Marriage Contracts and Divorce : an Equilibrium Analysis*

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Abstract

The paper provides a general equilibrium analysis in which individual decisions determine the aggregate divorce rate and are influenced by it. Reinforcement is caused by search frictions and a meeting technology whereby remarriage is more likely if the divorce rate is higher, implying multiple equilibria. Welfare tends to be higher at equilibria with more divorce. We show that in search markets, a legal policy that enforces voluntary contracts need not be socially optimal, because the presence of rents allows the partners to neglect the interest of prospective spouses whom they may meet in the future.

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1. Introduction

The divorce rate in the US has doubled during the decade 1965-1975's having been roughly at 10 per mill from 1940 to 1965 and roughly 20 per mill from 1975 to 1995 (see Figure 1). Other countries have also experienced dramatic changes in the divorce rate (see Clarke, 1995 and Stone, 1995). There have been several attempts to identify the *exogenous* factors that are responsible for this sudden change, such as changes in production technology, including contraceptive technology, that allowed women to enter the labor market, thereby increasing their economic independence, and changes in the norms and laws governing divorce (see Michael, 1988, Becker, 1992, Ruggles, 1998 and Stone, 1995). In this paper, our point of departure is somewhat different. We try to identify the basic features *inherent* in marriage markets which make them susceptible to such exogenous shocks. In marriage markets, where finding a mate takes time and meetings are random, the decision of each couple to terminate its marriage depends, in addition to the realized quality of the particular match, on the prospects of remarriage and, therefore, on the decisions of others to divorce and remarry (see Mortensen, 1988, and Becker et al., 1977). It is clear that such positive feedbacks can lead to inefficiency and to large aggregate responses to small exogenous changes. It is less clear what are the welfare implications of such sharp changes and whether and how such "search markets"should be regulated.

Social observers have viewed the sharp increase in the divorce rate with considerable alarm, especially because of the potential harm to children (more than 1 million children in the US are involved in a divorce every year). The welfare loss associated with divorce depends on the divorce settlements, including the assignment of custody and financial transfers in the form of alimony and child support. In this paper, we analyze the determination of such transfers in a general equilibrium context, where the transfer is allowed to influence and to be influenced by the aggregate divorce rate. We show that there are private incentives to *overinsure* against the risk of remaining single in the aftermath of divorce. This tendency to overinsure implies that, if ex-ante contracts are fully enforced, the equilibrium divorce rate may be *too low* and insufficiently sensitive to exogenous changes in the economic costs of divorce. This line of argument may justify the establishment of guidelines which regulate the child support and alimony awards, instead of simple "stamping" of contracts on which the partners agree. The surprising aspect is that these guidelines should be more *stringent* than the transfer agreed upon by the partners themselves.

Our basic model contains the following ingredients. The gains from marriage include a systematic element and a random element which is realized after some time elapses. The systematic part of the gains motivates marriage and remarriage. The random shocks trigger divorce. In the basic model, the systematic element is the economic gain from *sharing* consumption goods by married partners, and the random element is the emotional feelings that the partners have about each other. These features distinguish the analysis of the family from the employment relationship. The ability to share collective goods suggests that bargaining within families may be less important than between workers and their employer. The explicit considerations of emotional factors, and the possibility that love can turn into hate, suggest that partners may decide to separate even at the price of substantial economic costs, implying an important role for insurance.

Couples with low realized quality of match may wish to break their marriage and seek a better match. However, finding a mate involves time and there is a risk of remaining single and bearing the higher costs of consumption. Therefore, each married person must weight the quality of his current match against the costs of divorce and the prospects of remarriage with a better match. These prospects depend on the decisions of others to divorce and remarry. Individuals are presumably aware of the risks of divorce and of remaining single and have an obvious incentive to insure themselves, through agreements which stipulate transfers from the one who remarries to the one who remains single (or to the custodian if children are present). Such insurance contracts can facilitate divorce among couples with bad realized matches and increase welfare. It seems natural for the courts to enforce such transfers. The question, however, is at what level should these transfers be set.

Enforcement of voluntary ex-ante contracts is inefficient because of two externalities that are present in our model. One is a *meeting externality,* that is associated with the impact of divorce on the remarriage prospects of others. In our model, the meeting technology is characterized by increasing returns, so that divorce is potentially beneficial to others; but this effect is ignored by individual decision-makers. A second and less standard inefficiency is generated by the presence of a *contract externality,* associated with the impact of commitments to the present spouse on the welfare of prospective matches. Because of the rents associated with random and infrequent meetings, a prospective match may prefer to remarry a person burdened by commitment to his ex-spouse, rather than remain single. Under these circumstances the current spouses may exploit their monopoly power and make commitments that do not internalize the costs born by prospective matches. Because consumption is shared, a transfer from a couple, where each dollar serves two people, to a single person is costly and overinsurance raises the costs of divorce. Thus, the two externalities reinforce each other, leading to an equilibrium divorce rate which is too low from a social point of view.

The role of insurance in matching markets has been already noted by Li and Rosen, 1998. They consider matching uncertainty, combined with payoff uncertainty which is induced by the aggregate relative supplies of eligible partners of each sex. Insurance can be obtained by ex-ante contracting on the sharing of the gains. They show that the desire to insure, motivated by risk aversion, can lead to unraveling and inefficiency. In our model, there is no aggregate uncertainty and insurance is motivated by match specific shocks. Yet, individual contracting influences, and is influenced by, the aggregate outcome. Contract externalities were discussed by Diamond and Maskin, 1979, who show that commitments can influence the bargaining outcome in subsequent matches, yielding inefficiently high divorce settlements. In their model, divorce is motivated by meeting better matches rather than by shocks to the quality of the match and agents are risk neutral, consequently insurance plays no role. Another related paper is Aiyagari et al., (2000) who construct and simulate a model of the marriage market which includes individual shocks, divorce and alimony payments among other things. They show that, at their chosen parameters, an increase in alimony raises welfare. Our model is substantially simpler than theirs, allowing us to discuss more explicitly the circumstances under which such an outcome is likely to occur. However, we achieve this added transparency at a substantial cost. In our model, individuals are assumed to be ex-ante *identical* so that all issues of assortative mating are set aside. Similarly, there are no unexpected changes in earnings that can trigger divorce and create ex-post heterogeneity and we do not discuss wealth accumulation and the intergenerational implications of marriage and divorce.[1] Finally, we leave aside several interesting extensions of the model, regarding in particular the case of independent valuations of the quality of the match and the role of children in divorce decisions. The reader is referred to a companion paper (Chiappori and Weiss 2000) for a discussion of these extensions.

[1] Recent papers that touch on these issues, but focus mainly on marriage, are Burdett and Coles (1997 and 1999) and Coles et al. (1998).

2. The Model

2.1. The basic framework

We focus on only one economic motive for marriage, the sharing of purchased consumption. In addition, the partners to the marriage derive non-monetary returns from their union. These returns are uncertain when the marriage is formed. When the quality of match is revealed, the partners can divorce and form another union. Individuals live only two periods and a marriage must last for at least one period. By assumption, all individuals have the same earning capacity Y, which is constant over time.

The gains from marriage The per period utilities of two partners in a given marriage are

$$u_i = u(c) + \theta_i, \; i = 1, 2, \tag{1}$$

where c is family consumption, $u(c)$ is monotone increasing and strictly concave, and θ_i is the subjective evaluation of the quality of the current match by partner i. The utility of an unmarried person is

$$u = u\left(c\right) \tag{2}$$

This match specific random variable is drawn from a given distribution, $F(\theta)$ which is common to all marriages. Throughout the paper we assume perfect correlation between the evaluations of the marriage by the two partners, $\theta_1 = \theta_2 = \theta$.[2] To sharpen the analysis, we assume that the *expected* value of the non-monetary benefits of marriage are zero; specifically, $F(\theta)$ has zero mean and is symmetric around zero, $F(\theta) = 1 - F(-\theta)$.

The meeting technology We assume equal numbers of males and females in each cohort. Each period, each single person meets a random draw from the population of the opposite sex *of the same age*. We view marriage as a short term commitment and do not allow "search on the job"[3]. We assume that a married

[2] The case of different valuations will be briefly discussed in the Conclusion.

[3] Our result would actually hold with 'search on the job' under the assumption that the intensity of search is higher for divorcees or that remarriage is easier with a divorcee than with a married person (the key ingredient being that a larger number of divorcees on the market still increases remarriage probability). Such a variant would however complicate the basic arguments with little substantive benefits.

individual cannot disengage the marriage before a full period elapses. Therefore, if the matched person is married (which may happen for second period meetings), there is no possible remarriage. If the matched person is single remarriage is possible. This assumption captures two stylized facts that we want to introduce. One is that the search process is not frictionless; in particular, after divorce, agents may remain single with a positive probability. Secondly, this probability decreases with the average divorce rate in the population: remarriage is easier, the larger the number of singles around.[4] As a consequence, a large divorce rate in the population lowers the economic cost of divorce for each household. Our assumptions provide these two properties at a low cost. The stratification of meetings by age simplifies the analysis considerably, because it ties directly the probability that a single person will remarry to the probability that married individuals will choose to divorce.

The legal environment The partners to marriage can sign binding contracts, enforced by law, which determine the size of the divorce transfer. For reasons described below, such voluntary insurance is generally inefficient, and we shall consider situations in which the size of the divorce transfer is determined by law. In actual practice, the realized quality of match is not a consideration that the law takes into account in determining the settlement; an obvious explanation is that the evaluation of the match by the partners is not verifiable by a third party. We therefore assume that payments can only be conditioned on actual divorce. For a similar reason, we assume that the payment to one's ex-spouse does not depend on the marital status of the ex-spouse of her or his *new* spouse[5]. Finally, we assume

[4] Search models of the labor market often assume constant returns, whereby the probability of meeting would depend on the *ratio* of single individuals of each sex. Increasing returns are generated here by "wasted" meetings with attached individuals. The presumption is that the establishment of more focused channels, where singles meet only singles, is costly and they will be created only if the "size of the market" is large enough. Indirect evidence for increasing returns is provided by the fact that the sudden rise in divorce during the period 1960-75 in the US was also associated with a large increase of the remarriage rate (see Norton and Miller, 1992).

[5] Without this assumption, optimal transfers between two spouses would typically depend on the marital status of *all* agents in the economy. Assume, for instance, that M and F have divorced and are both remarried (to F' and M' respectively). Assume, further, that the former husband of F' (say, M") has remarried too, whereas the former wife of M' (say, F") is single. Then, F" will receive a transfer from M' (and F), while M (and F') are not required to make any transfer. Efficient risk-sharing would therefore require a transfer from M to F, although both are remarried. That, however, is not the end of the chain, since this transfer should also

that whether divorce was asked by the husband or the wife is not verifiable either, so that contingent transfers must be symmetric between spouses[6].

2.2. The marriage and divorce decisions

In this model, the marriage decision is straightforward: every meeting between two single persons ends up in marriage. The reason is that the sharing of consumption goods provides a strong economic incentive for marriage and couples can always divorce after one period, when the quality of the match is revealed. It is important to note that this property would hold even in the presence of income heterogeneity across agents, although we keep our homogeneity assumption for simplicity. In the first period, since everyone starts as a single, everyone finds an eligible match and gets married. In the second period, the decision to remarry depends also on the level of contingent transfers, since remarriage may imply either losing a transfer from the former spouse or having to pay a transfer to her. We assume throughout the paper that the divorce transfer does not exceed half the income. This requirement, as discussed below, guarantees that the partner who remarries is better off than the partner who remains single. As a consequence, when two divorced persons meet at period two, they always remarry.[7]

At the end of the first period, the quality of the initial match is realized and the partners can decide whether to continue the marriage. If the partners to a marriage draw a negative value of θ, they may wish to separate and look for a new match. This decision depends on the prospects of remarriage and the legal environment. Despite the negative draw of θ, one may prefer to stay in the current match if the economic loss associated with being single is substantial and the risk of remaining single in the aftermath of divorce is high. Finally, the costs of remaining single depend on the divorce transfers.

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depends on possible transfers from M" to the former husband of his new spouse (say, F"'), and so on. Obviously, conditioning on all these contingencies would generate prohibitive transaction costs.

[6] In our basic framework, the non monetary valuation θ is common to both members, so the latter always agree on the divorce decision. Then divorce is always asked by both members if at all. In practice, divorce is more often initiated by the wife. For instance, in the US, 1988, 60.7 of divorces were petitioned by the wife, 32.5 percent by the husband and 6.8 percent by both. This pattern clearly suggests different evaluations of the quality of the match - a case discussed in Chiappori and Weiss (2000).

[7] This assumption is not very restrictive, since, as it will become clear later on, a couple will never be willing to sign a marriage contract involving a settlement larger than half the income.

Denote the probability of remarriage by α and the divorce transfer by x. Because of the symmetry imposed on the problem, the only transfer is from a married person to his unmarried ex-spouse and is common to all couples. For the time being, let us take the transfer x as given and concentrate on the divorce and remarriage decisions.

Following separation, the relevant states for each member in a given marriage are

- Both remain single, state ss.
- Both remarry, state mm.
- Remarriage, and the ex-spouse stays single, state ms.
- Staying single and the ex-spouse remarries, state sm.

The utility of each partner in state ss is

$$V_{ss} = u(Y). \tag{3}$$

The expected utility of each partner in state mm is

$$V_{mm} = \alpha u(2Y) + (1-\alpha)u(2Y - x). \tag{4}$$

The expected utility for a remarried person with a single ex-spouse is

$$V_{ms} = \alpha u(2Y - x) + (1-\alpha)u(2Y - 2x). \tag{5}$$

In both states mm and ms, the risk arises from the fact that the ex-spouse of the *new* partner may or may not remarry.

Finally, the utility of a person who remains single, while his ex-spouse remarried is

$$V_{sm} = u(Y + x). \tag{6}$$

Thus, the expected utility upon divorce is

$$V = (1-\alpha)^2 V_{ss} + \alpha^2 V_{mm} + \alpha(1-\alpha)(V_{sm} + V_{ms}). \tag{7}$$

Define

$$H(\alpha, x) = V - u(2Y) \tag{8}$$

and consider a marriage, formed in the first period, with realized quality of match θ. Then divorce occurs if and only if:

$$\theta \leq H(\alpha, x). \tag{9}$$

The function $H(\alpha, x)$ describes the *average* economic gain from divorce in the population, as computed *interim* (i.e., after divorce but before remarriage). It will play a key role in what follows. We briefly note some properties of this function.

- First, the gain from divorce is zero if one can remarry with certainty; it is negative otherwise, i.e. if the probability of remarriage is less than one, because of the (economic) costs of remaining single. That is, for all x,

$$H(1, x) = 0 \text{ and } H(\alpha, x) < 0 \text{ for } \alpha < 1 \tag{10}$$

- The gain from divorce raises in the probability of remarriage, provided that the imposed transfer is not too large. Specifically, $H_\alpha(\alpha, x) > 0$ for $x \leq \frac{Y}{2}$. In the absence of transfers, $H(\alpha, 0) = (1 - \alpha)(u(Y) - u(2Y))$, which is linearly increasing in α.

- An increase in the transfer, x, reduces the cost of divorce if one remains single, but raises it if one remarries and has to support his ex-spouse. Therefore, the impact on the expected value of divorce is ambiguous, and depends on risk aversion. Specifically:

  - If individuals are risk neutral, then the gain from divorce decreases with x, because any individual is twice as likely to *pay* x as to *receive* x. This property, in turn, is a direct consequence of the public good assumption. Whenever one dollar is transferred from a couple to a single, two persons lose one dollar each, whereas only one receives the dollar. This effect is quite general, and will hold whenever marriage generates economies of scale (or, equivalently, whenever living as a single is economically inefficient).
  - However, the transfer is received by singles, who by assumption have low income. When agents are risk averse, this is a desirable feature, especially for initially small transfers. Indeed, if risk aversion is large enough, then $H_x(\alpha, x)$ may be positive for small values of x. This effect is especially strong when α is close to one, since almost no couple pays the transfer twice.

– Finally, it can be checked that $H_{xx}(\alpha, x) < 0$ (i.e., the previous effect decreases with x), and that $H_x\left(\alpha, \frac{Y}{2}\right) < 0$. Thus, when transfers are large enough, they reduce the gains from divorce, whatever the utility function. For x close to $\frac{Y}{2}$, the wealth of a divorced person is almost equal to that of a married person, so that the risk sharing effect is negligible and the public good effect dominates.

Ex post incentive compatibility In calculating the expected value from divorce, we assume that a single person who meets another single person always remarries. Incentive compatibility requires that expected utility upon remarriage exceeds the expected utility upon remaining single, that is,

$$\alpha V_{mm} + (1-\alpha)V_{ms} \geq \alpha V_{sm} + (1-\alpha)V_{ss}. \tag{11}$$

The expectation on the LHS of (11) is with respect to the risk the ex-spouse may or may not remarry, conditioned on being married. The expectation on the RHS of (11) is with respect to the same risk conditioned on being single.

A necessary and sufficient condition for incentive compatibility for *all* α is

$$x \leq \frac{Y}{2}. \tag{12}$$

It is easy to verify that (12) implies that $V_{mm} > V_{sm}$ and $V_{ms} > V_{ss}$; that is, remarriage is better irrespective of one's ex spouse's marital status. This property guarantees that the solution is renegotiation proof, once a partner is found. A renegotiation might occur only in the situation where one divorced partner - say, the wife - meets a new mate but prefers under the existing contract to remain single. Then a new payment from the husband, *conditional on her remarriage* (a feature that does not exist in the initial contract), could possibly make both better off by inducing remarriage and raising total surplus. Condition (12) however guarantees that no partner ever prefers to remain single.

Even when the transfer is determined by law independently of the preferences of the partners, the incentive compatibility condition (11) still binds the government. Otherwise, no one will choose to remarry and the transfer cannot be imposed. It should also be noted that (11) needs not be satisfied for all α, but only at the equilibrium rate.

2.3. Equilibrium

Members of each couple decide whether or not to separate, based on their expectations of remarriage. Since marriage requires a meeting with a single person, the probability of remarriage is equal to the proportion of divorcees in the total population of the cohort. In equilibrium, the expected remarriage rate must equal the proportion of married couples who choose to divorce. If the partners draw the same value of θ, the equilibrium condition is:

$$\alpha = \Pr\{\theta \leq H(\alpha, x)\} = F\left(H\left(\alpha, x\right)\right). \tag{13}$$

Our model includes two basic components that influence the equilibrium outcomes. The first component is the random draws of match quality which determine the divorce rate, holding constant the private expected gains from divorce, which is determined by the shape of $F(\theta)$. The other component is the impact of the expected remarriage rate on the private expected gains from divorce, which is determined by the shape of $H(\alpha, x)$. To separate these two features, we may rewrite the previous condition as

$$H(\alpha, x) = G(\alpha) \tag{14}$$

where $G(\alpha)$ is the inverse probability function, that is,

$$G(\alpha) = F^{-1}(\alpha). \tag{15}$$

The inverse probability function can be interpreted as the gains from divorce, based on the expected remarriage rate, which are required to support the equilibrium divorce rate. From the definitions, the inverse probability function $G(\alpha)$ is increasing in α with $G(0) = F^{-1}(0) < 0$ and $G(1) = F^{-1}(1) > 0$.[8]

A sufficient condition for the existence of an equilibrium with positive divorce rate is that non economic factors (i.e., quality of the match) 'matter enough'. Technically:

Proposition 1. *Assume that the support of the distribution of θ is widespread enough, so that divorce would occur with positive probability even if the expected remarriage rate was zero - that is*

$$G(0) < H(0, x) = u(Y) - u(2Y) \tag{16}$$

[8] The inequalities $F^{-1}(0) < 0$ and $F^{-1}(1) > 0$ are a consequence of the assumption that the expectation of θ is zero.

Then there exists at least one equilibrium with a positive divorce rate. Moreover, generically at least one such equilibrium is stable, in the sense that it satisfies

$$G'(\alpha) > \frac{dH(\alpha, x)}{d\alpha} \tag{17}$$

Proof. Just note that $H(1, x) = 0 < G(1)$. If (16) holds, existence follows from continuity, while stability relies on differentiability and a standard index argument. ■

Condition (16) can also be written as:

$$F[H(0, x)] > 0 \tag{16'}$$

which states that there is a positive probability for a realized match quality which is sufficiently bad to overcome the costs of being single for sure. This implies that no equilibrium without divorce may exist. This condition is sufficient to guarantee the existence of at least one solution to equations (13) in the interval $(0, 1)$. Because $H(\alpha, x)$ is always negative, a couple with a positive θ will not divorce. Therefore, the assumption that $F(\theta)$ is symmetric implies that the equilibrium rate α cannot exceed $\frac{1}{2}$.

However, because both $G(\alpha)$ and $H(\alpha, x)$ increase in α on some subinterval of $(0, 1)$ it is possible to have *multiple* equilibria (see Figure 2)[9]. Multiplicity reflects the self-fulfilling nature of divorce expectations. If many couples are expected to divorce at the end of period 1, the prospects of remarriage are high. Divorce is then less costly, and each particular couple is more likely to split. Conversely, if the divorce rate is expected to be low, then divorce entails a large loss and is less likely to take place, which ex post confirms the initials beliefs.

The stability condition (17) can equivalently be written as:

$$f[H(\alpha, x)] H_\alpha(\alpha, x) < 1, \tag{17'}$$

where $f(\theta)$ is the density function and H_α stands for $\frac{dH}{d\alpha}$. This condition states that the impact of the expected remarriage rate on the gains from divorce is weaker than the increase required to support a comparable change in the equilibrium divorce rate. Thus, an arbitrary change in the expected remarriage rate

[9] In this example, we assume a single shock and $F(\theta)$ is bimodal triangular on the interval $[-1, 1]$ with modes at $-\frac{1}{2}$ and $\frac{1}{2}$. Utility, is of the form $u(x) = b\frac{x^{1-r}}{1-r}$ with $r = 10$ and $b = .014$. Also, $Y = .5$. See also Burdett and Wright (1998) for an example with multiplicity in a similar context.

generates a smaller change in the actual divorce rate, leading to the adjustment of expectations downwards.

If the solution is unique it must satisfy requirement (17). If several equilibria coexist, then under (16) their number n is odd and $\frac{n+1}{2}$ of them are stable generically.

Finally, note that the incentive compatibility constraint (11) is an additional requirement for equilibrium. Thus, an equality in (14) which does not satisfy this requirement is *not* an equilibrium.

2.4. The Social Multiplier

The equilibrium divorce rate is a function of the exogenous transfer x. From the equilibrium condition, one gets:

$$\frac{d\alpha}{dx} = \frac{H_x(\alpha, x)}{G'(\alpha) - H_\alpha(\alpha, x)}, \tag{18}$$

or equivalently,

$$\frac{d\alpha}{dx} = \frac{f\left(H(\alpha, x)\right) H_x(\alpha, x)}{1 - f\left(H(\alpha, x)\right) H_\alpha(\alpha, x)}. \tag{18'}$$

At a stable equilibrium, the denominator is positive. It follows that transfers (marginally) increase the divorce rate if and only if, at equilibrium, they increase the agent's expected utility after divorce. In particular, when risk aversion is weak, or transfers are large, then increasing transfers decreases the divorce rate. Conversely, in a context where transfers are small and agents are very risk averse, larger transfers may generate more divorce.

We refer to

$$\gamma = \frac{1}{1 - f\left(H(\alpha, x)\right) H_\alpha\left(\alpha, x\right)} \tag{19}$$

as the *social multiplier*, because it represents the impact of social interactions in the marriage market (see Becker, 1991, and Goldin and Katz, 2000).[10] At a stable equilibrium, $\gamma > 1$, which shows that social interactions tend to reinforce

[10] In our model, the social interactions arise from search externalities, but other factors, such as diminished social stigma associated with divorce when it becomes prevalent, have similar reinforcement effects.

the impact of the policy, potentially by a large factor: even a small change which influences the private gain from divorce can have a large impact.

The social multiplier may be quite large. A simple thought experiment can be used to illustrate this point. Start from some equilibrium $\bar{\alpha}$, and let $\bar{h} = H(\bar{\alpha}, x_g)$. Assume that the shape of the distribution is modified around $\bar{h}$; specifically, assume that while the *value* of the cdf F at $\bar{h}$ is kept constant, its *slope* (i.e. $f\left(\bar{h}\right)$) is increased. This leaves the equilibrium unaffected, but inflates the social multiplier, because a larger $f\left(\bar{h}\right)$ implies that more people will switch marital status following a change in transfers. An important consequence is that any policy evaluation that disregards the reinforcement effect may grossly underestimate the actual impact of a change in transfers.[11]

One may go further, and show that a small change in policy can cause a discrete *jump* in the equilibrium. This may occur if there are multiple equilibria. Typically, bifurcations may exist, where a small change in the parameters of the model can lead to a qualitative switch in the number of equilibria, thus generating a 'catastrophic' discontinuity in the equilibrium divorce rate. An illustration is provided in Figure 3 that describes the determination of the equilibrium divorce rate when the exogenous transfer set at two *fixed* levels of $\frac{Y}{2.35}$ and $\frac{Y}{2.7}$.[12] As in Figure 2, the higher transfer of $\frac{Y}{2.35}$ is associated with three equilibria. When the transfer is reduced to $\frac{Y}{2.7}$, the gains from divorce rise, eliminating the two lower equilibria, slightly raising the level of the top equilibrium. Thus, in this case, the divorce rate can jump from .11 to .39.

2.5. Welfare

For policy analysis, one is mainly interested in the ex-ante welfare *at equilibria*, i.e. divorce (remarriage) rates that satisfy condition (13) and the incentive compatibility constraint (11).

The expected lifetime utility of each member in society, evaluated at the time of first marriage is

$$W = u(2Y) + \Pr\{\theta \geq h\}[u(2Y) + E\{\theta_i \mid \theta \geq h\}] + \Pr\{\theta \leq h\}[h + u(2Y)], \quad (20)$$

where, $h = H(\alpha, x)$. Equation (20) can be rewritten as

[11] For instance, in a recent paper, Brien, Lillard and Stern (1999) find weak effect of divorce costs on divorce. According to our results, the total impact of cost reduction, if applied to the whole population, may still be important, because of reinforcement.

[12] All other parameters are the same as in Figure 2.

$$W = 2u\left(2Y\right) + \int_{h}^{\infty} \theta f(\theta) d\theta + F(h)h, \tag{20'}$$

Differentiating w.r.t. h, we get

$$\frac{\partial W}{\partial h} = F(h) > 0, \tag{21}$$

which is the usual envelope result. An increase in the expected gains from divorce raises welfare in all states in which one would choose to divorce; the additional, indirect impact on welfare through the induced change in the divorce rate is negligible, because the marginal divorcee is indifferent between leaving and staying.

Because equilibrium is characterized by the condition that $\alpha = F(h)$ and F is increasing, the equilibrium divorce rate and expected gains from divorce move together. Therefore, *welfare is higher at equilibria with higher divorce rates.* It follows that any policy that can implement a higher divorce rate as an *equilibrium outcome* is beneficial. This result sounds surprising, given the high economic costs for divorce that we embedded in the model. But high costs of divorce simply imply that high divorce rates cannot be easily implemented.

The intuition, here, is that each divorce has a positive externality on other couples, since it increases their probability of remarriage in case of divorce. The higher divorce rate implies higher welfare because it provides both partners with a better option to recover from bad matches.

As is common in search markets, the equilibrium is generally *inefficient*. Each individual can improve his welfare if there is an *option* of divorce and remarriage when the current match quality is revealed to be low. However, such an option is present only if *others* in society also choose to divorce. In the absence of coordination, the marriage market will not be efficient. In other words, the search process creates an externality: one's divorce (marginally) increases the remarriage probability of other divorcees. At a market equilibrium, this positive externality is typically underproduced.

3. Private insurance transfers

The law often regulates the marriage market through intervention in the divorce process by influencing child support transfers and alimony payments. There are two possible approaches that the law may take: a conservative approach, that lets the partners determine, ex-ante, the most desirable transfer and then enforces this contract ex-post, and an interventionist approach, that sets the transfer according to some social goals at a level that may differ from the ex-ante choice of the couple.[13]

Consider, first, the case in which the court awards an alimony that is based on the agreement reached by the partners. We assume throughout this section that agents sign efficient contracts. However, efficiency can be defined from either an interim or an ex ante viewpoint. Ex ante efficiency refers to contracts signed at the time of marriage; the interim perspective, on the other hand, is relevant after divorce, when the ex-partners realize that remarriage may or may not occur. Obviously, the main difference between the ex ante and the interim viewpoints is that the former considers divorce as an endogenous phenomenon, the occurrence of which depends in general of the type of contract that has been signed, whereas divorce is taken as given in the interim approach. For that reason, ex ante optimal contracts may in principle differ from interim efficient ones. In such a case, a renegotiation problem arises. Once the divorce decision has been made, any particular feature of the contract aimed at decreasing the probability of divorce becomes irrelevant. Then agents may be willing to switch to some other, interim-efficient settlement. Of course, the partners will, ex ante, rationally anticipate this renegotiation. It follows that unless agents can commit not to renegotiate - a commitment that is difficult to enforce - an ex ante contract cannot be implemented unless it is renegotiation-proof, i.e., interim efficient[14].

3.1. Characterization of interim efficient contracts

From an interim perspective, agents will choose a contract that maximizes individual expected utility after divorce. Let $\hat{H}(\alpha, x, x')$ denote the expected private gains from divorce, as function of the expected remarriage rate, α, the transfer agreed by the partners and enforced by law, x, and the transfers x' that the new

[13] The simple model developed so far provides some insights to issues associated with alimony. The specific issues associated with the support of children will be briefly discussed in the conclusion.

[14] An implication of the renegotiation proofness requirement is that transfers cannot be contingent on θ, even if θ could be verified. Indeed, because of the additive preference structure we use, the efficient interim contract does not depend on θ. Although transfers contingent on θ may be useful in order to influence the decision to divorce, they will become inefficient once divorce has occured.

spouse, in case of remarriage, is committed to pay to his/her ex partner. When choosing x, the partners maximize $\hat{H}(\alpha, x, x')$, taking as given the transfer x' and the divorce rate α. Formally,

$$\begin{aligned}\hat{H}(\alpha, x, x') &= \left(\alpha^3 - 1\right) u(2Y) + \alpha^2 (1-\alpha)\left[u(2Y - x) + u(2Y - x')\right] \\ &\quad + \alpha (1-\alpha)^2 u(2Y - x - x') + \alpha (1-\alpha) u(Y + x) + (1-\alpha)^2 u(Y)\end{aligned}$$

and the optimal transfer satisfies

$$\hat{H}_x(\alpha, x, x') = 0 \Leftrightarrow \alpha u'(2Y - x) + (1-\alpha) u'(2Y - x - x') = u'(Y + x)$$

Because every one is identical ex-ante, we can set $x = x'$. Note that $H(\alpha, x) = \hat{H}(\alpha, x, x)$. We denote the solution for the optimality condition, evaluated at $x = x'$, by $x(\alpha)$. That is, $x(\alpha)$ is defined by

$$\alpha u'(2Y - x(\alpha)) + (1-\alpha) u'(2Y - 2x(\alpha)) = u'(Y + x(\alpha)) \tag{22}$$

We can state a few properties of $x(\alpha)$:

Proposition 2. *A solution to (22) always exists. Under risk neutrality, the solution is indeterminate in* $\left[0, \frac{Y}{2}\right]$*. Under strict risk aversion, the solution is unique for each* α*, and the function* $x(\alpha)$ *is continuously differentiable, with*

$$x'(\alpha) = -\frac{u'(2Y - 2x) - u'(2Y - x)}{\alpha u''(2Y - x) + (1-\alpha) u''(2Y - 2x) + u''(Y + x)} > 0$$

It is increasing in α*, and* $x(0) = \frac{Y}{3}$*,* $x(1) = \frac{Y}{2}$*.*

The probability of remarriage has a positive impact on the divorce transfer, because it reduces the expected marginal utility of income upon remarriage. Also, note that Condition (22) implies condition (11). Therefore, the incentive compatibility constraint (11) is always satisfied if the contract is set by the partners and recognized by law.

When voluntary ex-ante contracts are enforced, then, because $x'(\alpha) > 0$ and $H_x(\alpha, x(\alpha)) < 0$, the multiplier will be smaller than under fixed settlements. Thus, the individual tendency to overinsure tends to *reduce* the sensitivity of the aggregate divorce rate to exogenous shocks

3.2. Ex ante efficiency

Optimality can also be defined from an ex ante viewpoint that takes into account not only the welfare properties of transfers once divorce has occurred, but also their impact on divorce probability.

As it turns out, the ex ante and ex post approaches do coincide in the case under consideration. This result is specific to the common valuation assumption; it may not hold when valuations are independent. The intuition, in the present case, is that although divorce is endogenous from the ex ante perspective, its occurrence only depends on interim welfare. At $x(\alpha)$, the impact of transfers on interim welfare is (marginally) zero. So divorce is not affected, and $x(\alpha)$ is also a local extremum ex ante. In addition, any increase in interim welfare has a positive impact on divorce, which is welfare improving ex-ante. Formally:

Proposition 3. *The interim and ex ante privately efficient settlements coincide. In particular, the ex ante efficient contract is always renegotiation-proof.*

Proof. Note that

$$\frac{\partial W}{\partial x} = \frac{\partial W}{\partial h}\frac{\partial \hat{H}}{\partial x} = F(h)\,\frac{\partial \hat{H}}{\partial x} = 0 \quad \text{for} \quad x = x(\alpha) \tag{23}$$

where $h = \hat{H}(\alpha, x, x')$. Since $F(h) > 0$, $\frac{\partial W}{\partial x}$ is positive for $x < x(\alpha)$, negative for $x > x(\alpha)$, hence $x(\alpha)$ is a global optimum (note however that W, as a function of x, is not concave in general). ■

3.3. Equilibrium

When all agents sign a contract involving divorce transfers equal to $x(\alpha)$, the equilibrium condition is:

$$H(\alpha, x(\alpha)) = G(\alpha) \tag{15a}$$

The proof of existence of an equilibrium must be modified to take into account the fact that x is now an endogenous function of α. Technically, condition (16) must be replaced by:

$$F[H(0, x(0))] > 0 \tag{16a}$$

If (16a) holds, then there exists at least one equilibrium with a positive divorce rate. Moreover, at least one such equilibrium is stable.

Note that the notion of stability should be understood in a slightly different way. Again, the condition states that the impact of the expected remarriage rate on the gains from divorce is weaker than the increase required to support a comparable change in the equilibrium divorce rate. However, the change in the actual divorce rate generated by an arbitrary change in the expected remarriage rate should also include the induced modification of marriage contracts, since optimal transfers will respond to the expected remarriage rate. Altogether, the resulting change must be smaller than the expected shift, leading to the adjustment of expectations downwards.

4. Public policy

Courts often adopt formulas which specify the divorce payment, based on the income of the two partners. These requirements may imitate the voluntary contract or depart from it, if the market allocation is inefficient and an improvement is feasible.

4.1. The inefficiency of private contracts

One reason for intervention is that ex-ante enforceable contracts may be inefficient. In our model, indeed, there is a divergence between private and public efficiency, as stated in the following Proposition:

Proposition 4. *At $x(\alpha)$, a marginal decrease of transfers throughout the population increases interim and ex ante welfare and the divorce rate.*

Proof. Since

$$H(\alpha, x) = \hat{H}(\alpha, x, x') \text{ for } x = x'$$

we get

$$H_x(\alpha, x) = \hat{H}_x(\alpha, x, x') + \hat{H}_{x'}(\alpha, x, x')$$

and

$$H_x(\alpha, x(\alpha)) = \hat{H}_{x'}(\alpha, x(\alpha), x(\alpha)) < 0$$

■

In words : private contracts result in a settlement that is too high from both an ex-ante and interim welfare points of view. This result is due to the presence of two externalities in the household decision making process. The first externality arises from the nature of the equilibrium, and has been described above. Each divorce marginally increases the remarriage probability of other divorcees, hence their interim welfare. Private contracts do not take this effect into consideration. In other words, private settlements consider the divorce rate as given. However, each settlement has a marginal impact on the equilibrium rate, that private agents disregard but a social planner would be willing to consider.

The second externality is inherent to the settlement contracting process. Consider a spouse who commits on some payment x in case of remarriage. Because of the public nature of consumption in the (new) household, the cost will also be born by the (future) new partner. This effect, however, will not be taken into account at the contracting stage, where the latter is not present (and cannot even be identified). In principle, this externality could be internalized in the remarriage market; that is, overcommitted divorcees will either find it more difficult to remarry, or have to compensate the new spouse. None of these mechanisms are present in our model. First, our public good assumption excludes compensation. Second, even in the presence of private consumption, the externality cannot be fully internalized, because search frictions create local monopoly powers: marrying an overcommitted spouse is better than waiting one more period. As a result, with enforceable but unregulated contracts, the partners tend to overinsure by committing on excessive settlement transfers, since part of the cost is born by a third party.

In principle, the two externalities might go in opposite directions. The main message of Proposition 5 is that, at any equilibrium involving privately optimal contracts, they tend to reinforce each other. The key insight is that around the privately optimal settlement, transfers marginally *decrease* the gain from divorce, H. Hence lowering transfers below the private optimum improves welfare both directly (because of the second externality) and indirectly since it boosts divorce, which is a desirable property in this context (see Figure 4[15]). In particular, the equilibrium divorce rate resulting from private contracts is too low from both an ex-ante and interim welfare points of view.

We remark that both the contract and search externalities reflect frictions in the marriage market. If one could find a match instantaneously, there would be no single individuals and no rents for the remarried.[16] The presence of such

[15] In this example, we assume a single shock and $F(\theta)$ is uniform on $[-1, 1]$. Utility is of the form $u(x) = \frac{x^{1-r}}{1-r}$ with $r = 3$ and $Y = .5$.

[16] In some search models, there are opposite externalities which, under special conditions, can offset each other, so that an efficient search equilibrium emerges (see Hosios, 1990, and Pissarides and Mortensen, 1998). However, these results do not apply here, because our model includes elements of non-transferable utility, symmetry and a meeting technology with increasing returns.

externalities explains the need to provide specific guidelines to the courts which regulate ex-ante contacting and does not simply "stamp" voluntary contracts.

4.2. Welfare impact of transfers

We can further specify how transfers affect welfare. Transfers operate through two channels: they directly influence expected utility and they modify the divorce rate. As we shall see, the latter, indirect effect always tend to reinforce the former, possibly by a large amount.

Direct and indirect impact We start with expected utility after divorce but before remarriage (the 'interim' viewpoint). Assume that the government determines the divorce settlement x and considers an infinitesimal increase dx. This reform changes the expected gain of divorce $H(\alpha, x)$ by an amount dh equal to:

$$dh = H_x dx + H_\alpha d\alpha = \left(H_x + H_\alpha \frac{d\alpha}{dx} \right) dx$$

Here, the first term corresponds to the direct impact of the policy, while the second summarizes the reinforcement effect. Using (18), one gets

$$\begin{aligned} \frac{dh}{dx} &= H_x + H_\alpha \frac{H_x}{G'(\alpha) - H_\alpha} \\ &= \frac{G'(\alpha)}{G'(\alpha) - H_\alpha} H_x \\ &= G'(\alpha) \frac{d\alpha}{dx} \end{aligned} \tag{24}$$

A first consequence is the following:

Proposition 5. *A change in transfers increases interim welfare if and only if it increases the divorce rate.*

A second conclusion is that the indirect effect always has the same sign as the direct one. This is the reinforcement effect: one is more likely to divorce if he expects others to divorce, because he can then find a better match more easily.

4.3. Publicly efficient transfers

The policy which is called for is to set the transfer *below* the level that the partners would choose on their own accord. What level of transfers should the state try to implement? A first remark is that the equivalence between the ex ante and interim perspectives still applies in that case. Increasing interim welfare can only promote divorce, which is always efficient in this context. Technically, ex ante welfare is an increasing function of the expected gains from divorce, so that any x that maximizes H maximizes W as well. Hence, the socially efficient settlement x must maximize $H(x, \alpha(x))$, where $\alpha(x)$ is the equilibrium divorce rate generated by x. Using (24), the maximization with respect to x leads to the following first order condition:

$$\frac{dh}{dx} = \frac{G'(\alpha)}{G'(\alpha) - H_\alpha} H_x = 0$$

or, equivalently

$$H_x(x, \alpha(x)) = 0 \tag{25}$$

This equation, however, may not have a solution. Also, since $H(x, \alpha(x))$ is not concave in x in general, a solution may not be a global, or even a local, optimum. Two cases must thus be considered. Either an interior solution exists; then it must solve (25). Or the solution is at a corner; then the maximum cannot be reached at the upper limit $Y/2$ (since $H_x\left(\alpha, \frac{Y}{2}\right) < 0$ for all α), so it must be reached for minimum values of x (which can be zero or negative). As an illustration, assume for a moment that agents are risk-neutral. Then, although each person is indifferent to whether or not transfers are made, from the social point of view transfers should be set at zero or even made negative. Indeed, any transfer from a couple to a single involves two persons losing one dollar and only one receiving the dollar. This inefficiency, that involves a one dollar loss by the *new* spouse, is not internalized in the private contract. Since, under risk neutrality, there is no compensating gain from risk sharing, transfers are unambiguously bad in this context.

5. Conclusion

We have identified a reinforcement mechanism that can generate multiple equilibria in marriage markets and may explain the abrupt increase in divorce rate in the US and other countries. The reinforcement is caused by search frictions and a meeting technology whereby remarriage is more likely if the divorce rate is higher.

Our analysis shows that the welfare evaluation of changes in the divorce rate is quite complex. Although there is ample evidence that divorce reduces the welfare of single wives (and of children with single or step parents - see Argys et al., 1998, Lamb et al., 1999 and Hetherington and Stanley-Hagan, 1999), this is only one part of the picture. Continuation of a marriage under adverse conditions can have equally harmful results, although these are harder to identify. Broadly viewed, divorce is a corrective mechanism that enables the replacement of bad matches by better ones. There is a risk that a better match will not be found, in which case the person who has divorced is worse off, but presumably rational agents take this consideration into account when deciding to divorce and can make the financial transfers to reduce the private costs of divorce. The problem, however, is that private decisions may lead to suboptimal social outcomes because of the various externalities that infest search markets. We have analyzed the roles of the meeting externality (divorce of any couple affects the prospect of others to remarry) and the contract externality (the transfers among ex-spouses affect the consumption opportunities of prospective new spouses). We have shown that the contract externality leads to overinsurance, because the presence of rents allows the partners to neglect the interest of prospective spouses whom they may meet in the future. The meeting and contract externality generally reinforce each other, implying an equilibrium divorce rate which is too low.

There are several considerations that can mitigate or reverse our overinsurance result. First, if public goods are unimportant and most goods are private, the negative impact on potential matches, although always present, would be smaller. Secondly, our analysis relies on the assumption that the quality of the match is identically perceived by both partners. If the evaluations of the two spouses differ, a third consideration is that divorce at will can harm the partner who wishes to continue the current match. The inflicted damage on the spouse who is left behind is higher when the prospects of remarriage are low. This conflict can be more or less serious depending on the respective importance of public and private consumption, but is always present if the partners have sufficiently different evaluations of the quality of their current match and contracts cannot be contingent on who initiates the divorce. This fact has several implications. First, the equilibrium divorce rate may be too high (paradoxically, this is more likely to be the case when the number of divorces is small[17]). Also, in contrast to our pre-

[17] Assume the number of divorces is infinitesimal: only the persons with the lowest possible valuation will be willing to divorce, and even then their gain is of second order. Since the valuation of the person's partner is almost surely larger, the corresponding loss is of first order,

vious analysis, ex ante and interim welfare need no longer coincide.[18] In that case, the ex ante optimum is unlikely to be implemented, since it is not renegotiation proof. The inefficiency can then be quite large. Finally, although over insurance may lock some couples into bad marriages, this may also have beneficial effects. Such a situation arises when marriage specific investments are important. When the probability of divorce is large, the partners, together or separately, may engage in defensive activities that detract from the value of the marriage, but enhances options outside the marriage. Reduced fertility, reduction in the time spent with children and increased labor market participation are examples of such defensive actions (see Johnson and Skinner, 1986). For instance, a high divorce equilibrium may be associated with a decision to have no children, and lower welfare. In this case, the enforcement of voluntary child support agreement may induce a shift to a low divorce equilibrium with children, and higher welfare.

All these additional elements are analyzed in a companion paper (Chiappori and Weiss 2000). The general conclusion is that one needs to be cautious in drawing strong policy conclusions from this analysis. However, the important insight that remains is that, in search markets, a legal policy that enforces voluntary contracts need not be socially optimal.

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and a situation with no divorce at all would be better from an ex ante viewpoint.

[18] It may actually be the case that the interim efficient settlement locally *minimizes* ex ante welfare.

References

[1] Aiyagari, S., Greenwood J. and N. Guner (2000), "On the State of the Union," **Journal of Political Economy,** 108, 213-244.

[2] Argys, L., Peters, E., Brooks-Gunn, J. and J. Smith (1998), "The Impact of Child Support on Cognitive Outcomes of Young Children," **Demography**, 35, 159-173.

[3] Becker, G., Landes E. and R. Michael (1977), "An Economic Analysis of Marital Instability," **Journal of Political Economy**, 85, 1141-1188.

[4] Becker, G. (1991), "A Note on Restaurant Pricing and Other Examples of Social Influences," **Journal of Political Economy,** 99, 1109-1116.

[5] Becker, G. (1992), "Fertility and the Economy," **Journal of Population Economics**, 5, 158-201.

[6] Brien, M., Lillard, L. and S. Stern (1999), "Cohabitation, Marriage, and Divorce in a Model of Match Quality," Department of Economics, University of Virginia.

[7] Burdett, K. and M. Coles, (1997), "Marriage and Class" **Quarterly Journal of Economics**; 112, 141-68.

[8] Burdett, K., and M. Coles (1999), "Long-Term Partnership Formation: Marriage and Employment," **The Economic Journal**, 109, F307-F334.

[9] Burdett, M. and R. Wright (1998), "Two Sided Search," **Review of Economic Dynamics,** 1, 220-245.

[10] Chiappori, P.A., and Y. Weiss (2000), "An Equilibrium Analysis of Divorce", WP, University of Chicago.

[11] Clarke, S. (1995), "Advance Report of Final Marriage Statistics, 1989-90," **Monthly Vital Statistics Report**, 43, No 9, Supplement.

[12] Cole, H., Mailath, G. and A. Postlewaite (1998), "Class Systems and the Enforcement of Social Norms" **Journal of Public Economics**, 70, 5-35.

[13] Diamond, P. and E. Maskin (1979), "An Equilibrium Analysis of Search and Breach of Contract, I: Steady States," **The Bell Journal of Economics**, 10, 282-316.

[14] Flinn, C. (1997), "Models of Interaction Between Divorced Parents," Department of Economics, New-York University.

[15] Goldin, C. and L. Katz (2000), "The Power of the Pill: Oral Contraceptives and Women's Career and Marriage Decisions," NBER working paper 7527.

[16] Hetherington, M. and M. Stanley-Hagan (1999), "Stepfamilies," in M. Lamb (ed.) **Parenting and Child Development in "Non-Traditional" Families**, Mahwah: Lawrence Erlbaum.

[17] Hosios, A. (1990), "On the Efficiency of Matching and Related Models of Search and Unemployment," **The Review of Economic Studies**, 57, 279-298.

[18] Johnson, W. and J. Skinner (1986), "Labor Supply and Marital Separation," **The American Economic Review**, 76, 455-469.

[19] Lamb, M., Sternberg, K. and R. Thompson (1999), "The Effects of Divorce and Custody Arrangements on Children's Behavior, Development and Adjustment," in M. Lamb (ed.) **Parenting and Child Development in "Non-Traditional" Families**, Mahwah: Lawrence Erlbaum.

[20] Li, H. and S. Rosen, (1998), "Unraveling in Matching Markets," **American Economic Review**, 88, 371-387.

[21] Norton, A. and L. Miller (1992), "Marriage, Divorce, and Remarriage in the 1990's," **Current Population Reports**, Special Studies, P23-180.

[22] Michael, R. (1988), "Why Did the Divorce Rate Double Within a Decade?" **Research in Population Economics**, 6, 367-399.

[23] Mortensen, D. (1988), Matching: Finding a Partner for Life or Otherwise," **American Journal of Sociology**, 94 (supplement), s215-s240.

[24] Mortensen, D. and C. Pissarides (1998), "New Developments in Models of Search in the Labor Market," mimeo. London School of Economics.

[25] Rugggles, S. (1997), "The Rise of Divorce and Separation in the United States, 1880-1990," **Demography**, 34, 455-466.

[26] Stone, L. (1995), **Road to Divorce**, Oxford: Oxford University Press.

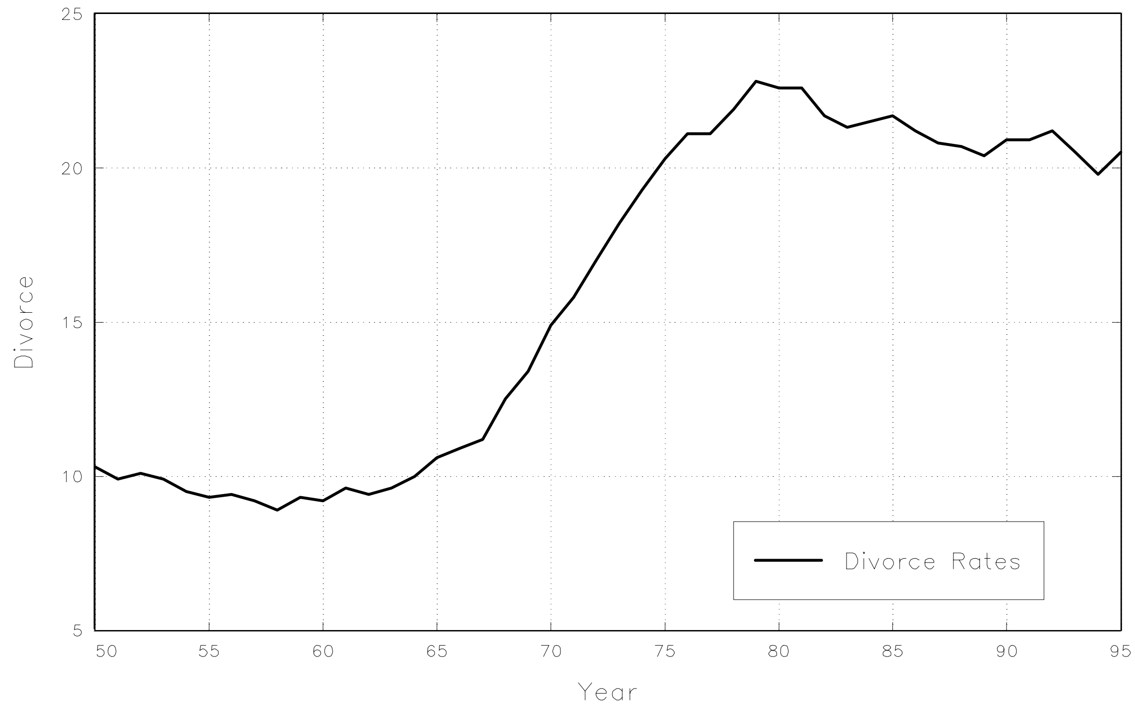
[27] Weiss, Y. and R. Willis (1985), "Children as Collective Goods," **Journal of Labor Economics**, 3, 268-262.

[28] Weiss, Y. and R. Willis (1993), "Divorce Settlements: Theory and Evidence," **Journal of Labor Economics**, 11, 629-679.

[29] Weiss, Y. and R. Willis (1997), "Match Quality, New Information and Marital Dissolution," **Journal of Labor Economics**, 15 (supplement) s293-s329.

[30] Willis, R. (1999), "A Theory of Out-of-Wedlock Childbearing," **Journal of Political Economy,** 107, s33-s64.

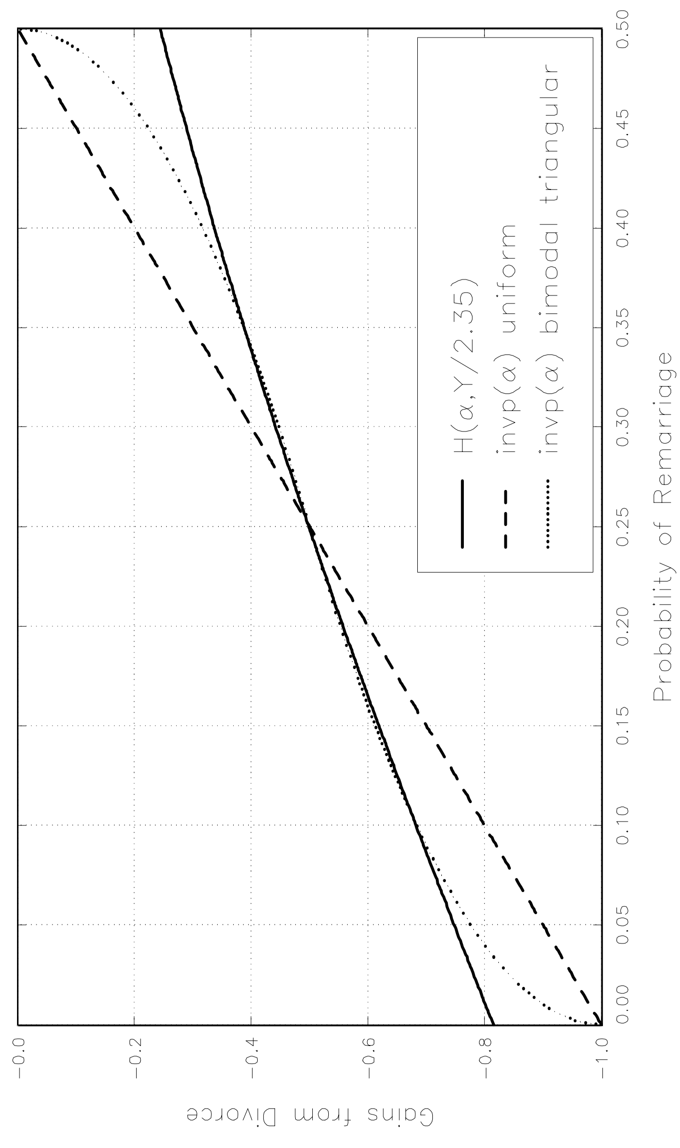
Figure 1: Divorce Rates US 1950−1995[1]



[1]Divorces and annulements per married women, 15+ .

References

Figure 2: Gain from Divorce, Inverse Probabilities and Divorce Equilibrium



[1]

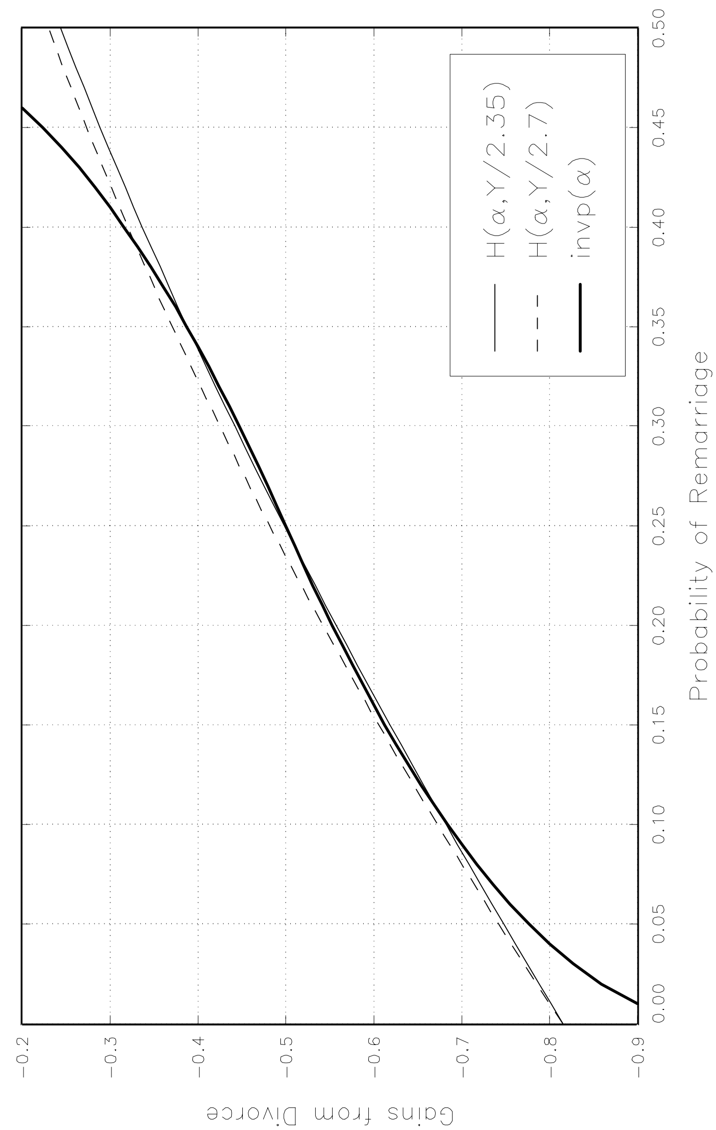


Figure 3: Effects of Transfers on Divorce Equilibria

Figure 4: Effects of Transfers on Divorce Equilibrium