Human Capital and Economic Opportunity:
A Global Working Group

Working Paper Series

Working Paper No. 2011-009

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October, 2011

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Abstract

At the end of the 1960s, the U.S. divorce laws underwent major changes and the divorce rate more than doubled in all of the states. The new laws introduced unilateral divorce in most of the states and changes in divorce settlements in every state, such as property division, alimony transfers, and child custody assignments. The empirical literature so far has focused on the switch from consensual to unilateral divorce and found that this change cannot fully account for the increase in the divorce rate. Also, the divorce rate increased even in states where the decision remained consensual. In this paper, I consider the effects of other aspects of the legal change. I show that changes in divorce settlements provide economic incentives for both spouses to agree to divorce. Moreover, I describe a mechanism that can explain the different change in divorce rate by age of couples. I solve and calibrate a model where agents differ by gender, and make decisions on their marital status, investment and labor supply. Under the new financial settlements, divorced men gain from a favorable division of property, while women gain from an increase in alimony and child support transfers. Since both of them are better off in the new divorce setting, the existing requirement of consent for divorce (consensual or unilateral) is no longer relevant. Results show that changes in divorce settlements account for a substantial amount of the increase in the aggregate divorce rate. I also find that the increase in divorce rate of young couples with children contributes the most to the overall increase, which is consistent with the data.

Key words: Age-specific divorce rate, unilateral and consensual divorce, divorce laws, property division, alimony and child support, child custody.
JEL Classification: J12, D13, K36

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1. Introduction

At the end of the 1960s, the U.S. divorce laws underwent major changes. The reform introduced unilateral divorce law in most of the states and changes in divorce financial settlements in every state. Between 1970 and 1980 the divorce rate increased from 13.0 divorces per thousand of married females to 23.0 divorces.

The empirical literature so far has focused on the switch from consensual to unilateral divorce and found very controversial results regarding the effects of the legal changes on the divorce rate. Using U.S. cross section data, Peters (1986, 1992) finds the law to be neutral. Her results have been criticized by (Allen, 1990, 1992), mainly on the grounds that she misclassified some states as having fault-based laws. Using U.S. panel data, Zelder (1993) and Friedberg, L. (1998) find a positive impact of the change to a unilateral law on divorce rates. In particular, Friedberg, L. (1998) found that unilateral divorce laws were responsible for about 17 percent of the increase in divorce rates in the U.S. during the Seventies and Eighties. Her results were widely accepted until Wolfers (2006), found that the effect of unilateral divorce is small and short-lived[1].

From a theoretical point of view, Clark (1999) argues that there is no basis for the argument that the law necessarily has no effect on the incidence of divorce, and that this does not imply that couples are missing mutually beneficial trades or that economic efficiency is compromised. He emphasizes other aspects of the law apart from the right to dissolve a marriage (unilateral or consensual agreement). In particular, the allocation of assets and resources within a marriage, and on dissolution, plays a central role in the analysis as they determine both the gains and losses from divorce and whether divorce occurs.

Data show that the change in divorce rate occurred uniformly in all states regardless of whether the unilateral or consensual regime were adopted, and divorce financial settlements have been revised all across the U.S.

The main changes in financial settlements include changes in property division rule, alimony and child support transfers, child custody, and fathers' visitation rights. In particular, under the old fault-based law, the wife receives more than half of the community property. With the new no-fault law, community assets and liabilities are divided equally. There have been changes in the amount of transfers from husbands to

[1]Similar studies have been conducted for Europe. In particular, González and Viitanen (2009) use panel data on 18 European countries from 1950 to 2003 to analyze the effect of changes in divorce laws in the divorce rate. They exploit the variation across countries in the timing and nature of the reforms, and find that the effect of no-fault legislation was strong and permanent, while unilateral reforms had only a temporary effect on divorce rates.

wives, especially when the mother has custody of the children. The rule that favorers the mother as the full custodial parent after divorce loses ground throughout the U.S. but not in a relevant measure. In principle today, husbands and wives have an equal right to custody in all states, but in the majority of the cases mothers are still the full custodian of the children. As a consequence of the nature of these changes, their impact on divorce decision has been different depending on the couple's age.

The purpose of this paper is to evaluate the effect of the changes in financial settlements on the increase in the aggregate and age-specific divorce rate. I show that changes in financial aspects of divorce law may explain a higher increase in the divorce rate of young couples (with children) than those of mid age and elder couples.

I provide a framework to study the financial aspects of the legal change. I modify a standard dynamic life-cycle model of household behavior to include divorce settlements and analyze the effect of the legal changes on the couples' decisions of divorcing. In every period, married couples with and without children, decide whether or not to divorce. They cooperate when making decisions while married, but do not cooperate as they get divorced. Divorce occurs when a new draw of match quality makes both better off as single rather than married. One important feature of the model is that agents solve different problems depending on the life-cycle stage they are in. In particular, to analyze the impact of the legal changes on couples of different ages, the life-cycle is divided into three parts: in the first part, agents make time allocation decisions about labor market, child care and leisure; in the second part, agents are childless and choose the amount of time to allocate between labor market and leisure; in the last period, all of the agents are retired. In every period they choose how much capital to accumulate. I calibrate the model to 1970 U.S. data and use it to simulate the impact of the legal reform on divorce rate of married couples of different ages. I show that changes in divorce settlements create incentives for both spouses to agree on divorcing, neutralizing the difference between consensual and unilateral regime. Under the new regime, the gain from a favorable division of property for husbands offsets the increase in child support payment requirements. Wives gain from an increase in liquidity coming from a higher expected value of alimony and child support transfer. This offsets the loss from the new rule on reallocation of property. The small increase in the number of fathers receiving sole or joint custody is not quantitatively relevant to determine their decision to divorce.

Results show that changes in divorce settlements account for a substantial amount of the increase in the divorce rate in the consensual regime. I also find that the increase in divorce rate of young couples contributes the most to the overall increase, and this is consistent with the data. This last result is driven by the division of life-cycle in the three parts. In the first part, married couples benefit from both of

the divorce settlements changes, as parents provide for child care, and accumulate capital. In the second and third part of their lifetime, children are not living in the parental house anymore, and the legal reform affects the division of property and transfers to wives.

This paper does not aim to study the (long run) effects of the legal changes on the divorce or marriage decisions. For such an analysis, see Rasul (2006), who develops a model of search and learning in marriage markets to analyze how a liberalization of divorce laws affects marriage market outcomes.

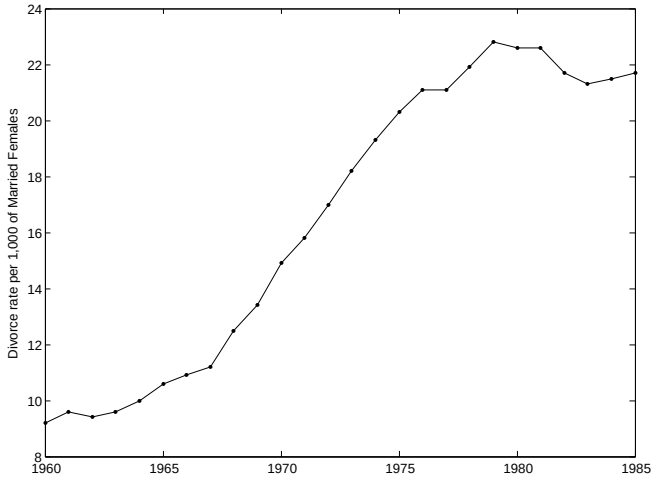
The rest of the paper is organized as follows. In the next section, I document the pattern of divorced rate observed in the data, and empirical evidence of the changes in divorce settlements. Section 3 describes the model. Section 4 explains how the model is parameterized and calibrated. Section 5 discusses the results from the benchmark model, and adds few experiments. Moreover, it discusses the welfare effects of the policy on married and divorced spouses. Finally, Section 6 concludes.

2. Empirical evidence

From the end of the Sixties to the beginning of the Eighties, the divorce rate increased from about 13 to 23 divorces per thousands of married females of 15 years and older[2]. Figure 1 shows the increase in the divorce rate. This aggregate measure does not reveal age differences in the divorce rate, and it does assume a standardized age structure of women at risk. A more precise measure is given by the age-specific divorce rate, and data are shown in Figure 2. The data show that rates increased from 1970 to 1980 with the most dramatic increase occurring in the 20 to 44 age groups. The 50 years old and over groups show no relevant change in this decade. In the Appendix, I provide the details about the states included in the computation of the rate.

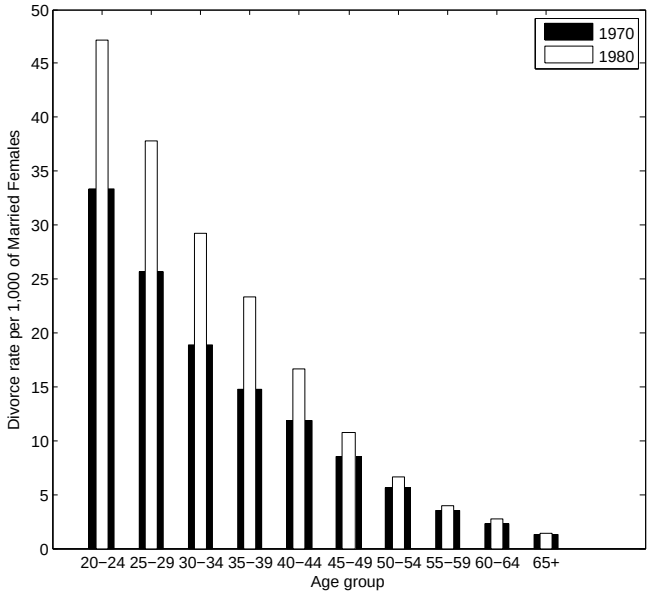
[2]The divorce rate is computed as the ratio between the total number of divorces in a given year and the total number of married females that are 15 years and over in the same year.

Figure 1: Divorce Rates per 1,000 of Married Females



Source: National Center for Health Statistics, various years

Figure 2: Age-Specific Divorce Rates per 1,000 of Married Females



Source: Kunz and England (1988)

The existing literature focuses on the changes that affected the grounds of divorce and the agreement to divorce. It is important to note that, while fault as a ground for the divorce has been abolished all over the U.S., the unilateral decision to divorce

has not been adopted by all of the states. Prior to the no-fault divorce revolution, a divorce could be obtained only through a showing of fault of one of the parties in a marriage. California was the first state to implement the no-fault ground divorce. Not all of the states have yet introduced the unilateral divorce regime: in seventeen[3] out of fifty-one states both of the parties have to express their consents to divorce.

In 1970, the Uniform Marriage and Divorce Act has been promulgated[4]. The legal reform introduced changes about property division and child custody aiming to a more gender neutral legislation. In Section 307, *Disposition of Property*, we read:

> "In a proceeding for dissolution of a marriage, legal separation, or disposition of property following a decree of dissolution of marriage or legal separation by a court [...], the court, *without regard to marital misconduct*, shall, [...], finally **equitably** apportion between the parties the property and assets belonging to either or both however and whenever acquired, and whether the title thereto is in the name of the husband or wife or both. [...]"

Weitzman (1985) provides data from a random samples of court dockets in San Francisco County and Los Angeles County, California. In 1968 the wife who was usually declared as the "innocent" party, was awarded by more than half of the total property value. Data in Table 1 shows that in only 12% of the cases the property was divided equally in San Francisco. Under the new law, the number of cases in which the property were equally divided increased substantially. By the end of the 1970s, the equal division became the norm[5].

[3]The states that have not yet adopted the unilateral law are the following: Arkansas, District of Columbia, Illinois, Louisiana, Maryland, Mississippi, Missouri, New Jersey, New York, North Carolina, Ohio, Pennsylvania, South Carolina, Tennessee, Vermont, Virginia, and West Virginia.

[4]The Uniform Marriage and Divorce Act was drafted by the National Conference of Commissioners on Uniform State Laws and by it approved and recommended for il all the states enactment in August 1970. A copy of the Act can be downloaded at http://www.uniformdivorce.com/UMDA.pdf. See also Jacob (1988) and Weitzman (1985).

[5]The average percentage of wealth inherited by the wife after divorce in sample data from the National Longitudinal Study (NLS) of the High School Class of 1972 (Fifth Follow-up, 1986) is about 58%.

Table 1: Division of Property in San Francisco County - Evidence from a random sample of court dockets.

	San Francisco		Los Angeles		
	Fault	No-fault	Fault	No-fault	No-fault
Fraction of Property	1968	1972	1968	1972	1977
Majority to Husband (over 60%)	2%	7%	6%	21%	10%
Approx. Equal Division (40 to 60%)	12%	59%	26%	44%	64%
Majority to Wife (over 60%)	86%	34%	58%	35%	26%
Mean percentage to Wife	**91**%	**62**%	**78**%	**54**%	...

Source: Weitzman (1985), p.74

Next, section 308 says the following on *Maintenance*:

> "In a proceeding for dissolution of a marriage, legal separation, maintenance, or child support, the court, may order either or both parents owing a duty support to a child to pay an amount reasonable or necessary for his support, *without regard to marital misconduct*, after considering all relevant factors including:
>
> (i) the financial resources of the child;
>
> (ii) the financial resources of the custodial parent;
>
> (iii) the standard of living the child would have enjoyed had the marriage not been dissolved;
>
> (vi) the physical and emotional condition of the child and his educational needs; and
>
> (v) the financial resources and needs of the noncustodial parent."

This disposition provides only a general guideline, and no details on the amount of transfers. This information can be deduced from commonly used data set. U.S. Census data show that the realized amount of transfers from husband to wife changed from 1970 to 1980. In particular, women with children in the household[6] were more

[6]In 1970, 21.12% of married couples of age 20 to 44 has no children; 18.75% has one child; 25.95% has two children; 17.84% has three children, and 16.34% has four or more children. There is no relevant change in the distribution of number of children from 1970 to 1980.

likely to receive a higher amount of transfers[7]. Data are in Table 2. Note that this increase took place before the nationwide implementation of the first reform on child support through the Child Support Enforcement (CSE) amendments of 1984 (see Neelakantan (2009)).

Table 2: Summary Statistics, divorced 20 - 44 years old

	Men		Women	
	1970	1980	1970	1980
% separated and divorced	3.59	7.84	10.0	14.58
% with children	0.69	1.96	12.72	17.75
% in labor force	93.14	93.40	71.36	77.34
Avg. Earnings[8]	18,318.55	19,484.11	11,213.49	12,543.85
Alimony and child support	33.34	40.72	943.46	1,171.64
% Receivers	0.69	4.01	28.09	37.29
Without children	27.65	35.24	193.19	315.65
% Receivers	0.39	3.90	8.99	12.90
With Children	74.44	76.68	1,337.87	1,579.86
% Receivers	2.82	4.71	37.99	49.07

Source: IPUMS 1970 and 1980

Tables 3 and 4 show the amount of alimony transfers to divorced men and women that are 45 years old and older[9]. Differently from Table 2, we observe a decrease in both the amount and in the percentage of receivers.

[7]Note that the availability of data for that time period is restricted to cross sectional data. It is not possible to deduce whether divorced mothers are sole or joint custodian of the children present in the household at the time of the survey. Moreover, it is not possible to distinguish between biological or step children.

[8]Amounts deflated using the Consumer Price Index, 1982-84=100.

[9]Note that, in 1970, 95% of divorced men and 83% of divorced women did not have dependent children living in the household. In 1980 the percentage of men decreased to 88%, and that of women to 64%.

Table 3: Summary Statistics, divorced 45 -59 years old

	Men		Women	
	1970	1980	1970	1980
% separated and divorced	4.80	8.90	7.8	12.0
% in labor force	85.47	76.33	76.27	73.61
Avg. Earnings	16,662.99	18,556.14	12,421.94	13,113.34
Alimony	64.80	46.84	339.89	194.04
% Receivers	1.81	1.90	8.75	6.53

Source: IPUMS 1970 and 1980

Table 4: Summary Statistics, divorced 60 - 75 years old

	Men		Women	
	1970	1980	1970	1980
% separated and divorced	4.60	6.20	4.70	5.90
Alimony	827.93	19.49	477.63	189.43
% Receivers	17.79	2.51	14.83	7.67

Source: IPUMS 1970 and 1980

Section 402 says about *Custody*:

> "The court shall determine custody in accordance with the *best interest* of the child. [...]"

Even thought changes in divorce law aimed to increase the gender (or parental) neutrality of child custody assignments, the observed percentage of sole custodian fathers did not substantially increase. From Weitzman (1985) and Jacob (1988), we can infer that until 1970, the custody was assigned to the mothers in almost 100% of the cases. In 1986, data from the National Longitudinal Survey of the High School Class of 1972[10] (Fifth Follow-up) show that mothers are still the sole custodians in

[10]See Appendix for details on the sample considered.

the 90.2% of the cases; fathers are given sole custody in the 3.2% of the cases; and, joint custody is agreed in the remaining 6.6% of the cases.

3. The model

In this section I develop a model of divorce decision in order to assess the quantitative contribution of the legal changes to the increase in age-specific (and aggregate) divorce rate in the U.S.

3.1. Environment

The economy is populated by four types of agents that differ by gender and marital status. Time is discrete, finite, and indexed by $t = 0, 1, .., T$. Agents are alive for $T < \infty$ periods and are ex-ante heterogenous. All individuals are born and randomly matched with a partner. The couples are indexed by a match quality $q \in \mathbb{R}$ that follows a couple- and time-specific stochastic process. An individual can be in of two marital states: married or divorced. The timing of the model is as follows:

1. In every period married couples draw a new match quality.
2. They compute their optimal allocations and optimal (present and discounted future) values to remain married or to divorce.
3. They choose the marital status, and live as married or divorced until the end of the period.

I assume that divorce requires consensual agreement, and that divorcing is an absorbing state. Husband and wife cooperate when making decisions, but each agent behaves non cooperatively while divorced. That is, a divorced agent chooses its optimal allocations taking as given the optimal choices of the divorced partner. In particular, husbands and wives take as given the optimal child care time choice of the other spouse. There is uncertainty in the quality of the match, and in the possibility of receiving alimony and child support transfers. Credit market are perfect and r denotes the net interest rate. The current utility function is assumed to be logarithmic.

Agents live for fifty years. They are born as married at age of 20, and die for sure at the age of 75. From age 20 to 44 (i.e. in the first stage of their life cycle), married and divorced agents provide consumption for their children, and allocate time between market, leisure, and child care. From age 45 to age 59 (and later), all of the

households are childless[11]. Agents continue to work in the market. Finally, in the last part of their life cycle, agents retire and consume their savings. For the remaining of the paper, the subscripts f and m denotes female and male, respectively. In the following section, I describe the maximization problem that married and divorced agents solve in each stage of their life cycle.

3.2. Married couples

Young couples. During the first part of their life cycle, agents allocate their time between market, child care, and leisure. The presence of children in the household is random and exogenous. I only distinguish between having a child or not having any child. Each agent $i = f, m$ in the couple chooses consumption c_1^i, child consumption c_1^k, leisure l_1^i, child care time t_1^i, market time h_1^i, and savings b_2, to maximize the Pareto weighted sum of spouses' utility. $\mu_i(w_1^f, w_1^m, x)$ is the Pareto weight on agent's i utility, with $\mu_i(w_1^f, w_1^m, x) \in [0,1]$ and $\sum_{\{i=f,m\}} \mu_i(w_1^f, w_1^m, x) = 1$. It is a linear function of the wage rates w_1^i of the two spouses, and of the property division rule at time of divorce $x \in [0,1]$. The value of being married depends on the random variable $q_t \in [\underline{q}_t, \overline{q}_t]$ that the couple draws at the beginning of every period from independent uniform distributions defined on period-specific intervals, and on the initial endowment of assets. The parameters $\gamma_1^i, \gamma_2^i > 0$ $(\forall i = f, m)$ are the weights on the utility from leisure and child care time respectively. The dynamic program of married couples of age 20 to 44 is the following:

$$\begin{aligned} V_{M,1}(b_1, q_1) \;=\; & \max_{\left\{c_1^i, c_1^k, l_1^i, t_1^i, h_1^i, b_2^i\right\}} \sum_{i=f,m} \mu^i(w_1^f, w_1^m, x) \Big\{ \log c_1^i + \log c_1^k + \gamma_1^i \log l_1^i \\ & + \gamma_2^i \log\left(t_1^f + t_1^m\right) \Big\} + q_1 \\ & + \sum_{t=2,3} \beta^{t-1} E \left\{ \sum_{i=f,m} \mu_i(w_t^f, w_t^m, x) V_1^i\left(b_t^i, q_t\right) \right\} \end{aligned}$$

subject to the constraints:

$$\begin{gathered} c_1^f + c_1^m + c_1^k \leq w_1^f h_1^f + w_1^m h_1^m + (1+r) b_1 - b_2 \\ l_1^i + h_1^i + t_1^i \leq 1 \;\forall i = f, m \\ b_1 \geq 0 \text{ given} \end{gathered}$$

[11] Children are not followed in their life cycle. This assumption simplifies the setup of the model and does not affect the results of the model.

Children's consumption and child care time are both public goods. If there are no children in the household, the problem simplifies to:

$$\begin{aligned} V_{M,1}\left(b_1, q_1\right) &= \max_{\left\{c_1^i, l_1^i, h_1^i, b_2^i\right\}} \sum_{i=f,m} \mu_i(w_1^f, w_1^m, x)\left\{\log c_1^i + \gamma_1^i \log l_1^i\right\} \\ &\quad + q_1 + \sum_{t=2,3} \beta^{t-1} E\left\{\sum_{i=f,m} \mu^i(w_t^f, w_t^m, x) V_t^i\left(b_t^i, q_t\right)\right\} \end{aligned}$$

subject to the constraints:

$$\begin{gathered} c_1^f + c_1^m \leq w_1^f h_1^f + w_1^m h_1^m + (1+r)\, b_1 - b_2 \\ l_1^i + h_1^i \leq 1 \ \forall i = f, m \\ b_1 \geq 0 \text{ given} \end{gathered}$$

The continuation value is defined as follows:

$$V_t^i\left(b_t^i, q_t\right) = \begin{cases} V_{M,t}^i\left(b_t, q_t\right) & \text{if } \textbf{one} \text{ of the spouses prefers to remain married} \\ V_{D,t}^i\left(x b_t\right) & \text{if } \textbf{both} \text{ of the spouses agree to divorce} \end{cases}$$

where $x \in [0,1]$ is the fraction of property inherited from marriage, and:

$$\begin{aligned} V_{M,\tau}^i\left(b_\tau^i, q_\tau\right) &= \log c_\tau^i + \log c_\tau^k + \gamma_1^i \log l_\tau^i + \gamma_2^i \log\left(t_\tau^f + t_\tau^m\right) \\ &\quad + q_\tau + \sum_{t>\tau} \beta^{t-1} E\left\{V_t^i\left(b_t, q_t\right)\right\} \end{aligned} \tag{1}$$

$$\begin{aligned} V_{D,\tau}^i\left(x b_\tau^i\right) &= \log c_\tau^i + \log c_\tau^k + \gamma_1^i \log l_\tau^i + \gamma_2^i \log\left(t_\tau^i + \hat{t}_\tau^j\right) \\ &\quad + \sum_{t>\tau} \beta^{t-1} E\left\{V_{D,t}^i\left(b_t\right)\right\} \end{aligned} \tag{2}$$

where (1) is the value to agent i of being married with children in the household[12], and (2) is the value of being divorced and having full custody of the children. In the case in which either the couple had no children before divorcing or spouse i did

[12]If no children are in the household, the value does not include utility from child's consumption and child care time. The consumption of agent i and of child k is computed using the equivalence scales as in Atkinson and Smeeding (1995).

not get joint or full custody, the value does not include utility from neither child's consumption nor child care time. See the next section for a more detailed description of the dynamic problem solved by divorced agents.

Mid age couples. In the second part of their life cycle, married couples allocate their time between market, and leisure. At this stage, children are not in the household, and parents do not receive any utility from spending time with them. The dynamic program of married couples of age 45 to 59 is the following:

$$\begin{aligned} V_{M,2}\left(b_2, q_2\right) &= \max_{\left\{c_2^i, l_2^i, h_2^i, b_3^i\right\}} \sum_{i=f,m} \mu^i(w_2^f, w_2^m, x) \left\{\log c_2^i + \gamma_1^i \log l_2^i\right\} \\ &\quad + q_2 + \sum_{t=3} \beta^{t-1} E \left\{ \sum_{i=f,m} \mu^i(w_2^f, w_2^m, x) V_t^i \left(b_t^i, q_t\right) \right\} \end{aligned}$$

subject to the constraints:

$$\begin{gathered} c_2^f + c_2^m \leq w_2^f h_2^f + w_2^m h_2^m + (1+r)\, b_2 - b_3 \\ l_2^i + h_2^i \leq 1 \ \forall i = f, m \end{gathered}$$

where the continuation value is defined as in (1) and (2).

Elder couples. In the third part of their life cycle, agents retire and consume their savings. I assume that the Pareto weights are the same as in the previous period. The dynamic program of married couples of age 60 to 75 is the following:

$$V_{M,3}\left(b_3, q_3\right) = \max_{\left\{c_3^i, l_3^i, b_3^i\right\}} \sum_{i=f,m} \mu^i(w_2^f, w_2^m, x) \left\{\log c_3^i + \gamma_1^i \log l_3^i\right\} + q_3$$

subject to the constraints:

$$\begin{gathered} c_3^f + c_3^m \leq (1+r)\, b_3 \\ l_3^i \leq 1 \ \forall i = f, m \end{gathered}$$

3.3. Divorced Agents

In this section, I describe the dynamic problem solved by divorced agents in each part of their life-cycle.

Young divorced. A divorced man or woman of age 20-44, with full or joint custody of the children, solves the following maximization problem:

$$V_{D,1}^{i}\left(xb_1\right) = \max_{\left\{c_1^i, l_1^f, t_1^i, h_1^i, b_2^i\right\}} \log c_1^i + \log c_1^k + \gamma_1^i \log l_1^i + \gamma_2^i \log\left(t_1^i + \hat{t}_1^j\right) + \sum_{t=2,3} \beta^{t-1} E\left\{V_{D,t}^{i}\left(b_t^i\right)\right\}$$

subject to the constraints:

$$\begin{array}{cc} c_1^i + c_1^k \leq w_1^i h_1^i + (1+r)\, xb_1^i - b_2^i + al_1 & \text{if } al_1 > 0 \\ c_1^i + c_1^k \leq w_1^i h_1^i + (1+r)\, xb_1^i - b_2^i & \text{if } al_1 = 0 \\ t_1^i + l_1^i + h_1^i \leq 1 & \end{array}$$

where xb_1 is the fraction of assets inherited from the marriage, $x \in [0,1]$ is the property division rule sets by the law, and al_t is the alimony and child support (positive or negative) transfer. He/she chooses consumption, leisure, and child care time in a non-cooperative fashion, as he/she takes as given the child care time choice of the father. The uncertainty in the continuation value depends on the possibility of not receiving the transfers. If the mother (or the father) does not have custody or there are no children in the household at time of divorce, she will not receive any utility from chid's consumption, nor child care time, and the transfer al_1 will only reflect the alimony payment.

Mid age divorced. The problem solved by divorced men or women of age 45-59 differs from the one above in the child custody aspect. The dynamic program solved by agent $i = f, m$ is the following:

$$V_{D,2}^{i}\left(b_2\right) = \max_{\left\{c_2^i, l_2^i, h_2^i, b_3^i\right\}} \log c_2^i + \gamma_1^i \log l_2^i + \sum_{t=3} \beta^{t-1} E\left\{V_{D,t}^{i}\left(b_t^i\right)\right\}$$

subject to the constraints:

$$\begin{array}{cc} c_2^i \leq w_2^i h_1^i + (1+r)\, b_2^i - b_3^i + al_2 & \text{if } al_2 > 0 \\ c_2^i \leq w_2^i h_1^i + (1+r)\, b_2^i - b_3^i & \text{if } al_2 = 0 \\ l_2^i + h_2^i = 1 & \end{array}$$

Elder divorced. Finally, the problem solved by agents older than 60 is the following:

$$V_{D,3}^i(b_3) = \max_{\{c_3^i, l_3^i, h_3^i\}} \log c_3^i + \gamma_1^i \log l_3^i$$

subject to the constraints:

$$\begin{array}{cc} c_3^i \leq (1+r)\, b_3^i + al_3 & \text{if } al_3 > 0 \\ c_3^i \leq (1+r)\, b_3^i & \text{if } al_3 = 0 \end{array}$$

3.4. Partial Equilibrium

Given wage rates $\left\{w_t^f, w_t^m\right\}_{t=0,\ldots,T}$, risk-free return from assets r, initial assets $b_1 \geq 0$, and Pareto weights $\left\{\mu^f(w_t^f, w_t^m, x), \mu^m(w_t^f, w_t^m, x)\right\}$, a partial equilibrium for this economy is a set of decision rules of married agents for

(i) consumption $\left\{\hat{c}_t^f(b_t, q_t), \hat{c}_t^m(b_t, q_t)\right\}_{t=0,..,T}$,

(ii) leisure $\left\{\hat{l}_t^f(b_t, q_t), \hat{l}_t^m(b_t, q_t)\right\}_{t=0,..,T}$,

(iii) market hours $\left\{\hat{h}_t^f(b_t, q_t), \hat{h}_t^m(b_t, q_t)\right\}_{t=0,1,..,T}$,

(iv) child-care time $\left\{\hat{t}_t^f(b_t, q_t), \hat{t}_t^m(b_t, q_t)\right\}_{t=0,..,T}$,

(v) investment in risk-free assets $\left\{\hat{b}_{t+1}(b_t, q_t)\right\}_{t=0,..,T}$;

and a set of decision rules of divorced agent $i = f, m$, with $j \neq i$, for

(i) consumption $\left\{\hat{c}_t^i(b_t^i, \hat{t}_t^j)\right\}_{t=0,..,T}$,

(ii) leisure $\left\{\hat{l}_t^i(b_t^i, \hat{t}_t^j)\right\}_{t=0,..,T}$,

(iii) market hours $\left\{\hat{h}_t^i(b_t^i, \hat{t}_t^j)\right\}_{t=0,..,T}$,

(iv) child-care time $\left\{\hat{t}_t^i(b_t^i, \hat{t}_t^j)\right\}_{t=0,..,T}$,

(v) investment in risk-free assets $\left\{\hat{b}_{t+1}^i(b_t^i, \hat{t}_t^j)\right\}_{t=0,..,T}$

such that agents maximize utility, $\hat{b}_{T+1}(b_T, q_T) = 0$ and $\hat{b}_{T+1}^i(b_T^i, \hat{t}_T^j) = 0 \; \forall i, j = f, m$.

4. Calibration of the baseline economy (the Seventies)

The calibration strategy consists of two stages. First, some parameters are assigned numerical values from the data. Second, the remaining parameters are estimated using the method of simulated moments based on cross-sectional patterns of age-specific divorce rate, average time spent in the market and in child care by married agents in the U.S. in 1970[13]. Table 5 summarizes the parameters which are calculated directly from the data. Table 6 contains seven estimated parameters based on moments described in Table 7 which are constructed using the data from the 1970 IPUMS CPS. The Appendix provides details on the sample selection and the calculation of moment conditions from these data set.

Table 5: Exogenous Parameters

Parameter	Value
Gross interest rate (1+r)	1.04
Period discount factor β	$\left(\frac{1}{1+r}\right)^t$
Age-profile of wages w_t^i	Computed from 1970 IPUMS CPS
Alimony transfers	Computed from 1970 IPUMS CPS
Percentage of married households with children	Computed from 1970 IPUMS CPS
Households' asset distribution	Bossons (1973)
Percentage of marital property to wife x	Weitzman (1985), Table 1
Pareto weights μ^i	$f(w_t^m, w_t^f, x)$

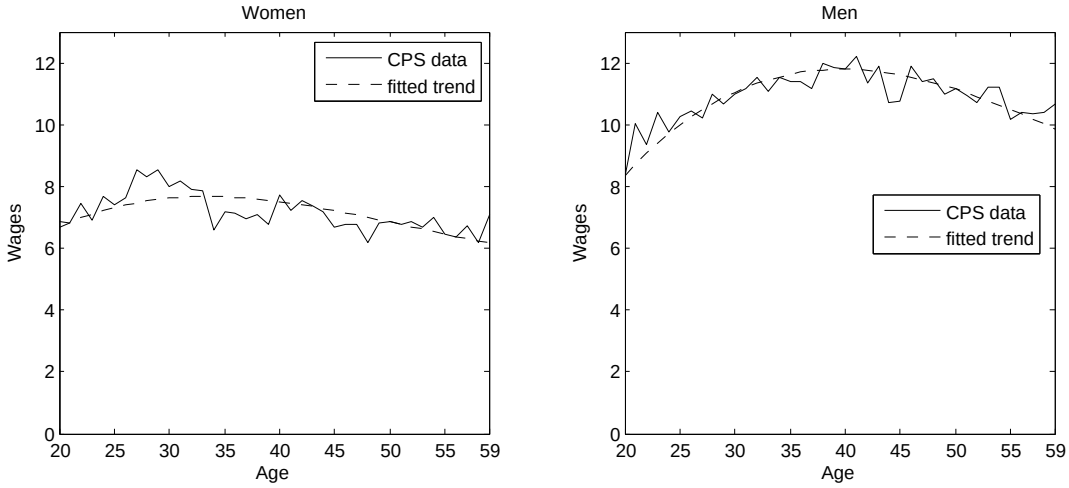
[13]I calibrate the parameters to the 1970 as, to my knowledge, there are no earlier data available for the divorce rate by age group.

Table 6: Calibrated Parameters

Parameter	Value
Lower bound on distribution of q_1, $\underline{q}_1$	-0.20
Lower bound on distribution of q_2, $\underline{q}_2$	-8.40
Lower bound on distribution of q_3, $\underline{q}_3$	-2.17
Preference parameter on leisure γ_1^f	3.21
Preference parameter on leisure γ_1^m	2.02
Preference parameter on child care time γ_2^f	0.97
Preference parameter on child care time γ_2^m	0.62

In order to characterize the household preferences described in section 3.2 and 3.3, five parameters are needed: four which identify the utility function $(\gamma_1^f, \gamma_1^m, \gamma_2^f, \gamma_2^m)$ and the discount factor β. As the annual gross interest rate is $(1 + r) = 1.04$, the discount rate is $(1/1 + r)^t$, where t is equal to 25 years for the first period of the life cycle, and it is equal to 15 in the second and third period. The average age-profile for wages, w_t^i, is computed from the 1970 IPUMS-CPS by dividing the individual labor income by the total hours worked. The age-profile of wages is smoothed using a cubic polynomial in age (Figure 3). Retired households only consume their savings and do not receive any pension transfer.

Figure 3: Wage age-profile, 1970



Source: IPUMS-CPS

Alimony and child support transfers are calculated from the 1970 IPUMS-CPS. They are feed in as a fixed proportion of the household income.

The percentage of married households with children is computed from the 1970 IPUMS-CPS. I only distinguish between married households of age between 20 and 44 with children (79%), and married households without children (21%).

Initial distribution of assets matches the distribution of assets of married households of age 20-44 in 1962 in the U.S. According to Bossons (1973), 93% of these households owned assets for a value lower than $\$15,000$ (1962 U.S. dollars); 4.7% had assets for a value between 15 and $\$30,000$; 1.7% owned assets valued between 30 and $\$60,000$; the remaining 0.6% had assets valued more than $\$60,000$.

The property division rule is set according to Weitzman (1985), as shown in Table 1. That is, in 1970, at time of divorce, only 2% of husbands were getting 80% of the property; 12% of husbands were inheriting 50% of the marital property; and, the remaining 86% were obtaining 20% of the property.

The Pareto weights are a linear function of the wages of the two spouses and of the property division rule, and I assume that they do not vary from the second to the third period of the life cycle.

4.1. Moment conditions for the simulated method of moments

Seven structural parameters must be calibrated: the lower bound on the match quality distribution at $t = 1$, $\underline{q}_1$; the lower bound on the match quality distribution at $t = 2$, $\underline{q}_2$; the lower bound on the match quality distribution at $t = 3$, $\underline{q}_3$; the females's preference parameter on leisure γ_1^f; the males's preference parameter on leisure γ_1^m; the mother's preference parameter on child care time γ_2^f; and, the father's preference parameter on child care time γ_2^m. Let $\Theta = (\underline{q}_1; \underline{q}_2; \underline{q}_3; \gamma_1^f; \gamma_1^m; \gamma_2^f; \gamma_2^m)$ define the vector of structural parameters to calibrate. The parameter values Θ are identified so that the resulting statistics in the model economy $G_j(\Theta)$ are determined by the seven specified targets G_j for $j = 1, \cdots, 7$ measured in the U.S. cross-section. The data for the seven targets come from three different sources: Kunz and England (1988), the IPUMS Current Population Survey, and the American's Time Use Survey. Data from Kunz and England (1988) are used to compute the average age-specific divorce rate per 1,000 of married females in each age group (23.10 for the young couples, 5.9 for the mid-age, and 1.8 for the elder couples). The IPUMS-CPS is used to estimate the average number of hours worked by married women (1,480 yearly hours, or 17% of the total time) and the average number of hours worked by married men (2,890, or 33% of total number of hours). The American's Use of Time Survey is used to estimate the average amount of yearly hours that married mothers and fathers spent

in child care (2,540 and 525, respectively). The total endowment of time in each period is normalized to 1.

Table 7: Moments targeted in the estimation

Calibration target	Data	Model	Data Source
Divorce rate young couples 20-44	23.1	23.3	Kunz and England (1988)
Divorce rate mid-age couples 45-59	5.9	5.9	Kunz and England (1988)
Divorce rate elder couples 60-75	1.8	1.8	Kunz and England (1988)
Hours worked by married females	0.17	0.17	1970 IPUMS CPS
Hours worked by married males	0.33	0.33	1970 IPUMS CPS
Child care hours by married mothers	0.29	0.29	Time Use Survey, 1965-1966
Child care hours by married fathers	0.06	0.06	Time Use Survey, 1965-1966

5. Baseline Experiment

The quantitative importance of the mechanism built into the model can be assessed by its ability to generate an increase in divorce rate. In this section, I use the changes in property division, child custody, child support and alimony transfers, to assess their quantitative contribution in explaining the rise in age-specific divorce rate (and hence aggregate divorce rate). In the next section, I decompose the increase in divorce rate to analyze the contribution of each group to the increase. The decomposition is based on presence of children, and on hourly earnings. Next, I discuss the implications of the legal changes on time allocation, and on welfare.

The main quantitative implications of the model are with respect to the change in the divorce rates from 1970 to 1980. In this baseline experiment, I *simultaneously* introduce the following changes:

1) Property division: husbands get a percentage of property that varies between 48% and 51% of the marital property;
2) Child custody: mothers have full custody with a probability of 90.2%; fathers are sole custodians with a probability of 3.2%; and, joint custody occurs in the remaining 6.6% of the cases;
3) Alimony and child support: alimony and child support transfers, and the probability of receiving them, change as in tables 2 and 3.

Table 8 reports the results of two experiments. Model (1) includes the three

changes mentioned above at the earning's level of 1970[14]. In Model (2), I do also take into account the observed changes in earnings from 1970 to 1980 for both men and women[15] (see Figure 4 in the Appendix).

Table 8: Results

		1970	1980		Change	
			(1)	(2)	(1)	(2)
20-44	Data	23.10		31.0		7.90
	Model	23.30	27.84	29.11	4.54	5.81
45-59	Data	5.90		7.0		2.10
	Model	5.90	6.0	6.30	0.1	0.40
60+	Data	1.80		2.0		0.20
	Model	1.80	1.81	1.81	0.01	0.01
Overall	Data	13.0		22.60		9.60
	Model	13.0	17.60	18.40	4.60	5.40

The model explains about 50% of the increase in divorce rate of the young couples, and about 5% of the increase in divorce rate of mid age and elder couples. In aggregate terms, it accounts for about 40% of the increase in the divorce rate from 1970 to 1980. The divorces taking place in the baseline economy calibrated to 1970 are generated by low draws of match qualities in the three periods of the life cycle. Analyzing the divorce policies of young men and women, it emerges that the number of women (with children) willing to divorce is higher than that of men[16]. In other words, once hit by a negative matching shocks, women are more willing to divorce and leave with the children than their husbands. This can be explained by the high unequal rule of assets division at time of divorce. Indeed, divorces are concentrated

[14]That is, alimony and child support transfers are computed as a fraction of household's income assuming that its level did not change from 1970.

[15]This implies that also alimony and child support transfers are adjusted to the earnings level of 1980.

[16]Recall that divorce is consensual, hence it takes place only if both of the spouses agree to divorce.

among household with low level of initial assets. In the simulated economies (both (1) and (2)) with the new legal divorce regime, the willingness to divorce of husbands increases as they receive a higher share of assets that compensates for the higher values of alimony and child support transfers. At the same time, wives gain from trading a share of assets against an increase in liquidity means. The net gain of both spouses is driven by the fact that, at time of divorce, husband and wife have different needs. In particular, the wife will have to bear the entire cost of her current child's consumption and to allocate part of her time in child care. The husband will have to provide for his own consumption and for the current and future transfers to the wife. Hence, wives (and especially mothers) will put a higher weight on the increase in transfers than on the decrease in assets. Viceversa for husbands. The results are exacerbated when the increase in current and future earnings is taken into account. The mechanism is different for couples in the later stage of the life cycle. In particular, in the baseline economy, mid age husbands are more likely to step out of the marriage than their spouses. The increase in women's earnings compensates for the decrease in alimony transfers and creates an incentive to agree to divorce.

5.1. What drives these quantitative predictions?

In order to understand what drives the results, I disentangle the increase in the divorce rate among couples with or without children, and couples with high or low education level (or husband's hourly earnings). The divorce rates by number of children and education level are my computation using the percentage of divorced with or without children, and of different education level in the CPS-IPUMS. The computation takes into account of the general increase in the percentage of young women without children of 0.7 percentage points, and the increase in the percentage of young men with some college degree of 6.5 percentage points.

As we can see from Table 9, the model predicts the direction of the increase, but not the level. In particular, the model does not predict a positive divorce rate for couples without children, and not even a change of it. The fact that couples with children were more likely to divorce than those without is also documented by the National Center for Health Statistics (1989). They report data on petitioner (or the party that first files for divorce). On average, among childless couples, the wife was the petitioner in 57% of the cases and the husband was the petitioner in 37% of the cases. Among couples with children, the wife was the petitioner in 66% of the cases, and the husband in 29% of the cases. To explain this phenomenon, four hypotheses are suggested:

(i) husbands, facing the prospect of child support payments, may be reluctant to file for divorce when there are children;

(ii) remarriage rates for older women are lower than remarriage rates for older men. Generally, childless women are older on average than women with children;

(iii) as women are granted custody in most cases, divorce may mean separation from children to fathers that refuse to file for divorce;

(vi) wives are first to file for divorce if they feel that the petitioner has a higher probability to get custody.

Hypothesis (iv) is also supported by reports from divorce attorneys cited by Weitzman (1985).

The model has nothing to say about hypothesis (ii), but it may be thought of a rationalization of the other three hypotheses (for what it concerns the level of the rates). Moreover, the higher increase in the divorce rate by couples with children can be explained (through the model) as mothers receive a higher provision of liquidity means to bear child consumption's cost and forgone labor earnings (due to child care time).

Table 9: Divorce Rate by Number of Children

		1970	1980		Change	
			(1)	(2)	(1)	(2)
With Children	Data	17.10		22.70		5.60
	Model	23.30	27.84	29.11	4.54	5.81
Without Children	Data	6.0		8.3		2.3
	Model	0.0	0.0	0.0	0.0	0.0

In terms of education level (or husband's hourly earnings), the model does match the higher level of divorces among the low educated couples, and the higher increase in divorces experienced by high educated couples.

Table 10: Divorce Rate by Education Level

		1970	1980		Change	
			(1)	(2)	(1)	(2)
Less than College	Data	17.30		20.10		2.80
	Model	19.49	20.88	21.89	1.39	2.40
Some College and More	Data	5.80		10.90		5.10
	Model	3.88	6.96	7.22	3.08	3.44

5.2. Implications on Allocations

The exercise predicts some changes in terms of the time allocation choices in line with those observed in the data. Table 11 and Table 12 report the fraction of time devoted to child care and market activity. The changes mostly regard the time spent in child care by married women (Table 11), which decreases by 24 percentage points, and by married men, for whom it increases by 50 percentage points. Time in the market (Table 12) slightly increases for married women, but decreases for young married men.

Table 11: Time Allocations, Young Couples

Child Care Time		1970	1980		Change	
			(1)	(2)	(1)	(2)
Young Married Women	Data	0.29		0.20		-0.31
	Model	0.29	0.28	0.22	-0.03	-0.24
Young Married Men	Data	0.06		0.07		0.17
	Model	0.06	0.09	0.18	2.0	0.50

Table 12: Time Allocations, Young Couples

Market Time		1970	1980		Change	
			(1)	(2)	(1)	(2)
Young Married Women	Data	0.17		0.19		0.12
	Model	0.17	0.17	0.18	0.0	0.06
Young Married Men	Data	0.33		0.21		-0.36
	Model	0.33	0.33	0.31	0.0	-0.06

5.3. Welfare Analysis

In order to assess the social effects of this policy change, Table 13 shows the average level of welfare and its percentage change from the baseline model to the simulated economies (1) and (2) (as defined above). The average welfare is computed as average utility of married and divorced couples. More precisely, I compute the welfare of couples that remain married for the entire lifetime, and of those who divorce while young. Note that, both experiments generate an increase in average welfare of divorced agents, especially men. Moreover, it predicts a higher decrease in welfare for married couples with children than for childless couples.

Table 13: Welfare Change

	1970	1980		Change	
		(1)	(2)	(1)	(2)
Married Couples *with* Children	1.89	1.51	1.49	-0.20	-0.21
Married Couples *without* Children	3.30	3.26	3.25	-0.01	-0.01
Divorced Women	-3.61	-3.60	-3.56	0.01	0.01
Divorced Men	-1.26	-1.24	-1.20	0.01	0.05

6. Conclusions

At the end of 1960s, divorce law underwent major changes. This paper assesses the quantitative impact of changes in divorce settlements on the divorce rate. Unlike the existing empirical literature, I do not consider the change to unilateral divorce, and show that changes in the divorce settlements contribute to a substantial increase in divorce rate. In particular, together changes in child custody assignments, alimony transfers and division of property account for 50% of the increase in divorce rate of couples in the age group 20-44, and for 5% of the increase in divorce rate of elder couples. Moreover, the model predicts a higher increase in the divorce rate of young couples with children and of couples with high educated husband which are consistent with the data.

A. Numerical solution and Algorithm

The household model is solved numerically by backward induction from the terminal node. At each state, I solve for the value function and the optimal policy rules, given the current state variables and the solution to the value function in the next period. Consider any arbitrary period. Each couple enters the period with a stock of assets, and a certain match quality. They draw a new match quality, and choose allocations for the case they remain married, and the case they get divorced. For each agent, I evaluate the level of utility associated with the two marital status. The level of utility conditional on marital status is computed by checking all of the possible alternatives for consumption, labor supply, time to spend with children, and saving. For each possible choice, I select the one that yields the highest level of utility. If at least one of the spouses prefers to stay married, then they remain married; if both of them prefers to divorce, they will divorce.

The presence of a discrete choice (decision to divorce) and several continuous decision variables like labor supply, time spent with children and saving implies that the value function of the married agents is not necessarily concave or differentiable. To solve the problem, I use a finite dynamic programming method and approximate the solution to the households' problems by solving them on a grid.

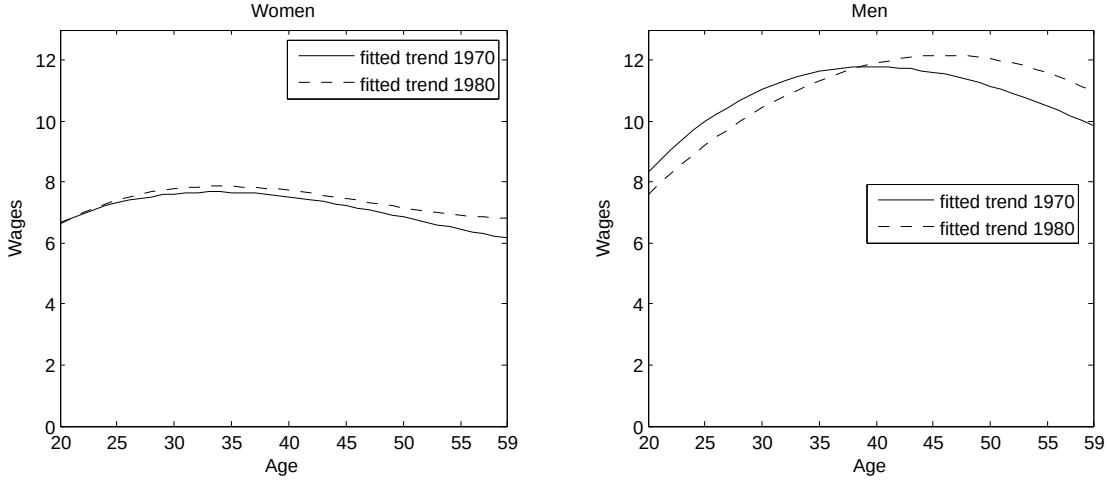
The algorithm used to solve the problem is the following. First, I guess the values of the parameters to be estimated. Given the guesses, I use finite dynamic programming to solve for optimal decision rules for marital status, savings, and time in the market and with children. Next, I simulate the shock histories of 100,000 households. Using the simulated histories and the optimal decision rules, I compute the targeted moments to pin down the values for estimated parameters which produce moments summarized in Table 6. Since the differentiability of the objective function in the estimated parameters is not guaranteed, I use a minimization procedure that does not rely on the existence of the gradient (simplex). Once the estimated parameters are identified, I solve the household problem one more time and save the optimal decision rules. Next, I use the resulting distribution of the match quality shock to run the experiments.

B. Data

IPUMS Current Population Survey. IPUMS-CPS is an integrated set of data from 48 years (1962-2009) of the March Current Population Survey (CPS), and is publicly available for download at the IPUMS-CPS website (King M. and M. (2004)). I concentrate on married couples and divorced (and separated) men and women of age 20 to 75. I only consider men and women who worked a positive number of

hours in the year preceding the interview. Alimony and child support payments are deflated using the Consumer Price Index (1982-1984=100). The variable used for the alimony and child support transfer is *incaloth*. I compute hourly wage by dividing the total yearly earnings by the total hours worked. Figure 4 shows fitted wages in 1970 and 1980.

Figure 4: Fitted Wage age-profile, 1970 and 1980



Source: IPUMS CPS

Americans' Use of Time, 1965-1966. This dataset includes adults between 19 and 65 years of age living in cities in the United States with a population between 30,000 and 280,000, and in households that had at least one adult employed in a non-farming occupation. Question related to caring or helping household children are asked in the survey. I use data on "primary child care activity". This activities include minutes spent providing physical care to children under 5 years and older (including meals, dressing, general supervision, getting up); helping with or supervising schoolwork; reading stories to or talking with children under 19 years old; indoor games or manual instruction; outdoor games or walk; medical care and other child care; trips related to child care. I only include married women with own children in the household.

NLS-72. The fifth follow-up survey of the National Longitudinal Study of the High School Class of 1972 (NLS-72) took place during spring and summer of 1986. The sample members averaged 32 years of age and had been out of high school for 14 years. I consider mothers who have been married and divorced at least once. All

of them are in the age group 30 to 40 by construction of the data set itself. In questions 67 and 68 of the survey (variable FI167 and FI168), respondents are asked to provide information about child custody and visitation agreement. Moreover, I analyze the answers given in question 62A (var. FI62A) and question 62B (var. FI162B) to compute the percentage of property inherited at the time of divorce. For each respondent, those variables provide the (intervalled) amount of properties received by themselves and by the spouse.

Kunz and England (1988) and Table 14 report the age-specific divorce rates for the states for which the data were available in both 1970 and 1980.

Table 14: Age-specific Divorce Rates

State	Year	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59	60-64	65+
HA	1970	28.6	24.8	19.5	16.5	12.8	10.2	7.5	3.8	3.3	2.2
	1980	45.5	40.2	30.1	23.2	16.2	11.0	5.2	4.0	2.9	1.2
IL	1970	34.5	25.6	19.2	15.3	11.7	8.2	5.6	3.5	2.1	1.1
	1980	50.5	37.6	27.7	22.0	16.1	9.9	6.9	3.5	2.3	1.2
KA	1970	42.5	30.5	20.1	16.5	11.8	8.9	6.2	3.7	2.3	1.4
	1980	54.6	42.1	32.6	25.9	18.8	11.4	6.3	3.9	2.5	1.7
MD	1970	19.8	18.1	13.2	10.9	8.4	6.3	4.7	2.6	2.1	0.9
	1980	36.4	35.2	26.0	19.7	15.0	9.9	6.4	3.7	2.5	1.1
MT	1970	52.3	32.4	22.3	19.6	16.1	9.9	5.9	5.0	4.7	1.5
	1980	58.0	43.5	35.4	29.4	23.4	16.3	9.6	11.8	0.9	0.0
NE	1970	30.5	18.3	13.5	10.2	8.8	6.5	3.5	1.9	1.3	0.8
	1980	40.1	31.3	24.2	20.1	15.8	9.3	5.3	3.6	1.9	1.0
OR	1970	46.7	31.6	25.3	21.4	16.5	10.2	7.6	5.4	3.2	1.6
	1980	63.4	50.1	38.9	33.9	24.6	15.4	9.6	6.9	4.1	2.7
RI	1970	19.3	16.5	11.6	9.9	7.1	5.1	2.6	2.3	1.4	0.6
	1980	39.2	32.8	26.7	22.3	15.3	9.7	5.3	3.6	2.2	0.6
SC	1970	20.2	16.5	12.5	9.8	7.4	5.5	3.6	1.8	1.8	0.1
	1980	39.9	33.1	24.7	20.2	13.6	9.7	6.4	3.9	2.6	1.3
TN	1970	42.2	29.5	21.1	17.1	12.6	9.9	7.4	4.0	3.2	1.6
	1980	66.0	48.8	35.5	27.8	19.9	12.8	8.4	5.2	3.9	3.6
TX	1970	43.5	30.8	22.0	19.4	14.7	11.6	7.9	5.3	3.8	2.2
	1980	61.1	48.6	36.7	29.8	21.8	14.5	9.4	6.3	4.1	2.5
UT	1970	32.8	27.1	17.8	15.8	10.5	8.2	6.8	3.8	1.9	1.3
	1980	40.7	34.0	27.7	8.6	17.2	11.8	6.7	4.3	2.7	2.5
VT	1970	24.6	19.6	15.7	11.6	8.3	8.1	3.7	2.8	1.4	0.7
	1980	45.0	42.7	35.1	29.7	20.3	14.4	6.5	4.3	2.8	1.4
VA	1970	22.1	18.4	14.1	10.9	8.9	6.5	5.0	3.1	2.2	1.2
	1980	36.5	35.4	26.5	20.6	15.8	10.7	6.9	4.2	2.6	1.3
WV	1970	28.1	27.1	16.8	13.8	12.1	9.8	8.5	5.9	5.5	2.8
	1980	47.1	32.7	25.8	20.3	14.2	10.1	5.8	3.7	4.9	0.0
Total	1970	33.1	24.2	17.6	14.5	11.2	8.2	5.7	3.7	3.7	3.1
	1980	47.0	39.0	29.0	21.0	17.0	10.0	6.0	3.9	2.5	1.1

Source: Kunz and England (1988)

Acknowledgments
This paper is adapted from a chapter of my Ph.D. dissertation at the University of Minnesota. I thank Francesca Carapella, V.V. Chari, Alessandra Fogli, Larry E. Jones, Katya Kartashova, Eric Langlais, Ellen McGrattan, Pricila Maziero, and Fabrizio Perri, Nicola Pavoni, Thomas Picketty, and Kamila Sommer for comments and suggestions. All errors are mine.

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