Yours, Mine and Ours: Do Divorce Laws Affect the Intertemporal Behavior of Married Couples?*

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October 2013

Abstract

This paper examines how divorce laws affect couples' intertemporal choices and wellbeing. Exploiting panel variation in U.S. laws, I estimate the parameters of a model of household decision making. Household survey data indicate that the introduction of unilateral divorce in states that imposed an equal division of property is associated with higher household savings and lower female employment, implying a distortion in household assets accumulation and a transfer towards wives whose share in household resources is smaller than the one of their husband. When spouses share consumption equally, separate property or prenuptial agreements can reduce distortions and increase equity.

*Department of Economics, The University of Chicago. Email: avoena@uchicago.edu. I thank my adviser Luigi Pistaferri and Michèle Tertilt as well as Caroline Hoxby, Petra Moser and Monika Piazzesi for their outstanding guidance as part of my dissertation committee at Stanford University. I am also grateful to Ran Abramitzky, Stefania Albanesi, Rick Banks, Maristella Botticini, Giacomo De Giorgi, Paula England, Max Floetotto, Seema Jayachandran, Hamish Low, Aprajit Mahajan, Neale Mahoney, Ellen McGrattan, Costas Meghir, Andrea Pozzi, Victor Rios-Rull, Martin Schneider, Brett Turner as well as participants in seminars and conferences. I owe special thanks to Elizabeth Powers and Jeffrey Gray, who provided critical data. I acknowledge the financial support of the Leonard W. Ely & Shirley R. Ely Graduate Student Fellowship through a grant to SIEPR and the Michelle R. Clayman Institute for Gender Studies Graduate Dissertation Fellowship.

This paper examines how property rights within marriage regulated by divorce laws influence the intertemporal behavior and the wellbeing of married couples. During the 1970s and 1980s, most U.S. couples entered a legal system which has allowed each spouse to obtain divorce without the consent of the other one and to keep a fraction of the marital assets, independently of who holds the formal title to the property (Golden 1983). This study explores the impact of the introduction of these regimes, namely of unilateral divorce and of equitable distribution, on the intertemporal behavior of couples. It also analyzes how the current divorce legal system affects the wellbeing of married and divorced women, who are often believed to face more negative consequences of divorce compared to men (e.g. Weitzman 1985, Peterson 1996), and the private consumption insurance opportunities available to couples.

To understand the welfare implications of the divorce law reforms, I build a dynamic model of household decision making that captures the key aspects of these laws. The model suggests that the impact of divorce laws crucially depends on how spouses allocate resources (consumption, leisure, assets) while married: only a spouse who has a sufficiently lower share of marital resources compared to the other spouse benefits from an equal division of property upon divorce, especially if (s)he can obtain divorce without the consent of the other spouse.

To uncover the parameters of intra-household allocation of resources, I examine the changes in household savings and wives' employment status in response to the reforms. In particular, I exploit the variation in U.S. divorce laws over time and across states using data from the Panel Study of Income Dynamics (PSID) and from the National Longitudinal Survey of Young and Mature Women (NLS-YW and NLS-MW), examining the behavior of the couples married *before* such reforms. These samples span from the late 1960s to the 1990s. Two main facts emerge from these surveys. First, the introduction of unilateral divorce in states where property is divided equally leads to higher accumulation of assets compared to states where property is not divided by the courts, but rather assigned to the spouse who holds the title to the property. Second, when unilateral divorce is introduced in states where property is divided equally, the women who are already married become less likely to work, while no significant change is observed in states that do not impose an equal division of property. Analysis of additional cross-sectional time use surveys between 1965 and 1994 suggests that the decrease in the labor supply of women was

associated with an increase in the amount of leisure time they enjoyed.

These estimates are consistent with the hypothesis that unilateral divorce results in limited commitment within marriage and in a reallocation of resources inside the household. Property division laws affect each spouse's divorce allocation. When a spouse can divorce unilaterally, the divorce allocations affect the intra-household allocations during marriage. This channel does not operate when divorcing requires the consent of both spouses. The estimates then also provide the information necessary to identify the parameters of intra-household allocation in the dynamic model. I use the estimated structural parameters to compute the welfare effects of the reforms and to perform counterfactual experiments, which examine who benefits and who loses from alternative legal regimes and from prenuptial agreements, and how such regimes affect consumption insurance.

The dynamic model, estimated by indirect inference, replicates the responses of assets accumulation and female employment when the wife's share of household resources in marriage before the reforms is sufficiently low compared to her husband's share, i.e. if wives' Pareto weight in the household planning problem is lower than their husband's Pareto weight. In particular, for couples married before the reforms, I estimate wives' Pareto weight to be equal to a third of their husband's Pareto weight. When mutual consent divorce is in place, such a weight entirely determines the ratio of the marginal utilities of spouses' consumption. After unilateral divorce is introduced, that ratio shifts to as spouses' participation constraints become binding.

The estimates indicate that women in the sample have a lower share of the couples' resources compared to their husband, assets included. Hence, they benefit from the laws that impose an equal division of property upon divorce. My simulation suggests that these women obtain a larger share of household assets at the time of divorce in community property states (where assets are divided equally) than in a title-based states (where assets are assigned to the spouse who holds the title to the property, reflecting the intra-household allocations). Equal division of property alters the allocation of resources in divorce compared the intra-household allocation, and unilateral divorce leads the divorce allocation to influence the intra-household one.

Moreover, unilateral divorce allows women who live in community property states to credibly exercise the threat of divorce and to gain, on average, more consumption and leisure also during marriage compared to the allocation in mutual consent divorce. Hence, a more symmetric

distribution of consumption in marriage follows from the symmetric distribution of resources in divorce that the equal division of property imposes.

The model indicates that asset accumulation during marriage increases because spouses' individual incentives to save are distorted by the reforms. Because mandated equal division of property does not reflect the allocation of resources within marriage, such regime results in the equivalent of a tax on savings for the spouse with larger Pareto weight, and a subsidy for the other spouse. For sufficiently low values in the wives' Pareto weight, the model also replicates the decline in female employment that follows the reforms.

I use the estimates of the parameters of the dynamic model to examine the wellbeing implications of the current property division rules. Given the estimates of the intra-household allocation parameters, my simulations suggest that, as intended by the policymakers who promoted it, the equal division of property granted more assets to women in the 1970s and '80s compared to a title-based property allocation. While such system benefits women with a low share in household resources, it may prevent women whose Pareto weight is close to their husband's weight from smoothing the marginal utility of their consumption upon divorce. When women consume as much as their husband in marriage, but have lower permanent income (for example, because of a gender wage gap), they may be better off in a separate property regime or signing a prenuptial agreement, as they may need to accumulate more savings to smooth the marginal utility of their consumption in case of divorce. Community property may preclude women from doing so, leaving them even more exposed to the consumption insurance costs of marital disruption.

The contribution of this paper is threefold. First, I develop and estimate a dynamic model that explicitly incorporates mutual consent versus unilateral divorce regimes and property division laws. In a dynamic setting, the introduction of unilateral divorce results in limited commitment to intra-household allocation, which is not present in the mutual consent regime. Intra-household reallocation in favor of wives, due to limited commitment, provides a straightforward explanation for the reduction in their likelihood of employment that is observed in survey data when unilateral divorce is introduced in community property states. This finding supports the evidence on the presence of limited commitment (Mazzocco 2007; Mazzocco, Ruiz and Yamaguchi 2007) in intra-household decision making, which reduces the opportunities to share income risk within the household, as indicated by my counterfactual simulation.

Second, this paper documents and explains the empirical relationship between changes in divorce laws (unilateral divorce and property division rules) and the saving behavior of married couples, adding to the literature that examines how unilateral divorce affects household outcomes, such as labor supply (Gray 1998, Stevenson 2008), the welfare of children (Gruber 2004), the divorce rate (Friedberg 1998, Wolfers 2006), household specialization (Stevenson 2007) and domestic violence (Stevenson and Wolfers 2006). In addition to the unilateral divorce reform, I document and exploit the variation in the introduction of equitable distribution over the course of the 1970s and 1980s. To isolate such a relationship from selection and sorting in the labor market, I examine a sample of couples that married before these reforms. Using panel household data, I show that asset accumulation and female employment respond to divorce law reforms in a way that is consistent with the predictions of the model. Understanding why the divorce laws affect the incentives to save and invest may have important policy implications, given the frequency of divorce in the United States and the fact that divorce laws are subject to continuous changes through the actions of courts and lawmakers. For example, in the summer of 2010, the state of New York approved no-fault unilateral divorce. Other states have introduced or consider introducing covenant marriages, which require the consent of both spouses to be broken.[1] Little is known about how or why the intertemporal behavior during marriage may respond to such reforms. Today, judges, legal authors and lawyers primarily rely on anecdotal evidence and personal experience when evaluating property division (Turner, 2005).

Third, this study illustrates the implications of the current U.S. property division laws on couples' welfare and shows that the equal division of property can sometimes result in the opposite of what policymakers intended when they promoted the removal of separate property. Divorce can generate significant economic costs, such as direct legal and relocation costs, as well as loss of economies of scale and risk sharing. It can be especially costly for the spouse with lower permanent income, who can no longer benefit from sharing resources with the partner. Because there is no market insurance for divorce, self-insurance plays a central role in consumption smoothing. This paper investigates how different ways of dividing property at the time of divorce can affect the ability of secondary earners to use savings to smooth consumption in divorce. Recently, some legal scholars have suggested that in order to insure the consumption of secondary earners, all

[1]Louisiana was the first state to approve covenant marriages in 1997, followed by Arizona and Arkansas. Several states are currently debating the issue (Nock, Sanchez and Wright 2008).

household property should be subject to division, including property acquired *before* marriage (Motro 2008). Others have instead suggested that even joint bank accounts should be banned to encourage spouses to manage their resources separately and let women have "a purse of their own" (Mahle 2006). This study shows that an unobservable parameter, wives' consumption share in marriage, has crucial implications for the debate over the benefits of alternative allocations of property rights inside the household. For a relevant set of values of this parameter (for instance, when husband and wife share consumption equally), mandated equal division of property assigns to secondary earners a *lower* share of household assets compared to a regime in which spouses can retain their own property or can jointly choose a division rule at the time of marriage. Thus, current property division rules may be inadequate to protect many secondary earners from a drop in consumption at divorce.

1 U.S. divorce laws: overview and literature review

Widespread and fundamental changes to state divorce laws occurred between the late 1960s and the 1980s. Across states and over time, spouses were allowed to divorce without the consent of the other party, and property division rules were modified to promote an equitable distribution of assets.

1.1 Grounds for divorce

Over the decades of analysis, the legal regimes governing the grounds for divorce in the United States can be described as mutual consent regimes and unilateral divorce regimes. Prior to the 1960s, state regulation allowed divorce only under mutual consent, which permits divorce when both husband and wife agree to it or based on fault grounds, such as adultery or domestic violence. The late 1960s brought about the start of the so-called "unilateral divorce revolution," which allows one party to obtain divorce without the consent of the other. From 1970 to 1990, the number of states allowing unilateral divorce grew from three to thirty-five, with considerable variation over time (see Table 8 in Appendix F).

A contentious literature has attempted to establish whether the surge in divorce rates that occurred in the 1970s was caused by unilateral divorce.[2] Making divorce easier may also affect

[2]By the Coase theorem, the change from mutual consent divorce to unilateral divorce should not affect the probability of divorce since couples should always be able to achieve the efficient outcome (Becker 1991). The assumptions underlying the Becker-Coase have been examined in the literature (Chiappori, Iyigun and Weiss 2007 and Fella, Manzini and Mariotti 2004). The empirical literature is vast and contentious: in cross-sectional

allocations within marriage, which could explain part of the decline in female suicide rate and domestic violence associated with the reforms (Stevenson and Wolfers 2006). However, research on how unilateral divorce affects the labor supply of women is not conclusive (cf. Gray 1998, Stevenson 2008).

Both an increase in the risk of divorce and a change in intra-household allocations due to divorce law reforms may affect household intertemporal behavior. Yet, there is little research on this subject. Stevenson (2007) finds that the introduction of unilateral divorce negatively affects the propensity to undertake marriage-specific investments, such as supporting a spouse through school, or buying a house, depending on the asset division regime.

1.2 Property division laws

Property division regimes over the period of analysis can be broadly classified into three main systems:

a) *Title-based regimes*, in which assets are allocated according to the title of ownership;

b) *Community property regimes*, in which marital assets and debts are divided equally between the spouses, under the presumption that they are jointly owned;

c) *Equitable distribution regimes*, in which courts have discretion in dividing marital assets in order to achieve equity. This process may result in equal division or in a division that favors either the spouse who contributed the most to the purchase of the asset or the one in higher financial need.

At the turn of the 20th century, property division based on the formal title to the property was the dominant legal regime, with the exception of eight states, primarily those with a French or Spanish colonial legacy, such as Louisiana, New Mexico or California, which had community property regimes. Over the course of the century, and in particular following the federal Uniform Marriage and Divorce Act (UMDA) of 1970, title-based states shifted towards equitable distribution (Golden 1983, Turner 1998).[3] The UMDA, which were intended to favor secondary earners

analysis, unilateral divorce states did not exhibit higher divorce rates (Peters 1986). Also, the empirical association between unilateral divorce and higher divorce rates in the state-level panel data (Friedberg 1998) may be driven by pre-existing trends in divorce rates (Wolfers 2006), apart from a short-term impact, which suggests that unilateral divorce increased the probability of divorce for couples that were already married (Mechoulan 2006). The difference between short-term and long-term effects may be driven by changes in the likelihood of marriage (Rasul 2003) and in the type of matches that arise in the marriage market.

[3]These legal reforms were salient to U.S. households. For instance, between June and July 1980, when equitable distribution was introduced in New York state, seven articles were published in *The New York Times* regarding

in divorce settlements, created the legal ground for the introduction of equitable distribution in all states: in 1989, Mississippi was the last title-based state to transition into equitable distribution (American Bar Association, 1977-2005).[4] In Appendix A, I illustrate how the timing of the transition from title-based regime into equitable distribution is uncorrelated with pre-reform proxies for the economic condition of women in each state.

From a theoretical perspective, the literature suggests that property division rules may influence both the accumulation of assets (Dnes 1999, Aura 2003) and marriage formation (Chiappori, Iyigun and Weiss 2008). While the reforms in property division rules have not been subject of empirical analysis, their cross-sectional variation has been used as a distribution factor in intra-household bargaining (Chiappori, Fortin and Lacroix 2002) and appears to influence the way unilateral divorce affects female labor supply (see Gray 1998).

2 The model

This model takes household formation as given, and hence is meant to examine the impact of divorce law reform on couples that are already married. To identify the channels through which divorce laws affect household behavior and welfare, I develop a dynamic model of household choice in which spouses jointly decide how much to save, how to allocate consumption and whether or not to work. Two individuals, husband H and wife W, are married at time 1 and live until time T. In every period from time 1 to T, they jointly choose how much to save, how to allocate private consumption between the spouses and whether to stay together or divorce. Between time 1 and time $T-R$, the household also makes decisions about the wife's labor market participation. Husbands always work until they retire. From time $T-R+1$ to T, spouses are retired.

2.1 Preferences

Both husband and wife derive utility from own consumption c^j and disutility from own labor force participation P^j for $j = H, W$. Preferences are separable across periods of time and states of the world.

this legal change. Between 1974 and 1990 eighty articles from *The New York Times* had either "marital property" or "divorce and dissolution" as their focus (http://www.lexisnexis.com).

[4]These reforms can be seen as a further expansion in the property rights of women after the long process of rights acquisition that commenced in the middle of the 19th century and granted women control over their property and earnings (Geddes and Lueck 2002, Doepke and Tertilt 2009, Fernandez 2009).

Each spouse has a subjective taste-for-marriage parameter ξ_t^j, which evolves over time. This parameter reflects the spouses' affection for one another and their attachment to marriage based on other idiosyncratic factors (e.g. fear of the social stigma associated with divorce, concerns about the wellbeing of the children).

Period utilities take the form

$$u^j_{married} = u(c^j_t, P^j_t) + \xi^j_t \qquad\qquad u^j_{divorced} = u(c^j_t, P^j_t).$$

The taste shocks follow a random walk stochastic process, which captures the persistence in the taste for the current marriage:

$$\xi^j_t = \xi^j_{t-1} + \epsilon^j_t, \qquad \xi^j_1 = \epsilon_1 \qquad \text{where } \epsilon^j_t \text{ is distributed as } N(0, \sigma^2) \quad \text{for } j = W, H.$$

The utility function $u(c, P)$ is Constant Relative Risk Aversion (CRRA) and is separable in consumption and participation in the labor market:

$$u(c, P) = \frac{c^{1-\gamma}}{1-\gamma} - \psi P, \qquad \text{with } \gamma \geq 0 \text{ and } \psi > 0.$$

2.2 Economies of scale and children

Spouses benefit from economies of scale in consumption: for a given level of household expenditure x, spouses' consumption depends on the household inverse production function

$$x = F(c^H, c^W)\, e(k) = \left[(c^H)^\rho + (c^W)^\rho\right]^{\frac{1}{\rho}} e(k).$$

With $\rho \geq 1$, this functional form implies that a couple is able to consume more than what it could consume if spouses were living separately, holding expenditure fixed.[5] Children affect household consumption according to an equivalence scale, denoted as $e(k)$ (where k stands for "kids").

Childbirth occurs at predetermined ages of the parents and fertility is exogenous. Previous literature has indicated that the introduction of unilateral divorce did not seem to have an impact on marital fertility, but it affected the selection into marriage (cf. Alesina and Giuliano 2009). Because the sample only includes couples married before the reforms, this selection mechanism does not influence my analysis.

[5]The magnitude of economies of scale in the household depends on the consumption gap between spouses: if one spouse does not consume anything, there are no economies of scale. Economies of scale are maximized when spouses consume the same amount.

2.3 Income over the life cycle

Each spouse's labor income (y^j for $j = H, W$) depends on her human capital (h^j) and on her permanent income (z^j):

$$ln(y_t^j) = ln(h_t^j) + z_t^j.$$

Spouses experience permanent income shocks, which follow a random walk process:

$$z_t^j = z_{t-1}^j + \zeta_t^j \quad \text{and} \quad z_1^j = \zeta_1^j \tag{1}$$

in which ζ_t^j is i.i.d. as $N(0, \sigma_{\zeta^j}^2)$ and is correlated between spouses.

Human capital is accumulated through labor force participation. The law of motion for each spouse's human capital h^j is:

$$ln(h_t^j) = ln(h_{t-1}^j) - \delta \cdot (1 - P_{t-1}^j) + (\lambda_0^j + \lambda_1^j \cdot t) \cdot P_{t-1}^j.$$

If a woman participated in the previous period, her human capital increases at a rate $\lambda_0^W + \lambda_1^W t$. If she did not, her human capital depreciates at a rate of δ. If a woman works, the household faces child care expenses d^k. Since men always work until they retire, $P_t^H = 1$, $\forall t$. At the end of period $T - R$, spouses retire and receive a share of their pre-retirement income in every subsequent period.

2.4 Budget constraints

In marriage, the budget constraints depend on the property division regime. The general form of the budget constraint is:

$$A_{t+1} - (1 + r) \cdot A_t + x_t = y_t^H + (y_t^W - d_t^k) \cdot P_t^W. \tag{2}$$

In a title-based regime, spouses save in separate "accounts" A^H and A^W that have the same market rate of return r. Thus, $A_t = A_t^H + A_t^W$. If divorce were not an option, spouses would be indifferent between the two accounts. Since divorce is possible, in each period spouses decide what fraction of household assets to allocate the husband and the wife. Upon divorce, each spouse retains her own assets.

In equitable distribution and community property states, assets are treated as jointly owned upon divorce; thus, spouses save jointly.

After divorce, spouses live off their individual income and assets. They both contribute to the consumption of their children as a fraction of their own consumption (which captures the cost of child custody and of child support) according to the equivalence scale $e(k)$ and they share

childcare expenses. The budget constraint becomes:

$$A^j_{t+1} - (1+r) \cdot A^j_t + c^j_t \cdot e(k_t) = (y^j_t - \frac{d^k_t}{2}) \cdot P^j_t. \qquad j = H, W \tag{3}$$

Each spouse's level of assets in that first year depends on the property division regime. Upon divorce, wealth is divided according to the state's property division law, unless spouses reach an agreement on an alternative division:

a) in a title-based system, spouses maintain their own "account" A^j;

b) in community property, assets are divided equally;

c) in equitable distribution, assets are divided but spouses are *ex ante* uncertain about exact shares. This captures the fact that "the essential feature of equitable distribution is the absence of fixed rules for the division of property" (Brake 1982) and that under equitable distribution between half and two thirds of the property is usually assigned to the spouse with the highest earnings (Woodhouse and Fetherling 2006).

At the time of marriage, spouses cannot commit to dividing property differently from what dictated by the law in case of divorce. This assumption reflects the fact that prenuptial agreements were rarely enforced before the mid-1980s and remain infrequent today (Mahar 2003). I discuss the welfare implications of prenuptial agreements in a counterfactual simulation exercise in Section 5.[6]

2.5 Problem of the divorcee

I now characterize the value of being divorced, given state variables ω. In this problem, $\omega_t = \{A^H_t, A^W_t, z^H_t, z^W_t, \xi^H_t, \xi^W_t, h^W_t, \Omega_t\}$ where Ω_t represents the vector of divorce laws at time t.

In each period t, a divorcee has an exogenous probability $\pi^{j\Omega}_t$ of remarrying another person. The probability of remarriage depends on gender, age and the divorce law regime. If remarriage occurs, it is an absorbing state and the problem is analogous to the one of a married couple with no possibility of divorce and no shocks in the taste for marriage.[7] In each period, the divorcee chooses consumption, savings and whether or not to work (if she is a woman). Thus, the value

[6] Prenuptial agreements were likely to only have a minor incidence, because they were not consistently enforced until the 1983 Uniform Premarital Agreements Act.

[7] The value of being remarried is $V^{jR}_t(\omega_t) = u(c^{j*R}, P^{j*R}) + \beta E[V^{jR}_{t+1}(\omega_{t+1}|\omega_t)]$ for $j = H, W$, from the solution to the problem $V^R_t(\omega_t) = max_{c^{HR}_t, c^{WR}_t, P^{WR}_t, A^R_{t+1}} \theta u(c^{HR}_t, P^{HR}_t) + (1-\theta) u(c^{WR}_t, P^{WR}_t) + \beta E[V^R_{t+1}(\omega_{t+1}|\omega_t)])$ subject to the budget constraints.

of being divorced at time t is:

$$V_t^{jD}(\omega_t) = max_{c_t^{jD}, P_t^{jD}, A_{t+1}^{jD}} \; u(c_t^{jD}, P_t^{jD}) + \beta \left\{ \pi_{t+1}^{j\Omega} E[V_{t+1}^{jR}(\omega_{t+1}|\omega_t)] + (1 - \pi_{t+1}^{j\Omega}) E[V_{t+1}^{jD}(\omega_{t+1}|\omega_t)] \right\}$$

$$\text{s.t. budget constraint in divorce (3), for } j = H, W.$$

The budget constraint depends on the property division regime at the time of divorce.

2.6 Household planning problem

The couple's planning problem depends on the current divorce law regime. In mutual consent divorce, the couple remains married unless *both* spouses want to divorce; in unilateral divorce, the couple divorces even if *just one* spouse wants to divorce. The household solves a constrained Pareto problem, in which the husband's Pareto weight is indicated by θ and the wife's weight by $1 - \theta$.[8] The parameter θ is determined exogenously.[9]

Define $q_t = \{c_t^H, c_t^W, P_t^W, A_{t+1}^H, A_{t+1}^W, D_t\}$ the vector of variables over which the household maximizes, in which D_t represents the divorce decision at time t.

2.6.1 Mutual consent regime

In the mutual consent divorce regime, state variables are
$\omega_t = \{A_t^H, A_t^W, z_t^H, z_t^W, \xi_t^H, \xi_t^W, h_t^W, \Omega_t\}$, where D_t equals 1 if divorce occurs and 0 otherwise. A couple that enters period t as married solves:

$$V_t(\omega_t) = max_{q_t} \; (1 - D_t) \left\{ \theta \; u(c_t^H, P_t^H; \xi_t^H) + (1 - \theta) \; u(c_t^W, P_t^W; \xi_t^W) + \beta E[V_{t+1}(\omega_{t+1}|\omega_t)] \right\}$$
$$+ D_t \left\{ \theta \left[u(c_t^H, P_t^H) + \beta E[V_{t+1}^{HDR}(\omega_{t+1}|\omega_t)] \right] + (1 - \theta) \left[u(c_t^W, P_t^W) + \beta E[V_{t+1}^{WDR}(\omega_{t+1}|\omega_t)] \right] \right\}$$

$$\left.\begin{array}{l} \text{s.t. budget constraint in marriage (2)} \end{array}\right\} \text{if } D_t = 0$$

$$\left.\begin{array}{l} \text{budget constraints in divorce (3) for } j = H, W \\ A_t^H + A_t^W = A_t \end{array}\right\} \text{if } D_t = 1$$

where the following participation constraints are satisfied whenever $D_t = 1$ and $D_{t-1} = 0$:

$$u(c_t^H, P_t^H) + \beta E[V_{t+1}^{HDR}(\omega_{t+1}|\omega_t)] > V_t^{HM}(\omega_t),$$
$$u(c_t^W, P_t^W) + \beta E[V_{t+1}^{WDR}(\omega_{t+1}|\omega_t)] > V_t^{WM}(\omega_t).$$

[8] My formulation is a special case of the collective model with non-participation, examined in Blundell Chiappori, Magnac and Meghir (2007), extended to a dynamic framework and subject to constraints that are imposed by the divorce option.

[9] For computational tractability, each marital cohort has one value of θ, which is exogenously determined (e.g. Del Boca and Flinn, 2009). The values of the Pareto weights may be the ones that allow clearing of the marriage market (Choo and Siow 2008) or can result from intra-household bargaining at the time of marriage based on non-cooperative threat points (Lundberg and Pollak 1993).

Given a sequence of consumption, female labor participation and marital status choices $\forall \omega_t$ $\{c_t^{*H}(\omega_t), c_t^{*W}(\omega_t), P_t^{*W}(\omega_t), D_t^*(\omega_t)\}_{t=1}^T$, each spouses' value of marriage is equal to

$$V_t^{jM}(\omega_t) = u(c_t^{*j}(\omega_t), P_t^{*j}(\omega_t); \xi_t^j) + \beta E[V_{t+1}^j(\omega_{t+1}|\omega_t)].$$

The continuation value is defined recursively based on the values in the terminal period $\forall \omega_T$

$$V_T^j(\omega_T) = (1 - D_T^*)V_T^{jM} + D_T^* V_T^{jD}(\omega_T)$$

where $V_T^{jM} = u(c_T^{*j}(\omega_T), P_T^{*j}(\omega_T); \xi_T^j)$.

In the remaining periods $t = 1, ...T-1$,

$$V_{t+1}^j(\omega_{t+1}) = (1 - D_t^*)V_{t+1}^{jM}(\omega_{t+1}) + D_t^* V_{t+1}^{jD}(\omega_{t+1})$$

for $j = H, W$ and $\forall \omega_t$. Then, the continuation value for the marriage problem $V_{t+1}(\omega_{t+1})$ is given by the weighted sum of each spouse's continuation values:

$$V_{t+1}(\omega_{t+1}) = \theta\, V_{t+1}^H(\omega_{t+1}) + (1-\theta)\, V_{t+1}^W(\omega_{t+1})$$

for $t = 1, ...T$.

Note that, after divorce, former spouses make separate decisions and have separate budget constraints. When married, the couple weighs each spouse's continuation value, which corresponds to the value of divorce when $D_{t+1} = 1$, by the Pareto weights.

As long as the couple is married, the allocation corresponds to the intertemporal Pareto-optimal allocation. At each time t, the couple divorces if and only if a *feasible* allocation of resources can be found such that both spouses prefer the divorce allocation V_t^{jD} described in Subsection 2.5 to the optimal marriage allocation V_t^{jM}. If the constraint of one spouse binds (i.e. if spouses disagree about whether to divorce, given the default property division rule), the allocation of assets upon divorce shifts to ensure that a larger fraction of the household assets are assigned to the spouse with the binding constraint, to make her indifferent between remaining married and divorcing (Becker 1991).

2.6.2 Unilateral divorce regime

In a unilateral divorce state, the couple maximizes the weighted sum of spouses' utilities in marriage under the constraint that *both* spouses must prefer the marriage allocation to the value of being divorced. Because the marriage allocation has to satisfy these participation constraints, the solution may depart from the Pareto optimal allocation and hence within-period Pareto weights will also enter the vector of state variables. State variables are $\omega_t = \{A_t^H, A_t^W, y_t^H, y_t^W, \xi_t^H, \xi_t^W, h_t^W, \Omega_t, \tilde{\theta}_t^H, \tilde{\theta}_t^W\}$.

The couple solves:

$$V_t(\omega_t) = max_{q_t}\ (1-D_t)\left\{\tilde{\theta}_t^H\ u(c_t^H, P_t^H; \xi_t^H) + \tilde{\theta}_t^W\ u(c_t^W, P_t^W; \xi_t^W) + \beta E[V_{t+1}(\omega_{t+1}|\omega_t)]\right\}$$
$$+ D_t\left\{\tilde{\theta}_t^H\left[u(c_t^H, P_t^H) + \beta E[V_{t+1}^{HDR}(\omega_{t+1}|\omega_t)]\right] + \tilde{\theta}_t^W\left[u(c_t^W, P_t^W) + \beta E[V_{t+1}^{WDR}(\omega_{t+1}|\omega_t)]\right]\right\}$$

s.t. budget constraint in marriage (2)

$$\left.\begin{array}{ll} \tilde{\theta}_{t+1}^H = \tilde{\theta}_t^H + \mu_t^H \qquad \text{and} \qquad \tilde{\theta}_1^H = \theta \\ \tilde{\theta}_{t+1}^W = \tilde{\theta}_t^W + \mu_t^W \qquad \text{and} \qquad \tilde{\theta}_1^W = (1-\theta) \end{array}\right\} \text{if } D_t = 0$$

$$\left.\begin{array}{l} \text{budget constraints in divorce (3) for } j = H, W \\ \\ A_t^H + A_t^W = A_t \end{array}\right\} \text{if } D_t = 1$$

The parameters $\tilde{\theta}_{t+1}^j = \tilde{\theta}_t^j + \mu_t^j$ for $j = H, W$ and $t = 1, ..., T-1$ ensure that the following participation constraints are always satisfied in marriage (whenever $D_t = 0$):

$u(c_t^H, P_t^H; \xi_t^H) + \beta E[V_{t+1}^H(\omega_{t+1}|\omega_t)] \geq V_t^{HD}(\omega_t)$

$u(c_t^W, P_t^W; \xi_t^W) + \beta E[V_{t+1}^W(\omega_{t+1}|\omega_t)] \geq V_t^{WD}(\omega_t)$.

Note that μ_t^j is the Lagrange multiplier associated with each spouse's sequential participation constraint (Marcet and Marimon 2011; Messner, Pavoni and Sleet 2012).

Like in the mutual consent case, given a sequence of consumption, female labor participation and marital status choices $\forall \omega_t\ \{c_t^{*H}(\omega_t), c_t^{*W}(\omega_t), P_t^{*W}(\omega_t), D_t^*(\omega_t)\}_{t=1}^T$, each spouses' value of marriage is equal to

$$V_t^{jM}(\omega_t) = u(c_t^{*j}(\omega_t), P_t^{*j}(\omega_t); \xi_t^j) + \beta E[V_{t+1}^j(\omega_{t+1}|\omega_t)].$$

The continuation value is defined recursively based on the values in the terminal period $\forall \omega_T$

$$V_T^j(\omega_T) = (1 - D_T^*)V_T^{jM} + D_T^* V_T^{jD}(\omega_T)$$

where $V_T^{jM} = u(c_T^{*j}(\omega_T), P_T^{*j}(\omega_T); \xi_T^j)$, and

$$V_T(\omega_T) = \tilde{\theta}_T^H V_T^H(\omega_T) + \tilde{\theta}_T^W V_T^W(\omega_T).$$

In the remaining periods $t = 1, ...T-1$,

$$V_{t+1}^j(\omega_{t+1}) = (1 - D_t^*)V_{t+1}^{jM}(\omega_{t+1}) + D_t^* V_{t+1}^{jD}(\omega_{t+1})$$

for $j = H, W$ and $\forall \omega_t$.

In each period, the couple remains married if and only if *both spouses* prefer the marriage allocation to the divorce one. If the participation constraint of one spouse binds, (s)he obtains a larger fraction of the couple's resources than the one dictated by the ex ante Pareto efficient household planning problem: the ratio of spouses' marginal utilities of consumption shifts, as

described in the literature on risk sharing with lack of commitment (Kocherlakota 1996), to satisfy the participation constraints.

For instance, if the wife's participation constraint binds (i.e., given the solution to the unconstrained problem, the husband wants to remain married while the wife wants to divorce), the ratio of marginal utility of consumption shifts in her favor. This allocation corresponds to the solution to a Pareto problem in which spouses' weights are $(\tilde{\theta}_t^H + \mu_t^H)$ and $(\tilde{\theta}_t^W + \mu_t^W)$. If such an allocation is not feasible, i.e. if any allocation that satisfies both spouses' participation constraints violates the household's intertemporal budget constraint, then divorce occurs. Appendix B provides a detailed description of the solution algorithm adopted.

The household model with unilateral divorce is similar to a model of risk sharing with limited commitment (e.g. Ligon, Thomas and Worrall 2000), which has been applied to models of intra-household allocation (Ligon 2002; Mazzocco 2007; Mazzocco, Ruiz and Yamaguchi 2007; Gallipoli and Turner 2011). However, a crucial distinction has to be made with respect to a village risk-sharing model. Here, risk sharing opportunities are not the only benefit of marriage: the marital surplus is also characterized by economies of scale (given by the parameter ρ) and by the time- and spouse-specific taste for marriage ξ_t^j. Hence, marriage could be sustained even in the absence of risk-sharing opportunities (for instance, in the absence of uncertainty in income or when spouses' income shocks are perfectly correlated), as long as the realization of the preference shock and the economies of scale are sufficiently large. Moreover, in case of negative shocks to the taste for marriage, divorce can occur even in the presence of future potentially beneficial risk-sharing opportunities and economies of scale, as long as the taste for marriage of at least one spouse (ξ^j) or both is sufficiently low to eliminate any expected surplus from marriage, so that there exists no $\{\tilde{\theta}_t^H + \mu_t^H, \tilde{\theta}_t^W + \mu_t^W\}$ that would satisfy the household's intertemporal budget constraint and both the husband's and the wife's participation constraints simultaneously. Hence, taste shocks ensure that, in some cases, spouses choose to end the marriage rather than adjusting the Pareto weights to enter a temporary autarky which could allow for future risk-sharing.

2.7 Divorce laws and household outcomes

The model has implications for three observable elements of household behavior: divorce, assets accumulation and female labor supply. These implications derive from both the direct effect of each law and the interaction effects between grounds for divorce and property division

laws.

Because utility is not perfectly transferable, in this model unilateral divorce increases the likelihood of divorce for couples that are already married.[10] In addition, it changes the terms of intra-household allocation for the couples who remain married. Under mutual consent divorce, the intra-household allocation is fully determined by the Pareto weights ($\frac{u_c(c_t^H,P_t^H)}{u_c(c_t^W,P_t^W)} = \frac{1-\theta}{\theta}$) for all t. Once unilateral divorce is introduced, the ratio of the marginal utilities of consumption shifts as soon a one spouse's participation constraints becomes binding ($\frac{u_c(c_t^H,P_t^H)}{u_c(c_t^W,P_t^W)} = \frac{\tilde{\theta}_t^W+\mu_t^W}{\tilde{\theta}_t^H+\mu_t^H}$).

For a given θ, property division laws then only affect marriages that have already taken place if divorce can be obtained unilaterally, as the consumption share shifts in favor of the spouse who would get more resources in divorce than in the initial intra-household allocation, while they might affect newly-formed couples irrespectively of the ground for divorce law, by shifting θ itself. Equal division of property increases the likelihood that the participation constraints becomes binding for the spouse with a smaller share in household resources, as it improves the outside option V_t^{jD} relative to the initial intra-household allocation.

This interaction mechanism only affects couples that are already married, while changes in divorce laws may also independently affect the types of couples that arise from the marriage market and the terms by which these new marriages form. For example, the new matches that form under equitable distribution may differ from those that would have formed under a title-based system if the distortions that equitable distribution imposes depend on the difference between spouses' permanent income and human capital. Also, conditional on a match having formed, the Pareto weight θ may differ from the one that would have arisen before a reform (see Lafortune *et al.* 2012). This model does not capture the effect of the reforms on the marriage market, and hence the empirical analysis focuses on couples that have already formed. Yet, unilateral divorce will subject newly-formed couples to the same limited commitment mechanism which is captured by this model. Also, conditional on a match taking place and a Pareto weight arising in different regimes, the model described in this paper can be used to examine the savings, labor supply and divorce choices of these couples.

In this model, divorce laws affect assets accumulation in two ways. First, they regulate the fraction of household's total assets each spouse can access upon divorce. Second, they influence

[10] This is consistent with the evidence in Wolfers 2007.

the amount of *total* savings that a household accumulates. In a title-based property division regime, the household can decide what share of the couple's assets to allocate to each spouse. To allow spouses to smooth consumption upon divorce, each spouse's assets is increasing in her Pareto weight and thus in her share of consumption in marriage. In equitable distribution and community property states, households can only choose the *total* amount of savings and courts decide spouses' shares. Thus, only a spouse with a relatively low Pareto weight will benefit from equal division of property compared to a title-based regime (see Figure 4, panel a). While in mutual consent the impact of property division laws is attenuated by the fact that spouses may renegotiate the divorce settlements if one spouse does not want to consent to divorcing, in unilateral divorce property division laws directly affect all divorce settlements, and are more likely to influence household behavior.

By altering spouses' individual resources, divorce laws also influence the incentives to save during marriage. Relative to a title-based regime, equal division of property imposed by courts alters the returns on savings. In marriage, each spouse's share of household consumption is increasing in her Pareto weight. Thus, an equal division of assets acts as a tax on savings for the spouse who consumes more in the marriage (the one with the higher Pareto weight) and as a subsidy for the other. Similarly to a change in the market return on assets or to a tax on savings, such a decrease has a substitution effect (consumption is cheaper at time t than at time $t+1$, which may decrease savings) and an income effect (for a net saver, resources available at time $t+1$ are lower, which may increase savings). More risk-averse households would respond to equal division of property in unilateral divorce by accumulating more savings, while less risk-averse one would respond by accumulating less assets (this is the *interaction* effect). Moreover, if divorce imposes upfront costs, independently of the property regime, an increase in the likelihood of divorce may lead households to save more (Cubeddu and Rios-Rull 1997, Gonzalez and Ozcan 2008) independently of the way property is divided (this is the *main* effect of unilateral divorce).

Turning to female labor supply, if women have fewer resources upon divorce than in marriage (e.g. if they benefit from a share of the husbands' income during marriage), they have an incentive to work to accumulate human capital when facing an increase in the risk of divorce (as verified in Johnson and Skinner 1986). However, the more favorable to women the property regime is, the weaker this channel would be, since tangible assets already provide women with insurance

in case of divorce.[11] In addition, a woman's likelihood of employment is *decreasing* in her share of household resources, which is related to the weight of the wife's disutility of working in the household planning problem. By increasing a woman's value of divorce, divorce laws that favor women may lead to an increase in their share in household resources and a reduction in her likelihood of employment.

3 Data and empirical analysis of the reforms

In this section, I illustrate how panel variation in U.S. divorce laws is correlated with a number of changes in the economic behavior of households. According to the dynamic model described above, the effect of divorce laws reforms on wealth accumulation and on female labor supply is closely tied to the structural parameters of the model. In this section, I will examine these two outcome variables. Appendix D illustrates more evidence on time allocated to housework and leisure by wives. Such variables are not included in the model but appear to also respond to changes in divorce laws, in a way that is consistent with a change in intra-household allocations.

3.1 The data

I use data from the PSID, the NLS-MW and NSL-YM. These surveys provide longitudinal information on U.S. households from the end of the 1960s until the 2000s. In this paper, I use 26 waves of the PSID (between 1968 and 1993), 19 waves of NLS of Mature Women (between 1967 and 1999), and 20 waves of NLS of Young Women (between 1968 and 1999).

The PSID provides key information on labor force participation. I use data until the 1993 wave, after which several questions were significantly modified in the survey. The NLSW provides uniquely rich data on household wealth. The NLS-MW and NLS-YW are part of the Original Cohorts of the National Longitudinal Surveys. The NLS-MW was administered from 1967 to 2003 on an initial sample of 5,083 women who were between 30 and 44 years of age in 1967. The NLS-YW was administered from 1967 to 2003 to an initial sample of 5,159 women who were

[11] This model does not consider alimony. Alimony in this context would imply a reduction in the scope for self-insurance for women and an increase in women's bargaining power in marriage when unilateral divorce is allowed. Data on alimony payments show that these were generally infrequent transfers. For instance, in the National Longitudinal Survey of Young and Mature Women only 10% of divorced women ever report receiving alimony between 1977 and 1999, for a median payment is 4,000 real 2008 dollars, approximately 15% of the divorcee's household income. Child support is usually a larger transfer from the non-custodial parent to the parent who is granted custody of the children. Del Boca and Flinn (1995) examine a sample of divorce cases in Wisconsin between 1980 and 1982, where the average child support transfer is about 20% of the father's income.

between 14 and 24 years of age in 1968. These surveys provide rich data on household asset holdings, which is not available in other longitudinal surveys from the 1970s and 1980s. Since the NLS does not disclose state identifiers, I matched women to their state of residence using the geographical variables provided in the surveys.[12]

Since the model takes household formation as exogenous, the empirical analysis only considers couples that married *before* the legal reforms took place: divorce laws may in fact also affect the decision to marry and the sorting in the marriage market. Thus, this sample includes couples in their first marriage who got married before the introduction of unilateral divorce in their state, before changes to divorce laws occurred.

The PSID provides detailed longitudinal information on female employment and divorce. Table 1 summarizes characteristics of the pooled sample of the 3,858 women I analyze. Average female employment in the sample is 54%.

In the NLSW, the women I analyze are slightly older than those in the PSID sample due to the sampling age of the initial cohort. Data on wealth is collected for a subset of years, leaving us with assets information for 4,538 couples.[13] Assets include real estate, financial assets and business assets. Table 1 reports the average and median characteristics of this sample. Household assets average almost 70,000 and income averages approximately 38,000, both in real 1990 dollars. Asset holdings peak when women are 64 at a mean level of 127,000 real 1990 dollars. Seventeen percent of households in the pooled sample hold zero or negative total assets at a point in time.

3.2 Empirical analysis

I exploit the variation in divorce laws across states and over time, as summarized in Appendix Table 8. Unilateral divorce was introduced at different points in time in thirty-three states between 1967 and 1992. In the same period, all twenty-seven states that had a title-based property division system adopted equitable distribution. The sources of variation that I use

[12]The variables that I use to match women to their state of residence are the size of the labor market in the 1960 Decennial Census in the area of residence, an index of the demand for female labor in the area of residence and the Census division of residence. A similar approach is used in Powers (1998) on the NLS-YM. I thank Jeff Gray for providing the Primary Sampling Unit-state matches. Since this information is only available for the waves between 1967 and 1971, I can only identify the state of residence for those survey respondents who did not move to another state after 1971. Thus, I match 10,086 women out of 10,242 at least once in the sample, but for a total of 2,856 women, the state of residence eventually becomes unavailable once they report having moved.

[13]In the NLS-MW assets are recorded in 1967, 1971, 1972, 1977, 1982, 1987, 1989, 1995, 1997, 1999. For NLS-YW, assets are available on for survey years 1968, 1971-1973, 1978, 1983, 1988, 1993, 1995, 1997, 1999.

are the introduction of unilateral divorce in different pre-existing property regimes (primarily community property and title-based regimes) and the adoption of equitable distribution under different legal grounds for divorce (mutual consent and unilateral divorce).

Variation in divorce laws is concentrated among the following cases:

a) households which experience the introduction of unilateral divorce while in a title-based regime (398 households in the NLSW, 290 households in the PSID) or while in a community property regime (653 households in the NLSW, 573 households in the PSID);

b) households which experience the introduction of equitable distribution in mutual consent states (1,149 households in the NLSW, 1,701 households in the PSID) or in unilateral divorce states (206 households in the NLSW, 249 households in the PSID);

c) households that experience the introduction of both equitable distribution and unilateral divorce in the same year (233 households in the NLSW, 178 households in the PSID).[14]

Other combinations of legal changes affected only a small number of households. A few households experienced the transition into unilateral divorce as equitable distributions states (12 households in the NLSW and 87 households in the PSID). Finally, only a few households entered a community property regime during the sample period, since Wisconsin was the only state that changed from an equitable distribution to a community property regime in 1986. Such observations are insufficient to provide accurate data for such a quasi-experiment; thus, they will not be used for causal interpretation.

3.2.1 Household wealth

To examine the impact of divorce laws on couples' accumulation of assets, I estimate the following equation for household i in state s and in year t:

$$\begin{aligned} assets_{i,s,t} = {} & \beta_1(Unilateral \cdot Com.Prop_{s,t}) + \beta_2(Unilateral \cdot Title_{s,t}) \\ & + \beta_3(Unilateral \cdot Eq.Distr_{s,t}) + \beta_4 Com.Prop._{s,t} + \beta_5 Eq.Distr._{s,t} \\ & + \gamma' Z_{i,t} + \delta_t + f_i + c_s + \epsilon_{i,s,t}. \end{aligned} \tag{4}$$

The dependent variable *assets* represents the total net assets of a married couple, reported in real 1990 dollars. Assets are measured in levels, to include households with net debt (negative assets).[15] The vector Z contains a set of controls for spouses' age, years since marriage and family

[14] This group includes those states in which the two legal reforms occurred in two consecutive years.

[15] Because this analysis is conducted on a sample of married samples, I consider the possibility that the results may be driven by non-random attrition due to diverse characteristics of divorcing couples across legal regimes. I

structure; δ_t denote year fixed effects; c_s state fixed effects and f_i household fixed effects.[16]

I consider a vector of property division and grounds for divorce regimes, in which the excluded category is a title-based mutual consent system:

a) Coefficient β_1 ($Unilateral \cdot Com.Prop.$) captures the effect of introducing unilateral divorce relative to a mutual consent regime in community property states.

b) Coefficient β_2 ($Unilateral \cdot Title$) captures the effect of introducing unilateral divorce relative to a mutual consent regime in a title-based system.

c) Coefficient β_3 ($Unilateral \cdot Eq.Distr$) captures both the effect of introducing unilateral divorce relative to a mutual consent regime in equitable distribution states and of introducing equitable distribution in unilateral divorce states relative to a title-based system.

d) Coefficient β_4 ($Com.Prop.$) measures the average difference in assets between title-based and community property states in mutual consent regimes. Since its estimation is not based on quasi-experimental variation, it has no plausible causal interpretation.[17]

e) Coefficient β_5 ($Eq.Distr.$) measures the average difference in wealth due to the introduction of equitable distribution in mutual consent regimes.

Table 2 reports the results of the estimation of Equation (4) using fixed-effect OLS regressions for different specifications. Column 1 is the baseline specification, which includes age dummies for the wife, year fixed-effects and individual fixed effects as controls. Column 2 controls for a polynomial in the husband's age, which is missing for some couples of the sample. Column 3 adds state fixed effects. Column 4 also includes a 4th degree polynomial in the years of marriage. Appendix C presents a set of robustness checks on these results.

The coefficient β_1, which represents the effect of unilateral divorce in community property states, is equal to 12,159 (Column 1, significant at 5 percent). In contrast, coefficient β_2 is equal to -5,959 real dollars and not statistically significant. [18] The effect of the transition from title-

use Inverse Probability Weighting to ensure that this is not the case (Appendix C).

[16]Because I restrict the sample to couples married before the reforms, it is important to control for life-cycle effects and for the duration of the marriage, to avoid mechanically attributing the impact of this feature of the sample to changes in divorce laws.

[17]The coefficient would be identified by households that change state of residence. As explained above, changes in the state of residence are not measured after 1971. Furthermore, only Wisconsin introduced community property in this sample period (1986), following the introduction of unilateral divorce.

[18]Similar findings are confirmed from estimating Equation (4) using median regressions (without individual fixed effects), as shown in the Appendix. However, the coefficients estimated using median regression are substantially smaller than those obtained from the OLS, suggesting that wealthy households exhibit a greater response to the

based regimes to equitable distribution in unilateral divorce (β_3) and in mutual consent (β_5) are both generally not statistically significant. Figure 6, panel a, illustrates an the dynamic impact of unilateral divorce in community property states obtained from estimating, on the sample of households for which $Com.Pr. = 1$:

$$assets_{i,s,t} = \beta_{pre} Uni.\, within\, 3\, yrs_{s,t} + \sum_{\tau=0(3)}^{12+} \beta_\tau Uni.\, for\, \tau\, to\, (\tau+2)\, yrs_{s,t} + \gamma' Z_{i,t} + \delta_t + f_i + c_s + \epsilon_{i,s,t},$$

where $Uni.\, within\, 3\, yrs$ is equal to 1 when household i in year t will experience the introduction of unilateral divorce within the subsequent 3 years and 0 otherwise, while $Uni.\, for\, \tau\, to\, (\tau+2)\, yrs$ equals 1 if unilateral divorce has been introduced in the past τ to $\tau+2$ years and 0 otherwise. The figure shows no increase in assets for the first 6 years since the reform nor for β_{pre}, and then a smooth raise in the accumulated assets over time.

The finding that households who live in community property and equitable distribution states modify their asset accumulation behavior in the presence of unilateral divorce, while no effect is observed in title-based states, is consistent with the hypothesis that the distribution of resources in divorce at baseline does not match the one in marriage in such states, leading to a change in the returns on savings once unilateral divorce is introduced in community property states. However, changes in total savings alone do not tell us *which* spouse obtains more resources in marriage.

3.2.2 Employment of married women

The likelihood of employment of married women may be affected by divorce laws, depending on the distribution of Pareto weights. To examine the impact of the legal regime on the female labor supply, I estimate the following equation using a linear fixed effects probability model:

$$\begin{aligned} P(employment_{i,s,t} = 1) = {} & \beta_1 (Unilateral \cdot Com.Prop_{s,t}) + \beta_2 (Unilateral \cdot Title_{s,t}) \\ & + \beta_3 (Unilateral \cdot Eq.Distr_{s,t}) + \beta_4 Com.Prop._{s,t} + \beta_5 Eq.Distr._{s,t} \\ & + \gamma' Z_{i,t} + \delta_t + f_i + c_s, \end{aligned} \tag{5}$$

where *employment* is equal to 1 if the woman is employed and to 0 otherwise. This equation is analogous to Equation (4). Coefficient β_1 and β_2 are meant to capture the effect of the introduction of unilateral divorce in community property states and title-based states respectively, relative to the mutual consent divorce regime. Coefficient β_3 identifies both the effect of the introduction of unilateral divorce in equitable distribution states and of equitable distribution

reforms.

in unilateral divorce states, relative to the mutual consent title-based system. Coefficient β_4 is not identified by any source of exogenous variation. Finally, coefficient β_5 captures the impact of introducing equitable distribution while in a mutual consent regime.

The results of estimating equation (5) suggests that unilateral divorce has no statistically significant impact on female employment in title-based and equitable distribution states. However, in community property states women's employment declines by 5.8 percentage points when unilateral divorce is introduced; the effect is statistically significant at the 1% level (Table 2). This finding is robust to controlling for the number of children in the household (Columns 6, 7 and 8), for state fixed effects (Column 7 and 8) and for the time elapsed since marriage (Column 8). Appendix C illustrates a set of robustness checks.

Figure 6, panel b, illustrates an the dynamic impact of unilateral divorce in community property states obtained from estimating, on the sample of households that satisfy $Com.Pr. = 1$:

$$P(employment_{i,s,t} = 1) = \beta_{pre} Uni.within\,3\,yrs_{s,t} + \sum_{\tau=0(3)}^{12+} \beta_\tau Uni.for\,\tau\,to\,(\tau+2)\,yrs_{s,t} + \gamma' Z_{i,t} + \delta_t + f_i + c_s,$$

where $Uni.within\,3\,yrs_{s,t}$ which is equal to 1 when household i in year t will experience the introduction of unilateral divorce within the subsequent 3 years. The figure shows no significant coefficient for β_{pre}, and then an immediate drop in employment which disappears over time.

This findings suggests that unilateral divorce may have increased women's allocations in marriage in those states where women received 50% of household assets upon divorce. As a result, women become less likely to work. This fact supports the hypothesis that women's Pareto weight is low enough compared to their husband's weight, so that unilateral divorce with equal division of property *improves* their condition with respect to the baseline intra-household allocation. First, women benefit from the post-reform intra-household allocation thanks to the more favorable divorce outside option compared to the initial marriage allocation. Second, the additional assets awarded by courts reduce women's need for accumulation of human capital as self-insurance against the risk of loss of consumption in the event of a divorce. Both channels contribute to reducing women's employment.

This result is broadly consistent with what described by Chiappori, Fortin and Lacroix (2002), who examine the labor supply of a cross-sectional sample of couples in the PSID and find that

female labor supply is lower in community property states than in other states. While Chiappori, Fortin and Lacroix (2002) focus on cross-sectional variation in property division rules as a distribution factor in a static model, without examining the impact of introducing unilateral divorce, the variation exploited in this study allows to identify the interaction effects of property division laws and ground for divorce laws, since I observe both the introduction of unilateral divorce in community property or title-based states and the introduction of equitable distribution in mutual consent and unilateral divorce states. The model suggests that these interaction effects are crucial to interpret the impact of changes in divorce laws for couples married before the reforms: as the model implies, the presence of unilateral divorce allows the divorce allocation to affect the one in marriage, while the intra-household allocation of couples who live in a mutual-consent regime is not affected by a change in property division rules. Such a mechanism can only operate in a dynamic model like the one developed in this paper, while previous models that have used divorce laws as a distribution factor, like Chiappori, Fortin and Lacroix (2002), are based on a static collective model. In particular, a dynamic model with limited commitment like the one developed in this model provides a microeconomic foundation for why divorce laws act as a distribution factor in a static collective model.

Interpreting the decline in female employment as a shift in intra-household allocation in favor of women is common in the literature on collective labor supply (for instance, Chiappori, Fortin and Lacroix 2002). One assumption that such an interpretation requires is that women do not entirely substitute market work with housework, in particular if the utility cost of housework is as high as, or higher than, the utility cost of market work. In Appendix D, I use data on time use from the Use of Time Survey (1965), the Time use in Economics and Social Account survey (1975) and the National Human Activity Pattern survey (1992-1994) to document that the decline in female employment that we observe when unilateral divorce is introduced in states with an equal division of property regime is associated with a net *increase* in their leisure time, while only a small and statistically insignificant increase in home production is observed. The increase in the amount of leisure time enjoyed by women reinforces the hypothesis that the decline in female employment may be due to an increase in women's weight in intra-households decision making, and hence an increase in their relative wellbeing.

4 Structural estimation

Divorce law reforms have two main effects on the outcomes analyzed in the Section 3. The presence of both community property (or equitable distribution, to a lesser extent) *and* of unilateral divorce is associated with more assets and lower female employment than when mutual consent divorce is in place. These changes are not observed when unilateral divorce is introduced in title-based states.

I exploit these facts to estimate the key structural parameters of the model, using indirect inference:

a) the Pareto weight of the husband θ,

b) the standard deviation of the shocks to the taste for marriage σ,

c) the utility cost of working ψ.

In a first stage, I estimate the parameters of the income process using moments of spouses' joint income distribution from the PSID (a two-step procedure makes the estimation computationally tractable, see Gourinchas and Parker 2002 and in De Nardi, French and Jones 2010). To account for the selection of women into the workforce, I exploit variation in divorce laws across states and over time as variables that, in the model, affect women's decision to work but that are otherwise excluded from the offer wage growth equation. Hence, the primary source of exogenous variation that I use to identify the structural model is also exploited to identify the parameters of the income process. The parameters estimated in this first step are the variance and covariance of spouses' permanent income shocks ($\sigma^2_{\zeta^H}$, $\sigma^2_{\zeta^W}$ and $\sigma_{\zeta^H\zeta^W}$), the returns to labor market experience for each spouse (λ^j_0 and λ^j_1), the depreciation rate of the human capital of women (δ) and the offer wage gender gap at the beginning of the spouses' career ($\frac{y^W_1}{y^H_1}$).

I also fix a set of pre-set parameters, as described in Table 4, to simulate the model and estimate the remaining structural parameters σ, ψ, θ.

4.1 Spouses' income processes

The spouses' income processes parameters allow the model to account for spouses' incentives to share income risk and for spouses' wage difference over the life cycle. I estimate the parameters using non-linear least squares (Table 3). Identification of such parameters is described in detail in Appendix E. The estimated offer wage gender ratio at age 23 is 81%. The wage gap first grows

and then shrinks over the life cycle, due to a higher λ_0^j and a lower λ_1^j for men.[19] Third, based on the estimated variances, the income of men is more variable than that of women. Finally, the estimates reveal a *positive* covariance in the shocks to the permanent wage of the husband and the wife (the implied correlation is equal to 15%).

4.2 Pre-set parameters

A group of parameters of the model are set to values drawn from the literature. Table 4 presents the pre-set parameters. To reduce the dimensionality of the problem, I set each period to correspond to 3 years of life. Spouses have the same life cycle: they are 23 years old at time 1; they retire at age 62 (end of period 13) and die with certainty at age 79 (end of period 18).

I calibrate the economies of scale parameter ρ to match the McClements scale, according to which a person living alone spends 61% of what a childless couple spends to achieve the same level of consumption. Such a scale is an intermediate value for the magnitude of economies of scale in the family estimated in the literature (see Fernandez-Villaverde and Krueger 2007). This calibration leads to a parameter value of $\rho = 1.4023$.[20] The McClements scale is also used to calculate the consumption of the children as a fraction of their parents' consumption.[21]

The relative risk aversion parameter γ is set to 1.5 (e.g. Attanasio, Low and Sanchez-Marcos 2008). I set the annual market rate of return on assets r to 3% and the annual discount factor β to 0.98.

4.3 Indirect inference

I use indirect inference (Gourieroux and Monfort 1993) to estimate the key parameters of the model, exploiting the variation provided by the divorce law reforms as the primary source of identification.

[19] My estimates for the returns to labor market experience for women λ_0^W is larger than others reported in the literature (Eckstein and Wolpin 1989; Attanasio, Low and Sanchez-Marcos 2008); however, the profile of women's wages is more concave (λ_1^W is smaller than in the literature). Such estimates imply that the average yearly returns to experience over 30 years of career is 3.4%, compared to 2.7% calibrated in Attanasio , Low and Sanchez-Marcos (2008). Olivetti estimates the returns to a year of full-time work in a 3% to 5% range. The estimates in this study lie between those by Attanasio, Low and Sanchez-Marcos (2008) and by Olivetti (2006). The estimate for the depreciation rate δ is roughly comparable to the 7.4% calibrated in Attanasio, Low and Sanchez-Marcos (2008).

[20] Based on to the McClements scale, $0.61x = c^j$. Under the assumption that spouses have identical consumption levels, the household inverse production function becomes $x = 2^{\frac{1}{\rho}} c^j$. Thus $\rho = \frac{log(2)}{log(\frac{1}{0.61})} = 1.4023$.

[21] A couple with a child aged 0-1 consumes 109% of what a childless couple consumes. The additional fraction is 18% for each child between 2 and 4 years, 21% between 5 and 7 years, 23% between and 8 and 10, 25% between 11 and 12, 27% between 13 and 15 and 38% between 16 and 18 years.

First, I solve the dynamic model under mutual consent divorce for vectors of possible values of structural parameters $\Pi = (\sigma \quad \psi \quad \theta)'$, given the realizations of the income and taste shocks. Couples are assumed to have no assets at the time of marriage (age 23). I simulate income and taste shocks and use the policy functions to obtain the corresponding profiles of pre-reform household assets, female labor participation and marital status before retirement.[22]

Second, I solve for the introduction of unilateral divorce at various stages of the life cycle. I again simulate the post-reform behavior of household assets, female labor participation and divorce, at ages that match those observed in PSID data. The underlying assumption is that couples do not change their state of residence in response to or in anticipation of divorce law reforms. This hypothesis appears especially plausible if one considers that most states in the U.S. have relatively long residency requirements before spouses can divorce in the state where they live.

I estimate the same auxiliary model on the simulated data and obtain a vector of auxiliary parameters $\phi_{sim}(\Pi)$. The optimal choice of $\hat{\Pi}$ minimizes the distance between the auxiliary parameters estimated on the actual data and the auxiliary parameters estimated on the simulated data. I choose $\hat{\Pi} = (\hat{\sigma_\epsilon^2} \quad \hat{\psi} \quad \hat{\theta})'$ such that:

$$\hat{\Pi} = Argmin_{\Pi}(\hat{\phi}_{data} - \phi_{sim}(\Pi))G(\hat{\phi}_{data} - \phi_{sim}(\Pi))' \tag{6}$$

where G is a symmetric and positive semi-definite weighting matrix.[23]

The auxiliary model includes the two difference-in-differences estimators for the introduction of unilateral divorce in different states at different points in time. To ease the computation and focus on the states that show the sharpest responses, I estimate the parameters on the sample of couples living in community property states.

The auxiliary parameters are $\{\phi_1, \phi_2, \phi_3, \phi_4\}$ from the following model:

a) the relative change in household assets when unilateral divorce is introduced

$$assets_{i,s,t} = \beta\, Unilateral_{s,t} + \gamma' Z_{i,t} + \delta_t + f_i + \upsilon_{1,i,s,t} \qquad \phi_1 = \frac{\beta}{average\, assets} \tag{7}$$

where $\hat{\phi}_{1,data} = 16.06\%$;

[22] I focus on the pre-retirement period for two reasons. First, my estimates in Section 3 are based on a sample of couples under the age of 65. Second, since attrition for death in my sample is higher after age 65 and it is not taken into account by the model, excluding retired people minimizes the potential impact of attrition.

[23] In this exercise, G is set to be equal to the inverse of the estimated variance-covariance matrix of the parameters of the auxiliary model.

b) the response of female participation when unilateral divorce is introduced

$$employment_{i,s,t} = \phi_2 \, Unilateral_{s,t} + \gamma' Z_{i,t} + \delta_t + f_i + \upsilon_{2,i,s,t} \tag{8}$$

where $\hat{\phi}_{2,data} = -6.02$ percentage points;

c) the average female participation rate in mutual consent regimes of the pooled sample of women between 23 and 50 years old (to avoid the confounding effect of retirement)

$$employment_{i,s,t} = \phi_3 + \upsilon_{3,i,s,t} \tag{9}$$

where $\hat{\phi}_{3,data} = 55.97\%$;

d) the average divorce rate in mutual consent regimes of the pooled sample of couples in which women are between 23 and 64 years old

$$ever\, divorced_{i,s} = \phi_4 + \upsilon_{4,i,s} \tag{10}$$

where $\hat{\phi}_{4,data} = 19.44\%$.

Equations (7) and (8) are analogous to the reduced-form Equations (4) and (5) from Section 3, estimated on the subsample of households living in community property states.[24]

4.4 Identification

The choice of the auxiliary parameters allows a rather transparent identification of the structural parameters of the model. All parameters of the auxiliary model contribute to the estimation of the structural parameters. However, in some cases, the theoretical link between a structural parameter and an auxiliary parameter is strong and crucial for identification.

The response of wives' likelihood of employment to changes in such laws provides the information to identify the parameter θ. Such a moment is decreasing in the Pareto weight of men for values of θ that are sufficiently large, namely larger than the husbands' relative share in household permanent income (and therefore at least larger than $\frac{1}{2}$). If the wife's Pareto weight is not substantially smaller than the Pareto weight of the husband compared to the relative permanent incomes, the introduction of unilateral divorce in community property has little effect on her labor supply; such an effect would be positive, in that case, because women may want to accumulate human capital in case divorce occurs. On the contrary, for values of θ sufficiently larger than $\frac{1}{2}$ (i.e. when the husband has more decision power) the participation of women drops following the introduction of unilateral divorce. The introduction of unilateral divorce leads to a

[24] For example, the asset equation $assets_{i,t} = \beta_1 (Unilateral \cdot Com.Prop.)_{s,t} + \beta_2 (Unilateral \cdot Title_{s,t})$ $+\beta_3 (Unilateral \cdot Eq.Distr_{s,t}) + \beta_4 Eq.Distr_{s,t} + \beta_5 Com.Prop._{s,t} + \gamma' Z_{i,t} + \delta_t + f_i + \epsilon_{i,t}$ when $Com.Prop_s = 1$ becomes $assets_{i,t} = \beta Unilateral_{s,t} + \gamma' Z_{i,t} + \delta_t + f_i + \upsilon_{i,t}$.

transfer of resources (consumption of goods and leisure) from the husband to the wife, because the divorce outside options are more favorable to women with respect to their share of resources in marriage at baseline. It follows that the estimated value of θ will need to be sufficiently larger than $\frac{1}{2}$ to match an auxiliary parameter $\phi_2 = -6.02$ percentage points (Figure 2, Panels a and b).

The primary role of the utility cost of participation (ψ) in the model is determining a woman's labor market participation decision. Since, *ceteris paribus*, a woman is more likely to participate in the labor market the lower her utility cost of working, the average female employment rate provides information for the structural parameter ψ (Figure 2 panel c). Similarly, the standard deviation of the preference shock parameter (σ) influences the likelihood of divorce. For low values of σ, divorce is an unlikely phenomenon, since few spouses receive negative shocks ξ^j sufficiently high to counteract the benefits of marriage that derive from the economies of scale. As σ increases, the likelihood that a spouse would prefer divorce increases. Therefore, identification of the parameter σ stems from the average divorce rate in mutual consent states (Figure 2 Panel d).

4.5 Results

Table 5 illustrates the solution to Problem (6). When unilateral divorce is introduced in the sample, women's weight in household decision is a third of their husband's weight ($\theta = 0.75$). The estimated disutility of working is equal to 0.0034 and the estimated standard deviation of preference shocks is equal to 0.0019. This corresponds to a baseline participation rate of 55.9%, which decreases by 6.27 percentage points after the introduction of unilateral divorce (Table 5). The increase is assets after the reform is equal to 14.77% in the simulations. Finally, the baseline divorce probability in the estimated model is equal to 19.32%.

Examining moments in the data that were not targeted in the estimation allows to evaluate the goodness-of-fit of the model. Like in the data, in simulations from the model the accumulation of assets responds slowly to unilateral divorce, while the probability of female employment exhibits a sharp drop. The dynamic coefficients on the regressions of both savings and labor market participation are economically and statistically comparable to the ones calculated on the actual data (Figure 6).

In addition, unilateral divorce in the simulations lead to an increase in the likelihood of

divorce for couples married before the reform that is in line with the one observed in the data. In the simulated data, the probability of divorcing within the first 25 years of marriage is equal to 40%. In the data, such probability is equal to 30% for cohort married in the 1950s, 40% for cohorts married in the 1960s and about 50% for those married in the 1970s (Stevenson and Wolfers, 2007).[25]

Simulating the model for a title-based regime confirms another pattern suggested by the model: because community property distorts the household's intertemporal choice, it should also reduce the overall value of the marriage. Hence, the divorce rate in a title based regime is slightly lower than the one in community property (17.7% in the simulation and 19.0% in the PSID data in a title-based regime, compared to 19.3% in the simulation and 19.4% in the PSID data in community property).

To validate the income process estimation, we can compare the outcome of the selection of women into employment that we observe in the data to the one generated by the model based on the separately estimated income process. I examine the share of total labor income earned by wives in the household, which is a crucial parameter, as it is highly correlated with the relative resources available to women in case of divorce. In the data from the PSID, such a ratio is equal to 24%. In the simulation of the estimated model, it is equal to 26%.

5 Welfare and counterfactual analysis

Having estimated the structural model, and in particular the intra-household allocation parameters, I can now examine the welfare of the households that were married before the reforms and their behavior under different legal scenarios.

5.1 Intra-household allocations and unilateral divorce reform

Simulations of the dynamic model allow interpreting the change in female labor supply and savings that we observe in the data when unilateral divorce is introduced in community property states. In the sample period, the introduction of unilateral divorce *increases* wives' share of resources within the marriage in states that imposed an equal division of property. The simulation indicates that in mutual consent, the share of household expenditures that goes to the wife is

[25]The model is likely to underestimate the risk of divorce compared to historical rates, since it is estimated using panel data from the PSID, in which attrition may be higher among divorcees.

equal to 40% (share implied by $\theta = 0.75$).[26] After unilateral divorce is introduced, wives' *average* share of resources increases to 42%, combined with a decline in the likelihood of working by 6.2 percentage points. Such changes are driven by the fact that in 21% of households wives have binding participation constraints at $\theta = 0.75$ once unilateral divorce is introduced, while only 1.5% of husbands. Conditional on a reallocation taking place, the wife's weight in intra-household decision making becomes on average equal to the one of the husband ($\theta = 0.5$), increasing those wives' share in household resources by 20%.

5.2 Property division regimes and Pareto weights

Title-based regimes were abandoned in the United States with the intent of increasing the share of savings granted to secondary earners (Turner 1998), who had higher marginal utility of consumption upon divorce. I use the estimated structural parameters to compare the share of household resources awarded to women in community property, in equitable distribution and in title-based regimes, by simulating the model for 5,000 households. This exercise suggests that community property and equitable distribution grant a larger share of assets to women compared to title-based division: according to the simulation, when $\theta = 0.75$, divorced women obtain a 40% share in a title-based regime (in community property, women's share of property is 50%, in equitable distribution it is, in expectation, 42%). Figure 4 illustrates the relationship between the average fraction of assets granted to women across legal regimes and the Pareto weight distribution in the household, based on simulations from the model. When the Pareto weight of the secondary earner is close to a half (i.e., spouses split consumption approximately equally), community property grants a *lower* fraction of assets to the secondary earner compared to what the household would choose under a title-based system, in which women obtain on average 55% of household savings. In these cases, community property may lead secondary earners to experience a drop in consumption upon divorce, while still inducing a distortion in the household's intertemporal behavior. For such households, re-introducing a title-based system may both increase household wellbeing and ensure that more resources are assigned to the spouse with lower permanent income.

[26] Using time use and wages data from the PSID in a static framework, Knowles 2007 calibrates a share of 34% in 1970. Similarly, Lise and Seitz (2011) estimate a share for women's consumption equal to 40% in UK survey data.

5.3 Divorce laws and consumption insurance

The divorce law regimes examined in this paper have important implications for the degree of intra-household risk sharing and consumption insurance available to couples. Because individual consumption and intra-household consumption insurance among married couples are typically not observed in the data, counterfactual simulations from this model can provide insights about the relationship between divorce laws and consumption insurance. To examine this question, I generate a simulated dataset of individual consumption, marital status and income profiles for 5,000 households for $t = 1, ...T - R$ under each one of the six possible combination of divorce law regimes (by ground for divorce laws and by property division laws) under the pre-set and the estimated parameters. I then use the simulated data to estimate the below equations for each spouse $j = H, W$:

$$log(y^j) = \kappa^j + \mu^j log(c^j) + \nu'^j X_{it} + \epsilon^j_{it} \tag{11}$$

$$log(c^j_{it}) = \chi^j + \eta^j Divorced_{it} + \psi'^j X_t + \upsilon^j_{it} \tag{12}$$

The coefficient μ^j captures the degree to which spouse's j income shocks, which are assumed to be permanent, are transmitted into changes in her or his individual consumption: a value of μ^j that is close to 1 indicates a low degree of consumption insurance with respect to income changes, while a value that is close to 0 indicates a high degree of insurance (see Blundell, Pistaferri and Preston 2008). Equation 11 is estimated maintaining the marriage profile even after divorce, to correct for the differential selection of couples into divorce as a result of different divorce laws. The coefficient η^j measures the change in consumption after divorce. Equation 12 is estimated on the sample of first marriages and divorcees.

Two main facts emerge from this exercise. First, as expected, spouses are better able to insure one another in the presence of mutual consent divorce than in the presence of unilateral divorce (Table 6): in this model, unilateral divorce introduces a limited commitment problem in the marriage, which is associated with a decrease in risk sharing (Kocherlakota 1996). For example, in an equitable distribution regime, $\mu^H = 0.52$ in a mutual consent regime, and $\mu^H = 0.57$ in unilateral divorce. The decrease in insurance (increase in μ^H) is driven by the couples that are changing their intra-household allocation, for which $\mu^H = 0.59$ in unilateral divorce.[27] Second, property

[27]Such a decline in insurance is over three times larger than the decline in insurance of permanent income shocks that is obtained by excluding private transfers within the extended family (Blundell, Pistaferri and Preston 2008).

division rules affect the way divorce affects the consumption of men and women. Generally, because of the loss in economies of scale, divorce is associated with a decrease in consumption (Table 7). However, by distributing assets in a way that is orthogonal to intra-household allocation, community property leads women to experience an *increase* in their consumption upon divorce (up to 40%), especially in unilateral divorce, when saving rates are higher, while men exhibit an even greater decrease in consumption compared to a title-based regime.

5.4 Reducing the financial cost of prenuptial agreements

This counterfactual simulation examines couples' willingness to pay to avoid community property in favor of an alternative division rule. Such a rule corresponds to what a couple would choose if they could write a prenuptial agreement without financial costs nor transaction costs nor stigma, and with certainty about its enforcement. In this exercise, such a choice is made holding the Pareto weight at the time of marriage θ fixed and allowing for the chosen property division rule to affect the allocation of resources through the limited commitment mechanism. One caveat of this exercise is that the Pareto weight that ultimately arises in the equilibrium marriage market might itself depend on the prenuptial agreement choice, as part of spouses' continuation value. If that is the case, evaluating the implications of prenuptial agreements on spouses' individual wellbeing would require solving for the Pareto weight in the equilibrium marriage market, which is beyond the scope of this exercise. To partly address this concern within the framework of my model, I compute the *lower bound* of the willingness to pay for a prenuptial agreement over a vector of possible values that the Pareto weight can take in the prenuptial regime.[28]

For the estimated value of $\theta^{CP} = 0.75$, the lower bound on the expected willingness to pay for such an agreement is equal to \$250, which might explain the low take-up of these contracts in

Note that he change in consumption insurance between mutual consent divorce and unilateral divorce is larger among men because women in this model also adjust their labor supply as result of changes in intra-household allocations.

[28] Under a prenuptial agreement, define α^* as the share of household assets that is granted to the husband upon divorce by solving $\alpha^* = Argmax_{\alpha} \; E_{y_1,\xi_1}[V_1(\alpha, \theta^{prenup}|\omega_1)]$. In community property, $\alpha = 0.5$ and the Pareto weight is denoted by θ^{CP}. The lower bound on the willingness to pay for α^* is computed as the lowest dollar amount $\mathbf{x}$ among those satisfying the set of equations

$$E_{y_1,\xi_1}[V_1(\alpha^*, \theta^{\mathbf{prenup}}|A_1 = 0)] = E_{y_1,\xi_1}[V_1(\alpha = 0.5, \theta^{CP}|A_1 = \mathbf{x})]$$

for the vector of $\theta^{\mathbf{prenup}}$, which is allowed to vary with respect to θ^{CP} as a result of the change in the asset division rule.

the years of the estimation. However, the expected willingness to pay increases the furthest the household is from finding an equal split of assets to be optimal, which occurs when $\theta^{CP} = 0.7$. With $\theta^{CP} = 0.5$, so when consumption is allocated equally between spouses, because of the gender earnings gap, the lower bound on the willingness to pay at the household level is equal to \$2,751, to avoid community property and assign a larger share of assets to the wife.

6 Concluding remarks

In this paper, I show that spouses' individual property rights have a significant effect on couples' intertemporal behavior during marriage: divorce laws that govern the decision to divorce and the division of property influence both the couples' accumulation of assets and the labor supply of married women. In particular, I use data from the PSID and NLSW to estimate household responses to divorce law reforms that occurred in the 1970s and '80s. My regression results suggest that introducing unilateral divorce in states where assets are divided equally is associated with more assets accumulated compared to title-based regimes. In addition, following the introduction of unilateral divorce in states with equal division of property, the labor force participation of women declines by about 5 percentage points.

To examine the welfare implications of these legal changes, I build a stochastic dynamic model that incorporates features of the U.S. divorce system. I use the regression results from survey data to estimate by indirect inference the key parameters of the model at the time of the divorce law reforms. The structural estimation indicates that, at the time of marriage, women in the sample (women married before the reforms are enacted) have a lower weight in the household planning problem compared to their husband, and hence a lower share in household resources. Because the introduction of unilateral divorce leads to renegotiating the intra-household allocation based on the divorce threat-points, women's share of intra-household resources increases when assets are divided equally in divorce. This finding explains why we observe a decline in wives' employment after the introduction of unilateral divorce. Moreover, the increase in the accumulation of assets in community property states is consistent with the presence of an income effect for husbands, who saved to self-insure against the loss of half of their assets to their wives in case of divorce.

The counterfactual exercises suggest that an equal division of property only benefits women who have lower weight compared to their husband in their household 's decision, such as the women married before the divorce law reforms that I examine. However, as women gain equality

in their marriage, well-defined property rights allow them to be better insured against a drop in consumption at divorce. Despite its centrality in intra-household analysis and for policy purposes, we know little about how consumption is allocated in marriage or about where the decision power in marriage stands. The role of women in the economy has changed radically in the past decades (Goldin 2002), but to what extent their position within marriage has been affected is still an open question.

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Tables and figures

Table 1: **Summary statistics**

	Obs.	Mean	Median	St. Dev.
PSID				
Age (women)	44,799	40	41	11.2
Number of children	44,799	1.7	1	1.69
Years since marriage	39,815	19	17	11.5
Woman is employed	44,799	0.58	1	0.49
NLSW				
Age	15,399	40	40	10
Number of children	15,399	2	2	1.79
Years since marriage	12,022	21	21	10
Assets (1990 dollars)	15,399	70,573	32,658	136,870

Notes: Summary statistics from Panel Study of Income Dynamics (1968-1993) and National Longitudinal Surveys of Young and Mature Women (1967-1999). Pooled samples of women married before divorce law reforms. NLSW sample restricted to couples with non-missing asset data.

Table 2: **Household Assets and Female Employment: Fixed Effects Regressions**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
VARIABLES	assets	assets	assets	assets	employed	employed	employed	employed
	NLSW	NLSW	NLSW	NLSW	PSID	PSID	PSID	PSID
Uni*Com.Pr	12,159	11,682	11,502	16,867	-0.0377	-0.0389	-0.0576	-0.0488
	(5,542)	(5,313)	(5,338)	(4,639)	(0.0158)	(0.0168)	(0.0168)	(0.0171)
Uni*Title	-5,959	-5,853	-5,472	-3,300	-0.0235	-0.0215	-0.0231	-0.0125
	(6,737)	(6,788)	(6,883)	(7,279)	(0.0273)	(0.0258)	(0.0251)	(0.0301)
Uni*Eq.Distr.	8,614	9,346	9,444	12,652	-0.0279	-0.0264	-0.0266	-0.0299
	(8,786)	(8,275)	(8,461)	(8,445)	(0.0294)	(0.0301)	(0.0372)	(0.0399)
Com.Pr.	13,944	14,387	69,175	-52,723	0.0340	0.0382	0.151	0.167
	(14,520)	(14,699)	(14,250)	(44,727)	(0.0272)	(0.0255)	(0.0544)	(0.0559)
Eq.Distr.	-13,898	-14,687	-14,833	-17,576	0.00185	0.00274	0.00258	0.00805
	(9,166)	(8,876)	(8,938)	(10,733)	(0.0172)	(0.0174)	(0.0173)	(0.0178)
Year f.e.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Age dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Children dummies	No	Yes	Yes	Yes	No	Yes	Yes	Yes
State f.e.	No	No	Yes	Yes	No	No	Yes	Yes
Polyn yrs. married	No	No	No	Yes	No	No	No	Yes
Observations	15,399	15,399	15,399	12,022	44,799	44,799	44,799	39,815
Individual f.e.	4,538	4,538	4,538	3,516	3,438	3,438	3,438	2,608
Standard errors in parentheses, clustered at the state level								

Notes: Columns 1-4: Data from the NLS of Young and Mature Women. Sample of couples married before legal reforms. Dependent variable is real total household net assets. Columns 5-8: Linear Probability Models. Data from the PSID. Sample of couples married before legal reforms. Dependent variable is female employment status. Excluded category for divorce laws: title-based mutual consent regime.

Table 3: **Parameters of the income process**

Parameter	Symbol	Estimate	Std. error
W's returns to experience (constant)	λ_0^W	0.065	(0.045)
W's returns to experience (age)	λ_1^W	-0.002	(0.000)
W's human capital depreciation	δ	0.064	(0.021)
H's returns to experience (constant)	λ_0^H	0.097	(0.009)
H's returns to experience (age)	λ_1^H	-0.004	(0.0003)
Initial offer wage gender gap	$\frac{y_1^W}{y_1^H}$	0.805	(0.068)
Variance of W's income shock	$\sigma^2_{\zeta^W}$	0.023	(0.019)
Variance of H's income shock	$\sigma^2_{\zeta^H}$	0.067	(0.017)
Covariance of H's and W's income shocks	$\sigma_{\zeta^H\zeta^W}$	0.006	(0.002)

Notes: Income process parameters estimated by non-linear least squares using PSID data of couples married before divorce law reforms. Standard errors in parentheses computed by bootstrap to account for first-stage estimation errors.

Table 4: **Pre-set parameters of the model**

Parameter	Value	Reference
Initial age	23	
Years in each period	3	
Age at death	82	
Retirement age	65	
Economies of scale in couple (ρ)	1.4023	McClements scale
Economies of scale for children ($e(k)$)		McClements scale
RRA (γ)	1.5	Attanasio *et al.* (2008)
Market returns on assets (r)	0.03	
Discount factor (β)	0.98	Attanasio *et al.* (2008)
Retirement income	1992 Soc. Sec. rules	Casanova (2009)
W's age at childbearing	26 and 29	PSID
Childcare costs (g^k)		Attanasio *et al.* (2008)
Remarriage probabilities $\pi_t^{j\Omega}$		PSID
Cost of divorce (CD)		Rosen law firm fee calculator

Table 5: **Estimated structural parameters and match of the auxiliary model**

Parameter	Symbol	Estimate	Std. error
Standard deviation of preference shocks	σ	0.00191	0.0002
Disutility from labor mkt participation	ψ	0.00341	0.0004
Husbands' Pareto weight	θ	0.75	0.0114
Auxiliary model parameter	Symbol	Target	Simulated
Effect of uni. divorce on savings in CP	ϕ_1	16.06%	14.77%
Effect of uni. divorce on participation in CP	ϕ_2	-6.02 pcpt	-6.27 pcpt
Baseline participation rate in CP	ϕ_3	55.97%	55.90%
Baseline divorce probability in CP	ϕ_4	19.44%	19.32%

Notes: Parameters of the dynamic model $\{\sigma, \psi, \theta\}$ estimated by indirect inference. The parameters of the auxiliary model are $\{\phi_1, \phi_2, \phi_3, \phi_4\}$.

Table 6: **Divorce laws and consumption insurance against income shocks**

	Married couples			
	Men		Women	
Regimes	Mutual consent	Unilateral divorce	Mutual consent	Unilateral divorce
Com. Pr.	0.528	0.592	0.528	0.554
Eq. Distr.	0.522	0.571	0.522	0.545
Title	0.533	0.639	0.533	0.535

Notes: The table reports the coefficients of the parameters μ^j obtained from the regressions

$$log(c_{it}^H) = \kappa^H + \mu^H log(y_{it}^H) + \nu'^H X_t + e_{it}^H \qquad \text{and} \qquad \log(c_{it}^W) = \kappa^W + \mu^W log(y_{it}^W) + \nu'^W X_t + e_{it}^W$$

in each legal regime, where X_t are spouses' age and age squared. The coefficients are estimated on data obtained from simulating the model using the pre-set and the estimated parameters for a sample of 5,000 households, correcting for the differential selection of couples out of marriage because of divorce laws by simulating income and consumption profiles only the policy functions of married couples.

Table 7: **Divorce laws and consumption insurance against divorce**

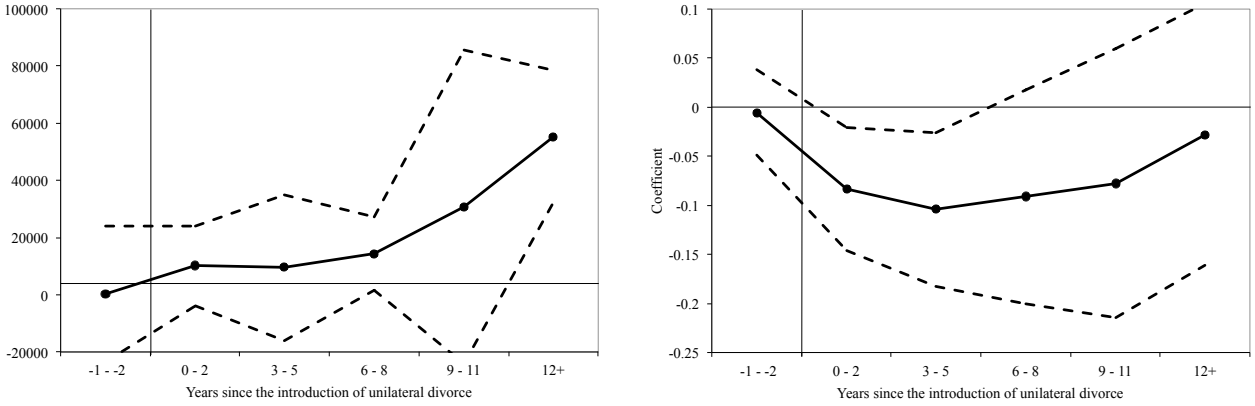
	Married couples and divorcees			
	Men		Women	
Regimes	Mutual consent	Unilateral divorce	Mutual consent	Unilateral divorce
Com. Pr.	-0.3296	-0.2465	0.0784	0.3885
Eq. Distr.	-0.3533	-0.2145	-0.4284	-0.4897
Title	-0.3042	-0.1968	-0.3696	-0.3926

Notes: The table reports the coefficients of the parameters η^j obtained from the regressions

$$log(c_{it}^H) = \chi^H + \eta^H Divorced_{it} + \psi'^H X_t + \upsilon_{it}^H \qquad \text{and} \qquad \log(c_{it}^W) = \chi^W + \eta^W Divorced_{it} + \psi'^W X_t + \upsilon_{it}^W$$

in each legal regime, where X_t are spouses' age and age squared. The coefficients are estimated using data obtained from simulating the model using the pre-set and the estimated parameters for a sample of 5,000 households in their first marriage and in divorce.

Figure 1: **Dynamic response of assets accumulation and female employment to the introduction of unilateral divorce in community property states**

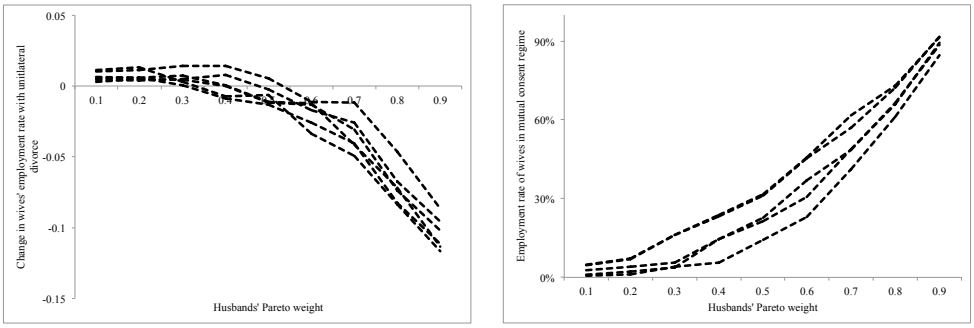


(a) Assets (NLSW)

(b) Female employment (PSID)

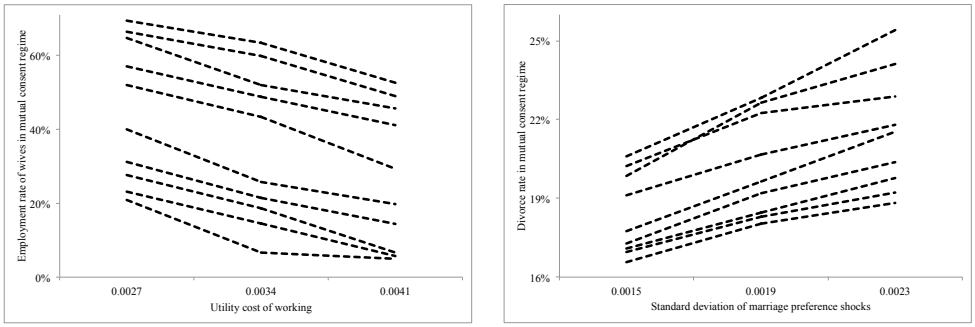
Notes: Coefficients $\beta.$ and 95% confidence intervals of obtained from estimating $assets_{i,s,t} = \beta_{pre} Uni.within\,3\,yrs_{s,t} + \sum_{\tau=0(3)}^{12+} \beta_\tau Uni.for\,\tau\,to\,(\tau+2)\,yrs_{s,t} + \gamma' Z_{i,t} + \delta_t + f_i + c_s + \epsilon_{i,s,t}$. Panel (a) estimated from NLSW data, panel (b) from PSID data. Standard errors clustered at the state level.

Figure 2: **Identification of the parameters**



(a) ϕ_2 and θ

(b) ϕ_3 and θ

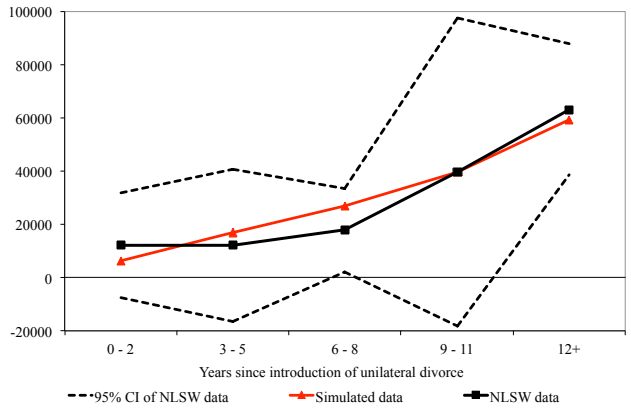


(c) ϕ_3 and ψ

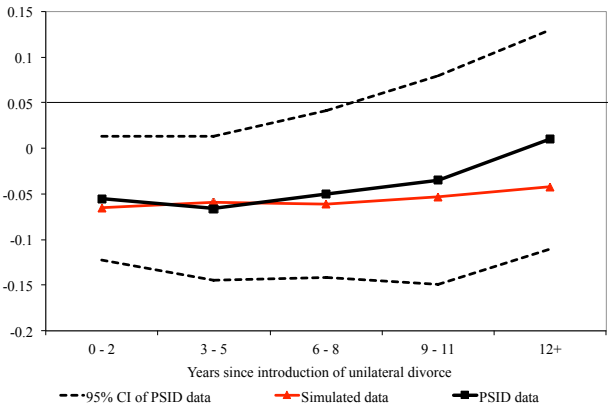
(d) ϕ_4 and σ

Notes: Relationship between a parameter of the structural model and a parameter of the auxiliary model obtained by simulation, for random values of the other structural parameters.

Figure 3: **Dynamic response of assets accumulation and female employment in the simulations and in the data**



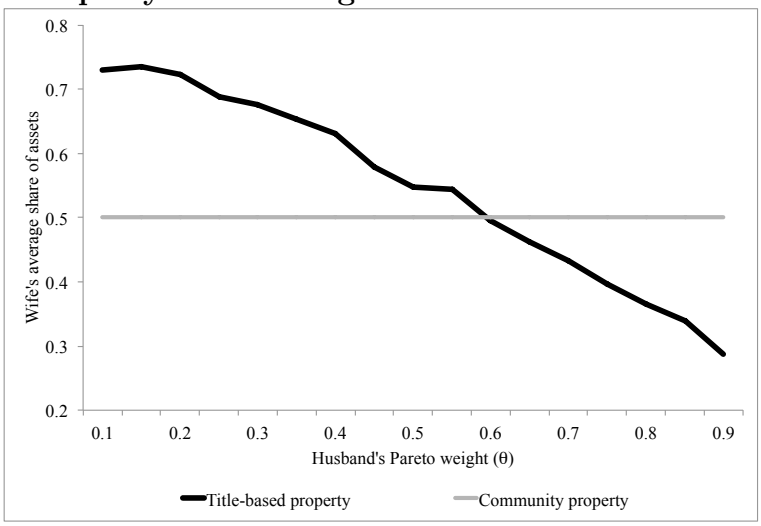
(a) Assets (simulation and NLSW)



(b) Female employment (simulation and PSID)

Notes: Coefficients $\beta.$ and 95% confidence intervals of obtained from estimating $employment_{i,s,t} = \sum_{\tau=0(3)}^{12+} \beta_\tau Uni.\, for\, \tau\, to\, (\tau+2)\, yrs_{s,t} + \gamma' Z_{i,t} + \delta_t + f_i + c_s + \epsilon_{i,s,t}$. Panel (a) estimated from NLSW data, panel (b) from PSID data. Standard errors clustered at the state level.

Figure 4: **Property division regime and husband's Pareto weight**



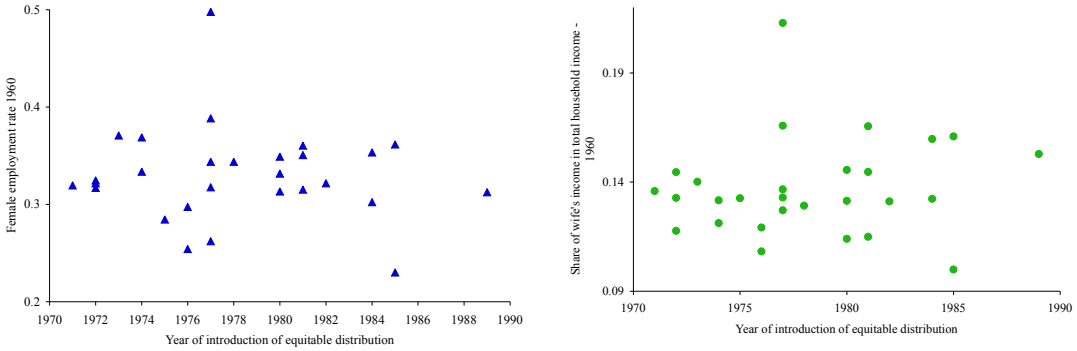
Notes: Panel a: average share of assets awarded to women aged 23-64 by divorce law regime and Pareto weight of the husbands in simulations from the dynamic model. Panel b: wife's consumption equivalent of introducing community property instead of a title-based regime. With the exception of the Pareto weights, all other parameters in the simulation are reported in tables 3, 4 and 5.

APPENDIX - NOT FOR PUBBLICATION

Appendix A: Timing of the property division law reforms

Although a large body of economic literature has documented and exploited the exogeneity of the introduction of unilateral divorce with respect to household economic behavior (among others, Gruber 2004, Stevenson 2007, Gray 1998), no research has shown how the timing of introduction of equitable distribution may be correlated with state-level and state-level trends. Specifically, I examine here how the timing of the changes relates to the share of women employed in the labor market and their income and find no correlation (Figure 5).[29]

Figure 5: **Timing of the introduction of equitable distribution and state characteristics**



(a) Female employment rate in 1960

(b) Share of wives' income in total household income in 1960

Notes: Data is , 1% sample of 1950 and 1960 U.S. Censuses. Sources: Ruggles Steven, J. Trent Alexander, Katie Genadek, Ronald Goeken, Matthew B. Schroeder, and Matthew Sobek. 2010. *Integrated Public Use Microdata Series: Version 5.0* [Machine-readable database]. Minneapolis: University of Minnesota.

Appendix B: Solution method

The problem of the female divorcee W has three state variables: A^W, h^W and the offer labor income y^W and two choice variables, c^W and P^W. The model is solved by backward induction

[29] I regress: $(\text{year of reform-1967})_s = \alpha + \beta \text{Female employment rate in 1960}_s + \epsilon_{1s}$, the coefficient for β is -8.79 (p-value 0.640) while $\hat{\alpha} = 14.12$ (p-value 0.031).
I also regress (graph not shown but available upon request) $(\text{year of reform-1967})_s = \gamma + \delta(\text{Female employment rate in 1960-Female employment rate in 1950})_s + \epsilon_{2s}$, the coefficient for δ is -1.417 (p-value 0.979) while $\hat{\gamma} = 11.311$ (p-value 0.007).
Finally, from $(\text{year of reform-1967})_s = \zeta + \eta(\text{Share of wives' income in 1960})_s + \epsilon_{3s}$, the coefficient for η is -26.67 (p-value 0.515) while $\hat{\zeta} = 7.555$ (p-value 0.190).

(Adda and Cooper 2003) under the terminal condition that $A^W_{T+1} = 0$ for a discrete vector of possible values for A^W_t. The solution leads to a sequence of values $V^{WD}_t(A^W_t, y^W_t, h^W_t)$ that represent the wife's valuation of the divorce. For the male divorcee, the problem is identical with the exception that the working is not a choice variable.

The married couple's problem has eleven state variables: spouses' assets level A^j, the wife's human capital h^W, spouses' preferences for marriage ξ^j, the income level for each spouse y^j_t, the spouses' renegotiation parameters M^j_t and the divorce laws vector Ω_t (which represents two state variables: grounds for divorce law and property division rule). The household takes the divorce laws Ω_t as given and assumes that they are going to persist in time: changes in Ω_t are thus unanticipated and exogenous to household behavior.[30] The problem is again solved numerically by backward induction with the terminal condition $A^j_{T+1} = 0$.[31]

I describe the problem of the couple in the last period T, when spouses are retired. The couple solves:

$$\begin{aligned} max_{c^H_T, c^W_T, A^H_{T+1}, A^W_{T+1}} \quad & \theta\ u(c^H_T; \xi^H_T) + (1-\theta)\ u(c^W_T; \xi^W_T) \\ & \text{s.t. budget constraint in marriage} \\ & A^j_{T+1} \geq 0 \qquad\qquad j = H, W. \end{aligned}$$

Define $V^{jM}_T(\omega_T) = u(c^{*j}_T; \xi^j_T)$ at the optimal values of c_T and A_{T+1} (where $A^j_{T+1} = 0$) given the solution of the Pareto problem for state variables ω_T. For each regime, there are three possible cases:

Mutual consent divorce

1. if $V^{jM}_T(\omega_T) \geq V^{jD}_T(\omega_T)$ for both $j = H, W$, then $V^j_T(\omega_T) = V^{jM}_T(\omega_T)$ and the couple remains married.

2. if $V^{jM}_T(\omega_T) < V^{jD}_T(\omega_T)$ for both $j = H, W$, then $V^j_T = V^{jD}_T(\omega_T)$ and the couple divorces.

3. $V^{jM}_T(\omega_T) < V^{jD}_T(\omega_T)$ and $V^{jM}_T(\omega_T) \geq V^{jD}_T(\omega_T)$

[30] Divorce laws impose restrictions on the state variables. In community property, $A^H_t = A^W_t \ \ \forall t$ and in equitable distribution $(1-\alpha)A^H_t = \alpha A^W_t \ \ \forall t$. In mutual consent divorce, $M^j_t = 0 \ \ \forall t$ and $j = H, W$.

[31] To obtain the numerical solution I discretize the vector of assets A and the vector of h^W, y^j_t and of ξ^j_t. I solve the value function for a subset of the vector of discrete values of A and then use a linear interpolation method to increase the computational speed. The random walk processes are discretized into Markov chains (Adda and Cooper 2003).

In the third case, the allocation of assets shifts. The spouse who wants to divorce (j) can persuade the other by offering her (him) a larger fraction of the household assets than that dictated by the law. I will call this share $\kappa \in [0,1]$. Assume the spouse who wants to remain married is the husband; then, the household finds $\kappa_T \in [0,1]$ where the husband's share of assets becomes $\kappa_T(A_T^H + A_T^H)$ such that: $V_T^{HD}(\omega_T, \kappa_T) = V_T^{HM}(\omega_T)$.

After this reallocation, consider the following two possible cases:

1. if $V_T^{WM}(\omega_T, \kappa_T) < V_T^{WD}$, then $V_T^j = V_T^{jD}$ and the couple divorces.

2. if $V_T^{WM}(\omega_T, \kappa_T) \geq V_T^{WD}$, then $V_T^j = V_T^{jM}(\omega_T, \kappa_T)$ and the couple remains married.

Unilateral divorce

1. if $V_T^{jM}(\omega_T) \geq V_T^{jD}(\omega_T)$ for both $j = H, W$, then $V_T^j(\omega_T) = V_T^{jM}(\omega_T)$ and the couple remains married.

2. if $V_T^{jM}(\omega_T) < V_T^{jD}(\omega_T)$ for both $j = H, W$, then $V_T^j = V_T^{jD}(\omega_T)$ and the couple divorces.

3. $V_T^{jM}(\omega_T) < V_T^{jD}(\omega_T)$ and $V_T^{jM}(\omega_T) \geq V_T^{jD}(\omega_T)$

In case **3**, the allocation shifts. Assume the spouse who wants to divorce is the husband; then, I find μ_T^H such that solving:

$$\begin{aligned} max_{c_T^H, c_T^W, A_T^H, A_T^W} \quad & (\theta + M_T^H + \mu_T^H)\ u(c_1^H; \xi_T^H) + (1 - \theta + M_T^W)\ u(c_T^W; \xi_T^W) \\ \text{s.t.} \quad & \text{budget constraint} \\ & A_{T+1}^j \geq 0 \qquad\qquad j = H, W. \end{aligned}$$

leads to $V_T^{HM}(\omega_T, \mu_T^H) = V_T^{HD}(\omega_T)$.

c) **Third step** Consider the following two possible cases, which depends on how the other spouse responds to the reallocation:

1. if $V_T^{WM}(\omega_T, \mu_T^H) \geq V_T^{WD}$, then $V_T^j = V_T^{jM}(\omega_T, \mu_T^H)$ for $j = H, W$: the couple remains married.

2. if $V_T^{WM}(\omega_T, \mu_T^H) < V_T^{WD}$, then $V_T^j = V_T^{jD}$ for $j = H, W$: the couple divorces.

Once the continuation values have been defined, for an arbitrary period t the allocation in marriage follows an analogous algorithm.

Appendix C: Robustness checks

In this Appendix, I present a series of robustness checks to the results described in section 3. First, I show that the results on both assets and female employment are not driven by changes in the two largest community property states (California and Texas: Table 9, columns 1, 2, 5 and 6). Second, I show that results are not driven by non-random attrition due to different likelihood of divorce between groups of states. In particular, remember that each main equation is estimated based on a sample of married couples. To address this concern on the assets regression, I use Inverse Probability Weighting (IPW, Wooldridge 2002) and re-weight observations based on the inverse of their likelihood to be included in the sample, i.e. the likelihood of remaining married (Table 9, column 7).[32]

Appendix D: Additional evidence on household time use

To examine how changes in divorce laws affected the time use of American couples, I use data from the Americans' Use of Time Surveys (1965), the Time Use in Economics and Social Account Survey (1975) and the National Human Activity Pattern Survey (1992-1994), based on the sample examined in Aguiar and Hurst (2007).[33]

I focus on three outcome variables. The variable *work hours* refers to the sum of the weekly hours devoted to work and work-related activities and to commuting. *Home production* refers to the sum of weekly hours devoted to meals preparation, housework, home and car maintenance, care of garden and pets. The outcome variable *leisure hours* refers to the sum of weekly hours devoted to leisure activities such as sports, watching TV, gardening, reading, traveling for leisure and so on, as defined by Aguiar and Hurst.[34]

For each of these outcome variables, I generate separate samples by marital and employment

[32]The standard errors do not account for first-stage estimation. Ignoring the first stage in the computation of the standard errors leads to a *conservative* estimate of the variance-covariance matrix: adjusting for the first stage would lead to smaller standard errors (Wooldridge 2002).

[33]For a detailed description of the sources of data, refer to Aguiar and Hurst (2007), p. 974.

[34]The definition of these variables follows the one in Aguiar and Hurst (2007). I thank the authors for making their data available at `http://www.markaguiar.com/papers/timeuse_data/datapage.html`.

status and estimate the following equation:

$$y_{i,s,t} = \beta_1(Unilateral \cdot Com.Prop_{s,t} + \beta_2(Unilateral \cdot Title_{s,t}) \quad (13)$$
$$+ \beta_3(Unilateral \cdot Eq.Distr_{s,t}) + \beta_4 Com.Prop._{s,t} + \beta_5 Eq.Distr._{s,t}$$
$$+ \gamma' Z_{i,t} + \delta_t + c_s + \epsilon_{i,s,t}.$$

where vector Z contains a set of controls for person i's age, education and number of children, δ_t denote year fixed effects and c_s state fixed effects. Lack of information on the year of marriage prevents conditioning on the number of years elapsed since marriage, although on separate robustness checks I have confirmed that conditioning on being at least 30 in 1968 does not qualitatively affect results.

Appendix table 10 reports the outcomes of estimating equation 13 on three separate samples of women aged between 23 and 64: all women, married women and married working women. Consistently with the evidence based on the PSID, data on time use indicates that the introduction of unilateral divorce in community property states was associated with a decline in the weekly hours worked by women and an increase in the time women devote to leisure (5.9 more hours per week on average, significant at the 10 percent level, column 6). No significant change in housework is observed.

In addition, the introduction of unilateral divorce in title-based states does not reveal statistically significant patterns with the exclusion of a *reduction* in leisure hours in the overall sample and in the sample of married working women (by 5 weekly hours, significant at the 5 percent level, column 3).

Appendix E: Identification of spouses' income processes

Parameters λ_0^H and λ_1^H, which represent men's income gains from experience, are estimated using the PSID income dataset for all working men under the age of 65:[35]

$$\Delta ln(y_t^H) = \lambda_0^H + \lambda_1^H \cdot t + \Delta u_t$$

Define unexplained growth of log-earnings as:

$$\Delta u_t^j = z_{t-1}^j + \zeta_t^j - z_{t-1}^j + \epsilon_t^j - \epsilon_{t-1}^j = \zeta_t^j + \epsilon_t^j - \epsilon_{t-1}^j \quad (14)$$

for j=H,W.

[35]See Meghir and Pistaferri (2004) and Low, Meghir and Pistaferri (2010) for examples of the estimation of men's income process parameters.

The variance of the husband's permanent income shocks is identified by the moment

$$E[\Delta u_t^H(\Delta u_t^H + \Delta u_{t-1}^H + \Delta u_{t+1}^H)] = \sigma_\zeta^{2H}.$$

Identification of the income process parameters for women requires accounting for the selection of women into employment. Assume that a wife participates in the labor market ($P_t^W = 1$) if $Z_t'\delta + M_t'\gamma + \eta_t > 0$, where M_t are exogenous variables excluded from the earnings equation and Z_t are variables which also appear in the earnings equations. In the dynamic model, M_t are divorce laws, Z_t is a vector of age and past experience and η_t are unobserved shocks to the taste for marriage and to productivity.

Assume that the income shocks of husbands and wives are correlated. Income shocks and participation shocks in each period are distributed as a multivariate normal which is serially uncorrelated:

$$\begin{pmatrix} \zeta_t^H \\ \zeta_t^W \\ \eta_t \end{pmatrix} is\, distributed\, MVN \left(\mathbf{0}, \begin{pmatrix} \sigma_{\zeta^H}^2 & & \\ \sigma_{\zeta^H\zeta^W} & \sigma_{\zeta^W}^2 & \\ \sigma_{\zeta^H\eta} & \sigma_{\zeta^W\eta} & 1 \end{pmatrix} \right)$$

Define $\alpha_t = -Z_t'\delta - M_t'\gamma$. I estimate the probability of female participation in the labor market as

$$P(P^W = 1) = P(\eta_t > -Z_t'\delta - M_t'\gamma) = P(\eta_t > \alpha_t)$$

using a probit model. Then:

$$\begin{aligned} E[\Delta log\, y_t^W | P_t^W = 1, P_{t-1}^W = 1] &= \lambda_0^W + \lambda_1^W \cdot t + E(\Delta u_t^W | P_t^W = 1, P_{t-1}^W = 1) \\ &= \lambda_0^W + \lambda_1^W \cdot t + \sigma_{\Delta u\eta}\left[\frac{\phi(\alpha_t)}{1-\Phi(\alpha_t)} + \frac{\phi(\alpha_{t-1})}{1-\Phi(\alpha_{t-1})}\right] \end{aligned} \tag{15}$$

The parameters of the income process are the solutions to the system:

$$E[\Delta u_t^W | P_t^W = 1, P_{t-1}^W = 1] = \sigma_{\zeta^W \eta} \frac{\phi(\alpha_t)}{1 - \Phi(\alpha_t)} \tag{16}$$

$$E[\Delta u_t^W (\Delta u_t^W + \Delta u_{t-1}^W + \Delta u_{t+1}^W) | P_t^W = 1, P_{t-1}^W = 1, P_{t+1}^W = 1, P_{t-2}^W = 1] \tag{17}$$

$$= \sigma_{\zeta^W}^2 + \sigma_{\zeta^W \eta}^2 \frac{\phi(\alpha_t)}{1 - \Phi(\alpha_t)} \alpha_t$$

$$E[\Delta u_t^H | P_t^W = 1, P_{t-1}^W = 1] = \sigma_{\zeta^H \eta} \frac{\phi(\alpha_t)}{1 - \Phi(\alpha_t)}$$

$$E[\Delta u_t^W \Delta u_t^H | P_t^W = 1, P_{t-1}^W = 1] = \sigma_{\zeta^H \zeta^W} + \sigma_{\zeta^H \eta} \sigma_{\zeta^W \eta} \frac{\phi(\alpha_t)}{1 - \Phi(\alpha_t)} \alpha_t \tag{18}$$

$$E[log\, y_t^W - log\, y_{t-2}^W | P_t^W = 1, P_{t-2}^W = 1] = \sigma_{\Delta^2 u \eta} \left[\frac{\phi(\alpha_t)}{1 - \Phi(\alpha_t)} + \frac{\phi(\alpha_{t-2})}{1 - \Phi(\alpha_{t-2})} \right].$$

Appendix F: Tables

Table 8: **Divorce law reforms in the sample period**

State	Unilateral divorce	Equitable distribution	State	Unilateral divorce	Equitable distribution
Alabama	1971	1984	Montana	1973	1976
Alaska	pre-1967	pre-1967	Nebraska	1972	1972
Arizona	1973	community property	Nevada	1967	community property
Arkansas	no	1977	New Hampshire	1971	1977
California	1970	community property	New Jersey	no	1974
Colorado	1972	1972	New Mexico	pre-1967	community property
Connecticut	1973	1973	New York	no	1980
Delaware	1968	pre-1967	North Carolina	no	1981
District of Columbia	no	1977	North Dakota	1971	pre-1967
Florida	1971	1980	Ohio	1992	1981
Georgia	1973	1984	Oklahoma	pre-1967	1975
Hawaii	1972	pre-1967	Oregon	1971	1971
Idaho	1971	community property	Pennsylvania	no	1980
Illinois	no	1977	Rhode Island	1975	1981
Indiana	1973	pre-1967	South Carolina	no	1985
Iowa	1970	pre-1967	South Dakota	1985	pre-1967
Kansas	1969	pre-1967	Tennessee	no	pre-1967
Kentucky	1972	1976	Texas	1970	community property
Louisiana	no	community property	Utah	1987	pre-1967
Maine	1973	1972	Vermont	no	pre-1967
Maryland	no	1978	Virginia	no	1982
Massachusetts	1975	1974	Washington	1973	community property
Michigan	1972	pre-1967	West Virginia	1984	1985
Minnesota	1974	pre-1967	Wisconsin	1978	community property (1986)
Mississippi	no	1989	Wyoming	1977	pre-1967
Missouri	no	1977			

Notes: Data from FLQ 1977-2005, Rasul (2003), Gruber (2004), Golden (1983), Davis (1983) and state-level sources.

Table 9: **Household Assets and Female Employment: Robustness Checks**

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	NLSW	NLSW	NLSW	NLSW	PSID	PSID	PSID
VARIABLES	assets	assets	assets	assets	employment	employment	employment
	OLS	OLS	median reg	IPW	linear prob	linear prob	linear prob
Uni*Com.Pr	16,160	21,003	6,414	18,360	-0.0678	-0.0561	-0.0525
	(9,399)	(5,435)	(3,700)	(5,053)	(0.0191)	(0.0182)	(0.0182)
Uni*Title	-1,543	-3,638	-674.6	-3,914	-0.0230	-0.0250	-0.0121
	(6,147)	(7,473)	(4,067)	(7,577)	(0.0252)	(0.0259)	(0.0238)
Uni*Eq.Distr.	12,428	12,481	6,938	16,368	-0.0222	-0.0243	-0.0117
	(8,078)	(8,497)	(3,573)	(10,029)	(0.0371)	(0.0374)	(0.0352)
Com.Pr.	-179,327	-52,857	-26,643	-27,393	0.179	0.149	0.154
	(67,566)	(51,035)	(58,468)	(12,906)	(0.0567)	(0.0614)	(0.0468)
Eq.Distr.	-6,303	-18,914	-5,005*	-19,325	0.00395	0.00163	-0.00265
	(7,259)	(11,486)	(2,602)	(12,246)	(0.0171)	(0.0171)	(0.0174)
Year f.e.	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Age dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State f.e.	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Children dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Exclude CA	Yes	No	No	No	Yes	No	No
Exclude TX	No	Yes	No	No	No	Yes	No
Include non-married	No	No	No	No	No	No	Yes
Observations	10,725	11,431	12,022	12,022	41,498	42,701	42,486
Individual f.e.	3,158	3,351	-	3,516	3,232	3,307	2,656
Standard errors in parentheses, clustered at the state level							

Notes: Columns 1-4: Data from the NLS of Young and Mature Women. Dependent variable is real total family net assets. Columns 5-7: Linear Probability Models. Data from the PSID. Sample of couples married before legal reforms. Dependent variable is female employment status. Excluded category for divorce laws: title-based mutual consent regime.

Table 10: **Women's time use: OLS regressions**

VARIABLES	(1) work hours	(2) home production	(3) leisure hours	(4) work hours	(5) home production	(6) leisure hours	(7) work hours	(8) home production	(9) leisure hours
	All			Married			Married and employed		
Surveys years	1965-1993			1965-1975					
Uni*Com.Pr.	-12.22	0.386	6.103	-8.357	-1.568	5.933	1.905	-4.488	4.300
	(4.732)	(1.693)	(3.521)	(3.824)	(2.267)	(3.205)	(6.824)	(3.377)	(5.157)
Uni*Title	-2.523	4.119	-5.839	-1.849	5.253	-4.590	-2.665	5.913	-9.287
	(3.308)	(3.131)	(2.760)	(4.367)	(3.938)	(3.896)	(9.736)	(3.163)	(5.016)
Uni*Eq.Distr.	-3.850	3.159	4.547	-2.671	2.883	3.792	-0.163	6.899	-1.218
	(3.956)	(1.628)	(3.438)	(4.615)	(2.493)	(3.158)	(6.684)	(3.668)	(4.083)
Com.Pr.	0.291	-0.494	-9.697	-7.397	5.563	-4.213	-44.81	16.81	-6.115
	(4.354)	(2.723)	(2.653)	(4.138)	(2.895)	(3.082)	(11.49)	(5.435)	(7.578)
Eq. Distr.	-10.42	1.501	1.790	-10.41	2.085	0.348	-18.39	6.121	4.803
	(3.303)	(1.825)	(3.204)	(4.907)	(3.490)	(4.331)	(11.41)	(4.443)	(5.205)
Year f.e.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State f.e.	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Age dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Education dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Children dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1,864	1,864	1,864	1,467	1,467	1,467	600	600	600
Standard errors in parentheses, clustered at the state level									

Notes: Data from multiple cross-sectional time use surveys from Aguiar and Hurst (2007). Columns 1-3 include years 1965, 1975 and 1993. Columns 4-9 restrict information to married couples, and drops the data from 1993, when marital status in not available. Excluded category for divorce laws: title-based mutual consent regime.