You are the father!

Effects of Costa Rica's Responsible Paternity Law on families

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Abstract

Costa Rica's Responsible Paternity Law made it easier for non-married women to declare the father of their newborn child and thus obtain child monetary support. This paper assesses the impact of the law on household decisions. I estimate the law's effects using the law as a natural experiment and a fuzzy differences-in-differences setting. I find that the law had a negative impact on male labor participation as well as female and male weekly labor supply. Using a collective household model with matching, I argue that the law strengthens women's bargaining power in household decision-making. This has two consequences: a couple selection effect and an intra-household allocation effect. Structural estimates show that both effects exist in households. These findings demonstrate how child-related laws help us better understand household formation and decision-making.

Keywords: Female labor, intrahousehold allocation, gender inequality, policy evaluation.

JEL Classification: D13, J12, J22, K36, O54

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1 Introduction

Gender inequality affects women's daily lives in a variety of ways, including poverty, the labor market, and the marriage market. According to Wodon and De La Briere (2018), gender equality in earnings would increase human capital wealth by 21.7 percent and total wealth by 14 percent globally. Several studies have found that maternity is a contributing factor to gender inequality in households and the labor market. The Organisation for Economic Co-operation and Development (2012) mentions how large gender differences exist because women continue to bear the burden of unpaid domestic tasks such as childcare and housework.

Important gender inequality exists in the household, where the decision process between husband and wife affects the latter's well-being. Some policies help improve their situation, for example, Chiappori et al. (2017) study how the changes in alimony laws in Canada affect household labor decisions. They show how different female labor supplies were for those households before and after the law was approved. Goussé and Leturcq (2022) show how different levels of protection upon separation affect cohabited couples' labor supply. Yet, there is little evidence on how paternity laws affecting children have side effects on their mothers, the main caretaker.

In this paper, I study the effects of the Responsible Paternity Law (paternity law hereafter) of 2001 in Costa Rica on household formation and labor outputs. This law was enacted to ensure that all children have a registered father by allowing non-married mothers to automatically register the father of their newborn child. The main effect of the paternity law on women is the ability to seek monetary child support. I find two sets of results. First, by employing fuzzy differences-in-differences, the law reduced the labor supply for men and women who cohabit together. Second, I find this effect stems from a greater outside option for women in case of a potential pregnancy. This is reflected in a couple selection effect, in which women are more likely to remain single or cohabit rather than marry, as well as an intra-household bargaining effect, in which women enjoy a larger share of household resources.

To obtain empirical evidence of the paternity law, I use a sample of single, cohabited, and married individuals from the Costa Rican *Encuesta de Hogares de Propósitos Múltiples* from 1997 to 2009. For the first set of results, I use the fuzzy differences-in-differences framework as presented by De Chaisemartin and d'Haultfoeuille (2018). I define treated individuals as those who had a child after 2002, once the paternity law was in place. I find an 8% decrease in male labor participation and an average decrease of 5.5 weekly labor hours for women and 4.5 for men.

I use a collective model with matching, as presented by Choo and Seitz (2013), to explain couple formation and intra-household effects of the paternity law. This model proposes a simultaneous decision for men and women to form or not a household and the intra-household allocation of resources and consumption. Estimates show a positive effect of the law on the probability of a woman being single or cohabiting, while it decreases the probability of her getting married. The inverse happens with the man. If a man and woman decide to cohabit, the paternity law has an intra-household effect. It increases woman's bargaining power in household decision-making, allowing them to decrease their labor supply and enjoy more leisure. I do not find an intra-household effect on married couples.

This paper relates to the empirical literature on collective household models. Introduced by Chiappori (1992), collective models assume households behave according to cooperative bargaining between its decision-makers, primarily the father and mother. A review of the literature is presented in Chiappori and Mazzocco (2017). Recently, some papers started including a matching framework, allowing a link of the household bargaining function with couple formation decisions. For example, Choo and Seitz (2013) argue that the household bargaining function is determined in a previous stage decision where both potential spouses consider the marital gains to relative choices. I use their setting to estimate the effect of the paternity law on Costa Rican households. The novelty relies upon obtaining evidence that children's related laws also affect the parents' decisions.

My paper relates to the literature on laws affecting household behavior. Most papers focus on divorce laws. Reynoso (2018) studies the effects of introducing unilateral divorce in the United States. She finds that unilateral divorce increases assortative matching among newlyweds. Then, by using a life cycle model of marriage, labor supply, consumption, and divorce she finds that new-form couples share more socioeconomic backgrounds and that women are more likely to remain single. Goussé and Leturcq (2022) show how different levels of protection upon separation affect cohabited couples' labor supply in Canada. They find that eligibility for a regime making cohabiting partners equal to married partners increases men's labor supply and earnings and decreases women's while eligibility for a regime allowing for post-separation transfers between ex-partners decreases women's earnings only. My paper contributes to this literature by providing additional evidence on how laws providing similar rights to non-married couples as those who are married improve women's leisure consumption and welfare in case of separation.

Lastly, related to the literature on paternity laws, Rossin-Slater (2017) studies the effect of a paternity law on the US. She obtains that there is a decrease in the marriage rate due to lowering the cost of legal paternity establishment. Ekberg et al. (2013) use Swedish data to study the effect of an incentive system for fathers to take parental leave. They find that the incentives for male parental leave have a large short-term effect, as males take much more parental leave after the change. However, they do not find behavioral effects in the household such as men having a higher incentive to use their proportion of the leave taken to care for sick children. Cools et al. (2015) show how paternity leave quotas increase the number of fathers taking leave, but also, an improvement in the child's school outcomes. My contribution is presenting evidence on the side effects on households, particularly for the mother. I contribute to the literature by quantifying the effects with a structural model, including a couple selection and intra-household bargaining effects.

The paper is structured as follows: The section that follows provides an overview of the institutional context in Costa Rica, explaining the contextual significance of the Responsible Paternity Law. The third section presents data and empirical evidence on the impact of paternity law on households. The fourth section presents the theoretical model, in which I discuss the effects of selection and intra-household competition. The following section describes the estimation strategy for the structural model. The structural results are presented in section six, and the final section concludes.

2 Institutional background

By the year 2000, nearly half of all births in Costa Rica were from single mothers, and one-third of them had no registered father (Robles, 2001). Non-married Costa Rican women had two options for determining the father of their child: first, the man recognized himself as the father or second, they petitioned a judge to order a DNA test. The mother was required to find witnesses and proof of their relationship with the father for the latter. Children born within marriage are not affected by this issue because both parents are automatically registered.

Because of the growing number of children without a registered father, mothers faced the entire cost of raising them. As a result, in 2001, the Costa Rican government proposed and lawmakers passed the Responsible Paternity Law, making it easier for non-married mothers to recognize the father of their newborn child. The paternity law made three important changes: first, even if the presumed father is not present, he can be registered in the hospital[1]. Second, if the man denies being the father, the mother's written and signed statement is sufficient to request a DNA test. The man pays for the test if he is found to be the father or the mother if he is not. Third, the mother receives retroactive child support for pregnancy expenses.

Figure 1 shows that after the law was passed, the number of child support demands filed in the Costa Rican Family Court increased. The Family Court received a 26% increase in child support demands in the second quarter of 2001 compared to the same quarter in 2000. This increase undercounts the actual number of child support agreements because it only includes cases where the parents couldn't agree, and the mother had to go to Family Court. The increase in child support demand in 2001 was nearly 16% higher than in 2000. When a request is filed in court, a judge determines a preliminary monetary child support amount until a final agreement is reached.

[1] Every hospital in Costa Rica has a Civil Registry office to register births.

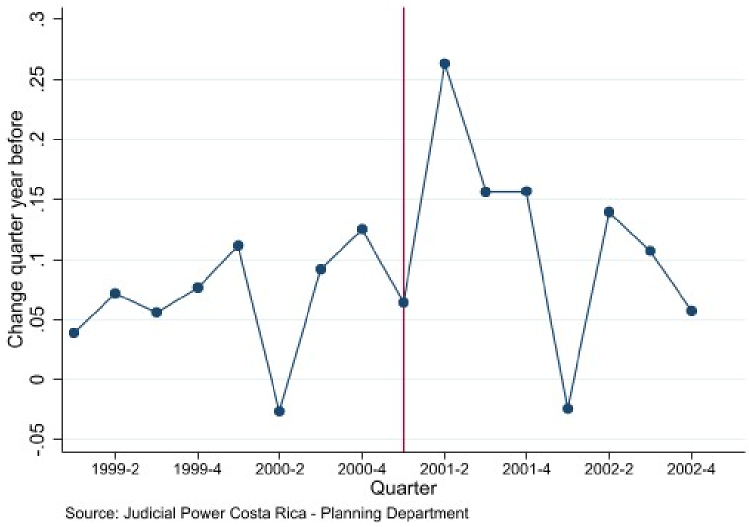

Figure 1: **Change in number of child support requests**

There are two studies of the paternity law's effects on women. First, Robles (2001) presents a descriptive analysis of the socioeconomic characteristics of mothers who use the paternity law. She discovers, through interviews with a small sample of women, that women who use the paternity law are mostly non-married women who live with the father of the child, have low education levels, and are mostly unemployed. Second, Ramos-Chaves (2010) shows that the paternity law had a causal effect on fertility outcomes in women. He finds a 5% drop in the birthrate and total fertility rate after the law is implemented. This result is larger for first-time mothers. The decline also had an impact on the marriage rate, implying a drop in marriages due to unexpected pregnancies.

3 Data and empirical evidence

3.1 Data

I use repeated cross-sections data from 1997 to 2009 of the yearly *Encuesta de Hogares de Propósitos Múltiples* (EHPM) from the Costa Rican *Instituto Nacional de Estadísticas y Censos* (Instituto Ncional de Estadísticas y Censos, 2009). Every year, the *EHPM* collected approximately 10,000 households and 40,000 individuals. The data includes variables such as age, gender, relationship with the head of the household, marital status, education level, labor situation, monthly wage, hourly working hours, and unemployment.

There is no information in the data to determine whether a woman used the paternity law at the birth of her child. As a result, I must approximate the households that are affected. I apply the same approach as Ramos-Chaves (2010) and set the law's effect effective date to 2002. This is due to the short time gap between the enactment of the bill (April 2001) and data collection (June 2001).

My sample consists of 33,618 households. Each household unit consists of a single individual, a married or cohabiting couple, and other members such as children, parents, or others. I select households where the head woman was at most 33 years old, and the head man was at most 40 years old. The age of the women was chosen based on Ramos-Chaves (2010), which shows that the paternity law has no effect on fertility outcomes for women over the age of 33[2].

Figure 2 shows the proportion of men and women working in the subsample. It shows how steady men's labor participation has been between 2001 and 2009, while female participation has almost doubled. Coupled women participate at a lower rate than single women, although their participation is increasing. In terms of weekly working hours, Figure 3 reveals another gender gap between men and women, but the average working hours for both groups are rather consistent. Women's behavior varies according to marital status, with married women working fewer hours than single women. For men, the opposite is true; non-married men work less than married men.

[2]Other selections were made, which are explained in Appendix A.

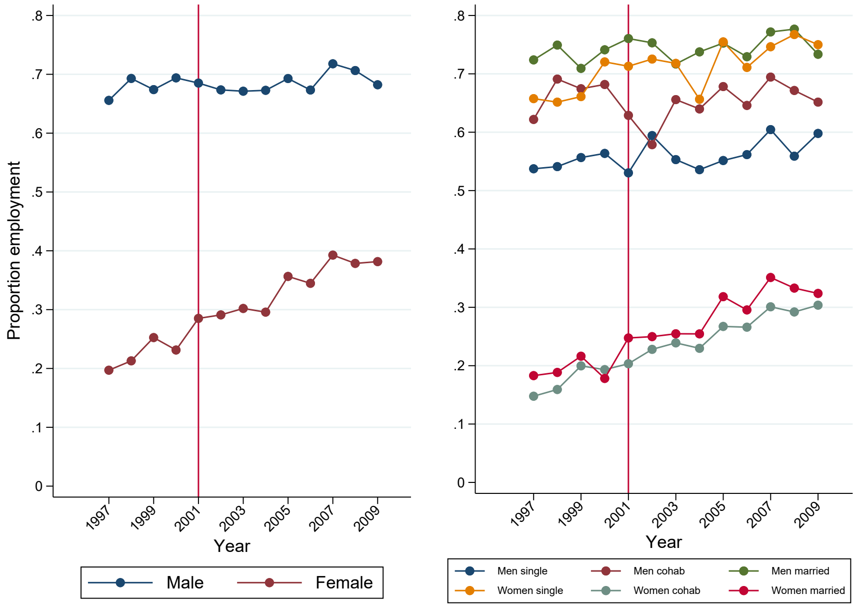

Figure 2: Labor Participation

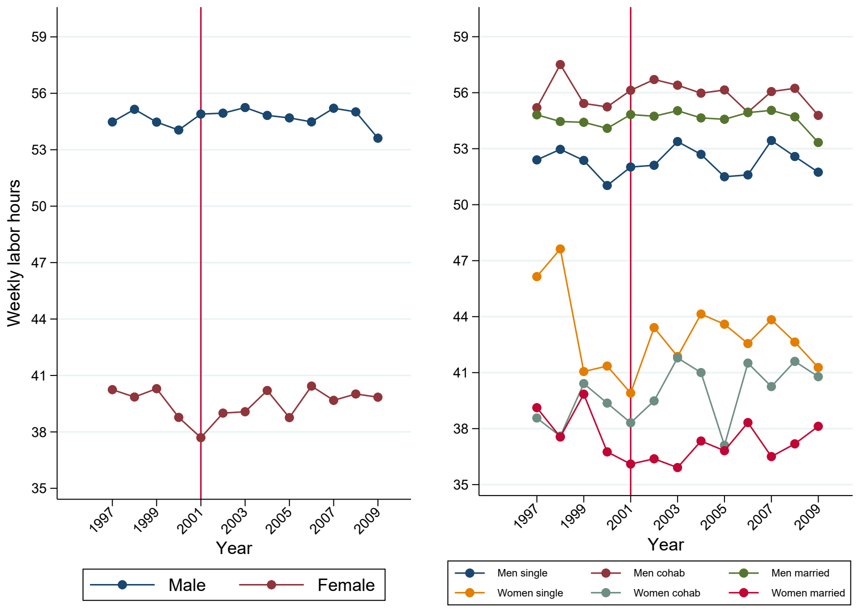

Figure 3: Labor Hours

Table 1 displays summary statistics for the most important individual variables. I define male employment as full-time employment and unemployment[3]. Female employment considers

[3]Male labor participation in Costa Rica is extremely high, around 95%. To have more variation I merge unemployment and subemployment. Subemployment is defined as individuals who work more or less than what they would like to.

both full employment and subemployment. The table shows that under these definitions, there is a clear gender difference in labor participation and weekly labor hours.

Table 1: Individual variables' descriptive statistics

	Men					**Women**				
Variable	**Obs**	**Mean**	**Std. Dev.**	**Min**	**Max**	**Obs**	**Mean**	**Std. Dev.**	**Min**	**Max**
Single	33,873	0.16		0	1	32,356	0.12		0	1
Cohabit	33,873	0.34		0	1	32,356	0.35		0	1
Married	33,873	0.50		0	1	32,356	0.53		0	1
Age	33,873	34.53	8.85	18.00	64.00	32,356	28.38	5.19	18.00	41.00
Primary School diploma or less	33,873	0.61		0	1	32,356	0.59		0	1
High School diploma or more	33,873	0.39		0	1	32,356	0.41		0	1
Years of Schooling	33,873	7.13	3.59	0.00	19.00	32,356	7.28	3.36	0.00	19.00
Employed	33,873	0.69		0	1	32,356	0.32	0.47	0	1
Hourly wage*	23,107	75.67	43.00	7.50	374.03	10,311	48.08	38.16	3.22	374.17
Labor hours*	23,107	54.69	10.95	14.00	95.00	10,311	39.59	16.81	4.00	80.00

*: Conditional on employment.

Table 2 presents the summary statistics for the household variables. Most of the households in my sample live in a rural area outside of the Central Valley. They have two children on average, and the average number of members in the household is 3.6, which can include family members other than the nuclear family. After 2002, 28% had at least one child.

Table 2: Summary Statistics - Household Variables

Variable	**Obs**	**Mean**	**Std. Dev.**	**Min**	**Max**
Total household income	37,813	79.32	60.03	0.00	376.52
Total household members	37,813	3.64	1.52	1.00	8.00
Number children					
Zero	37,813	0.23		0	1
One	37,813	0.25		0	1
Two	37,813	0.29		0	1
Three or more	37,813	0.24		0	1
Children born before 2002	37,813	0.66		0	1
Children born after 2002	37,813	0.28		0	1
Geographic urban area					
Outside Central Valley, rural area	37,813	0.44		0	1
Central Valley, rural area	37,813	0.23		0	1
Outside Central Valley, urban area	37,813	0.15		0	1
Central Valley, urban area	37,813	0.18		0	1

3.2 Empirical evidence

The law was intended for a non-married woman who is unable to easily declare the father of their newborn child. I consider a treated observation as a woman with a child born after 2002. The control group consists of married women while the treated group groups cohabited and single women. To estimate the paternity law effect, I use the estimation strategy presented by De Chaisemartin and d'Haultfoeuille (2018). Their fuzzy differences-in-differences framework estimates a treatment effect when the proportion of treated units in the treatment and control groups increases, and no unit remains completely untreated.

Consider a binary treatment D. $Y(1)$ and $Y(0)$ represent the potential outcomes of the same treatment unit with and without treatment. The observed outcome is $Y = DY(1)+(1-D)Y(0)$. Consider T a random variable that divides the data into two time periods, before and after 2002. The treated group, $G = 1$, is defined as non-married individuals, which includes cohabited and single individuals. The "sharp" differences-in-differences setting is when $D = G \times T$. In my fuzzy framework, some units in the control group are treated at period 1 while others remain untreated, implying that equality does not hold. This problem arises in my context for two reasons. First, I have repeated cross-sections and do not observe when a household was formed, only when their children were born. Second, married couples could have married after the law was passed, and some control group households did not have a child at the time they were surveyed. Lastly, let $S = \{D(0) < D(1), G = 1\}$ be the set of "treatment group switchers": treatment group units going from non-treatment to treatment between period 0 and period 1. I estimated the Local Average Treatment Effect (LATE) for this group.

The following assumptions must be made to identify the LATE estimator. First, due to the fuzzy design, the control and treatment groups experience a treatment effect, but the latter has a larger increase in the effect of its treatment rate. The second assumption states that the percentage of treated units in the control group remains constant between periods. The third assumption is about treatment status: units are either untreated or treated. Finally, the fourth assumption is a common trend assumption.

Define for any random variable R, R_{gt} and R_{dgt} as two other random variables such that $R_{gt} \sim R|G = g, T = t$ and $R_{dgt} \sim R|D = d, G = g, T = t$, where $\sim$ denotes equality in distribution. Under this notation and the previous assumptions, the LATE estimator is identified and defined as

$$LATE = \frac{E(Y_{11}) - E(Y_{10} + \delta_{D_{10}})}{E(D_{11}) - E(D_{10})}$$

where $\delta_d = E(Y_{d01}) - E(Y_{d00})$ denotes the change in the mean outcome between period 0 and 1 for the control group unit with treatment status d. This estimator is called the time-corrected Wald estimator (De Chaisemartin and d'Haultfoeuille, 2018).

For dummy outcome variables, the time-corrected Wald estimator works well. De Chaisemartin and d'Haultfoeuille (2018) propose the changes-in-changes Wald ratio for continuous variables. For the latter, the LATE estimator is identified using two additional assumptions. First, the potential outcomes are assumed to be strictly increasing functions for a scalar unobserved heterogeneity term with a stationary distribution over time. Second, there is full support and continuous density of outcomes across all the G and T cells. The LATE is defined as

$$LATE = \frac{E(Y_{11}) - E(Q_{D_{10}}(Y_{10}))}{E(D_{11}) - E(D_{10})}$$

where $Q_d(y) = F^{-1}_{Y_{d01}} \circ F_{Y_{d00}}(y)$ is the quantile-quantile transform of Y from period 0 to 1 in the control group conditional on $D = d$ and F is the density function.

I estimate using the *fuzzydid* Stata package by De Chaisemartin et al. (2019). I estimate the effect of having a child after 2002 on labor participation and weekly hours worked separately for men and women. The results are shown in Table 3. Female labor participation is unaffected, but male labor participation is reduced by 8 percentage points. In terms of weekly labor supply, both women and men reduce their supply by 5.6 hours and 4.5 hours, respectively. Some graphs showing the parallel trend assumption are presented in Appendix B.

Table 3: **Effect of paternity law in female labor decisions**

	Labor participation		Weekly labor hours	
	Women	Men	Women	Men
LATE	0.03	-0.08**	-5.57*	-4.49**
	(0.045)	(0.037)	(2.935)	(2.040)
Controls	Yes	Yes	No	No
N	32,356	33,694	10,311	23,107

Standard errors computed with a bootstrap procedure using 150 replications. Controls include individual and household demographics and geographical variables.
*:10% significance, **: 5% significance, ***: 1% significance.

These findings indicate that the paternity law had a significant impact on the labor decisions of households. However, the law may have an impact on couple formation. Because men are almost certainly declared fathers under paternity law, they must almost certainly pay child support, which raises the cost of being single. Therefore, given economies of scale in the household, it increases the incentives to form a couple, either married or cohabiting. Women, on the other hand, do not need to marry to receive financial support for their newborn child, and in some cases prefer to be single mothers. This latter effect is consistent with Ramos-Chaves (2010), who found a 5% decrease in the marriage rates. To understand the mechanisms behind the effects of the law on labor participation and labor supply, I present a theoretical model in the following section.

4 Theoretical model

In this section, I present a collective marriage matching model following Choo and Seitz (2013). It seeks to explain the couple selection and intra-household effects that paternity law has on economic behavior.

Individuals in the model simultaneously decide whether to form a household and then decide on intra-household allocations. I explain it in two stages for clarity. Individuals decide what type of household they want to form in the first stage. Individuals in my model can choose between single, cohabited, and married households. Wages and assets are known before deciding whether to form a couple, and the bargaining power of the woman and man is determined alongside the option to form a couple. In the second stage, intra-household allocations are chosen to realize the indirect utilities predicted in the first stage. Labor decisions in the household differ between the woman, who chooses her labor supply, and the man, who decides whether to participate in the labor market. This is due to the data's small variation in men's labor supply.

4.1 Preferences

Let C_i be private consumption for the man or woman $(i = m, f)$, h_i is i's labor supply and k is the type of household: single (s), cohabited (c) or married (j). Each individual utility is:

$$u(i,k)(1-h_i, C_i) + \Gamma_{i,k} + \epsilon_{i,k},\ i = m, f; \quad k = s, c, j;$$

where the first term is defined over consumption and leisure and affects the intra-household allocation. $\Gamma_{i,k}$ captures invariant gains of being in a household of type k and it is assumed to be separable from consumption and leisure. Lastly, $\epsilon_{i,k}$ is an idiosyncratic, additive separable and i.i.d. preference shock specific to each individual and type of household. The shocks are realized before the marriage decision is made. Both $\Gamma_{i,k}$ and $\epsilon_{i,k}$ affect marriage behavior but do not directly influence the intra-household allocation.

4.2 Intra-household allocation

I present the model recursively, starting with the intra-household decision process. It follows the collective model developed by Choo and Seitz (2013) and Blundell et al. (2007). I first describe the single individual household and then the allocation problem for cohabited and married households.

4.2.1 Singles

A single individual faces the problem:

$$\max_{h_i, C_i}\ u(i,s)(1-h_i, C_i) + \Gamma_{i,s} + \epsilon_{i,s},\ i = m, f \tag{1}$$

$$\text{s.t. } C_i = w_i h_i + y_s \quad \text{for } i = m, f \tag{1a}$$

where w_i is the wage and y_s is non-labor income when single. This non-labor income includes monetary child support received by the mother and paid for by the father.

4.2.2 Couples

When a man and woman decide to form a couple, whether married or cohabit, they engage in a bargaining process to allocate the household's income and consumption. The following maximization problem defines the collective model:

$$\begin{aligned} \max_{h_m, C_m, h_f, C_f} \quad & \lambda_k(w_m, w_f, y, \mathbf{z}) u(m,k)(1-h_m, C_m) + \Gamma_{m,k} + \epsilon_{m,k} + \\ & (1-\lambda_k(w_m, w_f, y, \mathbf{z})) u(f,k)(h_f, C_f) + \Gamma_{f,k} + \epsilon_{f,k}, \quad k = c, j \end{aligned} \tag{2}$$

$$s.t. \begin{cases} u(f,k)(1-h_f, C_f) + \Gamma_{f,k} + \epsilon_{f,k} \geq U_s^f(1-h_f, C_f) + \Gamma_{f,s} + \epsilon_{f,s}\ , \quad k = c, j & \text{(2a)} \\ u(m,k)(1-h_m, C_m) + \Gamma_{m,k} + \epsilon_{m,k} \geq U_s^m(1-h_m, C_m) + \Gamma_{m,s} + \epsilon_{m,s}\ , \quad k = c, j & \text{(2b)} \\ C_m + C_f = w_m h_m + w_f h_f + y_k\ , \quad k = c, j & \text{(2c)} \\ h_m \in \{0,1\},\ 0 \leq h_f \leq 1 & \text{(2d)} \end{cases}$$

where $\lambda(w_m, w_f, y, \mathbf{z})$ is a Pareto weight that depends on the couple's wage, non-labor income and distribution factors $\mathbf{z}$ which are defined ahead.

The decision process, as is commonly assumed in collective models, results in Pareto-efficient outcomes[4]. As a result, the model can be decentralized by the Second Welfare Theorem and described as a two-stage process. In the absence of public goods, the Pareto weight has a one-to-one relationship with the bargaining function.

The man and woman allocate total income shares $\Psi_k^m(w_f, w_m, y, \mathbf{z})$ and $\Psi_k^f(w_f, w_m, y, \mathbf{z})$ in the first stage, referred to in the literature as the sharing rules or bargaining functions. These shares are determined by wages, non-labor income, and distribution factors that account for

[4]A simple argument in favor of this assumption is that man and woman can know well each other's preferences and because of their interaction are unlikely to not consider Pareto-improving decisions. For more about the validation of Pareto-efficiency, see Vermeulen (2002) and Chiappori and Mazzocco (2017).

the power each spouse has in the household. This power is based on the man's and woman's outside options: the greater their outside option, the more likely they are to split the couple and be single. This power is linked to a key component of collective models: distribution factors $\mathbf{z}$. A distribution factor is a variable that meets two criteria: (i) it has no effect on preferences or budget constraints, but (ii) it can influence the decision process by influencing the decision power of household members. Some common distributionns factors are the gender ratio in the household's neighborhood and divorce laws (Chiappori et al., 2002). The central idea is that a distribution factor influences a spouse's outside option benefit, increasing his or her bargaining power and improving utility. In the short run, the paternity law is a distribution factor[5].

In the second stage, the man and woman solve their individual problem using income share from the income allocation derived from the first stage. I present the general program faced by the woman given the labor participation decision made by the man:

$$\max_{h_f, C_f} \; u(f,k)(h_f, C_f), \quad k = c, j \tag{3}$$

$$s.t. \begin{cases} C_f = w_f h_f + \Psi_k^f(w_f, w_m, y_k, \mathbf{z}), \quad k = c, j & \text{(3a)} \\ 0 \leq h_f \leq 1 & \text{(3b)} \end{cases}$$

where $\Psi_k^f(w_f, w_m, y_k, \mathbf{z}) = y_k + w_m - \Psi_k^m(w_f, w_m, y_k, \mathbf{z})$ is woman's sharing rule. The Marshallian labor supply of the programme is $H^f(w_f, \Psi_k^f(w_f, w_m, y_k, \mathbf{z}))$ and the reduced form equation is

$$h^f(w_f, w_m, y_k, \mathbf{z}) = H^f[w_f, \Psi_k^f(w_f, w_m, y_k, \mathbf{z})]. \tag{4}$$

The man's labor participation frontier is defined by a set of wages and non-labor income bundles (w_f, w_m, y_k) for which the man is indifferent between participating or not. Following Blundell et al. (2007), it is possible to parametrize the labor participation frontier with the use of a shadow wage condition and recover the structural parameters of the bargaining function. I explain in section five the identification of the structural parameters and how to retrieve them from a reduced form estimation.

[5] In the long run, the law can potentially affect preferences. I do not consider this case as there is no empirical way to prove it due to data limitations.

Intuitively, the collective bargain is reflected in both the man's labor participation and the woman's labor supply. Changes in a household's income include the bargaining effect. Because the man's wage increases the man's bargaining power, there is a difference in the woman's labor supply depending on whether extra income comes from non-labor income or an increase in the man's wage. There is also an effect even if the man does not participate in the labor market and does not have a wage because his potential wage gives him bargaining power. The bargaining effect is reflected in the reservation wage that defines the man's labor participation. Changes in the woman's wage have an impact on the reservation wage due to changes in the bargaining process, and thus his share of resources.

4.3 Marriage decision and marriage market

In the first stage of the model, once the idiosyncratic gains from couple formation $\epsilon_{i,k}$ are realized, the man and woman decide whether to form or not a couple and what type of couple, either married or cohabited. For individual i, the indirect utility functions for being single, cohabited, or married are respectively:

$$V_{i,s}(\epsilon_{i,s}) = Q_{i,s}[w_i^*, y_s] + \Gamma_{i,s} + \eta_{i,s} \tag{5}$$

$$V_{i,c}(\epsilon_{i,c}) = Q_{i,c}[\Psi_c^i(w_f^*, w_m^*, y_c, \mathbf{z})] + \Gamma_{i,c} + \eta_{i,c} \tag{6}$$

$$V_{i,j}(\epsilon_{i,j}) = Q_{i,j}[\Psi_j^i(w_f^*, w_m^*, y_j, \mathbf{z})] + \Gamma_{i,j} + \eta_{i,j} \tag{7}$$

where $Q_{i,k}[\cdot]$ are the indirect utilities from the second stage intra-household allocation decisions and w_i^* denotes potential wages. The optimal choice is such that

$$\max V_i = \max[V_{i,s}, V_{i,c}, V_{i,j}] \tag{8}$$

Under the assumption that the idiosyncratic shocks $\eta_{i,k}$ are i.i.d Type 1 Extreme Value and $V_{i,s}^*$ the indirect utility functions without $\eta_{i,k}$, I can define π_i the probability i prefers to enter a household type k relative to the other alternatives:

$$\pi_{i,k} = \frac{\exp(V^*_{i,k})}{\sum_{l \in s,c,j} \exp(V^*_{i,l})} \tag{9}$$

The equilibrium definition and proof of existence can be found in Choo and Seitz (2013).

4.4 Effect of the Responsible Paternity Law

There are two effects of the paternity law on economic behavior. A couple formation effect and an intra-household effect. First, because the law provides monetary child support to the non-married woman in case of a pregnancy[6], it increases the woman's income, relaxing her budget constraint (equation 1). With it, the indirect utility of remaining single (equation 5) in a potential pregnancy increases and hence the probability for the woman to be single $\pi_{f,s}$.

For the man, the effect is the opposite: they must pay child support, reducing their available income and, as a result, decreasing their utility of being single. He would try to increase the woman's indirect utility of being in a couple, whether married or cohabited because living in a household implies sharing costs and other benefits (household work, joint income, and so on). The only way he can do that is by increasing the woman's bargaining power, $\Psi_f(\cdot)$, and reducing his own, $\Psi_m(\cdot)$. This increase in the woman's bargaining power equates to an increase in her income, relaxing her budget constraint in equation 3a, creating an income effect on her labor supply. This increases the indirect utilities, 6 and 7, and thus the probability of being in a couple, either cohabit $\pi_{m,c}$ or married $\pi_{m,j}$.

The woman's income effect increases her likelihood of choosing a relationship over being single, which is what the man desired. The final decision is made based on the value $\Gamma_{i,k}$ to determine the type of household.

5 Empirical model

In my data, I cannot observe who is the father of the baby for non-married single mothers or the amount of child support for each child. As a result, I am unable to fully estimate the model

[6]There may be a dynamic effect for married women because they can divorce and have a child later in another relationship and benefit from the law, increasing their outside options. This would increase divorce rates and the likelihood of being single. I ignore it because it is impossible to estimate it using my data.

proposed by Choo and Seitz (2013). However, I conduct two separate estimations. First, I compute a multinomial logit model to quantify the couple formation effect. Second, I estimate the collective household decision-making by Blundell et al. (2007).

5.1 Couple formation

As I have repeated cross-sections, the notation i, t denotes an observed individual i at period t. To estimate the couple formation effect, I used a multinomial logit estimation.

Each individual i decides on three possible households k: single (s), cohabited (c) or married (j). The utility that individual i obtains from alternative k is decomposed into (1) an observed part labeled $V_{i,k}$ and (2) $\varepsilon_{i,k}$ is an i.i.d random variable. The probability that i chooses alternative k is:

$$\begin{aligned} P_{i,k} &= \text{Prob}(V^*_{i,k} + \varepsilon_{i,k} > V^*_{i,k'} + \varepsilon_{i,k'}, \quad \forall k' \neq k) \\ &= \text{Prob}(V^*_{i,k} + \varepsilon_{i,k} - V^*_{i,k'} > \varepsilon_{i,k'}, \quad \forall k' \neq k) \end{aligned}$$

Assuming $\varepsilon_{i,k}$ follows an extreme type 1 value distribution, the probability individual i chooses option k is:

$$P_{i,k} = \frac{e^{V^*_{i,k}}}{\sum_l e^{V^*_{i,l}}}$$

I include in $V^*_{i,k}$ the age, gender, and education of each individual. I control for geographical variables, household information regarding the number of members in the house, the number of children born before 2002, and wealth variables.

5.2 Collective household model

The following notation i, t denotes an observed household at period t. The woman's labor supply equation differs depending on the man's labor participation:

$$h^f_{i,t} = A^f_{0,t} + A_m \text{ln} w^m_{i,t} + A_f \text{ln} w^f_{i,t} + A_y y_{i,t} + \mathbf{A} \cdot \mathbf{X}'_{i,t} + u_{1,i,t}, \quad \text{if husband works} \tag{10}$$

$$h^f_{i,t} = a^f_{0,t} + a_m \text{ln} w^m_{i,t} + a_f \text{ln} w^f_{i,t} + a_y y_{i,t} + \mathbf{a} \cdot \mathbf{X}'_{i,t} + u_{0,i,t} \quad \text{if husband does not work} \tag{11}$$

where $\mathbf{X}$ is a vector of control variables that includes the spouses' age and education, geographic and household variables. The man's latent labor participation is:

$$p^m_{i,t} = b^m_{p,t} + b^m_m w^m_{i,t} + b^m_f \ln w^f_{i,t} + b^m_y y_{i,t} + \mathbf{b} \cdot \mathbf{X}'_{i,t} + u^m_{p,i,t} \tag{12}$$

I model wages using a standard human capital approach with time variation in the coefficients:

$$w^m_{i,t} = \alpha^m_{0,t} + \alpha^m_{1,t}\text{educ}^m_{i,t} + \alpha^m_{2,t}\text{age}^m_{i,t} + \alpha^m_{3,t}(\text{age}^m_{i,t})^2 + \mathbf{c} \cdot \mathbf{W}'_{i,t} + u^m_{w,i,t} \tag{13}$$

$$\ln w^f_{i,t} = \alpha^f_{0,t} + \alpha^f_{1,t}\text{educ}^f_{i,t} + \alpha^f_{2,t}\text{age}^f_{i,t} + \alpha^f_{3,t}(\text{age}^f_{i,t})^2 + \mathbf{d} \cdot \mathbf{W}'_{i,t} + u^f_{w,i,t} \tag{14}$$

I assume that the individual's wage is determined solely by her or his age and education, as opposed to the labor outcomes, which are determined by both spouses. Variables in $\mathbf{W}$ only affect wages, as the firm's size, public or private employment, and job position.

Non-labor income is calculated as the difference between the total household income and the total labor income of the spouses. Doing this reduces measurement error and accounts for wealth that may have been overlooked when declaring. Following Blundell et al. (2007), I regard this measure as endogenous and use its predicted values using the reduced form equation:

$$\begin{aligned} y_{i,t} = \alpha^y_{0,t} + \alpha^y_{1,t}\text{educ}^m_{i,t} + \alpha^y_{2,t}\text{age}^m_{i,t} + \alpha^y_{3,t}(\text{age}^m_{i,t})^2 + \alpha^y_{4,t}\text{educ}^f_{i,t} + \alpha^y_{5,t}\text{age}^f_{i,t} + \\ \alpha^y_{6,t}(\text{age}^f_{i,t})^2 + \alpha^y_{7,t}\mu_{i,t} + \alpha^y_{8,t}\mu^2_{i,t} + \alpha^y_{9,t}\mathbf{1}(\mu_{i,t} > 0) + \mathbf{e} \cdot \mathbf{K}'_{i,t} + u_{y,i,t} \end{aligned} \tag{15}$$

where $\mathbf{K}_{i,t}$ are household variables that include geographical location and the total number of members. $\mu_{i,t}$ includes non-labor income transfers, and other household members' wages and transfers. I include a quadratic term and a nonzero indicator to improve the fit.

5.2.1 Identification

The identification of bargaining parameters is based on *double indifference* used by Blundell et al. (2007). This assumption states that if member i is indifferent about whether to work, then the other member is indifferent too. This assumption implies that the model's solution is contingent on whether the man participates. However, the sharing function is continuous in the participation frontier, allowing for identification. The model's constraints are detailed in Appendix D. It includes the entire model as well as instructions on how to recover structural parameters from reduced-form results.

6 Results

First, I present the couple formation model estimated using multinomial logit. The average marginal effects on the probability of each marital status category are shown in Table 4. The man is less likely to be single if he had a child after the paternity law was passed. The likelihood that he is in a couple, whether cohabit or married, rises. The woman, on the other hand, is more likely to be a single mother or cohabit, and less likely to be married. These findings corroborate the model's predictions, showing a couple selection effects from the law.

Table 4: Average Marginal Effects of paternity law on Marital Status

	All sample	Men	Women
Single	0.01**	-0.16***	0.07***
	(0.004)	(0.011)	(0.005)
Cohabit	0.05***	0.11***	0.03***
	(0.006)	(0.007)	(0.006)
Married	-0.06***	0.05***	-0.10***
	(0.006)	(0.009)	(0.006)
Controls	Yes	Yes	Yes
N	66,229	33,873	32,356

Standard errors under parentheses clustered at the household year level.
Controls include individual and household demographics and geographical variables.
*:10% significance, **: 5% significance, ***: 1% significance.

Next, I present the findings from the estimation of the collective household model. I use the couples' sample where the woman works as I only recover the bargaining function if $h^f_{i,t} > 0$ (Blundell et al., 2007).

To estimate the bargaining effect of the paternity law on households, I estimate the collective household model on two different samples based on whether the paternity law affected the households. I define treated as those cohabited households who had a child after 2002, while cohabited households without a child born children after 2002 serve as the control sample. The main result is determining whether the man and woman collectively bargain in the household or not, and the intra-household effect of the paternity law. For each sample, I estimate two models: an unrestricted model and a model with collective restrictions, which are both reported in the appendix. The likelihood ratio test is whether the collective constraints hold. The null hypothesis for the collective model is that in the household, both the man and woman in the cohabiting household are decision-makers. As mentioned above, households in a collective framework react differently to non-labor income and wages, as the bringer of them gains bargaining power. The alternative hypothesis is not clear as it is difficult to tell from which channel the rejection of the null hypothesis comes. However, if the household does not behave as in the collective model, it might do as in the unitary model, where there is a single decision-maker. If this is the case, income is pooled, such that an increase in non-labor income or in the man's wage has the same effect on the woman's labor supply (only if the man works). The extra income has a standard income effect on the man's labor participation. I present the theoretical unitary model and results in the appendix.

The results for woman's labor supply and man's participation in the control sample is presented in Table 5 and the result for the treated sample is in Table 6. The complete tables results are presented in Appendix F.

Table 5: Estimation results - treated sample

Woman's weekly labor hours - Man does not work				
	Unrestricted		Collective	
	Coef	**SE**	**Coef**	**SE**
Hourly wage man	-3.667	(2.430)	11.484	(0.337)
Hourly wage woman	2.114	(4.472)	10.387	(0.415)
Non-labor income	-4.688	(9.764)	-6.290	(0.031)
Intercept	35.762	(8.606)	6.254	(0.135)
N	1,376		1,376	

Woman's weekly labor hours - Man works				
	Unrestricted		Collective	
	Coef	**SE**	**Coef**	**SE**
Hourly wage man	-1.405	(2.430)	-2.641	(3.364)†
Hourly wage woman	4.965	(2.184)	9.341	(2.172)†
Non-labor income	0.113	(1.180)	-6.284	(0.030)
Intercept	39.684	(5.061)	15.127	(0.450)
N	2,622		2,622	

Man's labor participation				
	Unrestricted		Collective	
	Coef	**SE**	**Coef**	**SE**
Hourly wage man	1.037	(0.181)	0.833	(0.121)
Hourly wage woman	-0.060	(0.157)	0.062	(0.133)
Non-labor income	-0.343	(0.332)	0.000	(0.003)
Intercept	-0.731	(0.262)	-0.633	(0.238)
N	3,998		3,998	

Standard errors are under parenthesis and have been computed using the bootstrap with 1000 repetitions and allowing for the fact that man's wage, woman's wage and non-labor income are predicted.
All estimations control for geographical zone, number of children, age, high school or college diploma, and year effects.
†*: standard errors computed using the Delta Method.*

Table 6: Estimation results - treated sample

Woman's weekly labor hours - Man does not work				
	Unrestricted		Collective	
	Coef	**SE**	**Coef**	**SE**
Hourly wage man	6.557	(4.106)	9.633	(1.204)
Hourly wage woman	14.584	(5.490)	7.506	(1.681)
Non-labor income	-12.408	(15.343)	-21.294	(1.299)
Intercept	31.105	(12.096)	23.304	(3.837)
N	1,506		1,506	

Woman's weekly labor hours - Man works				
	Unrestricted		Collective	
	Coef	**SE**	**Coef**	**SE**
Hourly wage man	-0.047	(4.106)	-0.398	(2.941)†
Hourly wage woman	8.937	(3.463)	10.365	(2.194)†
Non-labor income	-22.812	(0.747)	-21.472	(2.303)
Intercept	45.158	(6.366)	47.059	(4.592)
N	2,868		2,868	

Man's labor participation				
	Unrestricted		Collective	
	Coef	**SE**	**Coef**	**SE**
Hourly wage man	0.632	(0.232)	0.640	(0.178)
Hourly wage woman	-0.237	(0.191)	-0.182	(0.138)
Non-labor income	-0.022	(0.433)	0.011	(0.223)
Intercept	-0.906	(0.475)	-0.920	(0.454)
N	4,374		4,374	

Standard errors are under parenthesis and have been computed using the bootstrap with 1000 repetitions and allowing for the fact that man's wage, woman's wage and non-labor income are predicted.
All estimations control for geographical zone, number of children, age, high school or college diploma, and year effects.
†*: standard errors computed using the Delta Method.*

Testing the collective restrictions with the treatment sample, the likelihood ratio statistic is 0.92 with a p-value of 0.63; hence, I do not reject that treated households behave as a collective household. For the control sample, the likelihood ratio statistic is 16.49 with a p-value of 0.0003; hence, I do reject that control households behave in a collective way.

The difference between samples being decision-makers or not is explained from the outside options for the man and woman. A woman in the control sample does not necessarily have child support or any other type of income from the man in case she decides to split the couple. A woman in the treated sample, on the contrary, can have child support from the man, which allows her to bargain from a better position with the man. This difference is reflected in the man's opportunity cost of working. It suggests that the cohabited man with a child born after the paternity law has less negotiating power with respect to the woman, which lowers his income share. The opportunity cost for a cohabited man without a child after the paternity law is part of the decision made by the household. This opportunity cost is in the model via a reservation wage. Recovering the man's reservation wages for both samples:

$$w^r_{treated} = \kappa_{treated} + \underset{(0.285)}{0.212}\,\ln w_f - \underset{(0.018)}{0.350}\,y, \quad \text{if child after paternity law}$$

$$w^r_{control} = \kappa_{control} + \underset{(0.067)}{0.146}\,\ln w_f + \underset{(0.371)}{0.326}\,y, \quad \text{if no child after paternity law.}$$

The coefficients show that man's reservation wage in the treated sample decreases for additional non-labor income and increases with the woman's wage, while in the control sample, it increases with both. I cannot test the difference between them as they were estimated using different samples.

Because in the treated sample I do not reject the collective household restrictions, I can recover the bargaining function by mapping the estimated parameters to the structural parameters. The mapping is explained in detail in Appendix D.3. The man's bargaining function from equation 6 is[7]:

$$\begin{aligned}
\Psi^m_{treated} &= \kappa_1 + \underset{(0.140)}{0.981}\,w_m + \underset{(0.226)}{0.253}\,\ln w_f - \underset{(0.316)}{0.016}\,y, \quad \text{if man works} \\
F(\Psi^m_{treated}) &= \kappa_0 + \underset{(0.113)}{0.464}\left(\underset{(0.140)}{0.981}\,w_m + \underset{(0.226)}{0.253}\,\ln w_f - \underset{(0.316)}{0.016}\,y\right), \quad \text{if man does not work}
\end{aligned}$$

From the equations, the man receives 0.981 extra units from the household total income for an additional unit in his wage. He obtains -0.016 extra units for every unit of non-labor income in the household. In exchange, the woman transfers him 0.253 units for every 10% rise in her

[7] Standard errors are estimated using the Delta Method.

wage. Finally, if the man does not work, he receives 46.4% of the total income he receives if he works.

These results show an important difference that comes from having a child once the paternity law took place. A man and woman in a cohabited household behave differently in their decision process. Those with a child after the law bargain collectively between themselves to allocate income, where the man has an important drop in his personal income if he decides not to work. On the other side, a man and woman that cohabit without a child born after the law, allocate income as a single agent household, indifferently if the man works or not. Hence, the paternity law had an important bargaining effect on the woman, by allowing her to have her own sharing rule.

Last, I estimated these results for different control samples, including married couples, samples with married and couple households, and couples before 2002. Most of the results reject the collective bargaining hypothesis. This goes in line with the model predictions that the law had a bargaining effect on cohabited couples that had a child, but not on married couples. On the latter, there was only a couple formation effect as shown above.

7 Conclusion

In this paper, I provide evidence on how a law that allowed non-married mothers to automatically declare the father of their newborn child affected labor decisions in Costa Rican households. I focus on labor outcomes: weekly worked hours and labor participation. The differences-in-differences estimation shows that the paternity law had significant effects on households' labor decisions. It decreased labor participation for both spouses, mostly for the man, and decreased the woman's labor supply.

I present a theoretical model to explain that the paternity law created two effects: a couple selection effect and an intra-household bargaining effect. I obtained a negative effect on the probability of a woman getting married due to the paternity law, where they are more likely to be single or in a cohabited household. The inverse happens for the man. From the estimation of a collective household model, I obtain that cohabited couples who had a child after the paternity law behave accordingly to a collective model, but not those cohabited couples without a child. The couples with children behave such that the man decreases his consumption in case he does not work, and the woman benefits from the man's wage in case he works. However, it is important to point out that I did not include in the model a potential substitution with domestic work, which can give different results depending on the effect of the law on domestic chores.

My results show how paternity laws that directly benefit children instead of the parents have wide effects on the economic behavior of the household. In this case, the registration of the father at birth generates a couple selection effect and affects decision-making in couple households. Specifically, my paper opens the possibility to think more broadly about how child-related laws affect mothers and can have an impact on the labor force. Further research is needed to understand the bargain changes from paternities laws, including the use of domestic time use data. These variables can help understand the substitution in time allocation between spouses.

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A Data manipulation

The data was constructed for the observational unit to be a household. A household can be a single individual or a couple. In the household there can be children or other family members.

The data cleaning process consisted of dropping a household completely if one of its members presented one of the following characteristics:

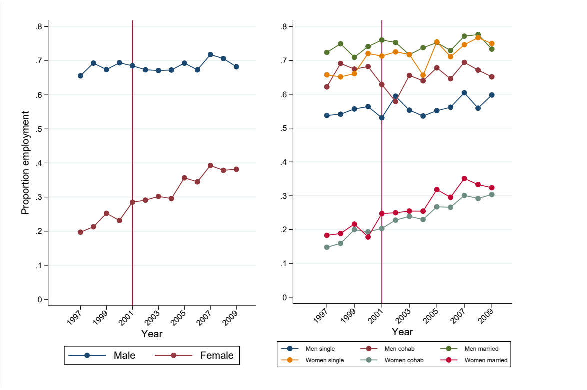
- Individuals without age.

- Individuals without years of schooling.
- Households that declared themselves as in a couple but only had one spouse present.
- Households were the age of one or both spouses are over 65.
- Same gender couples.
- Households one spouse was under age 18.
- Households one or both spouses declare themselves as unpaid workers.
- Households one or both spouses declare themselves as working but had a zero wage.
- Households one spouse or both spouses attend education.
- Households one spouse's wage was on the top and bottom 3%.
- Households other income variable was on the top and bottom 2%.
- Households the primary working hours variable was on the top and bottom 1.5%.

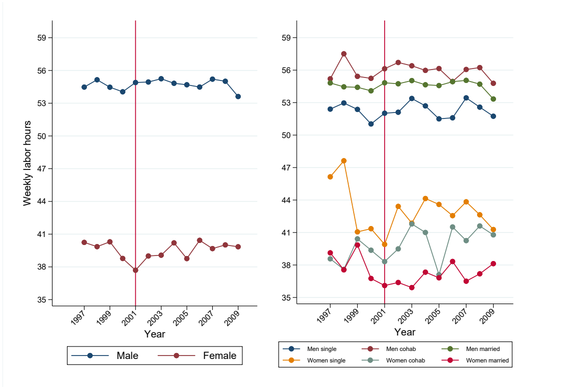
For the wage and income variables, I corrected for inflation using the Costa Rican Central Bank information and setting the base year in July 2009. All the values are in hundred thousand *colones* (exchange rate was 577 *colones* for 1 US dollar).

B Fuzzy differences-in-differences

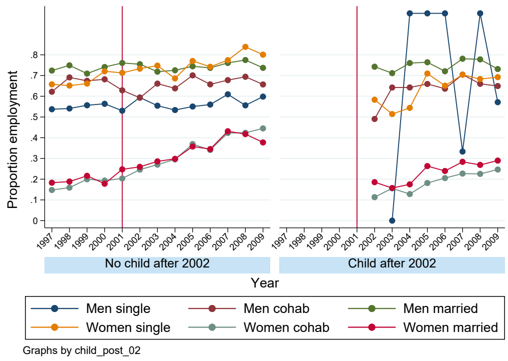
In this section, I present graphs corresponding to the parallel trend assumption for the household. The graphs correspond to the evolution of household formed and labor outputs for men and women, before and after the paternity law.



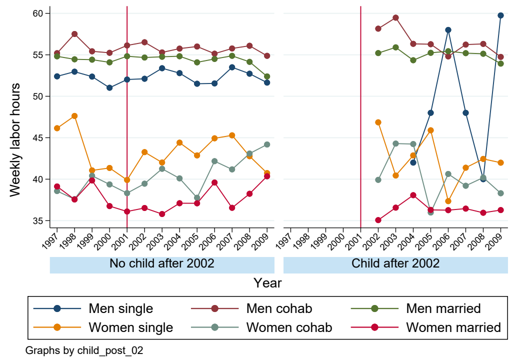
(a) Labor participation



(b) Labor hours



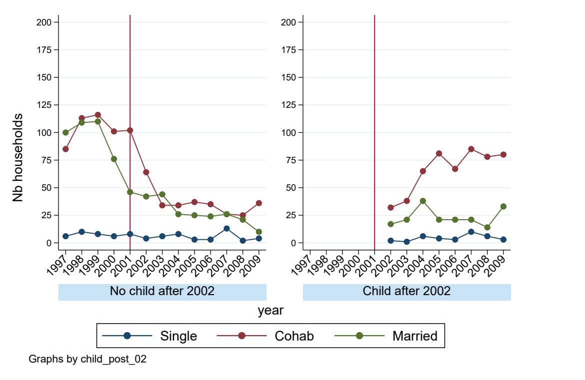
(c) Labor participation by child condition



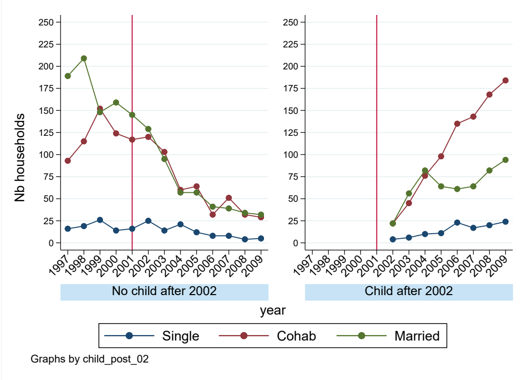
(d) Labor hours by child condition

Figure A1: Labor outputs by marital status

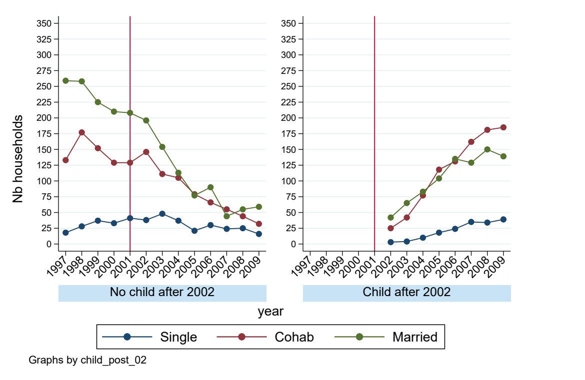
An important characteristic of the treatment relates to women's fertility. Because of this, I also present the graphs according to women's group age.



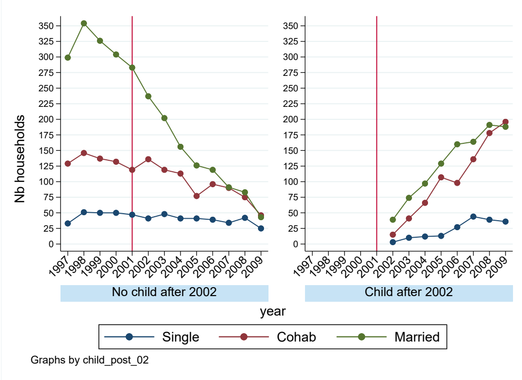
(a) Ages 18-20



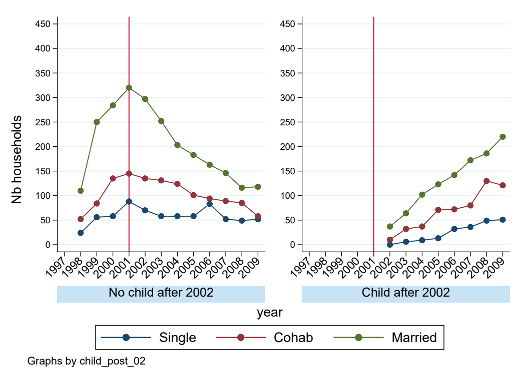
(b) Ages 21-23



(c) Ages 24-26

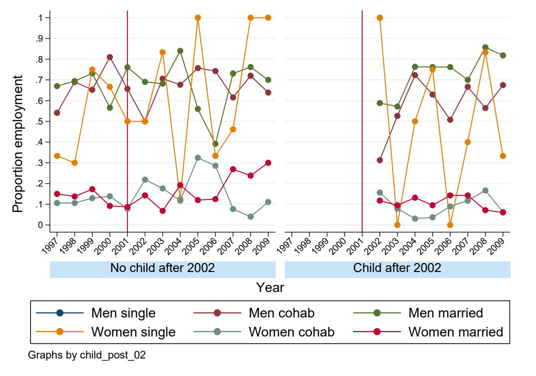


(d) Ages 27-29

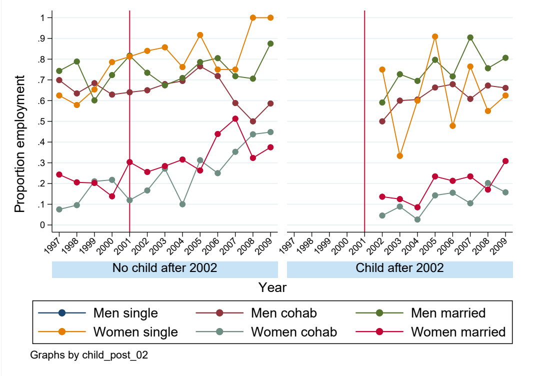


(e) Ages 30-32

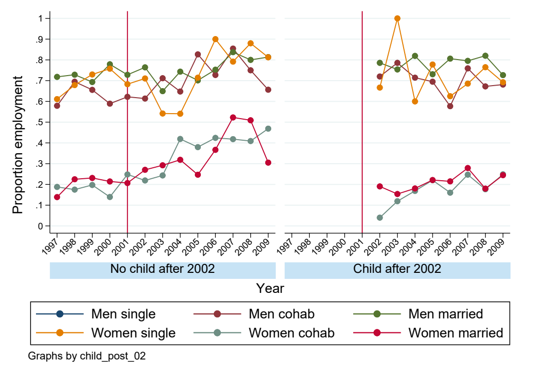
Figure A2: Number of households by martial status and women's age



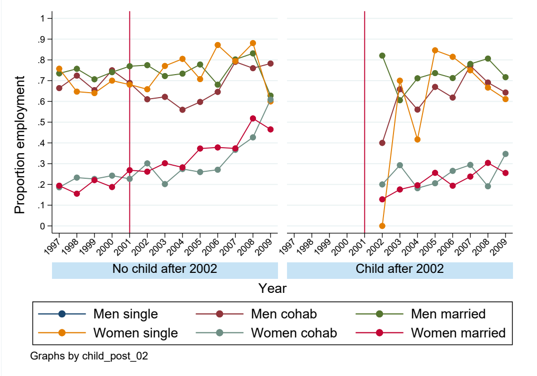
(a) Ages 18-20



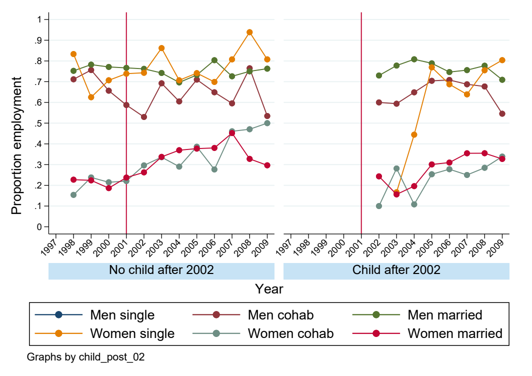
(b) Ages 21-23



(c) Ages 24-26

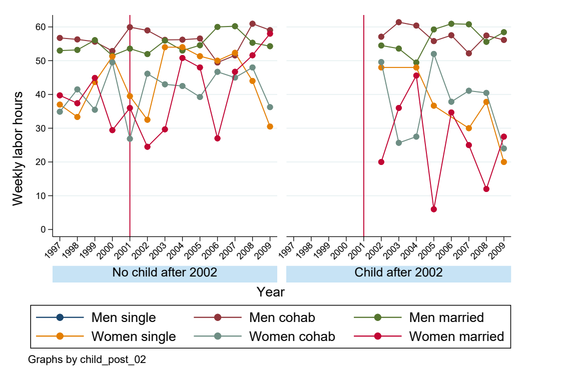


(d) Ages 27-29

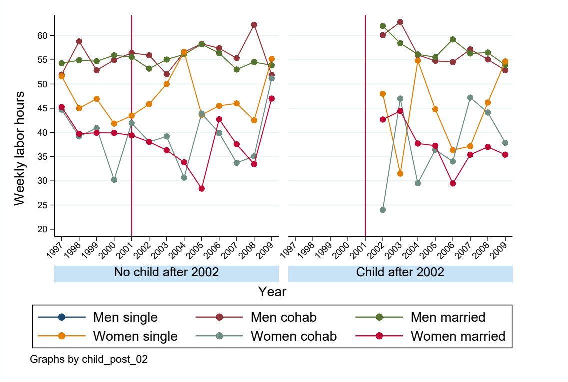


(e) Ages 30-32

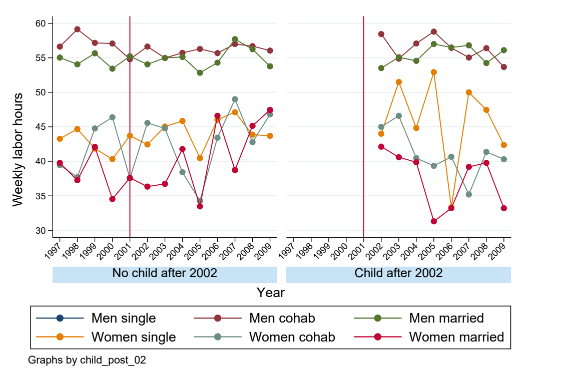
Figure A3: Labor participation by martial status and women's age



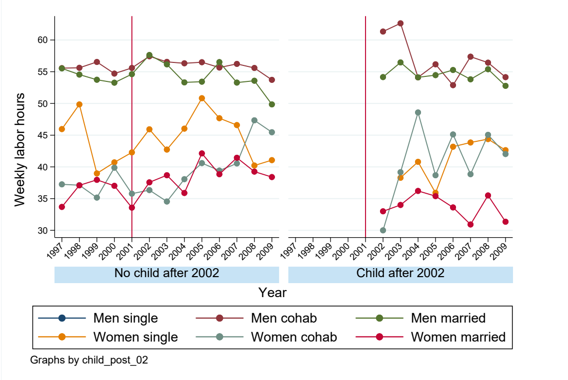
(a) Ages 18-20



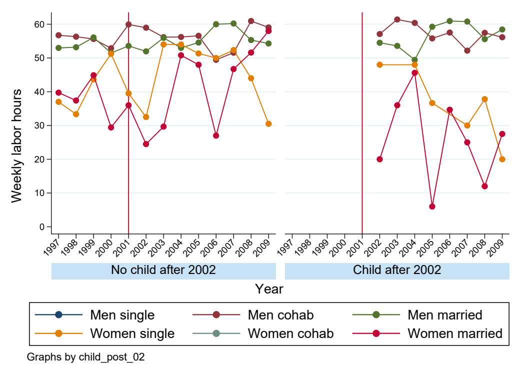
(b) Ages 21-23



(c) Ages 24-26



(d) Ages 27-29



(e) Ages 30-32

Figure A4: Labor hours by martial status and women's age

C Imputation

I impute teens' wages and household non-labor income using different samples of the Costa Rican National Household Survey from 1997 to 2009. I impute men's and women's wages separately using a Heckman two-step selection procedure with the following Mince equation for wages:

$$\log w^i = \alpha_0^i + \alpha_2^p \text{age}^i + \alpha_3^p (\text{age}^i)^2 + \mathbf{X}'\mathbf{B} + u_w^i \tag{A1}$$

where i is an individual and $\mathbf{X}$ includes demographics and exogenous variables related to the industry she works and the size of the firm she is employed. Table A1 shows the results of the estimation. For the women, Table A2 shows the results. Figure A5 shows the comparison between the observed and predicted values for both imputations.

Table A1: Men's wage imputation results

	Dependent variable:	
	Employed	Log Hourly wage rate
Years of education	0.072***	0.057***
	(0.003)	(0.002)
Experience	0.005	
	(0.012)	
Experience square	0.205***	
	(0.030)	
Total number people in hhd	0.301***	
	(0.028)	
Cohabited hhd	0.021	
	(0.032)	
Married hhd	−0.083***	
	(0.031)	
Number of children	−0.060*	
	(0.032)	
Children under age 6		−0.062***
		(0.009)
Children age 7-17		0.068***
		(0.007)
Size firm 1-5		−0.074***
		(0.011)
Size firm 20 or more		−0.075***
		(0.013)
Self-employed		−0.211***
		(0.011)
Employed himself	0.038***	0.037***
	(0.010)	(0.004)
Employed private sector	−0.001***	−0.0005***
	(0.0001)	(0.0001)
Central Valley rural zone	0.149***	0.082***
	(0.021)	(0.008)
Non Central Valley urban zone	0.248***	0.071***
	(0.026)	(0.010)
Central Valley urban zone	0.261***	0.138***
	(0.024)	(0.010)
Constant	−0.761***	−0.891***
	(0.171)	(0.084)
Year effects	Yes	Yes
Observations	25,924	19,229
R^2		0.292
Adjusted R^2		0.291
Log Likelihood	-16,290.130	
Akaike Inf. Crit.	32,630.260	
ρ		0.544
Inverse Mills Ratio		0.220*** (0.056)

*p<0.1, **p<0.05, ***p<0.01.

Baseline categories: different occupations (manager, research, technical and academic professors, and staff), different industries (finance, public administration, real state, teaching, social health, domestic and others), spouse or another relationship in the household, working in a firm with less than 10 employees and for the geographical variable it is living outside the Central Valley in a rural zone.

Table A2: Women's wage imputation results

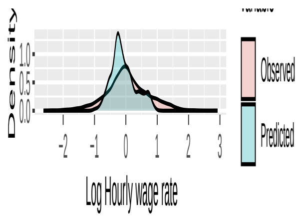
	Dependent variable:	
	Employed	Log Hourly wage rate
Age	1.274***	0.395***
	(0.102)	(0.073)
Age square	−0.027***	−0.009***
	(0.002)	(0.002)
Head of household	−0.249***	
	(0.090)	
Spouse head of household	−0.349***	
	(0.107)	
Child of household	0.059	
	(0.076)	
Cohabited	−2.483***	
	(0.048)	
Married		−0.164***
		(0.035)
Single		−0.067
		(0.053)
Manual occupation		−0.066
		(0.051)
Size firm 1-5		−0.010
		(0.042)
Size firm 10-19		0.029
		(0.031)
Size firm 100-		−0.204***
		(0.036)
Industry Manufacture	−0.380***	
	(0.088)	
Industry Services	−0.313***	
	(0.076)	
Industry Domestic Services	−0.121	
	(0.083)	
Central Valley rural zone	0.222***	0.104***
	(0.056)	(0.037)
Non Central Valley urban zone	−0.058	0.096***
	(0.054)	(0.036)
Central Valley urban zone	0.150***	0.137***
	(0.047)	(0.031)
Constant	−13.151***	−4.439***
	(1.049)	(0.772)
Year effects	Yes	Yes
Observations	14,272	1,931
R^2		0.115
Adjusted R^2		0.105
Log Likelihood	-2,800.443	
Akaike Inf. Crit.	5,644.886	
ρ		0.148
Inverse Mills Ratio		0.074*** (0.017)

*p<0.1, **p<0.05, ***p<0.01.

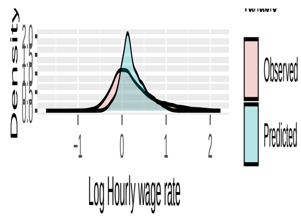
Baseline categories: different occupations (manager, research, technical and academic professors, and staff), different industries (finance, public administration, real state, teaching, social health, domestic and others), spouse or another relationship in the household, working in a firm with less than 10 employees and for the geographical variable it is living outside the Central Valley in a rural zone.

For non-labor income, I define it as the difference between household labor income and its

Figure A5: Imputation wages



(a) Women.



(b) Men.

total income. The sample of I use consists of 46,568 households. I impute using the predicted values from the following regression:

$$y = \alpha_0^y + \alpha_1^y \text{educ}_i^f + \alpha_2^y \text{age}_i^f + \alpha_3^y (\text{age}^f)_i^2 + \alpha_4^y \text{educ}_i^m + \alpha_5^y \text{age}_i^m + \alpha_6^m (\text{age}^m)_i^2 + \\ \alpha_7^a \mathbf{1}(a_i > 0) + \mathbf{Q}_i' \mathbf{E} + u_{yi} \tag{A2}$$

where i is a household, f refers to the father, m the mother, and a are the rents and profits that the household has, unrelated to labor and government transfers. I include it as an indicator for $a > 0$ to improve the fit. $\mathbf{Q}_i$ are household-level variables like the number of children, demographics, and geographical location. Table A3 shows the results of the estimation and Figure A6 shows the comparison between the observed and predicted values.

Table A3: Non-labor income imputation results

	Dependent variable:
	Non-labor income
Zero rent income	-32.606^{***}
	(1.907)
Age father	0.002
	(0.909)
Age father square	0.001
	(0.010)
Age mother	1.049
	(1.110)
Age mother square	-0.012
	(0.013)
Father's years of schooling	2.306^{***}
	(0.179)
Mother's years of schooling	2.849^{***}
	(0.180)
Household of 4	0.086
	(1.455)
Household of 5	3.101^{*}
	(1.763)
Household of 6	10.128^{***}
	(2.656)
Central Valley rural zone	-4.126^{***}
	(1.579)
Non Central Valley urban zone	-3.109^{*}
	(1.684)
Central Valley urban zone	-4.715^{***}
	(1.511)
Constant	27.228
	(25.126)
Year effects	Yes
Observations	2,756
R^2	0.321
Adjusted R^2	0.316
Residual Std. Error	28.778 (df = 2,734)
F Statistic	61.668^{***} (df = 21; 2,734)

$^{*}p<0.1$, $^{**}p<0.05$, $^{***}p<0.01$.

Baseline categories: positive rent income, household members, and for the geographical variable it is living outside the Central Valley in a rural zone.

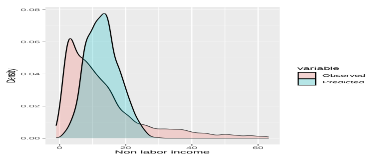


Figure A6: Imputation non-labor income

D Collective household model

D.1 Extended theoretical model

In this section, I present the extended model presented by Blundell et al. (2007). Their model depends on the husband's labor participation and the wife's labor supply.

Wife's labor decision when the husband works If the husband participates in the labor market his utility is $U_k^m(0, C^m)$, then:

$$u(m,k)(0, C^m) = \bar{u}^m(w_f, w_m, y_k), \quad k = c, j \tag{A3}$$

Solving (A3) for C^m:

$$C^m = \Psi_k(w_f, w_m, y_k)$$

$\Psi_k(w_f, w_m, y_k)$ is the sharing rule, which is affected by wages and non-labor income. With the solution of C^m and because of Pareto efficiency, the wife's optimal decision is the solution of the following programme:

$$\max_{h_f, C_f} \; u(f,k)(1-h_f, C_f), \quad k = c, j \tag{A4}$$

$$s.t. \begin{cases} C_f = w_f h_f + \Psi_k^f(w_f, w_m, y_k) & \text{(A4a)} \\ 0 \leq h_f \leq 1 & \text{(A4b)} \end{cases}$$

where $\Psi_k^f(w_f, w_m, y_k) = y_k + w_m - \Psi_k^m(w_f, w_m, y_k)$. The solution of the programme is $H^f(w_f, \Psi_k^f(w_f, w_m, y_k))$ and the reduced form is:

$$h^f(w_f, w_m, y_k) = H^f[w_f, \Psi_k^f(w_f, w_m, y_k)] \tag{A5}$$

Wife's labor decision when the husband does not work

In the case the husband does not work, his utility is $U_k^m(1, C^m)$ and:

$$u(m,k)(1, C^m) = \bar{u}_k^m(w_f, w_m, y_k) \tag{A6}$$

which can be solved to:

$$C^m = F(\Psi_k(w_f, w_m, y_k))$$

where $F(\cdot)$ is a transformation to consider the fact that the man does not work. The wife's decision program can be written as above, and it leads to a labor supply of the form:

$$h^f(w_f, w_m, y_k) = H^f[w_f, y_k - F(\Psi_k(w_f, w_m, y_k))] \tag{A7}$$

Husband's labor participation decision

The participation frontier L is defined by a set of wages and non-labor income bundles (w_f, w_m, y_k) for which the husband is indifferent between participating or not. Using *Lemma 1* in Blundell et al. (2007), it is possible to parametrize L with the use of a shadow wage condition,

$$w_m > \gamma(w_f, y)$$

for some γ that describes the participation frontier, which is true with the following assumption from Blundell et al. (2007).

Assumption. *The sharing rules are such that:*

$$\forall(w_f, w_m, y_k), \quad \left| [1 - F'(\Psi_k(w_f, w_m, y))] \times \frac{\partial \Psi_k(w_f, w_m, y_k)}{\partial w_m} \right| < 1 \tag{A8}$$

So whenever $h^f > 0$, γ is characterized by:

$$\forall(w_f, y_k), \quad \Psi_k(w_f, w_m, y_k) - F(\Psi_k(w_f, \gamma(w_f, y), y_k)) = \gamma(w_f, y_k) \tag{A9}$$

D.2 Restrictions

To recover the collective model structural parameters from a labor supply reduced form estimation it is necessary to add restrictions. First, from the male participation equation (12) solving for w_{it}^m when $p_{i,t}^m = 0$ allows obtaining the male reservation earnings and the parameters on the husband's participation frontier:

$$\gamma_f = -\frac{b_f^m}{bm^m}, \quad \gamma_{y_k} = -\frac{b_{y_k}^m}{bm^m} \tag{A10}$$

Second, to recover the wife's labor structural parameters the restrictions come from equations (10), (11) and (A10):

$$-\frac{1}{\gamma_{y_k}} = \frac{A_m - a_m}{A_{y_k} - a_{y_k}}, \quad \frac{\gamma_f}{\gamma_{y_k}} = \frac{A_f - a_f}{A_{y_k} - a_{y_k}} \tag{A11}$$

D.3 Recovering structural parameters

If the data do not reject the collective restrictions, I can recover the sharing function of the household as done by Blundell et al. (2007). On any point of the frontier, the four restrictions above, create a non-linear system of equations in the unknowns $(\psi_f, \psi_m, \psi_y, F')$. With some algebra, one obtains the following equation in F':

$$(\gamma_y ba - 1 + a - \gamma_y b)(F')^2 + (-b + 1 - 2\gamma_y ba + \gamma_y a - a)F' + b + \gamma_y ba = 0$$

where $a = a(w^f, y) = A[w^f, \gamma(w^f, y), y]$ and likewise for b. Blundell et al. (2007) show that if there is a solution to this quadratic equation that satisfies equation (A8), then the sharing rule is identified. This solution is such that:

$$F'(\Psi^m(w^f, w^m, y)) = \theta_\Psi^m(w^f, y)$$

and (ψ_f, ψ_m, ψ_y) are recovered with the following equations (rewritten from the restrictions above):

$$\psi_m[w^f, \gamma(w^f, y), y] = K(w^f, y) = \frac{b}{(a-b)}\left(a - 1 - \frac{a}{\theta_\Psi^m(w^f, y)}\right)$$
$$\psi_f[w^f, \gamma(w^f, y), y] = L(w^f, y) = \frac{\gamma_f}{(a-b)\gamma_y}\left(a - 1 - \frac{b}{\theta_\Psi^m(w^f, y)}\right)$$
$$\psi_y[w^f, \gamma(w^f, y), y] = M(w^f, y) = \frac{1}{(a-b)}\left(a - 1 - \frac{b}{\theta_\Psi^m(w^f, y)}\right)$$

Then, from the mapping between the structural Marshallian labor supply and its reduced form equation, I recover the last parameters:

$$\theta_\Psi^f = \frac{A_y}{1 - \psi_y}$$
$$\theta_w^f = A_f + \theta_\Psi^f \psi_f$$

Lastly, it is important to remind that functions Ψ and F are identified up to a constant on the man's labor participation.

D.4 Identification and stochastic specification

The identification of the model comes from various sources. First, the sharing rule when both partners are working is a result of Chiappori et al. (2002). This sharing rule is identified up to an additive constant.

There are two restrictions for each case whether the husband participates in the labor market or not. For any (w_f, w_m, y_k) and $h_f((w_f, w_m, y_k)) > 0$:

$$\begin{aligned} A(w_f, w_m, y_k) &= \frac{h^f_{w_m}}{h^f_{y_k}}, \text{ if husband works} \\ B(w_f, w_m, y_k) &= \frac{h^f_{w_m}}{h^f_{y_k}}, \text{ if husband does not work} \end{aligned} \tag{A12}$$

These restrictions show the fact that, when the man is working, his wage affects the woman's labor supply only through an income effect. In other words, what is determined by the couple's decision process is the man's reserved utility he would reach for each wage-income bundle. This utility's level is implemented by distinct levels of consumption, affected by the husband's labor participation.

The second identification is from Blundell et al. (2007) for collective models with corner solutions. The main assumption is "double indifference". It states that, in the participation frontier, both spouses are indifferent between one spouse working or not:

$$\begin{aligned} (\Psi_{y_k} & +\gamma_{y_k}\Psi_{w_m}) = \tfrac{\gamma_y}{1-F'} \\ \Psi_{w_m} & = \tfrac{\gamma_{w_f}}{\gamma_{y_k}}\Psi_{y_k} \end{aligned} \tag{A13}$$

Restrictions (A12) and (A13) create a system of partial derivatives for $\Psi_{w_f}, \Psi_{w_m}, \Psi_y, F'(\cdot)$. Proposition 2 in Blundell et al. (2007) with data on wages, non-labor income, female labor supply and male labor participation allows the recovery of preferences and sharing rule up to an additive constant when $h_f > 0$. To estimate the bargaining effect of the paternity law on Costa Rican households, I split the sample according to those affected by the law and those that were not. Applying the identification for each sub-sample allows me to recover the sharing function parameters and compare them.

For the stochastic specification, I assume that the errors terms $(u_{1,i,t}, u_{0,i,t}, u^m_{p,i,t}, u^m_{w,i,t}, u^f_{w,i,t}, u_{y,i,t})$ are jointly conditionally normal with constant variance. Following Blundell et al. (2007), I include additive observed heterogeneity in the labor supply functions and the sharing rule. Additive heterogeneity ensures that the identification results of the sharing rule remain valid. However, the heterogeneity might come from the labor supply or the bargaining function. For this reason, is that the constants in the structural equations are not identified.

I allow for general time effects in preferences and the sharing rule by including time dummies in the model.

D.5 Imputation and Likelihood

I impute wages for non-working spouses using a two-step Heckman selection estimation. I do this by first estimating a participation equation for both males and female ($j = m, f$):

$$\begin{aligned} p^j_{i,t} = \; & \beta^j_{0,t} + \beta^j_{1,t}\text{educ}^f_{i,t} + \beta^j_{2,t}\text{age}^f_{i,t} + \beta^j_{3,t}(\text{age}^f_{i,t})^2 + \\ & \beta^j_{4,t}\text{educ}^m_{i,t} + \beta^j_{5,t}\text{age}^m_{i,t} + \beta^j_{6,t}(\text{age}^m_{i,t})^2 + \beta^j_y y_{i,t} + \beta^j \cdot Y'_{i,t} + v^j_{i,t} \end{aligned} \tag{A14}$$

where Y are geographical and household variables. In the second step, I estimate the spouses' wage equations including the inverse Mills ratio. I impute wages using the predicted values. I impute non-labor income using the predicted values of equation A2.

After imputing wages and non-labor income, I estimate the structural model in two stages. The first stage is estimating the participation frontier for the husband, equation (12), with a probit. The second stage is estimating the wife's labor supply using a truncated regression. The likelihood function depends on the husband's labor participation. Define $f(\cdot)$ as the conditional normal density function and $\mathbf{1}(\cdot)$ as the indicator function. The likelihood when the husband works and there are n_W such observations are:

$$\begin{aligned} \log L^W = \; & \sum_{i=1}^{n_W} \{ \mathbf{1}(h^f_{i,t} < 0) \log \Pr(p^m_{i,t} > 0, h^f_{i,t} < 0) + \\ & \mathbf{1}(h^f_{i,t} > 0)[\log \Pr(p^m_{i,t} > 0) + \log f(h^f_{i,t} | p^m_{i,t} > 0)] \} \end{aligned} \tag{A15}$$

The likelihood when the husband does not work and there is (n_N) such observations are:

$$\begin{aligned} \log L^N = \; & \sum_{i=1}^{n_N} \{ \mathbf{1}(h^f_{i,t} < 0) \log \Pr(p^m_{i,t} < 0, h^f_{i,t} < 0) + \\ & \mathbf{1}(h^f_{i,t} > 0)[\log \Pr(p^m_{i,t} < 0) + \log f(h^f_{i,t} | p^m_{i,t} < 0)] \} \end{aligned} \tag{A16}$$

E Unitary model

The other common model of household behavior besides the collective model is the unitary model, which assumes that households behave as one single decision-maker.

For the unitary model, the household behaves as a single unit according to a twice continuously differentiable, strictly monotonic, and strongly concave utility function $U^H(l^f, l^m, C)$. It maximizes the following program:

$$\max_{h^f, h^m, C} \; U^H(l^f, l^m, C) \tag{A17}$$

$$
s.t.\begin{cases}
C = w^f h^f + w^m \overline{h}^m \mathbf{1}\{h^m = 0\} + y & \text{(A17a)} \\
0 < h^f \leq 1, \quad h^m \in \{0,1\} & \text{(A17b)} \\
l^f + h^f = 1 & \text{(A17c)} \\
l^m + h^m = 1 & \text{(A17d)}
\end{cases}
$$

In the unitary case, the household pools income, such that an increase in non-labor income or in the man's wage has the same effect on the woman's labor supply (only if the man works). The extra income has a standard income effect on the man's labor participation.

The unitary model uses the same parametric specification, providing two restrictions that be tested.

$$
\begin{aligned}
A_t &= A_y \\
a_t &= 0
\end{aligned} \qquad \text{(U1)} \qquad\qquad
\begin{aligned}
(1+\gamma_y)(a_y - A_y) &= 0 \\
A_y \gamma_p &= (1+\gamma_y)a_p^* - A_p^*
\end{aligned} \qquad \text{(U2)}
$$

The null hypothesis for these restrictions is that the household acts as a single unit decision-maker. Under the null, restrictions U1 refer to the household income distribution and how it affects the woman's labor supply. There is the same effect of an increase in the man's wage and non-labor income on the woman's labor supply. If the man does not work, there is no effect on his potential wage. Restrictions U2 refer to income and substitution effects caused by shifts in the woman's labor supply on the man's decision to work. Increases in non-labor income result in higher reservation wages, allowing the man to not work. The same holds for a raise in the woman's wage.

F Results paternity law on structural estimation

The following tables present the complete results of the collective household model for the treated and control samples.

Table A4: Unrestricted estimation results - control sample

	Woman's weekly labor hours				**Man's labor participation**	
	Man does not work		Man works			
	Coef	**SE**	**Coef**	**SE**	**Coef**	**SE**
Hourly wage man	-3.667	(2.430)	-1.405	(2.430)	1.037	(0.181)
Hourly wage woman	2.114	(4.472)	4.965	(2.184)	-0.060	(0.157)
Non-labor income	-4.688	(9.764)	0.113	(1.180)	-0.343	(0.332)
Intercept	35.762	(8.606)	39.684	(5.061)	-0.731	(0.262)
CV rural	1.979	(2.348)	-3.440	(2.158)	0.001	(0.096)
Non cv urban	2.542	(2.406)	-2.854	(2.066)	0.195	(0.100)
CV urban	4.297	(3.025)	-1.787	(1.998)	0.084	(0.100)
Children number	-1.589	(1.017)	-2.040	(0.774)	-0.047	(0.032)
Man has hs or college diploma	-0.066	(2.917)	-2.310	(1.853)	-0.151	(0.101)
Man's age	-0.266	(0.165)	-0.027	(0.117)	-0.010	(0.006)
Woman has hs or college diploma	2.609	(2.387)	3.025	(1.784)	0.079	(0.091)
Woman's age	0.456	(0.272)	0.145	(0.191)	0.013	(0.009)
Year effects	Yes		Yes		Yes	
N	1,376		2,622		3,998	

Standard errors are under parenthesis and have been computed using the bootstrap with 1000 repetitions and allowing for the fact that man's wage, woman's wage, and non-labor income are predicted.

Table A5: Collective estimation results - control sample

	Woman's weekly labor hours				**Man's labor participation**	
	Man does not work		Man works			
	Coef	**SE**	**Coef**	**SE**	**Coef**	**SE**
Hourly wage man	11.484	(0.337)	-2.641	$(3.364)^{\dagger}$	0.833	(0.121)
Hourly wage woman	10.387	(0.415)	9.341	$(2.172)^{\dagger}$	0.062	(0.133)
Non-labor income	-6.290	(0.031)	-6.284	(0.030)	0.000	(0.003)
Intercept	6.254	(0.135)	15.127	(0.450)	-0.633	(0.238)
CV rural	2.027	(0.053)	-2.577	(0.039)	0.006	(0.097)
Non cv urban	2.092	(0.030)	-1.045	(0.217)	0.175	(0.098)
CV urban	2.007	(0.081)	-1.189	(0.154)	0.091	(0.094)
Children number	-0.062	(0.697)	-2.497	(0.682)	-0.048	(0.032)
Man has hs or college diploma	-0.730	(0.329)	-1.196	(0.444)	-0.079	(0.087)
Man's age	-0.279	(0.157)	0.116	(0.115)	-0.008	(0.006)
Woman has hs or college diploma	0.394	(0.270)	2.708	(0.341)	0.054	(0.087)
Woman's age	0.661	(0.181)	0.688	(0.133)	0.011	(0.009)
Year effects	Yes		Yes		Yes	
N	1,376		2,622		3,998	

Standard errors are under parenthesis and have been computed using the bootstrap with 1000 repetitions and allowing for the fact that man's wage, woman's wage, and non-labor income are predicted.
†*: standard errors computed using the Delta Method.*

Table A6: Unrestricted estimation results - treated sample

	Woman's weekly labor hours				Man's labor participation	
	Man does not work		Man works			
	Coef	**SE**	**Coef**	**SE**	**Coef**	**SE**
Hourly wage man	6.557	(4.106)	-0.047	(4.106)	0.632	(0.232)
Hourly wage woman	14.584	(5.490)	8.937	(3.463)	-0.237	(0.191)
Non-labor income	-12.408	(15.343)	-22.812	(0.747)	-0.022	(0.433)
Intercept	31.105	(12.096)	45.158	(6.366)	-0.906	(0.475)
CV rural	-0.513	(3.332)	-6.814	(2.451)	0.135	(0.127)
Non cv urban	-7.654	(3.875)	-5.646	(2.404)	0.119	(0.124)
CV urban	-3.657	(4.754)	-5.424	(2.378)	0.218	(0.133)
Children number	1.522	(1.335)	0.420	(0.949)	-0.121	(0.043)
Husband has hs or college diploma	-2.028	(3.377)	-0.945	(2.495)	0.297	(0.126)
Husband's age	0.035	(0.207)	-0.439	(0.157)	-0.032	(0.007)
Wife has hs or college diploma	-4.506	(3.709)	1.057	(2.380)	0.177	(0.120)
Wife's age	-0.327	(0.422)	-0.096	(0.237)	0.037	(0.012)
Year effects	Yes		Yes		Yes	
N	1,506		2,868		4,374	

Standard errors are under parenthesis and have been computed using the bootstrap with 1000 repetitions and allowing for the fact that man's wage, woman's wage, and non-labor income are predicted.

Table A7: Collective estimation results - treated sample

	Woman's weekly labor hours				Man's labor participation	
	Man does not work		Man works			
	Coef	**SE**	**Coef**	**SE**	**Coef**	**SE**
Hourly wage man	9.633	(1.204)	-0.398	(2.941)†	0.640	(0.178)
Hourly wage woman	7.506	(1.681)	10.365	(2.194)†	-0.182	(0.138)
Non-labor income	-21.294	(1.299)	-21.472	(2.303)	0.011	(0.223)
Intercept	23.304	(3.837)	47.059	(4.592)	-0.920	(0.454)
CV rural	0.606	(1.337)	-7.049	(1.347)	0.133	(0.126)
Non cv urban	-6.584	(1.601)	-5.937	(1.499)	0.111	(0.121)
CV urban	-3.057	(1.041)	-5.559	(1.268)	0.210	(0.128)
Children number	1.403	(1.243)	0.437	(0.912)	-0.119	(0.041)
Husband has hs or college diploma	-2.815	(1.152)	-0.918	(1.910)	0.292	(0.113)
Husband's age	-0.014	(0.197)	-0.438	(0.147)	-0.032	(0.006)
Wife has hs or college diploma	-1.133	(1.231)	0.245	(1.735)	0.154	(0.106)
Wife's age	-0.059	(0.315)	-0.147	(0.216)	0.036	(0.011)
Year effects	Yes		Yes		Yes	
N	1,506		2,868		4,374	

Standard errors are under parenthesis and have been computed using the bootstrap with 1000 repetitions and allowing for the fact that man's wage, woman's wage, and non-labor income are predicted.
†*: standard errors computed using the Delta Method.*

F.1 Unitary model estimation

I can test the unitary model restrictions presented above. The null hypothesis for the unitary model is that the household acts as a single unit decision-maker. Testing the unitary restrictions with the treatment sample, the likelihood ratio statistic for the unitary model restrictions is 2.80 with a p-value of 0.59; hence, I do not reject that treated households behave as the unitary model predicts For the control sample, the likelihood ratio statistic for the unitary model is 0.23 with a p-value of 0.99; hence, I do not reject that control households behave as the unitary model predicts.

Table A8: Unitary estimation results - control sample

	Woman's weekly labor hours				**Man's labor participation**	
	Man does not work		Man works			
	Coef	**SE**	**Coef**	**SE**	**Coef**	**SE**
Hourly wage man	0.000		-1.258	(1.520)	1.036	(0.182)
Hourly wage woman	3.044	(1.488)†	4.412	(1.777)	-0.061	(0.154)
Non-labor income	-1.258	(1.520)	-1.258	(1.520)	-0.363	(0.335)
Intercept	32.245	(5.985)	39.878	(4.643)	-0.730	(0.260)
CV rural	1.559	(2.008)	-3.396	(2.020)	0.002	(0.089)
Non cv urban	2.308	(1.939)	-2.803	(1.866)	0.196	(0.096)
CV urban	3.841	(2.620)	-1.710	(1.833)	0.084	(0.097)
Children number	-1.537	(1.033)	-2.031	(0.734)	-0.047	(0.032)
Man has hs or college diploma	-1.464	(1.755)	-2.315	(1.560)	-0.151	(0.100)
Man's age	-0.296	(0.156)	-0.029	(0.115)	-0.010	(0.006)
Woman has hs or college diploma	2.040	(1.583)	3.224	(1.582)	0.079	(0.091)
Woman's age	0.457	(0.266)	0.149	(0.188)	0.013	(0.009)
Year effects	Yes		Yes		Yes	
N	1,376		2,622		3,998	

Standard errors are under parenthesis and have been computed using the bootstrap with 1000 repetitions and allowing for the fact that man's wage, woman's wage, and non-labor income are predicted.
†*: standard errors computed using the Delta Method.*

Table A9: Unitary estimation results - treated sample

	Woman's weekly labor hours				**Man's labor participation**	
	Man does not work		Man works			
	Coef	**SE**	**Coef**	**SE**	**Coef**	**SE**
Hourly wage man	0.000		-4.380	(3.732)	0.608	(0.220)
Hourly wage woman	6.530	(5.480)†	11.184	(3.746)	-0.220	(0.188)
Non-labor income	-4.380	(3.732)	-4.380	(3.732)	0.212	(0.212)
Intercept	36.638	(16.845)	49.337	(5.636)	-0.872	(0.466)
CV rural	0.052	(6.418)	-6.774	(2.391)	0.135	(0.124)
Non cv urban	-7.020	(3.409)	-5.703	(2.368)	0.118	(0.128)
CV urban	-1.819	(5.471)	-5.361	(2.355)	0.218	(0.135)
Children number	1.256	(1.289)	0.361	(0.932)	-0.122	(0.042)
Husband has hs or college diploma	0.269	(1.914)	0.749	(2.691)	0.304	(0.125)
Husband's age	0.055	(0.255)	-0.374	(0.154)	-0.032	(0.007)
Wife has hs or college diploma	-4.623	(2.847)	-0.036	(4.198)	0.167	(0.119)
Wife's age	-0.312	(0.598)	-0.214	(0.235)	0.036	(0.012)
Year effects	Yes		Yes		Yes	
N	1,506		2,868		4,374	

Standard errors are under parenthesis and have been computed using the bootstrap with 1000 repetitions and allowing for the fact that man's wage, woman's wage, and non-labor income are predicted.
†: standard errors computed using the Delta Method.