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THE ECONOMICS OF MARRIAGE

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The economics of marriage.*

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Abstract

In a separate-property jurisdiction, marriage may induce domestic cooperation, and enhance efficiency in the production of children, because it may lend credibility to the prospective main earner's promise to compensate the main childcarer when the children will no longer be economically dependent on them. In a community-property jurisdiction, marriage will induce domestic cooperation, and enhance efficiency in the production of children, because it rules out strategic behaviour. Whatever the matrimonial property regime, reducing the cost or difficulty of obtaining a divorce will have no permanent effect on the divorce rate. In a separate-property jurisdiction, it will encourage marriage, and induce more married women to specialize in market work. Couples should be allowed to choose the matrimonial property regime.

Key-words: divorce, alimony, matrimonial property, commitment, fertility, domestic division of labour.

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1 Introduction

Marriage is losing ground to unmarried cohabitation throughout the developed world.¹ In the US, by the start of the millennium, the ratio of unmarried to married couples was 8 to 100, and 35 out of 100 births occurred out of wedlock. Similar figures apply to Western Europe (with a peak, in Sweden, of 18 unmarried to 100 married couples, and 55 percent of children born out of wedlock). The trend was preceded by changes in legislation and public attitudes. Cohabitation without marriage has been socially acceptable, in Western societies, at least since the 1960s, and the legislative trend is towards giving unmarried couples the same rights as married ones where tax treatment, inheritance, adoption, housing tenure, recognition of partner as next of kin (e.g., in case of hospitalization), and so on are concerned. Any residual form of legal discrimination has disappeared, in most European countries, with the introduction of legislation enabling unmarried couples to acquire the same legal rights as married ones by simply recording their union in a public register.² The name given to these officially recognized, non-marital unions varies from country to country (*Eingetragene Lebenspartnerschaft* in Germany, civil partnership in the UK, *pact civil de solidarité* in France, etc.), but the substance is the same. Two persons can costlessly obtain the same legal benefits as a married couple, without surrendering the right to terminate their union at any moment and, generally, without any legal obligation to make compensatory transfers to each other. That notwithstanding, marriage remains the most popular option among couples, especially when they decide to have children (in many cases, marriage coincides with the birth of the first child). Why? I do not underestimate the value of ritual, nor the weight of religion (in some countries, and for certain confessions, a religious marriage counts as a civilian marriage, and it is thus not possible to have the former without the latter). But, is there also an economic argument?

A number of empirical economics papers, including Waite (1995), Brown and Booth (1996), Manning and Lichter (1996), Bumpass and Lu (2000), Manning et al. (2004), Kenney and McLanahan (2006), and Björklund et al. (2010), reports that marriage makes a difference to the domestic allocation of resources, and to the well-being of children. Another body of empirical papers, including Zelder (1993), Gray (1998), Clark (1999), Chiappori et al. (2002), Stevenson (2008), Gonzalez and Viitanen (2009), and Bargain et al. (2010), reports that the introduction

¹See, for example, Stevenson and Wolfers (2007).

²This possibility is open to both homosexual and heterosexual couples, but it is not to be confused with homosexual marriage, which is in no way different, for our present purposes, from heterosexual marriage.

of divorce on demand throughout the developed world in the course of the 1980s had only a small and temporary effect on the divorce rate, but permanently affected the marriage rate, and the participation rate of married women. Until recently, however, the theoretical economics literature has largely ignored the issue. Even Gary Becker's seminal 1972 and 1974 articles, entitled "A theory of marriage", are actually not about marriage at all, because they model couple formation and dissolution under the assumption that the "spouses" can costlessly re-optimize every time a new matching opportunity presents itself. As far as I am aware, the first paper to address the role of the marriage institution is Mnookin and Kornhauser (1979), which uses game-theoretical concepts to show how being married conditions a couple's private bargaining. The second is Ch. 5 of Cigno (1991), where it is shown that divorce rules induce some married couples to inefficiently separate, and others to inefficiently stay together. Only recently has this deficit of theory started to be filled by a wave of fresh contributions, including Fella et al. (2004), Drewianka (2004 and 2006), Matoushek and Rasul (2008), Cigno (2009) and Wickelgren (2009).

A popular explanation of the role of marriage is that, being difficult or costly to rescind, it constitutes a commitment to stay together for a while, and will thus encourage efficiency-enhancing, couple-specific investments. A corollary of this explanation is that, the more difficult or costly it is to obtain a divorce, the greater will the commitment value of marriage be. This does not appear to be borne out by fact however. The introduction of divorce on demand made the marriage bond substantially looser. By eliminating the need to gather or fabricate evidence of misdemeanour on the other spouse's part, it also reduced the cost of obtaining a divorce. Contrary to what many expected, however, this legislative innovation caused only a modest and short-lived increase in the divorce rate, which can be easily interpreted as a once-for-all mismatch correction. Were it true that a reduction in the cost or difficulty of obtaining a divorce leads to a reduction in the commitment value of marriage, furthermore, American couples intent on making a success of their marriage would have taken advantage of a subsequent legislative innovation of opposite sign (first in Louisiana and then in other US states), which allows a couple to opt for a form of marriage ("covenant marriage") characterized by a substantially higher cost of divorce. This fortified form of divorce has had extremely few takers. In what follows,³ I shall argue that

(i) marriage may indeed serve as a commitment device, and thus encourage couple-specific investment, not because it makes it difficult

³For a more technical exposition, see Cigno (2009), on which I draw.

for the parties to go their different ways, but because it empowers a court of law to decide who should compensate whom in the event of divorce, and

(ii) a reduction in the cost or difficulty of obtaining a divorce can only raise the commitment value of marriage.

As the focus is on marriage, the analysis will start where the matching process ends. Like much of the theoretical literature on the subject, I shall restrict my attention to heterosexual couples, and assume that the parties are perfectly informed not only about each other's characteristics, but also about the characteristics of all alternative partners (in much of the exposition, I shall also assume that incomes are known with certainty, but this only will affect a policy conclusion). That ignores some important features of the real world, but will allow me to concentrate on fundamentals. Like most authors, I shall take it for granted that the couple will not draw up a contract enforceable through an ordinary court of law. That is not true in all cases, but it is not a bad assumption from which to start. Even in a business context, some contracts are no more than memoranda of agreement,⁴ and others are legally unenforceable because the parties explicitly wave their right to court adjudication in case of dispute.⁵ The reason for this reluctance to enter into watertight contracts could be that the latter are not only expensive to draw up, but also expensive to enforce (high cost of gathering evidence, large court and lawyers fees), and that the outcome of litigation is not guaranteed in any case, because the courts have some degree of discretion. In a family context, there is an additional deterrent to the formulation of legally enforceable contracts, namely that the punctilious enumeration, at the outset of a union, of each party's possible misdeeds, and of the attendant penalties, would likely kill even the most promising of relationships stone dead.

In Becker (1972, 1974), already mentioned, the distribution of the surplus generated by "marriage" is determined by the "marriage market". In the game-theoretical literature on the subject, by contrast, the distribution is the outcome of a two-person game. In the wake of Manser and Brown (1980), and McElroy and Horney (1981), the assumption is generally that the game will be cooperative. An exception is Lundberg and Pollak (1994), where the partners behave non-cooperatively, but the nature of the game is still taken as given. The choice of game is endogenous in Del Boca and Flinn (2005), where it is taken to depend on an exogenously given transactions-cost of cooperation. I allow for the choice of game to depend on all the parameters of the model, including

⁴See Macaulay (1963)

⁵See Ryall and Sampson (2009).

the couple's initial endowments, and the legal environment. For simplicity of exposition, I shall identify cooperation with Nash-bargaining, and non-cooperation with playing Cournot-Nash. As both parties have right of veto over the choice of game, the couple will play Nash-bargaining only if (after any appropriate money transfer) neither party would be better-off playing Cournot-Nash.

2 Fundamentals

The moment the couple is formed, each party is endowed with a certain earning capacity ("human capital"), and a certain amount of conventional assets ("money"). The latter may be the result of gifts, bequests or personal savings, and can be further increased by saving in the course of communal life. The former reflects natural talent, past educational investments, and learning by doing. From the moment the couple is formed, however, human capital can be accumulated only by market work. This generates increasing returns to market work. One may similarly assume increasing returns to domestic work, but so long as there are increasing returns to the other activity, that would only strengthen the results. Both parties derive utility from a private good, consumption, and a local public good, children. The latter have a "quantity" (number) and a "quality" (potential lifetime utility) dimension. Each child absorbs a certain amount of specifically maternal time in the peri-natal period.⁶ Above that amount, paternal time is a substitute for maternal time. For simplicity, I shall assume that it is a perfect substitute, but nothing of substance changes if we assume that paternal time substitutes for maternal time at a diminishing marginal rate. Child quality is produced by means of "attention" (parental time above the minimum that can only be provided by the mother) and money. The latter (hence, anything money can buy, including the services of hired helpers) substitutes for the former at a diminishing marginal rate. I shall assume that fathers and mothers have the same preferences.

The time that the parties have left to live from the moment the couple is formed can be divided into two phases. In the first one, the parties can work, have children, and condition these children's quality of life by expending resources on them. In the second, the parties can still work, but not affect the quality of any children that might have been born in the previous phase, because those children are now become independent adults. This segmentation of the time line is the most appropriate one for my present purposes, but not for others. Were I concerned like Del

⁶This minimum includes the perinatal period, and a certain amount of time (as short as three weeks, or as long as three years, according to school of pediatric thought) after the child is born.

Boca and Flinn (1995), with the effects of custodial arrangements on the amount of support provided by the non-custodial parent I would end the first phase somewhat earlier, when the children are still dependent on their parents. Were I concerned with the matching process like Peters and Siow (2002), Chiappori et al. (2006) or Cigno (2007), I would let the first phase end even earlier, when the couple is formed.

If the parties do not cooperate, the number of children is decided by the woman, who has ultimate control over her own fertility. This assumption is widely used in the economics of the family literature, but the conclusion do not change in any substantive way if it is assumed instead that both parties have power of veto. Each party has the option of unilaterally withdrawing from the union if the couple is not married, of petitioning a court for divorce if the couple is married. In real life, many unions break down while the children are still dependent on their parents, or even before the children are born. That, however, is a result of imperfect information. In our perfect information world, it does not make sense to sense for a person to form a union with a particular partner when a better one is known to be available, or to have children and then withdraw from the union while there is still scope for cooperatively increasing the utility of these children. Separation may make sense only in the second phase, when the children are grown-up and out of the way. As is often done in the endogenous fertility literature, I shall treat leisure as a constant. This simplifying assumption has some empirical justification. Burda et al. (2006) report that a person's total (market plus domestic) work time varies across countries (notably, between Europe and the US), but not across households within the same country. What varies across households is only the allocation of total work time between market and domestic work. In the second phase of communal life, when there are no more children to look after, both parents will work full time for the market. Therefore, the way a person's total work time is divided between market and domestic work in the first phase determines that person's earnings not only in the first, but also in the second phase.

Let us now look at the properties of a Pareto-optimal optimal allocation of a couple's joint resources. As a child's quality and, consequently, the utility of each parent depend on the amount of parental attention that the child receives, but not on how much of this attention is provided by each parent, the optimization can be carried out in two steps. First, we find what share of any given amount of parental attention should be provided by each parent in order to minimize the opportunity-cost of this attention. Second, we look for the amount of money and attention per child, and the quantity of children, that maximize a parent's utility for each possible level of the other's. In the presence of credit mar-

ket imperfections, this maximization will be subject to the constraint that the couple cannot borrow more than the sum of the man's and the woman's individual credit rations. If that constraint is binding, the resulting allocation will be only a "local" Pareto optimum, because the wider economy in which the household is immersed is not at an optimum. That is the sense in which the expression "Pareto efficiency" is generally used in game theory.

The first step of the optimization is illustrated in Figure 1, where t_0 is the minimum amount of time that a woman must necessarily spend with each child, t the total amount of attention (time in addition to t_0) that the parents give each child, t_f the amount provided by the mother, and t_m that provided by the father. Given increasing returns to market work, the isocosts are convex to the origin. For the perfect substitutability assumption, the isocosts are straight lines with absolute slope equal to unity. Therefore, it is efficient for one parent to provide all of t . I shall call this parent the main childcarer, and the other the main earner.⁷ Notice that, as the isocosts are not symmetrical around the 45° line, because the origin of the axes is translated by t_0 , there is more than a 50/50 chance that the solution will be at the South-East corner, as in the diagram, and that it will consequently be efficient for the woman to be the main childcarer. For the opposite to be the case, the woman's human capital endowment would have to be sufficiently larger than the man's to compensate for the fact that part of her time is necessarily absorbed by the children. In other words, the man may have a comparative advantage in market work even if his human capital endowment is no larger than the woman's. Nothing of substance changes if we assume that paternal attention is not a perfect substitute for maternal attention, and the isoquant is consequently convex to the origin. Provided it is not more convex than the isocosts, there will still be some degree of specialization.

Given the cost-minimizing division of labour, and recalling that children are a local public good, the efficient quantity of children will equate the sum of the costs for the parents to the benefit for each of them of having an extra child. An efficient allocation of the couple's endowments will equate the MRTS of parental attention for money in the production of child quality to the minimized opportunity-cost of this attention, and equalize his and her MRS of present for future consumption. The common value of this MRS will be equal to the interest factor if the couple's joint borrowing constraint is not binding, higher if it is. In the second case, the allocation will only be a local Pareto-optimum. In Fig. 2, U_j denotes the main childcarer's, and U_j the main earner's, utility. The con-

⁷In developed countries, where fertility is low, and life expectancy high, the main childcarer has plenty of time left to engage in market work.

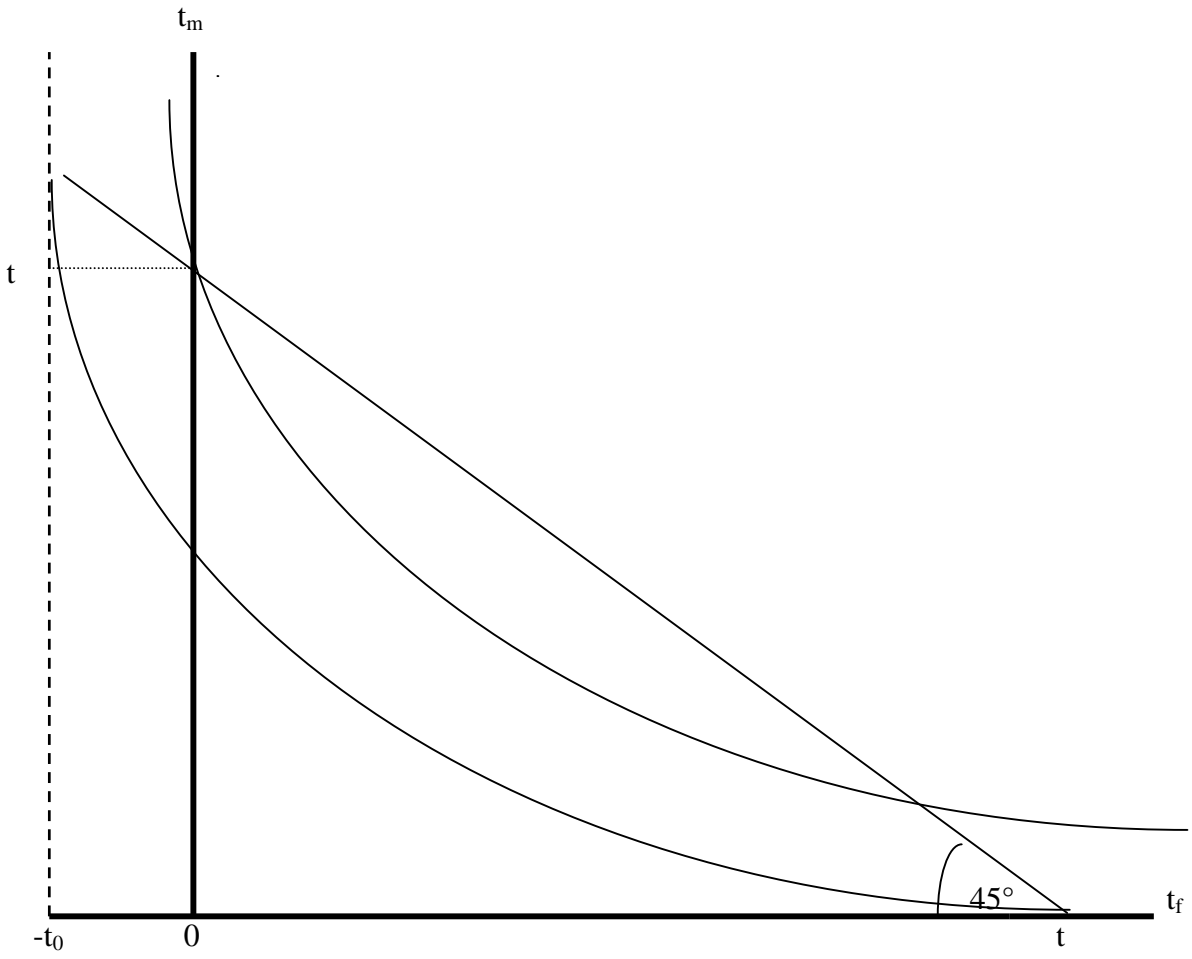


Figure 1. The cost-minimizing division of labour

tinuous, concave-to-the-origin curve, symmetrical around the 45° line, is the locus of the Pareto-optima.

In the next two sections, I shall look for the properties of the domestic equilibrium, with and without marriage. Before doing that, however, I must be a little more specific about the relative size of the money endowments with which the parties started their communal life (that is irrelevant for the characterization of an efficient allocation, which depends only on the sum total). In some of his writings, Gary Becker hypothesizes that couples are positively assorted, which may be taken to mean that the parties to a union will have the same money and human capital endowments. In other of his writings, he hypothesizes that the criterion for getting together is complementarity of traits, which may be taken to mean negative assortment (rich boy seeks talented girl, or vice versa). Lam (1988) demonstrates the existence and stability of matching equilibria characterized by either positive or negative assortment. In the more recent literature, the assumption is generally that partners are matched by income or wealth. In our context, however, if a person enters into a partnership with another, his or her income and wealth will depend on the domestic division of labour. As the latter depends, in turn, on the human capital endowments of the two partners, we have then a circular argument. Couples are matched by income or wealth, but income and wealth depend on the match. The matter becomes even more complicated if one allows, like Konrad and Lommerud (2000), Peters and Siow (2002) or Cigno (2007), for the possibility that young people, or their parents, invest in human capital and conventional assets with a view to influencing the outcome of the matching process. My way out of the quagmire is to assume that men and women are matched by their maximized utility in the best alternative to the present match (singlehood, or a different match). Then, either the parties to a union will have the same endowments (positive assortment), or one will have a larger human capital, and the other a larger money endowment (negative assortment).

3 Games couples play

In a Cournot-Nash game, each party maximizes its own utility, subject to its own budget and borrowing constraints, taking the other's actions as parameters. In the present context, the woman will choose how much to work and save, the quantity of children, and how much of her own time and money to contribute to these children's upbringing, subject to her individual budget and borrowing constraints, taking the man's contributions as given. The man will choose how much to work and save, and his own time and money contributions to the children's upbringing,

subject to his individual budget and borrowing constraints, taking the quantity of children, and the woman's contributions, as given. In equilibrium, the parties will equalize their earnings, consumption and utility. But this utility, and the quality of the children, will be inefficiently low. In Fig. 2, the Cournot-Nash equilibrium is represented by point **C**, on the 45° line, but below the efficiency locus. That should come as no surprise. We know that Cournot-Nash equilibria are inefficient. But let us see in which way it is inefficient in the present context.

If the parties have the same money, and the same human capital endowment, they will split everything down the middle. The man and the woman will work in the market for the same amount of time, spend the same amount of time looking after their children (as t_0 can only be provided by the woman, this implies that the man will supply more than half of t), and bear half the monetary cost of each child. Now, we know that, if the parties have the same human capital endowment, it would be efficient for the woman to be the main childcarer. As this is not happening, it then follows that the parties are not exploiting their comparative advantages. As the opportunity-cost of parental attention is not minimized, children will be brought up with too little parental attention, and relatively too much money. As a further consequence, the full marginal cost (monetary plus opportunity-cost) of children will be inefficiently high. But this does not necessarily imply that the quantity of children will be inefficiently small. Given that the mother bears only half of the cost of each child, there is in fact no way of telling, in general, whether the quantity of children will be too large or too small. In other words, the inefficiency arising from the woman's free-riding will be traded-off against the one arising from the misallocation of the couple's time endowments. If the parties have different human capital (hence, money) endowments, they will equalize earnings. As this implies that the party with the larger human capital endowment does less market work than the other, this is the same as saying that the parties specialize *against* their comparative advantages. As private consumption will still be equalized, this implies that the party with the larger money endowment will bear the larger part of the monetary cost of the children. I have already remarked that it would make no sense for a couple to separate in the first phase of communal life. If the couple plays Cournot-Nash, the parties will be indifferent between separating or staying together in second one, because their utility will be the same either way.

What is there to stop a couple from agreeing to allocate their joint resources in an efficient way? We know that efficiency requires division of labour. Given that the main childcarer would earn less, in both phases of communal life, than the main earner, neither party will want to be the

former unless it receives adequate compensation from the latter. This raises a problem. In the second phase, when the children will have grown up, there will be no more efficiency gains to be reaped through cooperation, and it will then be in the main earner's interest to renege on any promise it may have made to the main childcarer in the first phase. In the absence of a contract enforceable through an ordinary court of law, any promise of future compensation the prospective main earner might make will then lack credibility, and the prospective main childcarer will agree to cooperate only if the compensation is paid at front. If the main earner is not credit rationed, that will not distort choice. The main earner will dissave or borrow to the point where its MRS of present for future consumption is equal to the main childcarer's. The Utility Possibility Frontier (UPF) of the Nash-bargaining game will then coincide with the efficiency locus. Suppose, however, that the main earner's individual borrowing constraint becomes binding before the transfer has reached the level required to buy the main childcarer's cooperation. At that point, the main earner's MRS will become larger than the main childcarer's, the allocation will cease to be efficient, and any further increase in the size of the transfer will make the inefficiency even larger. The UPF will then fall below the efficiency locus. In Fig. 2, the dashed, concave-to-the-origin curve is the UPF if the main earner's borrowing constraint is binding for all positive values of the main childcarer's utility. This frontier is everywhere steeper than the efficiency locus.

In many household economics applications of Nash-bargaining theory, the coordinates of the threat-point are given by the outside options of the two parties. In Lundberg and Pollak (1996), by contrast, the threat-point is identified with the equilibrium of the Cournot-Nash game that the couple could have played as an alternative to Nash-bargaining. In general, this approach runs up against the objection that each party's money and human capital endowments will be irreversibly modified by the couple's time allocation decisions. Once the children are born, and time is spent on them, there will be no way to reach the alternative Cournot-Nash equilibrium, and this equilibrium cannot then be the threat-point of the Nash-bargaining game.⁸ The objection loses force, however, if compensation is paid at front. In Fig. 2, the threat-point of the Nash-bargaining game is then **C**. The rectangular hyperbolas through points **B** and **B'** are contours of the Nash-maximand. If the main earner's individual borrowing constraint is never binding in the relevant range, the equilibrium is at point **B**, where the efficiency locus intersects the 45° line. Otherwise, it will be at point **B'**, inside the efficiency locus, and above the 45° line. As the distortion caused by the

⁸This endogeneity problem is addressed in Basu (2006).

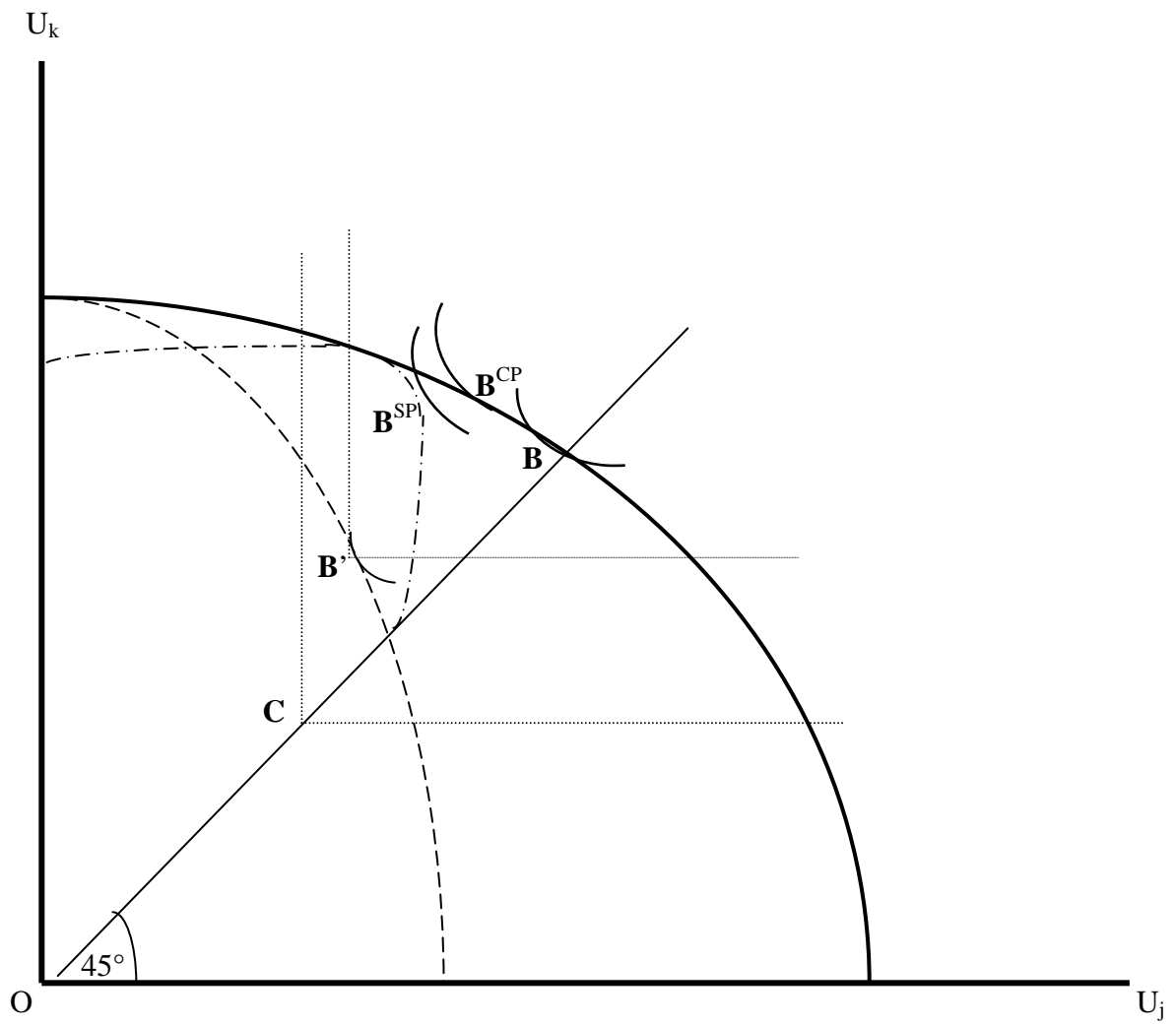


Figure 2. Cournot-Nash equilibrium. Nash-bargaining equilibrium without marriage, and with either separate-property or community-property marriage.

main earner's borrowing constraint increases with the size of the compensation, the re-distribution will stop before full utility equalization is achieved. If the main earner's borrowing constraint is very tight, a Nash-bargaining equilibrium may not exist (C may lie outside the UPF). If that is the case, the couple will play Cournot-Nash. Recalling that a woman can qualify for the main earner's job only if her human capital endowment is strictly larger (and, consequently, her money endowment strictly smaller) than her partner's, the main earner is more likely to be credit rationed, and cooperation less likely to come about, if the main earner is the woman ($k = f$), than if it is the man ($k = m$).

4 Games married couples play

Let us now bring in the marriage institution. A marital union differs from a non-marital one in that it cannot be dissolved without court permission. In the event of dissolution ("divorce"), the court will have to split any assets the couple might hold in common in some way, and may also order one party to make a flow of income payments ("alimony") to the other. As it remains true that neither spouse can have an interest in divorcing while the children are still small, any award the divorce court might make in either party's favour cannot then be construed as child maintenance. As already pointed out, in reality, some couples divorce while their children are still dependent on them, but this cannot be explained within a perfect information framework.⁹ A couple will marry if, after appropriate compensation, the married equilibrium Pareto-dominates the unmarried one. If the former neither dominates nor is dominated by the latter, the couple will spin a coin.

Recall that, without marriage, the main earner cannot credibly promise to pay the main childcarer compensation in the future. Marriage may change that if legislation and jurisprudence make it in the main earner's interest to honour its promise. Compared with the unmarried one, the married equilibrium must satisfy two additional ("divorce-threat") constraints, namely that it must not be in either spouse's interest to seek divorce. Clearly, at most one of these constraints will be binding. If the main childcarer's is, that will relax the main earner's borrowing constraint. Whose divorce-threat constraint is binding depends on the matrimonial property regime. In a separate-property regime, it depends also on divorce policy. In some legal systems, the law prescribes how any joint assets should be split, and who should get alimony. In other systems, the divorce courts have some degree of discretion, which they

⁹For an economic analysis of the effects of child-support orders, see Del Boca and Flinn (1995).

typically exploit to compensate the economically weaker party. I will consider only two possibilities. Either the courts do not award alimony (remember that there are no young children to be supported), and split any assets held in common down the middle, or they award alimony, and split any assets held in common, in such a way that to the two former spouses will have the same utility.

In a separate-property jurisdiction, any income or assets a spouse generates or acquires in the course of married life are that spouse's personal property. Without marriage, the main earner's promise to compensate the main childcarer at some future date not be credible. This promise will become credible, however, if divorce policy is egalitarian, because it will then be in the main earner's interest to honour his promise. In that is the case, the distortion generated by the main childcarer's divorce-threat constraint will be traded-off against the one generated by the main earner's borrowing constraint. In Fig. 2, the UPF of the Nash-bargaining game plaid by a couple married in a separate-property jurisdiction is represented by the concave-to-the-origin, dot-and-dash curve. At the North-West corner of this curve, where the divorce-threat constraint is most, and the borrowing constraint least stringent, the main earner's MRS is smaller than the main childcarer's. Where the UPF crosses the 45° line, the divorce-threat constraint is not binding, and the main earner's MRS is larger than the main childcarer's. In between these extremes, there is a point where the MRS is the same for both spouses. At that point, the UPF coincides with the efficiency locus. If the couple would have cooperated even without marriage as in the illustrative example, the threat-point of the married Nash-bargaining game is \mathbf{B}' . The equilibrium is then at point \mathbf{B}^{SP} , inside the efficiency locus and above the 45° line, but closer to both than \mathbf{B}' is. It would be even closer if, without marriage, the couple would have plaid Cournot-Nash, and the threat-point of the married game were then \mathbf{C} .

The lower is the cost of obtaining a divorce, the tighter is the main childcarer's divorce-threat constraint (at any point of the UPF), and thus the closer to the 45° line, and to the efficiency locus, will point \mathbf{B}^{SP} be. Therefore, the lower is the cost of obtaining a divorce, the greater are the chances that a married Nash-bargaining equilibrium will exist. To see what this implies, take a cost of divorce so high that, for a number of couples, neither divorce-threat constraint is binding, and the married equilibrium coincides with the unmarried one. These couples will marry with probability one half (will spin a coin). Now consider a lower cost of divorce. More couples will marry, and play Nash-bargaining, at this than at the higher cost. Some of these additional married couples would have play Nash-bargaining anyway, but the rest

would have plaid Cournot-Nash. A larger proportion of married couples will then play Nash-bargaining at the lower than at the higher cost of divorce. This has two interesting implications. The first is that, as cooperation is good for efficiency, and child quality is higher if parental time is efficiently allocated, a low cost of divorce is good for children. The second is that, as the main earner's borrowing constraint is more likely to be binding if the main earner is the woman rather than if the main earner is the man, a larger proportion of married women will specialize in market work at the lower, than at the higher cost of divorce. This explanation is consistent with recent evidence, in Bureau of Labor (2004), Drago et al. (2004), and Stancanelli (2007) among others, that a substantial minority of women (up to one in five) in developed countries now earn more than their male partners.

In a community-property jurisdiction, any assets either party might have at the date of marriage remain that party's individual property, but any income produced or assets acquired after that date are the couple's joint property. Furthermore, the couple has a joint credit ration, instead of two individual ones as in separate-property marriage. The fact that neither party can hold on to what it earns rules out the possibility of a Cournot-Nash game. The couple can only play Nash-bargaining. The fact that the only assets of which a party can individually dispose are those it has at the time of marriage gives a bargaining advantage to the spouse with the larger money endowment, rather than to the main earner as in separate-property marriage. That advantage disappears if the divorce courts are egalitarian, but not if the courts have a neutral stance. The fact that the couple faces only a joint borrowing constraint implies that, in the absence of an operative divorce threat, the parties will have the same MRS of present for future consumption, and the equilibrium will then be efficient. If the presence of an operative divorce threat, however, there will be no credit-induced distortion against which to trade the one induced by this threat. It will then be in the interest of the spouse with the larger money endowment to transfer enough of its own assets to the other spouse for this source of distortion to disappear. The argument can be illustrated with the help of Figure 2. If money endowments are so re-distributed that neither spouse can credibly threaten divorce, the married UPF coincides with the efficiency locus. If the unmarried Nash-bargaining game has an equilibrium as pictured, the threat-point is \mathbf{B}' , and the married equilibrium is \mathbf{B}^{CP} . Otherwise, the threat-point will be \mathbf{C} , and the married equilibrium will be at \mathbf{B} . In the second case, the equilibrium gives the same utility to both spouses. In the first, it gives more to the main earner. In both cases, however, the married equilibrium dominates the unmarried one, and it will thus be in

the interest of the party with the larger money endowment to transfer part of its money endowment to the other in return for marriage.

It should be clear from the foregoing argument that, in a community-property jurisdiction, the married equilibrium is independent of the cost of divorce, because neither spouse can ever have an interest in divorcing. Zelder (1993) and Friedberg (1997) estimate that the introduction of divorce on demand encouraged divorce in the US. Smith (1997) finds that it had no effect in the UK. A possible reason for these contradictory results is that the two US studies, based on cross-state data, do not control for the matrimonial property regime, while the UK study is based on variations over time in a single country, where the regime was the same throughout the sample period. Controlling for the matrimonial property regime, Gray (1998) does in fact find that this legislative innovation did not encourage divorce in the US as the earlier studies suggested, but did encourage married women to supply more labour in separate-property states. Stevenson (2008), however, attributes the effect of the matrimonial property regime to an omitted-variable problem. My argument that a reduction in the cost of obtaining a divorce will lead to an increase in married women's labour supply in a separate-property jurisdiction, but will have no effect in a community-property one, is consistent with Gray's finding. The explanation Gray gives of it is, however, that the introduction of divorce on demand induced married women to insure against the risk of finding themselves without male income support by refusing to be the main childcarer. My explanation, by contrast, is that the introduction of divorce on demand made it possible for better qualified wives to credibly promise to compensate their less well qualified husbands at some future date, and thus to induce the latter to accept the main childcarer role.

Looking at Fig. 2, it is clear that a separate-property equilibrium cannot be more efficient, or more equitable, than a community-property one. Under conditions of certainty, this carries the policy implication that the government should offer only the latter. But, suppose that the main earner is engaged in a business activity, and thus at risk of bankruptcy. It could then be in the common interest of both spouses not to hold assets in their joint names. The couple will then marry if separate-property marriage is available, stay unmarried if it is not. In general, therefore, the couple should be allowed to choose the matrimonial property regime. In countries where the couple is given that choice, a sizeable minority opts for separate property.¹⁰

¹⁰That is true even of countries like Italy, where the choice is available, but community property carries certain fiscal advantages.

5 Conclusion

The economic argument for marrying varies according to the matrimonial property regime. In a separate-property jurisdiction, if the cost of obtaining a divorce is sufficiently low, and provided that it is court policy to equalize post-divorce utility across the former spouses, marriage induces cooperation, and will thus allow the spouses to specialize according to their comparative advantages, because it lends credibility to the prospective main earner's promise to compensate the prospective main childcarer at some future date, when the children will be no longer economically dependent on them. In a community-property jurisdiction, marriage induces cooperation, and will thus allow the spouses to specialize according to their comparative advantages anyway, because it rules out strategic behaviour. Without cooperation, parents will raise their children with the wrong mix of money own time (too little of the latter, relatively too much of the former). Therefore, cooperation raises the utility of both parents and children. Contrary to popular belief, a reduction in the cost of obtaining a divorce would have no permanent effect on the divorce rate. In a separate-property jurisdiction, it would encourage marriage, and induce a larger proportion of married women to specialize in market work. The legislator should allow the couple to choose the matrimonial property regime.

6 References

- Gonzalez, L. and T. Viitanen (2009), "The Effect of Divorce Laws on Divorce Rates in Europe", *European Economic Review* 53, 127-138
- Bargain, O., L. Gonzalez, C. Keane and B. Özcan (2010), "Female Labor Supply and Divorce: New Evidence from Ireland", IZA DP 4959
- Basu, K. (2006), "Gender and Say: A Model of Household Behaviour with Endogenously Determined Balance of Power", *Economic Journal* 116, 558-580
- Becker, G. S. (1972), "A Theory of Marriage: Part I", *Journal of Political Economy* 81, 813-846
- (1974), "A Theory of Marriage: Part II", *Journal of Political Economy* 82, S11-S26
- Björklund, A., D. K. Ginther and M. Sundström (2007), "Does Marriage Matter for Children? Assessing the Causal Impact of Legal Marriage", IZA DP 3189
- Burda, M., D. Hamermesh and P. Weil (2006), "The Distribution of Total Work in the EU and US", IZA DP 2270
- Bureau of Labor (2004), *Women in the Labor Force: A Databook*. Washington DC: US Department of Labor

- Chiappori, P. A., B. Fortin and G. Lacroix (2002), "Marriage Market, Divorce Legislation, and Household Labor Supply", *Journal of Political Economy* 110, 37-72
- , M. Iyigunand and Y. Weiss (2009), "Investment in Schooling and the Marriage Market", *American Economic Review* 99, 1689-1713
- Cigno, A. (1991), *Economics of the Family*, Oxford and New York: Clarendon Press and Oxford University Press
- (2007), "A Theoretical Analysis of the Effects of Legislation on Marriage, Fertility, Domestic Division of Labour, and the Education of Children", CESifo WP 2143
- (2009), "What's the Use of Marriage?", IZA DP 4635
- Clark, S. (1999), "Law, Property, and Marital Dissolution", *Economic Journal* 109, C41-C54
- Del Boca, D. and C. Flinn (1995), "Rationalizing Child Support Orders", *American Economic Review* 85, 1241-1262
- (2005), "Modes of Spousal Interaction and the Labor Market Environment", CHILD WP 12/2005
- Drago, R., S. Black and M. Wooden (2004), "Female Breadwinner Families: Their Existence, Persistence and Sources", IZA DP 1308
- Fella, G., P. Manzini and M. Mariotti (2004), "Does Divorce Law Matter?", *Journal of the European Economic Association* 2, 607-633
- Gray, J. S. (1998), "Divorce Law Changes, Household Bargaining, and Married Women's Labor Supply", *American Economic Review* 88, 628-642
- Konrad, K. A. and K. E. Lommerud (2000), "The Bargaining Family Revisited", *Canadian Journal of Economics* 33, 471-487
- Lam, D. (1988), "Marriage Markets and Assortative Mating with Household Public Goods: Theoretical Results and Empirical Implications", *Journal of Human Resources* 23, 462-487
- Lundberg, S. and R. A. Pollak (1994) "Noncooperative Bargaining Models of Marriage", *American Economic Review* 84, 132-137
- (1996), "Bargaining and Distribution in Marriage", *Journal of Economic Perspectives* 10, 139-158
- Macaulay, S. (1963), "Non-Contractual Relations in Business: A Preliminary Study", *American Sociological Review* 28, 55-67
- Manser, M. and M. Brown (1980), "Marriage and Household Decision Making: A Bargaining Analysis", *International Economic Review* 21, 31-44
- McElroy, M. B. and M. J. Horney (1981), "Nash-Bargained Household Decisions", *International Economic Review* 22, 333-349

Mnookin, R. H. and L. Kornhauser (1979), "Bargaining in the Shadow of the Law: The Case of Divorce", *Yale Law Journal* 88, 950-997

Peters, M. and A. Siow (2002), "Competing Premarital Investments", *Journal of Political Economy* 110, 592-608

Ryall, M. D. and R. C. Sampson (2009), "Formal Contracts in the Presence of Relational Enforcement Mechanisms", *Management Science* 55, 906-925

Stancanelli, E. (2007), "Marriage and Work: An Analysis for French Couples", OFCE WP 207

Stevenson, B. (2008), "Divorce Law and Women's Labor Supply", *Journal of Empirical Legal Studies* 5, 853-873

————— and J. Wolfers (2007), "Marriage and Divorce: Changes and their Driving Forces", *Journal of Economic Perspectives* 21, 27-52

Wickelgren, A. L. (2009), "Why Divorce Laws Matter: Incentives for Non-Contractible Marital Investments Under Unilateral and Consent Divorce", *Journal of Law, Economics and Organization* 25, 80-106

Zelder, M. (1993), "Inefficient Dissolutions as a Consequence of Public Goods: The Case of No-Fault Divorce", *Journal of Legal Studies* 22, 503-520