPLY RESPONSE BY AGE RANGE AND SINGLE/COUPLE

	Unconditional			Conditional		
	Labor force partic.	Hours worked	Hours worked others	Hours worked (logs)	Prob. overtime	Hourly wage
	(1)	(2)	(3)	(4)	(5)	(6)
treated						
18 to 24						
single	-0.021+	-0.465	-	-0.065+	-0.002	0.254***
[s.e.]	[0.011]	[0.367]	-	[0.037]	[0.022]	[0.066]
mean	50.8%	16.7	-	40.7	13.6%	\$1,214
in couple	-0.007	1.034	3.334	0.044	0.028	0.005
[s.e.]	[0.008]	[1.247]	[16.73]	[0.034]	[0.019]	[0.043]
mean	33.1%	10.3	43.7	39.0	8.9%	\$1,607
25 to 50						
single	-0.012	-0.075	-	-0.017	-0.021	0.028
[s.e.]	[0.009]	[0.593]	-	[0.021]	[0.019]	[0.034]
mean	78.50%	30.1	-	40.1	12.40%	\$2,831
in couple	0.011**	-0.295+	0.161	-0.026*	-0.015*	0.044**
[s.e.]	[0.004]	[0.153]	[0.468]	[0.012]	[0.007]	[0.016]
mean	49.2%	18.2	45.7	42.2	14.7%	\$2,152
Observations	308,245		220,144		126,404	122,056

Significant at: ***0.1%, **1%, *5%, + 10%.

All regressions include demographic controls. Unconditional outcomes control for whether the subject has work experience while conditional outcomes control for time in current job. The means used correspond to the year 2006.

probability translates to a loss of 0.45 hours per worker, which is a reduction of 1.0% in average conditional hours. This means that about 38% of the effect on conditional working hours is due to lower probability of working overtime, and the remaining 62% would be a reduction by individuals not working overtime, if we assume that other features did not change (which might not be the case, people working overtime may have reduced their hours more).

The third outcome on these tables, unconditional working hours of the spouse, shows no significant response. The effect is large for younger mothers, but very imprecise. However, the effect found for the overall group of mothers in Table 3 is significant and amounts to an increase of 2.5% in the spouse's hours. This effect could be a response from spouses of women that are now working, if they see their time as complementary.

Four groups significantly reduce their working hours conditional on working (column 4). Critically, this outcome is harder to explain than the previous three, because it applies only to workers. This means that changes in the composition

of workers can lead to increases or decreases in this metric making it harder to interpret. For example, the effect of treatment on wages for these four groups is positive, and it could be the result of more productive workers that work on average less hours being attracted to the labor market, pushing the average down. Extra complexity stems from the fact that three of the four groups additionally shift their labor force participation in response to treatment. For these groups compositional changes may be more important. For example, while wage increases significantly more for less educated young mothers than for their more educated counterpart, the effect on conditional hours is only significant for the former group. This could stem from the negative labor force participation effect experienced by the younger mothers, if it pushes out of the labor market workers that on average work less hours. Nevertheless, likely some of the effect is not just compositional, as we observe negative responses for groups that increase labor force participation, sustain it, and decrease it. For all the effect to be compositional it would be necessary for each group to be affected very differently by the same treatment, and in fact we can observe some consistent patterns. Decreases in conditional working hours seem more pronounced between the less educated and younger workers.

In summary, we observe young mothers reducing their labor force participation and their conditional working hours, more so if they are less educated (hours) or single (both). We also see that older women increase their labor supply if they are in a couple, offsetting their extensive margin increase by reducing conditional working hours and probability of working overtime.

7. MECHANISMS

It seems to me that the finding that younger mothers reduce their labor supply is particularly important. However, they could be replacing their working time with more leisure or with more education, and which they choose would be an important consideration in any analysis of this policy, and others like it. Alternatively, they could be moving their labor supply to the informal market. However, the reform did nothing to motivate more informal transactions. In fact, it further disconnected the subsidy from contemporaneous choices (and reality), which would make the informal market less interesting, if anything.

If the money gives these women the opportunity to increase their investment in their own education, we might see it as a positive externality of the SUF subsidy and would like to leave the program as is. However, if what is happening is that the extra money allows young and capable women to reduce their labor supply in order to increase their leisure time, we might think that the program must be modified.

To answer this question, I tried a few analyses. First, I ran the model with a new outcome, whether a woman is a student at the time of the survey. I find no evidence that mothers are increasing their educational investment after the reform from this analysis. The model suggests instead that young mothers become less

likely to become students because of the policy reform, although the point estimates of some subpopulations are too large to be sensible. Nevertheless, this raises the concern that maybe some behaviors could be worsened by the reform, so I decided to look at fertility rates among teenagers. Although I cannot analyze this metric correctly using my model, a review of the probability of a teenage woman to be a mother shows no significant change around the year the policy was modified or after; another check using only the 2015 survey and computing the years at which the women interviewed for the survey became teenage mothers (for those that did) shows similarly no increase after the 2007-2010 reform of the SUF.

These analyses show no evidence that the response to the policy by young mothers creates some positive externalities. Although a few other positive externalities that I cannot test for could still exist (i.e., time dedicated to raising their children could be affected positively), these results should help inform this debate.

8. CONCLUSIONS

This paper provides the first piece of evidence that CCT programs are likely to create labor supply distortions for second or third generations of beneficiaries. I show here that we can expect both positive and negative externalities, depending on beneficiaries' personal characteristics as well as the relative size for the transfer.

The analysis shows that younger mothers between 18- and 24-years old experience a relatively large reduction in labor supply that becomes more pronounced if they are less educated or single, on both the intensive and the extensive margin. This makes the distortion strongest for the people in more need, which is at the same time a logical conclusion and a concerning outcome.

We also find a positive response by older mothers on the extensive margin, if they studied beyond high school and/or are part of a couple. However, these groups also show negative intensive margin responses that are more in line with the prior expectations. These responses appear to be driven by the transfer and its effect on wages at least partially and may warrant a look at the family unit as a whole to fully understand the dynamics at play.

These findings provide valuable information to countries that today have been using CCT programs for almost twenty years and may be wondering about their implications today and in the future. Additionally, they stress the need for research beyond that done through randomized control trials to answer this type of questions, which cannot be considered properly at the beginning of the process but need to be asked much later and may require larger samples. Nevertheless, my strategy has limitations, evident in Figure 3a for younger mothers (which shows a zig-zag from survey to survey) and makes more research necessary. Ideally, a look at a CCT program from a country that currently is poorer, and where the CCT is relatively larger, could be very helpful to continue to understand their labor supply implications. Progress needs to be made on studying other distortions as well. The incipient research on CCTs' distortions has concentrated

in labor supply, as this study itself. However, my results suggest that young mothers may be particularly affected by this type of welfare program. It would be interesting to see whether this demographic is also responding to the CCT by changing their education choices, fertility timing, and even family composition. I do not find any evidence that young women are moved towards what might be considered undesirable behaviors (other than leisure), but my design was not meant to capture these responses primarily.

If these results are confirmed and expanded upon, CCTs could be redesigned to avoid the most egregious distortions created. For example, my results suggest that increasing the age of eligibility for the program to 25 years old would possibly eliminate arguably the most concerning (labor supply) responses, in this particular case.

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APPENDIX A

Having children can be so transformative that we may doubt a comparison between women with and without children. Correspondingly, I evaluated alternative definitions of treatment and control groups that bridge this gap. However, these definitions have limitations by design, which lead me to create two alternative definitions, so that they can confirm and complete each other. Non mothers are completely ignored in what follows, with control being conformed instead by mothers that we can logically expect to be less responsive to the system's reform, as they can expect lesser gains.

One of these alternative definitions relies on number of children to distinguish treatment from control, and the other uses the age of the youngest child for the same purpose.

Number of Children

The subsidy under study is given in per capita basis, one per child (and one for the mother). This means that each extra child increases the transfer significantly. The second child increases the monthly transfer by one third, third child increases its overall value by only twenty five percent, and each subsequent child provides a smaller increase (in percentages). The chosen categorization in column three of Table A.1 means that the average number of children of the control group is 1.47, and for treatment is 3.34. This implies that the value of the monthly transfer for the treatment group is 76% higher, assuming all these children are complying with the conditions for the transfer. We would expect therefore that when the program is reformed in 2007, and turned into an entitlement, women with more children will be more likely to apply to the program, since it benefits them more. This allows for some significant differences between the original treatment and control group to be abridged. First, and most important, all are mothers. But also, other differences are reduced: years of schooling, albeit marginally; percentage receiving the subsidy; and labor supply related variables. In fact, only the percentage of mothers that have no spouse is considerably different between treatment and control still. Nevertheless, Figure A.1 puts some doubt on whether the parallel trends assumption holds for this model.

There is another penalty to pay for this choice. Almost no women under twenty-five years old has three or more children, making the analysis of that important demographic impossible using this definition for treatment and control.

Youngest Child

To address the important limitations of the previous approach I explored an additional dimension along which the benefits of the policy differ: age of the youngest child. The argument is essentially unchanged. Mothers with younger children can expect to receive the subsidy for a longer time, so they benefit more from applying to it after the reform makes it more accessible.

Indeed, when mothers whose youngest child is at most eleven years old, the average age of the youngest child for mothers in the treatment group is 4.7, compared to 16.1 for control. That means that, even at a ten percent discount rate, the program is almost three times more beneficial for the mother of the younger child, if considered till the age of eighteen, and still fifty percent more valuable when estimated till twenty-four years of age. Furthermore, all things equal, a mother with a younger child is more likely to have more children in the program as well, adding to the difference.

As Table A.3 shows, these groups are more comparable in terms of numbers of children, single status, and income; and are also not too unbalanced in labor force participation, education, and hours worked. As we would expect, mothers with younger children are significantly more likely to participate in the program. Additionally, the parallel trends assumption is better supported by this approach, as is shown in Figure A.2.

The limitation of this third definition is that again all younger mothers are $_t$ squarely in one category, although in this case is treatment. This means that we will be using as control for them older mothers exclusively.

Results

Tables A.4 through A.9 show the same analysis done in the paper for the chosen treatment/control definition for both approaches. To note particularly, these results confirm the negative response by young mothers to treatment and the positive response by more educated mothers. Furthermore, although the result is not shown here the approach by youngest child also confirms that older mothers with spouse marginally increase their labor force participation, even though the approach by number of children suggests zero response.

TABLE A.1
MOTHERS BY NUMBER OF CHILDREN

Children	Frequency	Status
1	138,983	control
2	124,275	control
3	54,543	treatment
4	14,887	treatment
5	3,691	treatment
6	1,038	treatment
7	330	treatment
8	143	treatment
9	32	treatment
10	20	treatment

TABLE A.2
DESCRIPTIVE STATISTICS FOR TREATMENT/CONTROL – NUMBER OF CHILDREN

Year	Obs.	Age	Years Educ.	# children	First Mom	% Single	% SUF	LF partic.	Work Income*	Work hours
Treatment										
1998	31,969	37.3	9.6	3.42	21.9	12.7	17.7	40.2	422,151	14.8
2006	43,159	38.6	10.6	3.38	22.3	16	15	49.9	397,500	18.2
2015	40,025	37.8	11.4	3.26	22	26.3	28.2	57.8	411,245	20.5
Control										
1998	3,495	33.6	10.6	1.5	23.9	24.4	9.9	48.0	346,391	18.3
2006	5,050	35.0	11.1	1.48	24.3	29.8	10.3	56.3	357,779	20.9
2015	7,109	35.3	12.1	1.44	24.7	38.9	19.5	64.8	405,913	24.0

*Refers to real values in CLP for mothers working at least 1 weekly hour.

TABLE A.3
DESCRIPTIVE STATISTICS FOR TREATMENT/CONTROL – YOUNGEST CHILD

Year	Obs.	Age	Years Educ.	# children	First Mom	% Single	% SUF	LF partic.	Work Income*	Work hours
Treatment										
1998	31,969	32.7	10.4	2.13	23.1	20.6	13.8	43.6	343,981	16.0
2006	43,159	33.4	11.2	2.02	23.3	26.1	13.1	52.3	362,499	18.9
2015	40,025	33.1	12.2	1.86	23.7	35.7	23.8	60.9	407,706	21.7
Control										
1998	3,495	43.2	9.5	1.92	23.9	22.3	5.3	52.5	439,798	21.7
2006	5,050	43.4	10.3	1.81	24.4	27.3	6.5	60.4	373,503	23.4
2015	7,109	43.8	11.3	1.63	24.9	38.0	13.0	69.9	401,836	27.5

*Refers to real values in CLP for mothers working at least 1 weekly hour.

TABLE A.4
LABOR SUPPLY RESPONSE OVERALL – NUMBER OF CHILDREN

	Unconditional			Conditional		
	Labor force partic.	Hours worked	Hours worked others	Hours worked (logs)	Prob. overtime	Hourly wage
	(1)	(2)	(3)	(4)	(5)	(6)
treated	0.005	0.113	1.007**	-0.008	0.008	-0.025
[s.e.]	[0.004]	[0.238]	[0.374]	[0.016]	[0.009]	[0.023]
Mean	49.9%	18.2	38.8	40.0	13.3%	\$2,704
Observations	262,353		187,718	103,917		100,236

Significant at: ***0.1%, **1%, *5%, +10%.

All regressions include demographic controls. Unconditional outcomes control for whether the subject has work experience while conditional outcomes control for time in current job. The means used correspond to the year 2006.

TABLE A.5
LABOR SUPPLY RESPONSE OVERALL – YOUNGEST CHILD

	Unconditional			Conditional		
	Labor force partic.	Hours worked	Hours worked others	Hours worked (logs)	Prob. overtime	Hourly wage
	(1)	(2)	(3)	(4)	(5)	(6)
treated	0.003	-0.344	-1.056**	-0.032**	0.012	0.038
[s.e.]	[0.004]	[0.216]	[0.333]	[0.012]	[0.009]	[0.027]
mean	52.3%	18.9	34.0	40.2	12.1%	\$2,566
Observations	271,939		195,186	107,693		103,885

Significant at: ***0.1%, **1%, *5%, +10%.

All regressions include demographic controls. Unconditional outcomes control for whether the subject has work experience while conditional outcomes control for time in current job. The means used correspond to the year 2006.

TABLE A.6
LABOR SUPPLY RESPONSE BY AGE AND EDUCATIONAL ATTAINMENT-
NUMBER OF CHILDREN

	Unconditional			Conditional		
	Labor force partic.	Hours worked	Hours worked others	Hours worked (logs)	Prob. overtime	Hourly wage
	(1)	(2)	(3)	(4)	(5)	(6)
treated						
18 to 24						
≤ High school	-0.027	-1.366**	-2.767***	-0.134	-0.066	0.103
[s.e.]	[0.023]	[0.148]	[0.510]	[0.110]	[0.065]	[0.182]
mean	40.5%	13.2	25.0	40.8	12.7%	\$1,333
> High school	-0.086**	1.604	-2.444***	0.005	-0.294***	0.226
[s.e.]	[0.062]	[8.607]	[0.242]	[0.146]	[0.060]	[0.228]
mean	46.0%	13.6	14.6	36.8	6.4%	\$1,629
25 to 50						
≤ High school	0.006	0.324	0.400	-0.005	-0.002	-0.029
[s.e.]	[0.007]	[0.393]	[0.619]	[0.031]	[0.017]	[0.045]
mean	50.9%	18.9	34.7	40.9	15.3%	\$1,689
> High school	0.001	0.08	1.011	-0.014	0.016**	-0.037**
[s.e.]	[0.004]	[0.200]	[0.778]	[0.011]	[0.006]	[0.014]
mean	74.1%	28.2	34.5	40.6	8.6%	\$4,592
Observations	262,353		187,718	103,917		100,236

Significant at: ***0.1%, **1%, *5%, +10%.

All regressions include demographic controls. Unconditional outcomes control for whether the subject has work experience while conditional outcomes control for time in current job. The means used correspond to the year 2006.

TABLE A.7
LABOR SUPPLY RESPONSE BY AGE AND EDUCATIONAL ATTAINMENT-
YOUNGEST CHILD

	Unconditional			Conditional		
	Labor force partic.	Hours worked	Hours worked others	Hours worked (logs)	Prob. overtime	Hourly wage
	(1)	(2)	(3)	(4)	(5)	(6)
treated						
18 to 24						
≤ High school	-0.175+	-11.74***	12.0	-0.101	-0.07	-0.580*
[s.e.]	[0.103]	[0.00001]	[148,197]	[0.334]	[0.191]	[0.263]
mean	40.5%	13.2	25.0	40.8	12.7%	\$1,333
> High school	0.008	-1.187	-3.14***	-0.154	-0.075	-0.461
[s.e.]	[0.083]	[1.316]	[0.321]	[0.314]	[0.188]	[0.293]
mean	46.0%	13.6	14.6	36.8	6.4%	\$1,629
25 to 50						
≤ High school	0.014*	-0.257	-0.723*	-0.034	0.015	-0.01
[s.e.]	[0.006]	[0.338]	[0.519]	[0.024]	[0.017]	[0.054]
mean	50.9%	18.9	34.7	40.9	15.3%	\$1,689
> High school	-0.001	-0.408***	-1.014***	-0.033***	0.007	0.061***
[s.e.]	[0.003]	[0.111]	[0.098]	[0.009]	[0.005]	[0.013]
mean	74.1%	28.2	34.5	40.6	8.6%	\$4,592
Observations	271,939		195,186	107,693		103,885

Significant at: ***0.1%, **1%, *5%, +10%.

All regressions include demographic controls. Unconditional outcomes control for whether the subject has work experience while conditional outcomes control for time in current job. The means used correspond to the year 2006.

TABLE A.8
LABOR SUPPLY RESPONSE BY AGE AND SINGLE STATUS –
NUMBER OF CHILDREN

	Unconditional			Conditional		
	Labor force partic.	Hours worked	Hours worked others	Hours worked (logs)	Prob. overtime	Hourly wage
	(1)	(2)	(3)	(4)	(5)	(6)
treated						
18 to 24						
single	-0.048	-4.079***	-	-0.396**	-0.05	0.316
[s.e.]	[0.035]	[0.032]	-	[0.120]	[0.383]	[0.346]
mean	50.8%	16.7	-	40.7	13.6%	\$1,214
in couple	-0.038+	1.673	-1.366**	0.234	-0.23	-0.018
[s.e.]	[0.022]	[6.340]	[0.231]	[0.151]	[0.184]	[0.149]
mean	33.1%	10.3	43.7	39.0	8.9%	\$1,607
25 to 50						
single	-0.004	-0.246	-	-0.016	0.015	0.010
[s.e.]	[0.010]	[0.633]	-	[0.027]	[0.017]	[0.032]
mean	78.5%	30.1	-	40.1	12.4%	\$2,831
in couple	-0.001	0.083	1.032**	-0.025**	0.007	-0.028*
[s.e.]	[0.003]	[0.172]	[0.381]	[0.011]	[0.005]	[0.014]
mean	49.2%	18.2	45.7	42.2	14.7%	\$2,152
Observations	262,353		187,718		103,917	100,236

Significant at: ***0.1%, **1%, *5%, +10%.

All regressions include demographic controls. Unconditional outcomes control for whether the subject has work experience while conditional outcomes control for time in current job. The means used correspond to the year 2006.

TABLE A.9
LABOR SUPPLY RESPONSE BY AGE AND SINGLE STATUS – YOUNGEST CHILD

	Unconditional			Conditional		
	Labor force partic.	Hours worked	Hours worked others	Hours worked (logs)	Prob. overtime	Hourly wage
	(1)	(2)	(3)	(4)	(5)	(6)
treated						
18 to 24						
single	-0.271**	-18.06***	-	-0.294	-0.041	-1.516***
[s.e.]	[0.102]	[0.000001]	-	[0.542]	[0.383]	[0.207]
mean	50.8%	16.7	-	40.7	13.6%	\$1,214
in couple	0.006	0.351	5.092	-0.225	-0.23	-0.253
[s.e.]	[0.008]	[5.895]	[911.4]	[0.334]	[0.184]	[0.408]
mean	33.1%	10.3	43.7	39.0	8.9%	\$1,607
25 to 50						
single	-0.006	-0.699	-	-0.040*	-0.02	0.046+
[s.e.]	[0.007]	[0.460]	-	[0.019]	[0.015]	[0.025]
mean	78.5%	30.1	-	40.1	12.4%	\$2,831
in couple	0.008**	-0.059	-1.039**	-0.016	-0.013*	0.027*
[s.e.]	[0.003]	[0.139]	[0.339]	[0.010]	[0.005]	[0.013]
mean	49.2%	18.2	45.7	42.2	14.7%	\$2,152
Observations	271,939		195,186	107,693		103,885

Significant at: ***0.1%, **1%, *5%, +10%.

All regressions include demographic controls. Unconditional outcomes control for whether the subject has work experience while conditional outcomes control for time in current job. The means used correspond to the year 2006.

FIGURE A.1
TEST FOR PARALLEL TRENDS - BY NUMBER OF CHILDREN

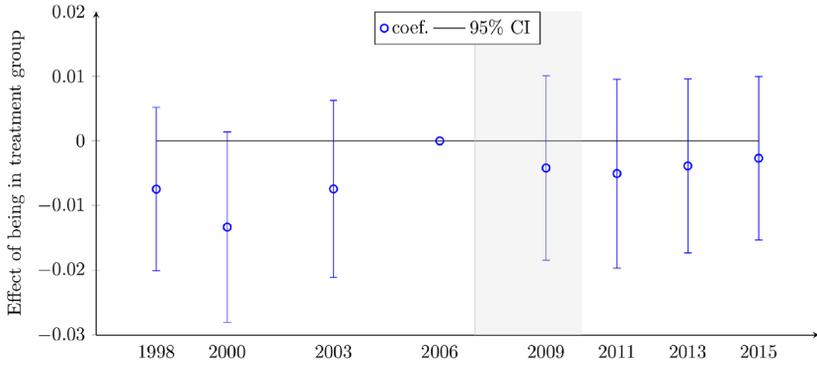
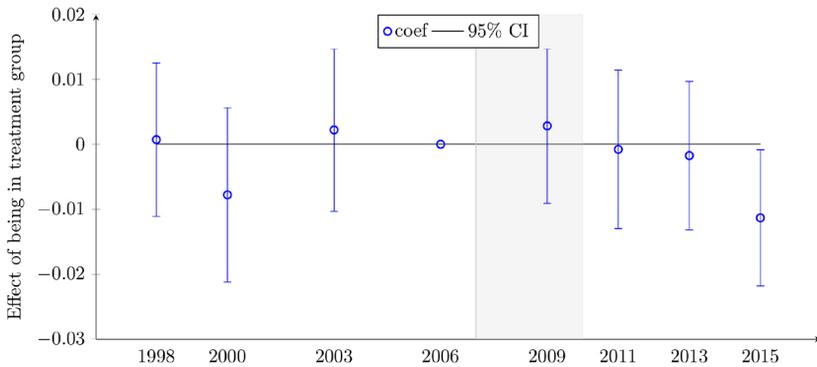


FIGURE A.2
TEST FOR PARALLEL TRENDS - BY NUMBER OF CHILDREN



APPENDIX B

TABLE B.1
LABOR SUPPLY RESPONSE BY AGE GROUP

	Unconditional			Conditional		
	Labor force partic.	Hours worked	Hours worked others	Hours worked (logs)	Prob. overtime	Hourly wage
	(1)	(2)	(3)	(4)	(5)	(6)
treated						
18 to 24	-0.017**	0.265	3.334	-0.016	0.011	0.114**
[s.e.]	[0.007]	[0.456]	[16.73]	[0.024]	[0.014]	[0.036]
mean	41.3%	13.2	23.4	40.1	11.6%	\$1,385
25 to 50	0.006	-0.047	0.161	-0.018	-0.016	0.036
[s.e.]	[0.005]	[0.307]	[0.468]	[0.014]	[0.011]	[0.023]
mean	56.3%	21.1	34.7	40.8	13.2%	\$2,602
Observations	308,993		220,756		126,404	

Significant at: ***0.1%, **1%, *5%, +10%.

All regressions include demographic controls. Unconditional outcomes control for whether the subject has work experience while conditional outcomes control for time in current job. The means used correspond to the year 2006.

TABLE B.2
LABOR SUPPLY RESPONSE BY SINGLE/COUPLE

	Unconditional			Conditional		
	Labor force partic.	Hours worked	Hours worked others	Hours worked (logs)	Prob. overtime	Hourly wage
	(1)	(2)	(3)	(4)	(5)	(6)
treated						
single	-0.014	-0.174	-	-0.021	-0.018	0.049
[s.e.]	[0.009]	[0.508]	-	[0.020]	[0.018]	[0.032]
mean	73.0%	27.6	-	40.1	12.3%	\$2,048
in couple	0.009*	-0.010	0.832+	-0.010	-0.007	0.036*
[s.e.]	[0.004]	[0.183]	[0.441]	[0.011]	[0.006]	[0.015]
mean	48.0%	17.6	33.5	42.0	14.6%	\$2,774
Observations	308,993		220,756		126,404	

Significant at: ***0.1%, **1%, *5%, +10%.

All regressions include demographic controls. Unconditional outcomes control for whether the subject has work experience while conditional outcomes control for time in current job. The means used correspond to the year 2006.

TABLE B.3
LABOR SUPPLY RESPONSE BY EDUCATION ATTAINMENT

	Unconditional			Conditional		
	Labor force partic.	Hours worked	Hours worked others	Hours worked (logs)	Prob. overtime	Hourly wage
	(1)	(2)	(3)	(4)	(5)	(6)
treated						
≤ High school	-0.005	-0.287	0.552	-0.036	-0.022	0.077+
[s.e.]	[0.008]	[0.447]	[0.698]	[0.028]	[0.020]	[0.041]
mean	49.7%	18.2	33.6	40.9	15.0%	\$1,660
> High school	0.003	0.236	0.733	-0.007	-0.001	0.026*
[s.e.]	[0.003]	[0.230]	[0.642]	[0.010]	[0.006]	[0.013]
mean	72.1%	27.1	33.0	40.5	8.5%	\$4,474
Observations	308,993		220,756		126,404	

Significant at: ***0.1%, **1%, *5%, +10%.

All regressions include demographic controls. Unconditional outcomes control for whether the subject has work experience while conditional outcomes control for time in current job. The means used correspond to the year 2006.

