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Evidence from Labor Supply**
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Abortion and Female Power in the Household Evidence from Labor Supply

Summary

Legalization of abortion in the 1970s represents a major cultural change: it gives women a higher degree of freedom to directly control their fertility, allowing them to ultimately decide upon children without man's consent and to decrease uncertainty in their expected labor market returns.

This public policy and its implications on female behavior have been so far analyzed through its direct consequences on fertility and fertility technology, primarily on women actually experiencing an abortion.

However, it seems relevant to evaluate its indirect effects on female bargaining power within the household, for all women that face abortion as an actual opportunity, without necessarily experiencing one. Although indirect, this impact may be widespread since in principle it concerns all couples where the woman is in her fertile age.

I focus on the indirect effect of abortion legalization in the United States on women's position in the household. My findings suggest that the legalization positively affected female bargaining power.

In a dynamic model of possible commitment to marital contract, I analyze households that were already formed before the legalization and I test for the renegotiation of the household's initial contract in the presence of the shock to bargaining power balance represented by abortion legalization. Results seem to reject the full commitment assumption.

Specifically, I analyze the legalization of abortion as a distribution factor in a collective model of household behaviour through its effects on female labor supply and find that (controlling for the number of children) the legalization significantly decreased labor supply of married women in their fertile age and significantly increased their husbands', while no such effect is found for older married women nor for single and divorced women or men.

Keywords: Abortion, collective household behavior, labor supply

JEL: D12, J12, J22, K39

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I. Introduction

Abortion legalization has always been one of the most debated policy issues in the United States and in many Western countries, recently also at the United Nations level². In the United States in particular, there have been many federal and state laws, amendments and regulations that have alternatively modified the conditions under which abortion is legal and the restrictions to women's autonomous decision.

Legalization of abortion undoubtedly affects women's freedom to ultimately control their fertility. It represents a new right to female autonomy in the fertility decision, an issue that in principle concerns both spouses involved in a relationship.

It is interesting to investigate and evaluate the impact of abortion legalization on female empowerment, specifically within the household, through its indirect effects on spouses' bargaining power. Such a right to women's autonomy in planning fertility may increase the female intra-household power and influence the household allocation of resources through two main channels. First, this right represents a new opportunity for the woman to decide upon children with or without man's consent, possibly affecting his fertility choices. It may be the case that spouses disagree on the number and timing of children, so that this new availability gives women more freedom with respect to men, possibly binding men's fertility decisions³. Second, this opportunity to avoid unwanted pregnancies decreases women's uncertainty about their future career which, *ex ante*, is likely to make their expected life-time earnings larger than before the legalization.

Abortion statistics (Allan Guttmacher Institute, US, 1970s) show that the practice of abortion is indeed seen as an opportunity by women involved in a stable relationship: around 27 % of women undergoing an abortion are legally married⁴. Hence, abortion may represent a credible threat and bound for men. Also, the vast majority of women undergoing an abortion are reported to do so because they do not want the child or they want to delay fertility, suggesting that this opportunity is used when an actual voluntary choice is involved, not merely for extreme contingencies such as rape, incest, fetal or woman's health problems (precisely, about 90 % for "unwantedness" reasons

² Refer, for instance, to the declarations at the United Nations World Conference on Women at Beijing (1995) and Conference on Population and Development in Cairo (1994).

³ In the literature on reproduction and fertility goals, potential disagreement between spouses is accounted for. For example, Coombs et al. (1979) state that "reproductive goals of one marital partner cannot with confidence be assumed to represent the views of the other". Thomson et al. (1990) show that "disagreeing couples experienced fertility rates midway between couples who wanted the same smaller or larger number of children". In particular, Williams (1994) says that a substantial proportion of births that are unwanted by mothers are wanted by fathers.

⁴ Of all women undergoing an abortion in the 1970s, 61 % are between the ages of 25 and 40, age group on which I focus for my empirical analysis. See the data description section for details.

versus 10 % for those contingencies)⁵. Moreover, sociological and gender studies show that abortion legalization is regarded specifically as a right which allowed women to decrease male domination within families⁶.

These statistical and literature evidence seems to suggest that the impact of abortion legalization on female bargaining power in the household may be economically sizable and interesting to model and estimate.

Actually, legalization of abortion leads to many changes, as it is acknowledged in the literature. We can distinguish among three main effects of this phenomenon.

1. Fertility effect: direct impact. The legalization of abortion straightforwardly allows women to get an abortion: through their decision to abort, the legalization affects demographic variables, with a substantial decline in fertility. The literature (Levitt Donohue (2001), Levine et al. (1996)) shows that this direct impact on fertility subsequently led to changes in teenagers' behavior on fertility, "out of wedlock" births and in crime.
2. Technology effect: indirect impact. The availability of abortion indirectly affects the fertility technology because it represents a sure mean of ultimately avoiding a pregnancy, as, for instance, the contraceptive pill is. Decisions on fertility, marriage and human capital investments may thus be affected, as it is precisely shown in Goldin-Katz (2001), Angrist-Evans (1996). These papers show that there is an indirect effect on long run increases in labor market participation and education of women who conceivably were on the contraceptive pill or took advantage of abortion legalization, not necessarily distinguishing across marital status.
3. Bargaining power effect: I propose a new analysis dimension, the indirect impact within families on household's decision process. The legalization of abortion represents an opportunity for women to decide upon their fertility. This may increase female bargaining power within the household and thus influence the observed households' optimal allocations, such as labor supply, participation and any specific consumptions variables that are susceptible to be influenced by bargaining power changes.

Most of the literature on abortion or reproductive technology concentrates in either one or both of the first two impacts. However, the bargaining power effect may be relevant and widespread since it potentially affects all couples possibly dealing with fertility decisions⁷: typically all couples where the woman is in her fertile age. In fact, all women for whom abortion becomes an available opportunity to self-determine fertility, including those that eventually never experience

⁵ These statistics on the reasons why abortion was undertaken are from 1987: they were not available before. However, in these past fifteen years unwantedness seems to represent the main motivation, so that these percentages are likely to reflect the 1970s as well.

⁶ Historically, those studies were developed even before the literature regarding abortion as a source of female empowerment in society. Now this issue is taken further by considering abortion as one of women's reproductive and sexual rights.

⁷ My analysis does not apply to lesbian or homosexual couples nor on the heterosexual couples where one spouse is totally dominant in the relationship. I refer to heterosexual couples where there is room for potential renegotiation of bargaining power balance between a man and a woman.

an abortion, may increase their intra-household bargaining power towards their spouses as a consequence of its legalization. Not only their power should increase, but correspondingly their male spouses' power should decrease. Also, this impact should show up immediately in the cohorts of women exposed to the legalization, since the legalization per se, as a new right to female autonomy, changes the bargaining power balance. Therefore, even though this intra-household effect is more indirect than the first order fertility decline effect, it may potentially affect a broader segment of the population. Then, the overall consequences of abortion legalization may be of much greater proportion than previously acknowledged. In addition to this, if we specifically consider an intertemporal framework, the bargaining power effect allows to investigate two further related issues: 1) to what extent spouses renegotiate their marital⁸ contract when there is such an unanticipated shock to their bargaining power balance; 2) how different marital contracts of couples who got married before the legalization are from those of couples who got married after the legalization. In this present paper I do not address the second issue, mainly because of small sample size⁹.

In order to test and measure the bargaining power effect of abortion legalization, I will focus on labor supply decisions, as in the literature on bargaining power (Chiappori (1992), Chiappori et al. (2002)). The intuition for how an increase in female intra-household bargaining power due to abortion legalization can affect spouses' labor supply is the following: *ceteris paribus*, an increase in women's bargaining power gives women a higher share of household resources and this translates into a positive income effect for them; if the income effect goes in the regular direction (if leisure is a normal good), women's labor supply decreases as a consequence of legalization of abortion.

It is crucial to emphasize that this labor supply prediction of the bargaining power effect goes in the opposite direction with respect to the fertility and the technology effects found in most of the literature. Indeed, if women get access to better fertility technology and fertility itself declines, becoming less of a constraint, female labor supply increases, as it is well documented in the literature on abortion and birth control such as the contraceptive pill. Moreover, transformations in fertility and its technology can be dealt with both a unitary and a non-unitary setting of household behavior, whereas the impact on intra-household bargaining power can be analyzed only in a non-unitary framework. In fact, while the first two effects can influence women regardless of the marital status, the latter impact on bargaining power may affect only those involved in a relationship with a male spouse, i.e. legally married or cohabiting women. This male spouse is also predicted to be affected by the legalization.

⁸ Throughout all my analysis, I use the word married as synonym for both legally married and cohabitants. By the same token, all the related words such as husband, wife, marriage, marital should be interpreted as referring also to cohabitants.

⁹ In my current data set, only less than ¼ of couples got married after the legalization. However, I am planning to switch to CPS data to try to analyze this further question.

The collective model of household behavior provides a natural theoretical framework to perform the analysis of this bargaining effect. Each spouse is assumed to have his own utility to maximize and spouses are assumed to take pareto-efficient decisions. The legalization of abortion may modify the household's environment and spousal opportunities, affecting the intra-household decision process and optimal allocations only through its impact on spousal bargaining within the household. In a dynamic setting, I focus on couples who got married before the legalization of abortion in order to avoid marriage market selection bias issues, and essentially to test for the renegotiation of their marital contracts due to the legalization.

I consider both the national legalization of abortion in 1973 and the early state legalizations by California, New York state, Washington state, Alaska and Hawaii in 1970 as sources of variation in the availability of abortion¹⁰. In fact these laws represented a very "open" legalization: women were allowed to decide autonomously (within a specified period from conception) and psychological distress and unwantedness were contemplated as motivations to seek an abortion¹¹. I use the Panel Study of Income Dynamics (PSID) from 1970 to 1979, with household data across the United States, to assess the impact of abortion on female bargaining power.

I estimate the impact of abortion legalization on married couples, singles and divorced. I find that the legalization significantly decreased labor supply of married women in their fertile age and significantly increased their husbands', whereas for married women beyond the fertile period, for singles, divorced women and men there is no such effect. My results suggest that couples indeed renegotiate their marital contract in response to abortion legalization, when it represents an actual opportunity (fertile women). Furthermore, this renegotiation leads to an increase in these women's intra-household bargaining power relative to their spouse.

Section II presents the theoretical framework to analyze the impact of abortion legalization on female bargaining power in the household and the possible marital contract renegotiation, namely an intertemporal collective model of labor supply. The following Section III provides the labor supply specifications. Section IV contains a description of the data and Section V presents the empirical results. The last sections Section VI and VII discuss sensitivity analysis and alternative explanations and Section VIII concludes the paper.

¹⁰ I do not consider twelve other states that inacted abortion laws between 1967 and 1970 because they legalized abortion only under special restrictive circumstances (life danger, rape). These states laws are also generally discarded in the abortion literature.

¹¹ See the appendix for a detailed timing and description of these laws.

II. Intertemporal collective model of labor supply with possible marital contract renegotiation

In a collective household behavior setting, I consider dynamic models of labor supply, either with or without commitment towards marital contract.

Each spouse in the household has a distinct utility function and the decision process is pareto-efficient. The household is composed of two decision makers, called husband and wife¹². They are assumed to be infinitely lived.

Let h^i_t and C^i_t for $i=1,2$ denote respectively member i 's labor supply and consumption of a private composite good in period t ; leisure is assumed to be a normal good. Let b_t denote the household net savings on a risk-free asset in period t .

Let's assume the standard specification of individuals with egoistic preferences, where welfare of member i does not depend on consumption or leisure of the other member (no externality, no public good): $U^i(1-h^i_t, C^i_t, z)$ where U is strictly quasi-concave, increasing, continuously differentiable and z are preferences parameters. From now on, $i = 1 =$ wife; $i = 2 =$ husband.

Spouses negotiate their marital contract and decide their optimal allocations of savings, consumption and leisure at the time of marriage in $t = 0$. Whether they decide upon the optimal allocations for the whole time horizon, and whether their observed behavior is possibly affected by abortion legalization, depends on the degree of commitment¹³.

1) Full commitment

Under full commitment, spouses stick to their marital contract throughout the whole period, even though the variables influencing bargaining power between spouses may change over time due to the legalization of abortion. The behavior of savings, labor supply and consumption over time is not affected by changes in these variables happening after the marriage.

In fact, the household intertemporal efficient allocation of resources can be written as the solution of the following program:

¹² I focus on spouses where the wife is in her fertile age, since abortion legalization may increase female bargaining power only for couples where fertility decisions are still an issue at stake. Once again, husband and wife stand for both legally married and cohabitant spouses.

¹³ I may use the same theoretical commitment framework to think of fertility decisions in terms of number and timing of children. They would be decided ex ante at the time of marriage and possibly renegotiated in favor of women at the time of legalization of abortion. In the data, preferences on number and timing of children can be captured by preference parameters and by the variables number of children and presence of infants in the household.

$$\max_{\{h_t^i, C_t^i\}_{i=1,2; t=0, \infty}} \sum_{t=0}^{\infty} \beta^t U^i(1 - h_t^i, C_t^i, z)$$

st :

$$\sum_{t=0}^{\infty} \beta^t U^2(1 - h_t^2, C_t^2, z) \geq \bar{U}^{2^0}$$

$$\forall t \rightarrow p_t(C_t^1 + C_t^2) + b_t \leq w_t^1 h_t^1 + w_t^2 h_t^2 + y_t + b_{t-1}$$

$$0 \leq h_t^1 \leq 1; 0 \leq h_t^2 \leq 1$$

$$\forall t \in [0, +\infty)$$

$$\Rightarrow C_t^i = C^i(p_t, y_t, w_t^1, w_t^2, b_{t-1}, \bar{U}^{2^0})$$

$$\Rightarrow h_t^i = h^i(p_t, y_t, w_t^1, w_t^2, b_{t-1}, \bar{U}^{2^0})$$

$$\forall i = 1, 2$$

$$\Rightarrow b_t = b(p_t, y_t, w_t^1, w_t^2, b_{t-1}, \bar{U}^{2^0})$$

where y is the household non-labor income, w is the wage rate, r is the interest rate at which they can lend or borrow money, \bar{U}^2 is the husband's reservation utility at the time of marriage; discount factors β^1 and β^2 and the interest rate r are assumed to be constant over time without loss of generality and, together with preference parameters, are omitted from any optimal allocation for notational simplicity (in particular, I assume $r = 0$). In general, the value of the reservation utility is a function of all information available at the time of the decisions. This information set is composed of all possible variables affecting bargaining power; in particular, I focus on distribution factors s , which consist of all other variables that modify household's environment and spousal opportunities without changing preferences nor the pareto-set; specifically, I analyze legalization of abortion as an additional opportunity to the wife to directly control her fertility, possibly increasing her bargaining power. In a full commitment setting, I denote the reservation utility as \bar{U}^{2^0} because optimal decisions are taken at the time of marriage $t = 0$.

The optimal allocation functions $C^i(\cdot), h^i(\cdot), b(\cdot)$ and the reservation utility function are assumed to be stationary. Also, the reservation utility, as well as the optimal allocations, is assumed not to depend on past realizations of non-labor income and wages for notational simplicity.

Theorem. Under full commitment, the above program is equivalent to the existence of the pareto-weight μ^0 , constant throughout the whole period, so that spouses solve the following optimization:

$$\max_{\{h_t^i, C_t^i\}_{i=1,2,t=0,\infty}} \mu^0 \sum_{t=0}^{\infty} \beta^t U^1(1-h_t^1, C_t^1, z) + (1-\mu^0) \sum_{t=0}^{\infty} \beta^t U^2(1-h_t^2, C_t^2, z)$$

$$st: \forall t \rightarrow p_t(C_t^1 + C_t^2) + b_t \leq w_t^1 h_t^1 + w_t^2 h_t^2 + y_t + b_{t-1}$$

$$0 \leq h_t^1 \leq 1; 0 \leq h_t^2 \leq 1$$

$$\forall t \in [0, +\infty)$$

$$\Rightarrow C_t^i = C^i(p_t, y_t, w_t^1, w_t^2, b_{t-1}, \mu^0)$$

$$\Rightarrow h_t^i = h^i(p_t, y_t, w_t^1, w_t^2, b_{t-1}, \mu^0)$$

$$\forall i = 1, 2$$

$$\Rightarrow b_t = b(p_t, y_t, w_t^1, w_t^2, b_{t-1}, \mu^0)$$

Proof. Lagrange theorem on the existence of Lagrange multipliers.

With full commitment, only the distribution of bargaining power at $t = 0$ matters: therefore, μ^0 is affected by bargaining power variables only of time $t = 0$. Since spouses commit ex ante to the stream of optimal allocations, legalization of abortion does not have any impact on households who got married before the legalization. Even though it may represent a change in distribution factors, spouses keep the power balance they established in $t = 0$. Therefore, under full commitment, abortion legalization should not have any impact on household behavior. In fact, the full commitment assumption does not allow to identify the reason why there is no such impact: it may be the case that abortion legalization does not affect bargaining power at all (it is not a distribution factor) or that indeed it represents a distribution factor but couples already married before the legalization are in fact fully committed.

The full commitment assumption may be too restrictive: it may not be realistic to assume that spouses commit to allocations decided at the time of marriage for their entire life together. In terms of the model, spouses may change their bargaining power balance and renegotiate their marital contract. Thus, the pareto-weight may vary accordingly over time. We can consider two sub-models of the limited commitment, both allowing for renegotiation of the marital contract due to unanticipated changes in bargaining power variables: a model of commitment but with full renegotiation at the time of the unexpected shock; a model without commitment where spouses negotiate their optimal allocations at any date.

2) Commitment with renegotiation due to unanticipated shocks to bargaining power

Under commitment with renegotiation, spouses stick to their marital contract until there is an unanticipated shock to their bargaining power, namely the legalization of abortion, making them renegotiate their optimal allocations at the

time of the shock. The behavior of savings, labor supply and consumption over time possibly changes after the marriage in response to abortion legalization.

In fact, the household intertemporal efficient allocations of resources can be written as the solutions of the following program:

if $t < \text{legal}$

$$\max_{\{h_t^i, C_t^i\}_{i=1,2; t=0, \infty}} \sum_{t=0}^{\infty} \beta^t U^1(1 - h_t^1, C_t^1, z)$$

$$st : \sum_{t=0}^{\infty} \beta^t U^2(1 - h_t^2, C_t^2, z) \geq U^{\bar{2}^0}$$

$$st : \forall t \rightarrow p_t(C_t^1 + C_t^2) + b_t \leq w_t^1 h_t^1 + w_t^2 h_t^2 + y_t + b_{t-1}$$

$$0 \leq h_t^1 \leq 1; 0 \leq h_t^2 \leq 1$$

$$\forall t \in [0, +\infty)$$

$$\Rightarrow C_t^i = C^i(p_t, y_t, w_t^1, w_t^2, b_{t-1}, U^{\bar{2}^0})$$

$$\Rightarrow h_t^i = h^i(p_t, y_t, w_t^1, w_t^2, b_{t-1}, U^{\bar{2}^0})$$

$$\forall i = 1, 2$$

$$\Rightarrow b_t = b(p_t, y_t, w_t^1, w_t^2, b_{t-1}, U^{\bar{2}^0})$$

if $t \geq \text{legal}$

$$\max_{\{h_t^i, C_t^i\}_{i=1,2; t=\text{legal}, \infty}} \sum_{t=\text{legal}}^{\infty} \beta^t U^1(1 - h_t^1, C_t^1, z)$$

$$st : \sum_{t=\text{legal}}^{\infty} \beta^t U^2(1 - h_t^2, C_t^2, z) \geq U^{\bar{2}^0}$$

$$st : \forall t \rightarrow p_t(C_t^1 + C_t^2) + b_t \leq w_t^1 h_t^1 + w_t^2 h_t^2 + y_t + b_{t-1}$$

$$0 \leq h_t^1 \leq 1; 0 \leq h_t^2 \leq 1$$

$$\forall t \in [\text{legal}, +\infty)$$

$$\Rightarrow C_t^i = C^i(p_t, y_t, w_t^1, w_t^2, b_{t-1}, U^{2^{\text{legal}}})$$

$$\Rightarrow h_t^i = h^i(p_t, y_t, w_t^1, w_t^2, b_{t-1}, U^{2^{\text{legal}}})$$

$$\forall i = 1, 2$$

$$\Rightarrow b_t = b(p_t, y_t, w_t^1, w_t^2, b_{t-1}, U^{2^{\text{legal}}})$$

Theorem. Under commitment with renegotiation, the above programs are equivalent to the existence of the pareto-weights μ^0 and μ^{legal} , so that spouses solve the following optimizations:

if $t < legal$

$$\max_{\{h_t^i, C_t^i\}_{i=1,2,t=0,\infty}} \mu^0 \sum_{t=0}^{\infty} \beta^t U^1(1-h_t^1, C_t^1, z) + (1-\mu^0) \sum_{t=0}^{\infty} \beta^t U^2(1-h_t^2, C_t^2, z)$$

$$st: \forall t \rightarrow p_t(C_t^1 + C_t^2) + b_t \leq w_t^1 h_t^1 + w_t^2 h_t^2 + y_t + b_{t-1}$$

$$0 \leq h_t^1 \leq 1; 0 \leq h_t^2 \leq 1$$

$$\forall t \in [0, +\infty)$$

$$\Rightarrow C_t^i = C^i(p_t, y_t, w_t^1, w_t^2, b_{t-1}, \mu^0)$$

$$\Rightarrow h_t^i = h^i(p_t, y_t, w_t^1, w_t^2, b_{t-1}, \mu^0)$$

$$\forall i = 1, 2$$

$$\Rightarrow b_t = b(p_t, y_t, w_t^1, w_t^2, b_{t-1}, \mu^0)$$

if $t \geq legal$

$$\max_{\{h_t^i, C_t^i\}_{i=1,2,t=legal,\infty}} \mu^{legal} \sum_{t=legal}^{\infty} \beta^t U^1(1-h_t^1, C_t^1, z) + (1-\mu^{legal}) \sum_{t=legal}^{\infty} \beta^t U^2(1-h_t^2, C_t^2, z)$$

$$st: \forall t \rightarrow p_t(C_t^1 + C_t^2) + b_t \leq w_t^1 h_t^1 + w_t^2 h_t^2 + y_t + b_{t-1}$$

$$0 \leq h_t^1 \leq 1; 0 \leq h_t^2 \leq 1$$

$$\forall t \in [legal, +\infty)$$

$$\Rightarrow C_t^i = C^i(p_t, y_t, w_t^1, w_t^2, b_{t-1}, \mu^{legal})$$

$$\Rightarrow h_t^i = h^i(p_t, y_t, w_t^1, w_t^2, b_{t-1}, \mu^{legal})$$

$$\forall i = 1, 2$$

$$\Rightarrow b_t = b(p_t, y_t, w_t^1, w_t^2, b_{t-1}, \mu^{legal})$$

where μ^0 is the pareto-weight associated to the wife at the time of marriage and μ^{legal} is the pareto-weight associated to the wife at the time of the renegotiation due to the unanticipated legalization of abortion.

Proof. Lagrange theorem on the existence of Lagrange multipliers.

Before the legalization of abortion, only the distribution of bargaining power at $t = 0$ matters: therefore, μ^0 is affected by bargaining power variables only of time $t = 0$

When abortion is legalized, there is an unanticipated shock to the bargaining power; spouses renegotiate their marital contract through μ^{legal} . Then, the household sticks to the optimal allocations decided at $t = legal$ for the whole time horizon from $t = legal$ on. After the legalization of abortion, only the distribution of bargaining power at $t = legal$ matters: therefore μ^{legal} and consequently the optimal allocations are affected by bargaining power variables only of time $t = legal$. In particular, if abortion legalization actually increases female bargaining power in the household, it must be true that:

$$\mu^{legal} > \mu^0$$

Therefore, abortion legalization should have an impact on households' observed behavior since wife's pareto-weight increases.

3) No commitment

Under no commitment, every period spouses decide their current optimal allocations, depending only on the current bargaining power. The behavior of labor supply and consumption over time may possibly change at any time after the marriage, not only in response to legalization per se but also to changes in accessibility of abortion.

In fact, the household intertemporal efficient allocations of resources can be written as the solutions of the following programs:

$$\forall t \in [0, +\infty)$$

$$\max_{\{h_t^i, C_t^i\}_{i=1,2}} U^1(1 - h_t^1, C_t^1, z)$$

$$st : U^2(1 - h_t^2, C_t^2, z) \geq \bar{U}^{2^t}$$

$$st : p_t(C_t^1 + C_t^2) + b_t \leq w_t^1 h_t^1 + w_t^2 h_t^2 + y_t + b_{t-1}$$

$$0 \leq h_t^1 \leq 1; 0 \leq h_t^2 \leq 1$$

$$\Rightarrow C_t^i = C^i(p_t, y_t, w_t^1, w_t^2, b_{t-1}, \bar{U}^{2^t})$$

$$\Rightarrow h_t^i = h^i(p_t, y_t, w_t^1, w_t^2, b_{t-1}, \bar{U}^{2^t})$$

$$\forall i = 1, 2$$

$$\Rightarrow b_t = b(p_t, y_t, w_t^1, w_t^2, b_{t-1}, \bar{U}^{2^t})$$

Theorem. Under no commitment, the above programs are equivalent to the existence of the pareto-weights μ^t , so that spouses solve the following optimizations:

$$\forall t \in [0, +\infty)$$

$$\max_{\{h_i^i, C_i^i\}_{i=1,2}} \mu^t U^1(1-h_t^1, C_t^1, z) + (1-\mu^t) U^2(1-h_t^2, C_t^2, z)$$

$$st : p_t(C_t^1 + C_t^2) + b_t \leq w_t^1 h_t^1 + w_t^2 h_t^2 + y_t + b_{t-1}$$

$$0 \leq h_t^1 \leq 1; 0 \leq h_t^2 \leq 1$$

$$\Rightarrow C_t^i = C^i(p_t, y_t, w_t^1, w_t^2, b_{t-1}, \mu^t)$$

$$\Rightarrow h_t^i = h^i(p_t, y_t, w_t^1, w_t^2, b_{t-1}, \mu^t)$$

$$\forall i = 1, 2$$

$$\Rightarrow b_t = b(p_t, y_t, w_t^1, w_t^2, b_{t-1}, \mu^t)$$

where μ^t is the pareto-weight associated to the wife at time t.

Proof. Lagrange theorem on the existence of Lagrange multipliers.

In every period t, only the current distribution of bargaining power in t matters; therefore, μ^t is affected only by current bargaining power variables. With no commitment, spouses are already updating their bargaining power balance and deciding their current optimal allocations period by period, independently of the realization of an unexpected shock to their bargaining power.

When abortion is legalized they take into account of the new power balance favorable to wives. Before the legalization,

$$\mu^t = \mu^0 \quad \forall t < legal, \text{ and at the time of the legalization, } \mu^t = \mu^{legal} \text{ for } t = legal.$$

Moreover, the no-commitment assumption allows for further adjustments in the power balance in response to changes in the degree of legalization, e.g. in terms of accessibility of abortion. If actual accessibility of abortion changes over time affecting wife's opportunity to directly control her fertility, spouses may change behavior accordingly. In particular, if abortion legalization actually increases female bargaining power in the household, it must be true that:

$$\mu^{legal} > \mu^{legal-k} \quad \forall k \in [1, legal]$$

Moreover, if actual accessibility of abortion changes over time and, by affecting wife's opportunity to directly control her fertility, further modifies her bargaining power, it also holds that:

$$\mu^{legal+k} \begin{matrix} > \\ < \end{matrix} \mu^{legal+j} \quad \forall k \geq 0 \quad \forall j > 0$$

Therefore, abortion legalization should affect household's observed behavior since wife's pareto-weight increases.

Testable predictions on labor supply

I use the concept of sharing rule, an equivalent alternative way of representing the intra-household power balance; it determines how non-labor income is divided between the two spouses in every period t . By efficiency, it is equivalent to the pareto-weight formulation.

After illustrating this equivalence, I derive the theoretical predictions that each model yields on how the change in bargaining power due to abortion legalization affects the sharing rule; subsequently, I use the impact of the sharing rule on labor supply to link the legalization to a labor supply effect. In this way, the testable predictions on labor supply will consist of ultimately testing whether the sharing rule changes due to abortion legalization.

Specifically, the share of non-labor income going to the wife is increasing in her pareto-weight ($\frac{\partial \rho}{\partial \mu} > 0$); a change in her share is an income effect and implies a change in the opposite direction of her labor supply. The reverse is true for the husband.

1) Full commitment

Theorem. Pareto-efficiency is equivalent to the existence of a time invariant sharing rule $\rho^0 = \rho(\mu^0, y_t, w_t^1, w_t^2, b_{t-1})$ such that the wife gets the share $\rho(\mu^0, y_t, w_t^1, w_t^2, b_{t-1})$ of the household non-labor income, the husband gets the remaining ($y_t - \rho(\mu^0, y_t, w_t^1, w_t^2, b_{t-1})$) and they solve the following programs:

$$\begin{aligned} & \max_{\{h_t^1, C_t^1\}_{t=0, \infty}} \sum_{t=0}^{\infty} \beta^1 U^1(1 - h_t^1, C_t^1, z) \\ & st : \forall t \rightarrow p_t C_t^1 + b_t^1 \leq \rho(\mu^0, y_t, w_t^1, w_t^2, b_{t-1}) + w_t^1 h_t^1 + b_{t-1}^1 \\ & \Rightarrow h_t^1 = h^1(p_t, w_t^1, b_{t-1}, \rho(\mu^0, y_t, w_t^1, w_t^2, b_{t-1})) \end{aligned}$$

$$\begin{aligned} & \max_{\{h_t^2, C_t^2\}_{t=0, \infty}} \sum_{t=0}^{\infty} \beta^2 U^2(1 - h_t^2, C_t^2, z) \\ & st : \forall t \rightarrow p_t C_t^2 + b_t^2 \leq y_t - \rho(\mu^0, y_t, w_t^1, w_t^2, b_{t-1}) + w_t^2 h_t^2 + b_{t-1}^2 \\ & \Rightarrow h_t^2 = h^2(p_t, w_t^2, b_{t-1}, y_t - \rho(\mu^0, y_t, w_t^1, w_t^2, b_{t-1})) \end{aligned}$$

$$\text{with } b_t^1 + b_t^2 = b_t \forall t$$

Proof. First and Second Welfare theorems.

Since μ^0 depends only on the distribution of bargaining power at $t = 0$, ρ^0 is affected by bargaining power variables only of the time of marriage $t = 0$. The sharing rule $\rho^0 \forall t \in [0, +\infty)$ is chosen by the two spouses ex ante at the time of the marriage ($t = 0$): it only depends on information available at the time of the contract and it applies to every period t for the whole time horizon. Equivalently to μ^0 , we can state that the household sticks to the sharing rule ρ^0 and to the optimal allocations she committed to in $t = 0$, even though the legalization of abortion may represent a distribution factor. Consequently, we can state that, everything else being equal:

- $\mu = \mu^0 \Rightarrow \rho = \rho^0 \quad \forall t \in [0, +\infty) \quad \Rightarrow \quad h_{legal+k}^1 = h_{legal-j}^1 \quad \forall k \geq 0 \quad \forall j > 0$
- $\mu = \mu^0 \Rightarrow \rho = \rho^0 \quad \forall t \in [0, +\infty) \quad \Rightarrow \quad h_{legal+k}^2 = h_{legal-j}^2 \quad \forall k \geq 0 \quad \forall j > 0$

Ceteris paribus, husband's and wife's respective labor supply should not change over time because of the legalization, since there is no increase (decrease) in wife's (husband's) share of non-labor income.

2) Commitment with renegotiation due to unanticipated shocks to bargaining power

Theorem. Pareto-efficiency is equivalent to the existence of the time invariant sharing rules $\rho^0 = \rho(\mu^0, y_t, w_t^1, w_t^2, b_{t-1})$ and $\rho^{legal} = \rho(\mu^{legal}, y_t, w_t^1, w_t^2, b_{t-1})$, such that the wife gets the share $\rho(\mu^0, y_t, w_t^1, w_t^2, b_{t-1})$ if $t < legal$, or $\rho(\mu^{legal}, y_t, w_t^1, w_t^2, b_{t-1})$ if $t \geq legal$, of the household non-labor income, the husband gets the remaining $(y_t - \rho(\mu^0, y_t, w_t^1, w_t^2, b_{t-1}))$ if $t < legal$, or $(y_t - \rho(\mu^{legal}, y_t, w_t^1, w_t^2, b_{t-1}))$ if $t \geq legal$, and they solve the following programs:

if $t < legal$

$$\max_{\{h_t^1, C_t^1\}_{t=0, \infty}} \sum_{t=0}^{\infty} \beta^t U^1(1 - h_t^1, C_t^1, z)$$

$$st : \forall t \rightarrow p_t C_t^1 + b_t^1 \leq \rho(\mu^0, y_t, w_t^1, w_t^2, b_{t-1}) + w_t^1 h_t^1 + b_{t-1}^1$$

$$\Rightarrow h_t^1 = h^1(p_t, w_t^1, b_{t-1}, \rho(\mu^0, y_t, w_t^1, w_t^2, b_{t-1}))$$

$$\max_{\{h_t^2, C_t^2\}_{t=0, \infty}} \sum_{t=0}^{\infty} \beta^t U^2(1 - h_t^2, C_t^2, z)$$

$$st : \forall t \rightarrow p_t C_t^2 + b_t^2 \leq y_t - \rho(\mu^0, y_t, w_t^1, w_t^2, b_{t-1}) + w_t^2 h_t^2 + b_{t-1}^2$$

$$\Rightarrow h_t^2 = h^2(p_t, w_t^2, b_{t-1}, y_t - \rho(\mu^0, y_t, w_t^1, w_t^2, b_{t-1}))$$

with $b_t^1 + b_t^2 = b_t \forall t$

if $t \geq \text{legal}$

$$\begin{aligned} & \max_{\{h_t^1, C_t^1\}_{t=\text{legal}, \infty}} \sum_{t=\text{legal}}^{\infty} \beta^t U^1(1 - h_t^1, C_t^1, z) \\ & st : \forall t \rightarrow p_t C_t^1 + b_t^1 \leq \rho(\mu^{\text{legal}}, y_t, w_t^1, w_t^2, b_{t-1}) + w_t^1 h_t^1 + b_{t-1}^1 \\ & \Rightarrow h_t^1 = h^1(p_t, w_t^1, b_{t-1}, \rho(\mu^{\text{legal}}, y_t, w_t^1, w_t^2, b_{t-1})) \end{aligned}$$

$$\begin{aligned} & \max_{\{h_t^2, C_t^2\}_{t=\text{legal}, \infty}} \sum_{t=\text{legal}}^{\infty} \beta^t U^2(1 - h_t^2, C_t^2, z) \\ & st : \forall t \rightarrow p_t C_t^2 + b_t^2 \leq y_t - \rho(\mu^{\text{legal}}, y_t, w_t^1, w_t^2, b_{t-1}) + w_t^2 h_t^2 + b_{t-1}^2 \\ & \Rightarrow h_t^2 = h^2(p_t, w_t^2, b_{t-1}, y_t - \rho(\mu^{\text{legal}}, y_t, w_t^1, w_t^2, b_{t-1})) \\ & \text{with } b_t^1 + b_t^2 = b_t \forall t \end{aligned}$$

Proof. First and Second Welfare theorems.

Before the legalization of abortion, only the distribution of bargaining power at $t = 0$ matters: therefore, μ^0 and consequently ρ^0 are affected by bargaining power variables only of time $t = 0$.

When abortion is legalized, the sharing rule $\rho^{\text{legal}} = \rho(\mu^{\text{legal}}, y_t, w_t^1, w_t^2, b_{t-1}) \forall t \in [\text{legal}, +\infty)$ is chosen by the two spouses at the time of the legalization and it only depends on information available at the time $t = \text{legal}$; it applies to the whole time horizon from $t = \text{legal}$ on.

Equivalently to μ^0 , we can state that the household sticks to the sharing rule ρ^0 and to the optimal allocations she committed to in $t = 0$, until the unexpected shock of abortion legalization makes her renegotiate the bargaining power and optimal allocations in $t = \text{legal}$, using the sharing rule ρ^{legal} . The household sticks to the sharing rule ρ^{legal} and to the optimal allocations she committed to in $t = \text{legal}$, from $t = \text{legal}$ on. Consequently, we can state that, everything else being equal:

- $\mu^{\text{legal}} > \mu^0 \Rightarrow \rho^{\text{legal}} > \rho^0 \Rightarrow h_{\text{legal}+k}^1 < h_{\text{legal}-j}^1 \quad \forall k \geq 0 \quad \forall j > 0$
- $\mu^{\text{legal}} > \mu^0 \Rightarrow \rho^{\text{legal}} > \rho^0 \Rightarrow h_{\text{legal}+k}^2 > h_{\text{legal}-j}^2 \quad \forall k \geq 0 \quad \forall j > 0$

Ceteris paribus, the increase in the wife's share of non-labor income represents a positive income effect, making her labor supply decrease after the legalization. The prediction for husbands has the opposite sign, since their share of non-labor income consequently decreases: bargaining power is indeed a relative concept.

3) No commitment

Theorem. Pareto-efficiency is equivalent to the existence of the sharing rules $\rho^t = \rho(\mu^t, y_t, w_t^1, w_t^2, b_{t-1})$,

$\forall t \in [0, +\infty)$, such that the wife gets the share $\rho(\mu^t, y_t, w_t^1, w_t^2, b_{t-1})$ of the household non-labor income, the

husband gets the remaining $(y_t - \rho(\mu^t, y_t, w_t^1, w_t^2, b_{t-1}))$, and they solve the following programs:

$$\max_{\{h_t^1, C_t^1\}} U^1(1 - h_t^1, C_t^1, z)$$

$$st : p_t C_t^1 + b_t^1 \leq \rho(\mu^t, y_t, w_t^1, w_t^2, b_{t-1}) + w_t^1 h_t^1 + b_{t-1}^1$$

$$\Rightarrow h_t^1 = h^1(p_t, w_t^1, b_{t-1}, \rho(\mu^t, y_t, w_t^1, w_t^2, b_{t-1}))$$

$$\max_{\{h_t^2, C_t^2\}} U^2(1 - h_t^2, C_t^2, z)$$

$$st : p_t C_t^2 + b_t^2 \leq y_t - \rho(\mu^t, y_t, w_t^1, w_t^2, b_{t-1}) + w_t^2 h_t^2 + b_{t-1}^2$$

$$\Rightarrow h_t^2 = h^2(p_t, w_t^2, b_{t-1}, y_t - \rho(\mu^t, y_t, w_t^1, w_t^2, b_{t-1}))$$

$$\text{with } b_t^1 + b_t^2 = b_t \forall t$$

Proof. First and Second Welfare theorems.

The sharing rule ρ^t is chosen in each period t and it reflects the current bargaining power balance μ^t .

In every period t, only the current distribution of bargaining power in t matters: consequently, ρ^t , as μ^t is, is affected by bargaining power variables only of time t. Under no commitment, the household renegotiates the bargaining power balance and optimal allocations in each t, using the sharing rule ρ^t . Ceteris paribus, spouses use $\rho^t = \rho^0$ if $t < \text{legal}$ and, at the time of legalization $\rho^t = \rho^{\text{legal}}$ for $t = \text{legal}$. Consequently, we can state that, everything else being equal:

- $\mu^{\text{legal}+k} > \mu^{\text{legal}-j} \Rightarrow \rho^{\text{legal}+k} > \rho^{\text{legal}-j} \quad \forall k \geq 0 \quad \forall j > 0 \Rightarrow h_{\text{legal}+k}^1 < h_{\text{legal}-j}^1 \quad \forall k \geq 0 \quad \forall j > 0$
- $\mu^{\text{legal}+k} > \mu^{\text{legal}-j} \Rightarrow \rho^{\text{legal}+k} > \rho^{\text{legal}-j} \quad \forall k \geq 0 \quad \forall j > 0 \Rightarrow h_{\text{legal}+k}^2 > h_{\text{legal}-j}^2 \quad \forall k \geq 0 \quad \forall j > 0$

If actual accessibility of abortion changes over time and correspondingly affects her bargaining power, we can also state that:

- $\mu^{legal+k} \begin{matrix} > \\ < \end{matrix} \mu^{legal+j} \Rightarrow \rho^{legal+k} \begin{matrix} > \\ < \end{matrix} \rho^{legal+j} \quad \forall k \geq 0 \quad \forall j > 0 \quad \Rightarrow h^1_{legal+k} \begin{matrix} < \\ > \end{matrix} h^1_{legal+j} \quad \forall k \geq 0$
- $\mu^{legal+k} \begin{matrix} > \\ < \end{matrix} \mu^{legal+j} \Rightarrow \rho^{legal+k} \begin{matrix} > \\ < \end{matrix} \rho^{legal+j} \quad \forall k \geq 0 \quad \forall j > 0 \quad \Rightarrow h^2_{legal+k} \begin{matrix} > \\ < \end{matrix} h^2_{legal+j} \quad \forall k \geq 0$

Ceteris paribus, the increase in the wife's share of non-labor income represents a positive income effect, making her labor supply decrease after the legalization. The prediction for husbands has the opposite sign, since their share of non-labor income consequently decreases: bargaining power is indeed a relative concept. Moreover, the wife's (husband's) labor supply may further decrease (increase) after the legalization if the accessibility of abortion, measured as territorial availability of abortion clinics and/or price for an abortion surgery, increases (decreases) over time.

Before turning to the data analysis, I present a summary of the prediction that each model yields on spouses' labor supply evolution over time in response to the abortion legalization. These predictions will be tested in the data. The negative effect of abortion legalization on fertile wives' labor supply and the corresponding positive effect on their husbands' labor supply seem unique to the bargaining power effect; also, they specifically concern women in their fertile age who have a spouse. In particular, the impact on married fertile female labor supply is the opposite of those predicted for all fertile women by the fertility effect and the technology effect.

summary of testable prediction of the models

Changes due to the legalization of abortion on fertile wives' and their husbands' labor supply

Before and after the legalization

	Share of non-labor income		change in her share	wife's ΔLs	husband's ΔLs
	<i>before</i>	<i>after</i>	<i>before / after legal</i>	<i>before / after legal</i>	<i>before / after legal</i>
$\forall k \geq 0 \quad \forall j > 0$					
Full Commitment	ρ^0	ρ^0	$\rho^0 = \rho^0$	$h^1_{legal+k} = h^1_{legal-j}$	$h^2_{legal+k} = h^2_{legal-j}$
Commitment with renegotiation at $t = legal$	ρ^0	ρ^{legal}	$\rho^{legal} > \rho^0$	$h^1_{legal+k} < h^1_{legal-j}$	$h^2_{legal+k} > h^2_{legal-j}$
No Commitment	$\rho^{legal-j}$	$\rho^{legal+k}$	$\rho^{legal+k} > \rho^{legal-j}$	$h^1_{legal+k} < h^1_{legal-j}$	$h^2_{legal+k} > h^2_{legal-j}$
			$\rho^{legal+k} \begin{matrix} > \\ < \end{matrix} \rho^{legal+j}$	$h^1_{legal+k} \begin{matrix} < \\ > \end{matrix} h^1_{legal+j}$	$h^2_{legal+k} \begin{matrix} > \\ < \end{matrix} h^2_{legal+j}$

III. Labor supply specifications

To test these predictions, I use the following labor supply equations:

$$h_t^1 = f_o + f_1 \log w_t^1 + f_2 \log w_t^2 + f_4 \log w_t^1 \log w_t^2 + f_3 y_t + f_5 s_t + f_6 z_t + \text{temporal and spatial fixed effects}$$

$$h_t^2 = m_o + m_1 \log w_t^1 + m_2 \log w_t^2 + m_4 \log w_t^1 \log w_t^2 + m_3 y_t + m_5 s_t + m_6 z_t + \text{temporal and spatial fixed effects}$$

I consider preference parameters such as age and education of each spouse, race, household composition, number of children and presence of infants, which represent a relatively standard specification in the labor supply literature. I assume that the individual discount factors and household's net savings are captured by those variables for both spouses and that the constant interest rate is also captured by the fixed effects.

Moreover, since I will focus on a data set of households both in a time series and cross-sectional dimension, the variation in legalization of abortion and its accessibility will not only be across time but across states as well.

In particular, to test for the bargaining effect of abortion legalization I will use the following specifications:

$$h_t^1 = a + b \text{ dy_legal} + X \beta + \varepsilon^1$$

$$h_t^2 = f + g \text{ dy_legal} + X \gamma + \varepsilon^2$$

The other regressors X include: logarithm of each spouse's wage, cross term of these logarithms, age and age squared, years of school of each spouse, household non-labor income, number of children in the household, dummy variable for the presence of infants, number of family members, dummy for blacks, logarithm of state total income as a measure of state local economy and unemployment, dummy variables for divorce laws such as unilateral and community property provisions, year fixed effects and region fixed effects (North East, South, West, with dummy variables for California and New York states and their corresponding regions adjusted)¹⁴.

The dummy variable dy_legal is equal to one if abortion is legal¹⁵. In terms of the models, it captures the possible sharing rule switching from ρ^0 to ρ^{legal} , with $\rho = \rho^{legal} \forall t \geq legal$, i.e. whether abortion legalization increases female bargaining power in the household and whether households renegotiate their marital contract in response to the legalization¹⁶. It is a test of the full commitment assumption.

¹⁴ These preference parameters and controls are similar to those used in the labor supply literature, in particular in Chiappori et al. (2002) where the specific issue of bargaining power effects on labor supply is analyzed.

¹⁵ In particular, it takes value of one for the five states that legalized abortion in 1970 and subsequently for all the US from the national legalization of January 1973 on (Supreme Court ruling of Roe vs. Wade).

¹⁶ In fact, the Supreme Court decision in 1973 legalized abortion unexpectedly, so that dy_legal represents an unanticipated shock. As to state legalizations in 1970, one for sure was expected (WA); however 1970 is the earliest year in my sample so that I do not exploit the time variation of these legalizations, but just the cross-sectional difference.

In this framework, testing these predictions consists of testing if dy_legal has a negative significant impact on fertile wives' labor supply and if it has a positive significant impact on their husbands' labor supply.

Alternatively, to test the bargaining effect not only of abortion legalization per se, but of possible changes in abortion accessibility, I will use the following specifications:

$$h_t^1 = a + c \, dy_low + d \, dy_high + X \beta + \varepsilon^1$$

$$h_t^2 = f + m \, dy_low + n \, dy_high + X \gamma + \varepsilon^2$$

The dummy variable dy_low (dy_high) is equal to one if abortion is legal and there is a low (high) accessibility according to state abortion rates¹⁷ yearly ranking, a good proxy for actual availability of abortion clinics and accessibility in terms of prices and services. I use a ranking threshold to classify states according to their abortion rates, year by year¹⁸. States whose abortion rate in a given year is ranked above that threshold have dy_high equal to one (and dy_low is equal to zero); those which have it below have dy_low equal to one (and dy_high is equal to zero). The classification is updated year by year, so that those dummy variables capture the actual variation in accessibility¹⁹.

By construction, the sum of these two dummies is equal to dy_legal .

Those dummy variables capture both the legalization and the possible variation in the degree of accessibility²⁰. In terms of the models, they capture the possible sharing rule switching from ρ^0 to ρ^{legal} , possibly with $\rho^{legal+k} \begin{matrix} > \\ < \end{matrix} \rho^{legal+j} \forall k \geq 0 \forall j > 0$, i.e. whether abortion legalization and its accessibility increase female bargaining power in the household and whether households renegotiate their marital contract in response to the legalization and changes in accessibility. It is a test of the full commitment assumption versus the renegotiation assumption; it is also a test of the non-commitment assumption with renegotiation according to the evolution in abortion accessibility.

In this framework, testing the prediction of the impact of the legalization per se consists of testing if dy_low and dy_high have a negative significant impact on fertile wives' labor supply and a positive significant impact on their husbands' labor supply. Then,

¹⁷ Number of abortions per thousand live birth.

¹⁸ For each year, I rank all the fifty-one states according to their abortion rates for that year. Since the categories are updated year by year, a state can be classified differently across years, also if it exhibits the same abortion rate. Given the steady increase in abortions just after the legalization, evaluating how accessible abortion is in a given state really depends on the period of time and on the other states.

¹⁹ I do not use the abortion rates per se as a proxy for accessibility, because there is no reason to expect bargaining power to vary continuously with the actual rates: bargaining power may increase if abortion legalization represents a relevant opportunity for women, as it would be the case in "high" availability states, but not just if abortion rates increase of a given amount of units. I nevertheless run the regressions with actual abortion rates as a regressor, instead of those dummy variables; its coefficients have the right sign, even though not significant.

²⁰ I also tried to use a dummy for the presence of Medicaid funding for abortion across states and years. It turned out to be not significant across specifications, possibly because it may concern only women under Medicaid.

testing the prediction on accessibility consists of testing if these dummies have a statistically different coefficient, with the coefficient on dy_high bigger in absolute value than the dy_low one ($|d| > |c|$ and $n > m$)²¹.

I additionally use singles and divorced women in their fertile age as control groups. For them, the household is composed of only one decision maker, so that the collective model collapses into the unitary one, without negotiations, reservations utility nor pareto-weight. Legalization of abortion can not affect any intra-household bargaining power by definition, since they are a single-member household. Accordingly, I will use the corresponding labor supply equation:

$$h_t = f_0 + f_1 \log w_t + f_3 y_t + f_4 s_t + f_5 z_t + \text{temporal and spatial fixed effects}$$

where f_4 should be zero, since single individual's labor supply does not depend on bargaining power variables.

In particular, to test for the absence of bargaining effect of abortion legalization, I will use the following specifications:

$$h_t = a + b \text{ dy_legal} + X \beta + \varepsilon$$

or alternatively:

$$h_t = a + c \text{ dy_low} + d \text{ dy_high} + X \beta + \varepsilon$$

where in X there are the same types of regressors as before but only those concerning the single member.

All the models' testable predictions imply that these coefficients b , c and d should not be significantly different from zero.

IV. Data description

I use the Panel Study of Income Dynamics (PSID) data; this data set starts in 1968 and collects annual observations, following the same families and their split-offs over time. Households are followed through time by keeping track of the "head" of the household, who is also the interviewed person. In households including a couple, the husband is automatically considered the head in almost all cases²².

²¹ If the coefficients are not statistically different, the specification collapses to the previous one with dy_legal , since by construction the latter is equal to the sum of the dy_low and dy_high .

²² I eliminate the very few households (less than 2 % of couples) where the sex of the head is female while there being a male spouse in the family.

I use waves 3 to 13, i.e. data from 1970 to 1979. I do not use 1968 and 1969 data because some variables of interest are not recorded in these first two years, and the coding of many variables is not comparable to those of subsequent years. Wave 13 is only used to assign income and labor variables to year 1979²³.

My sample is composed of married, singles and divorced²⁴. The PSID code for marital status classifies couples that are cohabitants as married. This makes my sample more representative of US families that have an actual spousal interaction decision process; it should also avoid a selection bias towards couples that decide to get legally married. Moreover, there is no risk to include unstable and short-term relationships in the sample, because PSID treats cohabitants as married only from the second interview wave in which they are found to be living together²⁵. To comply with the theoretical predictions on renegotiation of marital contracts, I only keep couples who got married before the legalization of abortion²⁶.

Moreover, I also split the sample according to age of wife (or of female single or divorced), to divide fertile from non-fertile women. These two groups are kept totally separate, since the same household is not allowed to have observations in both groups. There being no fertility question in the PSID, I use an age threshold below which women are considered fertile: I consider forty years old, a standard age upper bound, at least in 1970s when medical fertility technology was not yet developed²⁷.

I exclude observations for which either the husband or the wife are different from one year to the subsequent one²⁸. This means that if a new household forms, it will enter my sample only from the subsequent year on. The main concern here is that whenever there is a major change in family structure, it is not clear to which head and wife the questions on income and labor are referred to, and also which spouses are affected by the law changes analyzed in this paper.

In addition to this, I keep only couples where the wife is actually present and exclude all households that have other income receivers besides the husband and wife. Since the focus is on the bargaining power balance within spouses, I cannot keep families where one spouse is in fact absent or households where other adults not only do live together with the couple, but represent an additional source of household income and potential decision power. Consequently, the household income variables are computed net of these other income receivers' total labor and transfer income.

²³ Later years are not included in the sample because laws, state regulations, amendments and Courts' rulings on abortion issues become much more frequent, making the classification of whether abortion is legal more problematic.

²⁴ I do not include widowed and separated couples to keep a neat distinction between multiple decision makers and one decision maker households.

²⁵ In fact, PSID records a "self-reported" marital status variable from 1977 on, where this distinction is actually made. Comparing these two variables at the end of the 1970s, it looks like at most 1 % of the PSID sample is cohabiting, representing around 1.5 % of all couples.

²⁶ Before the national legalization and also before the state legalization for those households living in the five states that legalized abortion in 1970. I have used different measures of "married before state legalization", including or not households which moved to those states just after 1970, requiring or not that they stay in one of those states at least up to 1972, etc. Results are robust to these definitions.

²⁷ As to non fertile women, using forty years old as lower bound should retain at most 5 % of all pregnancies. At any rate, results are robust to changes in the age threshold and in particular to its increase as lower bound for non fertile.

²⁸ To check if a household that is present in the survey for more than one year is actually composed of the same husband (wife), I check if the husband (wife) at time t is at most two years older than at time $t-1$: if this condition is not fulfilled, I do not include the corresponding household observation in my sample for year t . This is done through the dummies "dy_check_h" and "dy_check_w" for husband and wife respectively.

My main sample consists of working individuals (in case of couples, both spouses have positive hours of work)²⁹. All individuals are aged 25 or more, to get more “stable” and homogeneous households, for which the assumption of efficiency in the intra-household decision process is more likely to be satisfied, and especially to discard full-time students, teenagers and very young married and divorced couples.

The dependent variables, annual hours of work (of husband and wife), are defined as total annual hours of work on all jobs in a given year. The wage rate is computed in the data as the average hourly earnings, defined by total labor income divided by annual hours of work. Total family income is the total amount of resources available to a household in a given year³⁰. I construct the variable non-labor income available to husband and wife as total family income minus the labor incomes of both spouses. All income, wage and labor hour variables refer to values of the calendar year prior to the interview and thus are “lagged”. All monetary variables across years are also deflated by the CPI index (for urban consumption, not seasonally adjusted, June figures) and are in 1970 \$.

Children variables consist of the total number of children aged 0-17 present in the household (there being no detailed information on children’s age brackets in the interview waves under consideration), and of a dummy variable “dy_age03child” denoting a household where the youngest child present is aged at most three years old.³¹

As to education, I use the number of grades completed by husband and wife. PSID started to record this variable in 1975, topcoding the years of schooling at 17. There are no missing values for this variable and since it is a variable that remains constant over time when you are no longer a student, I attributed the 1975 values back to the same households present in years 1970 to 1974³². As to race, only race of the head of the household is available, so that we cannot detect how many interracial couples there are. I construct a dummy variable (dy_black) denoting a black household head. In the PSID sample in the 1970s individuals are almost all either black or white, so that one dummy should be enough to capture the racial effect on labor supply and household behavior in general.

Outliers on total family income, wage, hours worked and number of children are excluded from the sample. Specifically, an observation is considered an outlier if it belongs to the top or bottom 2 % of the sample distribution (only top 2 % for children, otherwise we would eliminate all households without children; as to hours worked, only positive amounts are considered to compute the outliers). I also drop households where the husband, or the single decision maker, has three years of school or less. I do not remove

²⁹ This may introduce a selection bias towards non working individuals. I take into account of this bias in my empirical analysis.

³⁰ All household net assets (rents, dividends, interest) are included in “taxable” income, which in turn is included in the definition of total household income. I cannot compute any savings or any income variable net of savings because in the 1970s PSID does not record any savings variable.

³¹ Children variables, as well as non-labor income and wages, are treated as exogenous variables in my main specifications. There is some evidence that they are not likely to be endogenous: for instance, using PSID data in 1970s and married women’s labor supply as I do, Mroz (1987) can not reject the exogeneity of children, non-labor income and wages. At any rate, I take into account of the possible endogeneity issues in the sensitivity section.

³² This procedure drops few households, especially because my sample mainly consists of households who got married before the legalization, so that they were already present between 1970 and 1972. Also, I believe the exact years of schooling to be a better education measure than the bracket variable “education” available in PSID from 1968 for heads and, missing between 1969 and 1971, for wives.

the so-called “poverty sample”. It consists of families who were poor (below twice the poverty line) in 1966: however, by 1970 and even more so by the end of the 1970s, those households may have come out of poverty and I already exclude income outliers.

Finally, to take into account of shocks to both the overall US economy and the state local labor market conditions, and of the fact that people may be different across different areas in the US, I use years fixed effects, regions³³ or alternatively state fixed effects, and the logarithm of state total income, as a proxy for state GDP. I cannot use the more specific state unemployment rate because up to the end of the 1970s it is not available; the county unemployment rate recorded in the PSID does not help either, since it is still a bracket variable and the coding changes during the sample period. I then discard the few observations from Alaska and Hawaii and abroad in the effort to maintain a homogeneous sample.

I use PSID household weights to make the sample representative of the US population and economy.

To account for different divorce laws in this decade, I follow Chiappori et al (2002), Gray (1998), Friedberg (1998) to construct three dummies, for unilateral divorce laws, community property laws and for the joint presence of these two provisions³⁴.

My estimation sample consists of around 1897 households on average (6079 observations), of which 1491 (4869) come from multiple-decision-maker households and 406 (1210) have only one decision maker. In particular, 968 (3254) come from fertile married women’s households, 297 (1026) from older married women’s households, 212 (672) from fertile single women and 194 (538) from fertile divorced women. For single and divorced, I focus on young women to have reasonable control groups to test the effects of abortion laws on household bargaining power.

Men work on average more annual hours than women and earn a higher hourly wage. Also, husbands are on average 3 years older than wives. As to education, on average married men have more years of schooling than married women in young couples, but this is no longer true in the other groups. Black married couples are less than one half of the number of whites, while black young single and divorced women represent around 50 % of their group. On average non-labor income is higher for older married couples than for younger and for single women, but it is somewhat lower than for divorced women. Its large variance is due to the fact that younger households have on average negative assets while older households tend to have positive assets, its maximum values are in fact much higher for older couples.

³³ I consider the PSID regions North East, North Central, South, West and Alaska-Hawaii, from which I exclude California and New York states, to add specific dummies for CA and NY, to single out these two highly populated and economically relevant states.

³⁴ The majority of states inacted the unilateral divorce provision between 1970 and 1975. In fact, these two provisions may be distribution factors potentially influencing spousal bargaining within intact households. The dummy for unilateral divorce (“dy_unil”) is constructed in the following way: a state in a given year is defined to have a unilateral divorce law, if spousal consent is not required to divorce and if fault grounds are not allowed not even for property settlements and alimony. Since unilateral divorce laws per se are not favorable to women, unless they are paired with favorable laws concerning property division, I also use a dummy variable for the presence of community property laws. Married women’s bargaining power is likely to be stronger in community property jurisdictions when unilateral divorce is legal, or under common law and mutual-consent divorce, if household assets are disproportionately in the husband’s name. Refer to the Appendix for a scheme of states and years in which these laws are present.

V. Results

V.1 Main specifications

I run my labor supply regression specifications³⁵ on fertile married women, their husbands, and on the other “control” groups such as single, divorced women in their fertile age and married women no longer fertile.

The main specification with `dy_legal` and region dummies outlined in Section III yields clear results.

For fertile married women the coefficient of `dy_legal` is negative significant; correspondingly, their husbands exhibit a positive significant coefficient, as theory predicts. For all the other groups not affected by the abortion bargaining power effect because wives are no longer fertile or because there is no spouse, `dy_legal` is totally not significant. Moreover, these coefficients of fertile married women, their husbands and married non-fertile women are also statistically different³⁶.

To corroborate my results, I consider four other specifications of the same labor supply equations for the same groups of households: heckman two-step to take into account of a possible selection bias for working individuals, fixed and random effects models for households effects and state instead of region fixed effects in my main regressions. It is remarkable that all these specification confirm the negative significant effect of abortion legalization for married fertile women and a corresponding positive impact for their husbands, while the legalization appears not to be significant in explaining the labor supply pattern of single and divorced fertile women and of married non-fertile women³⁷.

Looking at the magnitude of this impact of abortion legalization on bargaining power in terms of labor supply, the decrease in annual hours worked of married fertile women is of about 200 hours at 3 % significance, while for their husbands the corresponding increase is of about 80 hours at 1 % significance. These effects are sizable, corresponding to a 15 % reduction of the average hours worked by married women below forty years old; for their husbands, the percentage becomes a 3.5 % increase of their average hours worked. Conversely, the magnitude of the coefficients for singles, divorced fertile women and for non-fertile married women is negligible, sometimes even positive and definitely not significant. The magnitude of the impact of abortion legalization is large, especially if we think that in the 1970s women are steadily increasing their labor participation and labor supply, and that abortion legalization directly affects fertility in a way that should increase female labor supply. If we compare this abortion bargaining power effect to the divorce

³⁵ I use robust standard errors (Huber/White/sandwich estimator of variance), clustered by state. Even though I do not impose the panel dimension structure in the covariance matrix, I account for the independence of households’ observations between states and allow for a possible independence across households within a state; also, I use years, regions or state fixed effects in all regressions. Clustering by state should be sensible in a framework where geographic, as well as legalization variations across time and space are relevant. However, clustering by household identity yields the same results.

³⁶ I can not pool singles or divorced women together with married fertile women in order to test for the statistical difference of their coefficients, because the former are single decision maker households and hence have a distinct labor supply equation.

³⁷ However, only the heckman two-step exhibits a statistical difference in coefficients. In the PSID the cross-sectional dimension is too large compared to the time dimension, especially for only one decade of data; using fixed effects models may wipe out all the variation across households; the same may happen to the state fixed effect specification, with the presence of 48 dummies in each regression. It is also true that I cannot use household weights in the fixed and random effects models in my statistical package, as instead I do in all my other specifications; the lack of statistical difference in the fixed, random and state effects may be due to the imprecise estimates.

bargaining power effect on labor supply documented in Chiappori et al. (2002), results are similar. In their study of cross-sectional differences of divorce laws across states, the mutual provision decreased female labor supply by 117 hours and increased their husbands by 22 hours on average. My magnitudes, as well as the stronger response of women with respect to men, are comparable to theirs; nevertheless, the average hours worked in my 1970s sample of young women are lower than theirs in 1989, making my 15 % and 3.5 % around the double of their effect. These figures seem sensible if we think that my sample consists of women below forty years old and their husbands: not only younger couples may be more responsive, but on average they also work fewer hours than couples up to sixty years old. Furthermore, if other common divorce provisions such as community property division and/or enforced court payments are also in place, the changes in hours become more than 10 % for women and around 3 % for men, exactly comparable to mine³⁸. It seems reasonable that abortion legalization represented a major increase in female bargaining power since it has been a one-shot symbolic shock; moreover, the legalization of 1973 by the Supreme Court ruling was sudden. Those divorce laws state variations concern particular provisions, not the legalization of divorce per se. The control that women achieve on their fertility increases their decisional power on such a relevant issue for both spouses as children, and at the same time increases their monetary power because the uncertainty in their future earnings decreases (if not their expected value increases) due to their ultimate control on fertility.

Similar evidence comes from the other labor supply specification with the availability indexes dy_low and dy_high . I use the threshold top 20 % (bottom 80 %) of state abortion rate ranking. These regressions as well show that only married fertile women and their husbands are affected by the legalization. Moreover, not only their coefficients for both dy_low80 and dy_high20 are negative significant, but the coefficient for dy_high20 is always larger (in absolute value) than and statistically different from dy_low80 in the main specifications. It seems that the bargaining power effect may be enhanced by a high accessibility of abortion services.

All other variables in the regressions show parameter estimates at conventional levels, comparable to the female labor supply literature. In particular, the dummy for blacks is significant and sizably positive for young married women, whereas it is negative but mildly significant for singles and divorced young women. The dummy for infants is instead very significant and sizably negative for young married women, and it remains negative and rather significant also for the other groups of women. As to the divorce dummies, there are spurious results, also varying across specifications, which may be due to small sample size combined with the presence of many dummy variables³⁹. For instance, in the main specification, while for married fertile women the coefficients are all negative and

³⁸ Chiappori et al. (2002) also use a cross-sectional divorce laws index of various provisions, which yields smaller effects. However, my focus is on the intertemporal effect of abortion laws on labor supply, so that I compare my results to their state divorce laws variables specification.

³⁹ Two caveats apply to interpret these divorce laws pattern. First, among the category “married” there are also cohabitants, whose bargaining power balance should not be affected by divorce laws, at least not in the same way as legally married couples. Therefore, the presence of cohabitants can generate spurious results. Second, couples may envisage the possibility of a divorce when signing the marital contract, already ruling on division of property in case of divorce, so that divorce laws may not affect couples already married in the years preceding the state law change. Finally, estimating the effects of abortion legalization without the divorce dummies in my regressions, I obtain the same results, both in terms of significance and magnitude of the coefficients.

not significant, for their husbands the cross term is very negative and significant and the other two dummies are positive significant and for older married women the cross term between unilateral and community property is positive significant.

All this evidence goes in the direction predicted by the theory and suggests that the bargaining power effect of abortion legalization is relevant and sizable.

At the same time, these results represent a rejection of the unitary model, in which no distribution factor influences household behavior.

They also suggest a rejection of the full commitment model: marital contracts are imperfect and it seems like we can not model household behavior using a full commitment approach. The significant decrease of married fertile women's labor supply, and their husbands' corresponding increase due to legalization of abortion, show that couples actually respond to shocks such as abortion legalization and renegotiate their marital contract. They are also likely to update their decisions over time following the evolution of the actual accessibility of abortion.

To further test the power of my results I analyze subgroups of married fertile households with characteristics that to some extent predict their degree of response to abortion legalization. It is interesting to explore the pattern of the bargaining power effect within these ex ante dimensions.

V.2 Religion, birth control and expected children

With the help of questions asked in PSID, I identify three dimensions through which I divide my sample of married fertile women: 1) religion, i.e. catholic versus religious denominations not totally opposing abortion; 2) use of birth control, i.e. households using birth control versus households not using any; 3) whether more children are expected, i.e. households expecting more children versus households not expecting any more. The predictions within groups are the following. Catholics should exhibit a much lower (if any) bargaining power effect due to abortion legalization than the whole group of married fertile women and in particular lower than other religions with a more "flexible" view on abortion. For the Catholic Church, abortion is a capital sin and all the focus is on the rights of the yet-to-be-born child; whereas some protestant denominations, such as Methodists, Episcopalian, Presbyterian and atheist in general⁴⁰, somewhat express understanding for women's choice of unwantedness⁴¹ and the views on abortion never involve an inflexible definition as sin. As to birth control, if couples already use a contraceptive method, abortion legalization does not represent such a new opportunity to control fertility. Hence, the bargaining power effect should be much milder (if any) for this group than for

⁴⁰ I could not consider Unitarians because PSID does not single them out as a distinct group.

⁴¹ For instance, the Catholic Church states that "abortion directly violates the divine commandment "you shall not kill"...it's an attack against human life" (Evangelium Vitae, 1995), while Methodists state that "they respect the sacredness of the life and well-being of the mother, for whom devastating damage may result from an unacceptable pregnancy" (United Methodists Social Justice Stands).

the whole sample or for the households not using contraception. Supposedly female bargaining power already changed with their decision of contraception, and fertility is less likely to be a conflicting issue for these households. Finally, couples not expecting children may not consider abortion legalization as a shock to their bargaining power balance because fertility choices are no longer at stake for them: it does not really represent an opportunity that can change their decisions and give women more freedom, since fertility is presumably no longer a source of conflict. Consequently, the bargaining power effect should be much milder (if any) for this group than for the whole sample or for the households still expecting more children.

Some clarifications apply. In PSID, the question on religious preference is asked every year, while those about the use of birth control and expectations of more children have been asked only in 1972. This year is before the national legalization which is my main source of variation. The answer on expected children may be endogenous to abortion in states that legalized in 1970, before the question was asked: households living in those states may be more likely to answer that they do not expect children because they are aware of the abortion legalization and its implications for fertility. Yet, I believe this dimension is still indicative; in particular, if an endogenous bias exists it should go in the opposite direction of my prediction: it should make those answering “not expecting any more” more responsive to abortion legalization because the bargaining power effect should be already in place in those states. As to religion, two comments are needed. First, the attitude of the entirety of the believers towards abortion may not necessarily reflect the official positions of their churches on this topic. However, I believe my empirical results across religious groups are interesting since their views on abortion are clearly divergent. Second, all these questions in PSID are asked to the head of the household (husband), so that we know the religion of the head of the household. General statistics on mixed marriages and a later question on religion of the wife (not used for too small sample size) show that in around $\frac{3}{4}$ of marriages spouses are of the same religion, even more so in the 1970s⁴².

The evidence on these subsamples of married fertile women confirms these predicted attitudes. Across the main specification regressions run on catholics, the coefficient of `dy_legal` is totally not significant and very mildly negative, while for Methodists, Episcopalian, Presbyterian and atheist in general, `dy_legal` is negative and very significant and even of larger magnitude than for the whole sample. As to the birth control dimension, couples using birth control exhibit a non-significant negative coefficient on `dy_legal`; couples not reported to use birth control show instead a very negative and significant coefficient. The prediction of lower impact of abortion legalization on couples not expecting children is also confirmed: their coefficient of `dy_legal` is not significant across specifications, while for couples expecting more children `dy_legal` has a negative significant coefficient.

These findings, together with the results on different marital status groups, represent comforting and ample evidence against the rejection of bargaining power effects of abortion legalization and of the collective model with renegotiation.

⁴² I do not present here other dimensions, for instance whether or not there is a large age or education gap between spouses, because there are mixed results, very few observations for some subgroups and issues of selection bias.

VI. Sensitivity analysis

I performed robustness checks on my empirical results across various regression specifications and dimensions, to get a confirmation of my theoretical predictions on the bargaining power effect and its implications on renegotiation. I illustrate the main ones in what follows, while an extensive discussion of alternative explanations will be performed in the next section.

Looking at the income distribution dimension, I analyze the response to abortion legalization of rich and poor married households where the wife is in her fertile age⁴³. As for the top 10 % of per capita household income, it is interesting to notice that the coefficient of `dy_legal` is not at all significant and mildly negative across specifications, while for the remaining “non-rich” the coefficients are very significant and of a larger magnitude than usual. This goes along with the fact that women of wealthy families can definitely afford to get safe abortions even before the legalization, so that the event of the legalization does not really affect their opportunities for fertility decision. The bottom 10 % of the per capita household income exhibits negative coefficients of very large magnitude, but not significant unless in the regression with state fixed effects. Also, the non poor subgroup of my sample exhibit negative significant coefficients but lower in magnitude than for the whole group. In principle, poor households respond more to the bargaining power effect because the abortion legalization represents an opportunity really taken advantage of by this group as these findings suggest; however, the sample size on one hand and the fact that Medicaid funding for abortion was available only up to 1976 may create this low power result⁴⁴. The comparison across the income range seems to show that legalization of abortion increased female bargaining power more for households not at the top of the income distribution.

When I split the sample according to race, both black and white married fertile households exhibit a strong negative response to abortion legalization. It is somewhat surprising that the significance of `dy_legal` for whites is much higher than for blacks: even though a higher number of abortions are performed on white than black women, the abortion rate has always been higher for blacks.

In the data description section I mentioned the possible endogeneity of children. I address this issue as follows. First, in my main specifications I consider children and income variables as exogenous. My motivation is primarily that in the literature on female supply there is evidence for not rejecting this exogeneity. In particular, Mroz (1987) shows that the exogeneity of children and income variables is not rejected and he focuses on married women’s labor supply, using PSID data of the 1970s exactly as I do. Second, I run the reduced form regression of the labor supply equation without children variables and also without wages⁴⁵: I find the same pattern

⁴³ I will explicitly refer to the main group of married fertile women; however, as to the other groups, results keep the same pattern as in my previous analysis.

⁴⁴ I do not use the poverty sample as a poverty cutoff. In fact, in my sample of married fertile women, the average family income and non-labor income are similar to the corresponding averages of households not belonging to the poverty sample. See also Section IV.

⁴⁵ It may be too drastic to drop the wage variables as far as intra-household behavior is analyzed: each spouse’s wage is a potential source of bargaining power.

of results across specifications. The coefficient of dy_legal is negative significant for married fertile women and positive significant for their husbands, the magnitudes being very similar to my main specification. Also, for all the other groups the coefficient is not at all significant. Last, I instrument the children variables, non-labor income and wages; following Chiappori et al. (2002), I use years of school squared, father's education, dummy variable for being catholic, dummy variable for being Latino, lagged wages and non-labor income, and the other suitable regressors as instruments. In this case as well I find the same pattern of results.

The empirical results appear robust as well to modifications in the restrictions of the regression specification. Further robustness checks involve changes in the age cutoff for fertility of women (42-38 years old), in the age lower bound (22-28 years old), in the education upper bound and lower bound for each spouse (16 years of schooling instead of 17, 3 or 4 as lower bound), in the stability of marriage (same marital status in both the previous and subsequent year), in the abortion rate thresholds (top 25 % or 33 %). It may make sense to increase the age lower bound for divorced, to keep a more homogeneous group: women that around 25 years old are already divorced may differ systematically from the rest of the sample. If we decrease the age lower bound to 22, 20 years old, the same pattern of results is observed, but with lower abortion coefficients. The sample size increases considerably, especially for fertile married women and singles; however, the probability of these new observations corresponding to a student or exhibiting teenage behavior is too high in my opinion to be included in the benchmark estimations.

All these evidence across dimensions and specifications seems to confirm that the negative impact of abortion legalization on female labor supply is unique to married fertile women and that this bargaining power effect along with its prediction of renegotiation is sizable and significant.

As last step of my empirical analysis, let's turn now to discuss in depth the issue of alternative explanations to the bargaining power effect of abortion legalization. It is challenging to investigate other phenomena possibly driving such a distinctive pattern of a decrease only of married fertile women's labor supply and of a corresponding positive impact on their husbands'.

VII. Abortion and female labor supply: alternative explanations

The explanation that the bargaining power effect, as a prediction of the intertemporal collective model with renegotiation, provides for the peculiar impact of abortion legalization on married fertile women's labor supply and their husbands' is a priori not exclusive. However, the collective model per se and our data allow testing for possible alternative explanations. In general, singles, divorced⁴⁶

⁴⁶ I also run my main specifications on single and divorced men getting the same result of no significant impact of abortion and different pattern from married fertile women's labor supply.

and older married women's labor supply movements provide a simple and powerful test for explanations alternative to my bargaining power effect and its theoretical predictions. Other explanations may imply the same pattern for singles, divorced or old married women's labor supply, since they share the same gender, age level or marital status as the main group of married fertile women. Indeed, in all our data specification, the empirical evidence clearly shows that the variables capturing abortion legalization do not have any impact on singles, divorced and older married women.

My analysis consists of four points: 1) labor market shocks; 2) fertility and marriage market effects; 3) modifications in the use of contraceptives; 4) welfare effects for women.

1) Spatial variation of labor demand, gender-specific and/or age-specific, wider economic shocks, especially after the national abortion legalization in 1973 with the first oil shock, may explain the significant decrease in labor supply of young married women. I think we can discard this explanation of downturns in the labor market, mainly for two reasons. First, in all regressions I control for wages and economy changes through years and regions fixed effects and state total income; second, these supposed labor market downturns do not seem true for young singles and divorced, and for older married women; if we think that younger workers respond more to economic shocks or that sectors demanding young female labor experienced downturns, this should hold also for young singles and divorced, but this is not what I find. Also, we know that female labor supply increased much overtime (not decreased) especially for married women. If, instead, labor demand varies according to marital status, and my abortion dummies are correlated with these unobserved labor market characteristics, we should see the same pattern for all married women's labor supply both below and above the fertile age. Finally, such a distinctive increase in men's labor supply, only for those married to fertile women, is hard to reconcile with economic downturns⁴⁷. The issue of possible measurement error caused by mobility across states in which abortion is available should not seriously affect my estimates. The fact that women living in neighbor states can go to states where abortion has been legalized would cause downward bias in the coefficient of the abortion dummies, making the true bargaining power effect even larger than in my findings. Also, this problem may raise only for variation across state laws, while my main source of variation is the national legalization of 1973.

2) The impact of abortion legalization on fertility and possibly on the marriage market as the primary sources of female labor supply movements should not represent an alternative explanation. First of all, I control for children variables (number of children aged 0-17; presence of infants), as well as for the age of wives, their wages, labor supply, marital status; second, the delay or decrease in fertility that appear to be the direct effect of the legalization should lead to an increase in female labor supply (as found in the literature) not to a decrease only for married young women and to an increase for their husbands. The decrease in labor supply may indicate that they

⁴⁷ I am planning to analyze the impact of abortion legalization also on labor market participation decisions.

spend more time with their children. However, children variables are also instrumented and results do not change⁴⁸. Moreover, as to married market changes, I focus on couples who got married before the legalization, so that there should not be any such issue by definition.

3) In general, birth control and female contraceptive methods, whose usage might have spread out in the 1970s, may yield the same bargaining power effect on labor supply as abortion legalization, because they give women an opportunity to control fertility decisions. Condoms, for instance, can not be considered as a bargaining power variable favorable to women because they require male's consent, thus not providing women with the freedom to directly control fertility and in any case their usage widely spread one decade later, in the 1980s. I focus on the availability and change in use of the major female contraceptives such as IUD, diaphragm and above all the contraceptive pill. Typically, they all give women exactly the same independence of choice as abortion legalization does, at a lower economic and emotional cost. Hence, we could not disentangle the bargaining power effect of abortion legalization from the one of female contraceptive availability if all changes happened in the same period of time. It turns out that the pill became available to married women in 1960, and its diffusion was very rapid⁴⁹; as to the other two mentioned contraceptives, they were already available in the 1960s, and the major changes in their usage happened in the 1960s. As in point 2), their other possible fertility effects should move labor supply in the opposite direction than my findings, so as not to represent an alternative explanation, and in any case they would be captured by my children variables. Furthermore, it seems like there is no relevant substitution effect from female contraceptives to abortion: specifically, US data on married women and contraceptive use show a mild increase (less than 1 % per year on average) in the percentage of married women using contraception in general and the pill, IUDs and diaphragm in particular, during the 1970s.

4) An increase in welfare benefits to women may explain a possible increase in women's bargaining power and a decrease in their labor supply, since per se they represent a positive income effect. However, if welfare benefits somewhat discourage work and if their increase concerned all young women, singles and divorced would be affected too; if they concerned all married women, they would affect also women above their fertile age, as instead it is not the case. Moreover, I control for income, wages and children in all my regressions, so that welfare mechanism and eligibility, if any, should be captured by these variables. Primarily, the most important argument against this alternative explanation is that welfare by definition concerns only low-income households, whereas my results hold also when low-income are removed from my sample, with the same strong significant decrease in married fertile women's labor supply, the significant increase in their husbands' and no effect at all for singles, divorced and older married women⁵⁰. Finally, the timing and pattern of the main welfare benefits such as AFDC, EITC and mandated benefits look different from abortion legalization. For instance, AFDC real benefit per capita decreases in 1970s and it is generally not available to two-parent families (Hoynes, Moffit).

⁴⁸ I am planning to model fertility decisions in my commitment framework.

⁴⁹ "Its use was approved by FDA in 1960 and its diffusion was so rapid that by 1965, 41 % of young married women using some form of contraception were "on the pill"" (Goldin Katz (2000)).

⁵⁰ Actually, from the previous discussion on sensitivity, we know that for non-poor households results are even stronger than for the whole sample.

Mandated benefits were affected by the federal legalization in 1978 (Gruber). EITC begins in 1975 as a modest program and then expands in the 1980s (Eissa Liebman, Moffit).

All this discussion suggests that my identification strategy is plausibly capturing the claimed effect of abortion legalization on bargaining power, without an overestimation bias due to this kind of omitted variables. However, it is possible that abortion legalization is part of deep social transformations occurring in the 1970s, that may have changed the relationship and bargaining power balance between spouses; in particular, I am referring to the feminist and sexual freedom and widespread increase in women's importance in society, of which abortion legalization and its highlighted bargaining power effect represent a major outcome⁵¹.

VIII. Conclusions

In this paper I propose, model and estimate the bargaining power effect of abortion legalization, focusing on the consequences of this legalization on female power within the household. My findings suggest that this legalization positively affected female bargaining power in households where women are in their fertile age.

In the framework of an intertemporal collective model of labor supply, with possible commitment to marital contract, I analyze households that were already formed before the legalization and I test for the renegotiation of the household's initial contract in the presence of the shock to bargaining power balance represented by abortion legalization. Results seem to reject the full commitment assumption and, overall, the unitary approach to household behavior.

I consider the early abortion state laws in 1970 and the federal legalization in 1973 along with data on state abortion rates in the 1970s. I use PSID data from 1970 to 1979. I control for various family and labor market characteristics, and also for possible selection bias for working women. I find that the legalization significantly decreased labor supply of married women in their fertile age and significantly increased their husbands', while no such effect is found for older married women nor for single and divorced women or men. It seems that during the 1970s in the US there has been a relevant impact on households' decision process and a change in family allocation of resources, along with a redistribution of bargaining power between spouses and a major impact on female labor supply for those women favored by this intra-household reallocation and for their husbands. I performed many robustness tests across various regression specifications and dimensions to establish two results. First, this frequently debated public policy had an indirect impact on female bargaining power within the household, beyond the fertility, education and marriage market effects found in the literature.

⁵¹ I control for years and region fixed effects and for variables like race, education and children in all my estimates; it is also unlikely that these social changes had exactly the same time and state pattern as abortion legalization and abortion rates did. Finally, there is no reason to believe that these transformations would not impact older married women for a whole decade, nor singles and divorced young women and that they would decrease female labor supply.

Second, the pattern of abortion legalization in that decade is important to explain those family changes. Nevertheless, it is possible that abortion legalization belongs to deeper transformations in social norms occurring in the 1970s in the US. This big symbolic movement may have changed spouses' perception and the way to address women's concerns in the household.

This paper is meant to be a contribution to the understanding of the effects of abortion legalization, specifically by introducing the new dimension of bargaining power effect. The overall impact of legalization of abortion on various aspects of society may be wider than previously thought.

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National legalization

Roe vs Wade ruling by the Supreme Court

“The detriment that the State would impose upon the pregnant woman by denying this choice altogether is apparent. Specific and direct harm medically diagnosable even in early pregnancy may be involved. Maternity, or additional offspring, **may force upon the woman a distressful life and future. Psychological harm** may be imminent. Mental and physical health may be taxed by child care. **There is also the distress**, for all concerned, **associated with the unwanted child**, and there is the problem of bringing a child into a family already unable, psychologically and otherwise, to care for it.”

Roe vs Wade, 410 US 110, 153 (1973)

Abortion legalization in the US

NATIONAL LEGALIZATION

- 1973 ROE vs WADE ruling by the SUPREME COURT
constitutional right of privacy to choose abortion within specified periods; public funding

EARLY STATE LEGALIZATION

- 1970 CA NY WA AK HI:
broadly available within specified periods; public funding
- 1967-1970 AR CO DE FL GA KS MD NM NC OR SC VA:
only under special circumstances; no public funding

Table 1
SUMMARY STATISTICS

	<i>married ≤ 40 years old</i>			<i>married > 40 years old</i>		
	mean (std. dev.)	min	max	mean (std. dev.)	min	max
<i>HH characteristics</i>						
hours worked wife	1255.893 (686.4)	50	2484	1348.605 (665.57)	49	2480
hours worked husband	2228.919 (509.4)	175	3680	1968.24 (713.07)	172	3675
log of wage of wife	.887 (.542)	-0.82	2.06	.874 (.515)	-0.82	2.06
log of wage of husband	1.396 (.431)	-0.39	2.38	1.32 (.554)	-0.36	2.37
log wage_wife X log wage husband	1.288 (.949)	-1.39	4.81	1.234 (.943)	-1.23	4.08
age of husband	33.79 (5.58)	25	57	57.59 (6.91)	35	82
age of wife	31.098 (4.207)	25	40	54.97 (5.57)	42	72
# of years of school of husband	12.71 (2.73)	4	17	11.44 (3.22)	4	17
# of years of school of wife	12.39 (2.69)	0	17	11.69 (2.52)	0	17
household non-labor income	623.347 (1580.7)	-3000	12848	1704.88 (2507.98)	-1882.09	21630
labor income wife	3617.358 (2740.6)	36.19	13753.73	3843.954 (2924.28)	65.8371	14382.21
labor income husband	9605.573 (3945.83)	295	26779.14	8368.168 (4637.39)	279.1367	23891.63
# of children 0-17 in the family	1.793 (1.172)	0	5	0.218 (.67)	0	5
dummy for presence of infants	.272 (.445)	0	1	.009 (.092)	0	1
# of family members	3.81 (1.18)	2	9	2.28 (.79)	2	9
dummy for black	0.088 (.28)	0	1	.08 (.27)	0	1
<i>bargaining power variables</i>						
<i>abortion</i>						
dummy for legal abortion	.77 (.42)	0	1	.73 (.45)	0	1
dummy for top 20 abortion rate states	.19 (.39)	0	1	.24 (.43)	0	1
dummy for bottom 80 abortion rate states	.58 (.49)	0	1	.48 (.50)	0	1
<i>divorce</i>						
dummy for unilateral divorce	.19 (.39)	0	1	.19 (.39)	0	1
dummy for community property law	.13 (.33)	0	1	.16 (.37)	0	1
unilateral X community property law	.08 (.27)	0	1	.10 (.30)	0	1
# observations (# HH)	3254 (968)			1026 (297)		

All monetary variables are in 1970 \$

SUMMARY STATISTICS (continued)

single women ≤ 40 years old

divorced women ≤ 40 years old

	mean (std. dev.)	min	max	mean (std. dev.)	min	max
<i>HH characteristics</i>						
hours worked	1805.621 (538.2)	180	3612	1794.51 (568.78)	192	3643
log of wage	1.212 (.456)	-0.38	2.26	1.04 (.51)	-0.32	2.36
age	28.8 (4)	25	40	31.5 (4.31)	25	40
# of years of school	14.45 (2.22)	7	17	12.62 (1.86)	6	17
household non-labor income	466.5717 (1076)	-595.09	12616	1106.32 (1321.8)	0	8152.8
labor income	6527.175 (2762.735)	229.36	16099.58	5701.98 (3040.68)	238.04	16099.58
# of children 0-17 in the family	.19 (.66)	0	5	1.37 (1.07)	0	5
dummy for presence of infants	.037 (.19)	0	1	.088 (.28)	0	1
# of family members	1.2 (.68)	1	7	2.39 (1.09)	1	7
dummy for black	0.15 (.36)	0	1	.16 (.36)	0	1

bargaining power variables

<i>abortion</i>						
dummy for legal abortion	.88 (.32)	0	1	.89 (.31)	0	1
dummy for top 20 abortion rate states	.35 (.46)	0	1	.28 (.45)	0	1
dummy for bottom 80 abortion rate states	.53 (.50)	0	1	.61 (.49)	0	1
<i>divorce</i>						
dummy for unilateral divorce	.29 (.45)	0	1	.21 (.41)	0	1
dummy for community property law	.17 (.37)	0	1	.18 (.38)	0	1
unilateral X community property law	.15 (.35)	0	1	.13 (.33)	0	1

observations (# HH) 672 (212)

538 (194)

All monetary variables are in 1970 \$

Table 2Coefficients of *dy_legal*, the dummy variable for whether abortion is legal

Labor supply regression specifications (dependent variable = annual hours worked) run on the below groups of households

		<i>Married fertile women</i>	<i>Married non-fertile women</i>	<i>Single fertile women</i>	<i>Divorced fertile women</i>	<i>Men married to fertile women</i>
<i>reg</i>	coeff.	-228.9209	26.255	44.58089	-157.0001	84.74177
	robust SE	103.9693	113.5096	132.9282	180.494	29.98411
	P value	0.033	0.818	0.74	0.391	0.007
<i>Heckman 2 step</i>	coeff.	-231.0824	82.30643	45.22168	-172.7425	*
	robust SE	110.8786	175.1893	112.8936	155.007	
	P value	0.037	0.638	0.689	0.265	
<i>FE model</i>	coeff.	-188.4712	-108.9619	13.23701	187.5217	74.69084
	SE	76.78318	89.88847	134.1192	169.3872	62.1967
	P value	0.014	0.226	0.921	0.269	0.23
<i>RE model</i>	coeff.	-188.0799	-126.6303	-82.22237	80.23523	72.5349
	SE	68.24426	83.93027	124.1277	143.4389	54.75274
	P value	0.006	0.131	0.508	0.576	0.185
<i>reg with dy states</i>	coeff.	-159.997	-121.4914	-91.21757	-193.6216	84.73326
	robust SE	68.46778	181.3714	77.50126	187.325	36.59229
	P value	0.024	0.507	0.248	0.309	0.025
<i># observations</i>		3254	1026	672	538	3254
<i># obs. for heck. 2 step</i>		5542	2418	851	628	

Reg is my main specification with region fixed effects

Heckman 2 step is the heckman specification (mle) to take into account of the possible selection bias.

FE model is the fixed effects specification, where the unit of observation is the household.

RE model is the random effects specification.

Reg with *dy_states* is the specification with state fixed effects instead of regions.

All regressions use PSID household weights and are clustered by state (apart from the FE and RE specifications). * Men that are the actual husbands of the women in the first column: maximize a MLE function for these men's hours taking into account that their wives' wages may be missing because some wives may not be working (to be done soon)

Table 2 (continued)Coefficients of *dy_legal*, the dummy variable for whether abortion is legalLabor supply regression specifications (dependent variable = annual hours worked) run also on single and divorced men ≤ 40 years old.

		<i>Single men ≤ 40</i>	<i>Divorced men ≤ 40</i>
<i>reg</i>	coeff.	175.7288	-27.2507
	robust SE	248.3992	276.0511
	P value	0.484	0.922
<i>Heckman 2 step</i>	coeff.	160.4572	-26.3934
	robust SE	236.8591	268.6867
	P value	0.498	0.922
<i>FE model</i>	coeff.	-117.65	131.173
	SE	178.8833	485.7234
	P value	0.511	0.787
<i>RE model</i>	coeff.	65.84294	5.379355
	SE	151.9922	320.4882
	P value	0.665	0.987
<i>reg with dy states</i>	coeff.	115.0406	-165.534
	robust SE	283.7595	258.6806
	P value	0.688	0.526
<i># observations</i>		575	411
<i># obs. for heck. 2 step</i>		601	414

Table 2 (continued)

Labor supply regression specification with region fixed effects, run on married fertile women (dependent variable = annual hours worked)

Parameter estimates

	<i>coefficient (std. dev.)</i>	<i>P value</i>
log of wage of wife	361.8339 (106.1094)	0.001
log of wage of husband	-39.0113 (71.61748)	0.589
log wage_wife X log wage husband	-82.99519 (71.13886)	0.25
age of husband	17.14531 (51.09891)	0.739
age of wife	51.58722 (85.4188)	0.549
# of years of school of husband	-36.06613 (9.39346)	<.001
# of years of school of wife	-3.939507 (6.458533)	0.54517
household non-labor income	-.0348834 (.0115154)	0.004
# of children 0-17 in the family	-126.4458 (79.19902)	0.118
dummy for presence of infants	-218.1202 (37.58655)	<.001
# of family members	21.94691 (79.47724)	0.784
dummy for black	223.6212 (42.92378)	<.001
dummy for legal abortion	-228.9209 (103.9693)	0.033
dummy for unilateral divorce	-20.98487 (49.30132)	0.672
dummy for community property law	-27.90524 (114.7418)	0.809
unilateral X community property law	-131.0397 (129.2954)	0.316
intercept	236.0305 (1225.962)	0.848
<i># observations (# HH)</i>	3254 (968)	

Table 3

Labor supply regression specification with region fixed effects (dependent variable = annual hours worked)

Coefficients of *dy_low80* and *dy_high20*, dummy variables for whether abortion is legal and an observation is in a state ranked bottom 80 % or top 20% in the yearly ranking of state abortion rates (# of abortion per 1000 live births)

	<i>Married fertile women</i>		<i>Married non-fertile women</i>		<i>Single fertile women</i>		<i>Divorced fertile women</i>		<i>Men married to fertile</i>	
	<i>dy_low80</i>	<i>dy_high20</i>	<i>dy_low80</i>	<i>dy_high20</i>	<i>dy_low80</i>	<i>dy_high20</i>	<i>dy_low80</i>	<i>dy_high20</i>	<i>dy_low80</i>	<i>dy_high20</i>
coeff.	-283.026	-406.024	20.06508	-3.40724	46.87817	164.9584	-150.522	-138.05	110.5746	169.3013
robust SE	69.24833	94.27175	116.7178	170.9283	102.7196	119.0822	203.7031	289.398	37.48834	59.54954
P value	< .001	< .001	0.864	0.984	0.651	0.176	0.465	0.636	0.005	0.007
<i>test dy_low80=dy_high20</i>										
p value=	0.0131		0.79		0.0931		0.9196		0.1135	
<i># observations</i>	3254		1026		672		538		3254	

Table 4

Pooled regression (with region fixed effects) to test for the statistical difference of the dy_legal coefficients between married fertile women, their husbands and married non-fertile women.

The comparison group is men married to fertile women.

pooling married: married women fertile + married women non fertile + men married to fertile women

dummy variables for each group: \updownarrow $dy_womanXfertile$ \updownarrow $dy_womanXnon\ fertile$ \updownarrow comparison group

All regressors are interacted with $dy_womanXfertile$ and $dy_womanXnon\ fertile$.

Therefore, the following coefficients show exactly whether the impact of abortion legalization is statistically different across those groups

			# obs.	7534
	$dy_womanXfertile$	$dy_womanXnon\ fertile$		
coeff.	565.0953	-1994.89		
robust SE	1643.803	3186.643		
P value	0.733	0.534		
	$dy_womanXfertileXdy_legal$	$dy_womanXnon\ fertileXdy_legal$		dy_legal
coeff.	-313.663 ♣	-58.4868		84.74177
robust SE	105.1695	117.818		30.02624
P value	* .005	** 0.622		0.007

♣ = coefficient of dy_legal for fertile women *minus* coefficient of dy_legal for men married to fertile

→ *married fertile women *statistically different* from their husbands

**non-fertile married women *not* statistically different from husbands of fertile women

The other regression specifications yield the same results.

Table 5

Sample split according to religion: totally against abortion (catholic) versus not against it for fetus' health problem and/or unwantedness (Methodist, Episcopalian, Presbyterian, non-religious in general).

Labor supply specifications with region fixed effects, heckman 2 step and regression with state fixed effects, run on married fertile women separately for each of these religion subsamples.

Coefficients of *dy_legal* (1 if abortion is legal).

		<i>totally against</i>	versus	<i>not against</i>
<i>reg</i>	coeff.	-38.3774		-270.363
	robust SE	155.3451		71.20102
	P value	0.806		< .001
<i>Heckman 2 step</i>	coeff.	-75.6486		-317.816
	robust SE	181.6089		75.15555
	P value	0.677		< .001
<i>reg with dy states</i>	coeff.	-34.0743		-130.322
	robust SE	229.9041		95.25729
	P value	0.883		0.179
<i># observations</i>		538		821
<i># obs. for heck. 2 step</i>		1018		1425

Table 6

Sample split according to birth control: households using birth control versus households not using any.

Labor supply specifications with region fixed effects, heckman 2 step and regression with state fixed effects run on married fertile women, separately for each of these birth control subsamples.

Coefficients of *dy_legal* (1 if abortion is legal).

		<i>birth control</i>	versus	<i>no birth control</i>
<i>reg</i>	coeff.	-132.424		-324.359
	robust SE	91.72249		136.0439
	P value	0.157		0.021
<i>Heckman 2 step</i>	coeff.	-125.118		-328.503
	robust SE	100.0996		149.7651
	P value	0.211		0.028
<i>reg with dy states</i>	coeff.	-61.326		-257.439
	robust SE	100.662		102.8194
	P value	0.546		0.016
<i># observations</i>		1508		1708
<i># obs. for heck. 2 step</i>		2663		2824

Table 7

Sample split according to expecting children: households who expect to have more children versus households who do not.

Labor supply specifications with region fixed effects, heckman 2 step and regression with state fixed effects, run on married fertile women separately for each of these expecting children subsamples.

Coefficients of *dy_legal* (1 if abortion is legal).

		<i>expect children</i>	versus	<i>not expecting children</i>
<i>reg</i>	coeff.	-365.508		-95.3601
	robust SE	160.9679		85.19503
	P value	0.028		0.27
<i>Heckman 2 step</i>	coeff.	-372.739		-98.9465
	robust SE	173.1763		90.63988
	P value	0.031		0.275
<i>reg with dy states</i>	coeff.	-354.056		-24.677
	robust SE	131.8403		72.20521
	P value	0.01		0.734
<i># observations</i>		1258		1748
<i># obs. for heck. 2 step</i>		2009		3085

Table 8

Endogeneity of children

Reduced form: without children variables.

Labor supply specification with region fixed effects, heckman 2 step and regression with state fixed effects, run on the various groups of households.
Coefficients of *dy_legal* (1 if abortion is legal).

		<i>Married fertile women</i>	<i>Married non-fertile women</i>	<i>Single fertile women</i>	<i>Divorced fertile women</i>	<i>Men married to fertile women</i>
<i>reg</i>	coeff.	-218.0587	22.75624	49.16694	-143.2091	82.95802
	robust SE	125.3994	109.4018	133.4684	202.1719	30.90407
	P value	0.089	0.836	0.715	0.484	0.01
<i>Heckman 2 step</i>	coeff.	-122.4078	74.86539	58.99938	-165.8361	*
	robust SE	92.25219	185.1588	108.8397	169.5992	
	P value	0.185	0.686	0.588	0.328	
<i>reg with dy states</i>	coeff.	-137.95	-124.1756	-87.17336	-188.7488	82.92927
	robust SE	82.80495	183.4485	84.70196	190.1463	38.36995
	P value	0.103	0.502	0.311	0.328	0.036
<i># observations</i>		3254	1026	672	538	3254
<i># obs. for heck. 2 step</i>		5542	2418	851	628	

Table 9

Endogeneity of children and wages

Reduced form: without children variables and without wage variables.

Labor supply specification with region fixed effects, heckman 2 step and regression with state fixed effects, run on the various groups of households. Coefficients of *dy_legal* (1 if abortion is legal).

		<i>Married fertile women</i>	<i>Married non-fertile women</i>	<i>Single fertile women</i>	<i>Divorced fertile women</i>	<i>Men married to fertile women</i>
<i>reg</i>	coeff.	-217.449	-16.97248	55.80685	-143.3301	54.10276
	robust SE	133.4824	121.4101	121.7724	203.7939	30.82676
	P value	0.11	0.89	0.65	0.487	0.086
<i>Heckman 2 step</i>	coeff.	-217.797	47.35859	51.22016	-164.9558	*
	robust SE	133.2733	207.2481	115.2914	190.4857	
	P value	0.102	0.819	0.657	0.387	
<i>reg with dy states</i>	coeff.	-131.44	-151.5257	-98.70588	-185.3996	58.05851
	robust SE	90.59801	185.6277	110.4946	192.1337	35.8832
	P value	0.154	0.419	0.379	0.342	0.113
<i># observations</i>		3254	1026	672	538	3254
<i># obs. for heck. 2 step</i>		5542	2418	851	628	

Table 10

Endogeneity of children, non-labor income and wages

Instrumental variables

instrumented: children variables, # of family members, non-labor income, wages

instruments: squared years of school, father's education, dummy variable for catholic, dummy variable for latinos, lagged wages, lagged non-labor income, usual regressors.

Labor supply instrumental variable specifications with region fixed effects and with state fixed effects, run on the various groups of households.

Coefficients of *dy_legal* (1 if abortion is legal).

		<i>Married fertile women</i>	<i>Married non-fertile women</i>	<i>Single fertile women</i>	<i>Divorced fertile women</i>	<i>Men married to fertile women</i>
<i>reg</i>	coeff.	-251.2272	-70.11441	8.779538	63.72698	65.89961
	SE	127.1843	174.7398	231.994	1159.551	74.79564
	P value	0.055	0.69	0.97	0.957	0.383
<i>reg with dy states</i>	coeff.	-255.1584	-238.4495	-102.312	3140.038	85.35779
	SE	210.8705	307.8587	149.4029	31884.83	89.53028
	P value	0.233	0.443	0.499	0.922	0.346
<i># observations</i>		2789	929	644	508	2789

Table 11

Sample split according to race: black versus white.

Labor supply specification with region fixed effects, run on married fertile women separately for each of these race subsamples.

Coefficients of *dy_legal* (1 if abortion is legal).

		RACE	<i>black</i>	versus	<i>white</i>
<i>reg</i>	coeff.		-219.971		-231.997
	robust SE		270.002		90.06161
	P value		0.422		0.013
<i>Heckman 2 step</i>	coeff.		-474.748		-241.484
	robust SE		85.18445		93.07167
	P value		< .001		0.009
<i>reg with dy states</i>	coeff.		-258.101		-139.144
	robust SE		313.1801		52.51451
	P value		0.417		0.011
<i># observations</i>			918		2212
<i># obs. for heck. 2 step</i>			1358		3987

Table 12

Sample split according to income: top 10 % of the per capita household income distribution versus the remaining bottom 90 %.

Labor supply specification with region fixed effects, run on married fertile women separately for each of these income subsamples.

Coefficients of *dy_legal* (1 if abortion is legal).

		RICH	<i>rich</i>	versus	<i>not rich</i>
<i>reg</i>	coeff.		-28.1744		-263.207
	robust SE		158.6374		100.5283
	P value		0.86		0.012
<i>Heckman 2 step</i>	coeff.		-85.1317		-244.891
	robust SE		103.7555		117.7303
	P value		0.412		0.038
<i>reg with dy states</i>	coeff.		125.6645		-211.249
	robust SE		180.3523		80.10892
	P value		0.491		0.012
<i># observations</i>			234		3020
<i># obs. for heck. 2 step</i>			377		5165

Table 13

Sample split according to income: bottom 10 % of the per capita household income distribution versus the remaining top 90 %.

Labor supply specification with region fixed effects, run on married fertile women separately for each of these income subsamples.

Coefficients of *dy_legal* (1 if abortion is legal).

		POOR	<i>poor</i>	versus	<i>not poor</i>
<i>reg</i>	coeff.		-213.612		-221.87
	robust SE		162.7115		102.6152
	P value		0.199		0.036
<i>Heckman</i> <i>2 step</i>	coeff.		-1178.76		-223.899
	robust SE		93787.22		112.6973
	P value		0.99		0.047
<i>reg with</i> <i>dy states</i>	coeff.		-392.003		-148.801
	robust SE		195.41		64.94011
	P value		0.053		0.027
<i># observations</i>			412		2842
<i># obs. for heck. 2 step</i>			602		4940

Divorce laws in the US
unilateral consent and community property

- 1970-1975 AZ CA CO IN IA ME MN MT NE NV NM OK OR WA
unilateral w/o fault grounds and lengthy separation

AZ CA ID LA NV NM TX WA
community property already in place

- $dy_{unil} = 1$ if there is the unilateral provision
- $dy_{comprop} = 1$ if there is the community property provision
- $unil_X_comprop = 1$ if there are both these provisions
- unilateral per se not favorable to women
while
unilateral combined with community property should increase female bargaining power

Gray (1998); Friedberg (1998); Chiappori et al. (2002)

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(liii) This paper was circulated at the International Conference on “Climate Policy – Do We Need a New Approach?”, jointly organised by Fondazione Eni Enrico Mattei, Stanford University and Venice International University, Isola di San Servolo, Venice, September 6-8, 2001

(liv) This paper was presented at the Seventh Meeting of the Coalition Theory Network organised by the Fondazione Eni Enrico Mattei and the CORE, Université Catholique de Louvain, Venice, Italy, January 11-12, 2002

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