

The Economics of Marriage and Divorce

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Why do people get married? Love, sex, children, money. Why do they get divorced? Probably for the same reasons. While most people would, at most, want to hear what economists have to say about the financial aspects of marriage, economists (who, surprising as it may seem, marry and divorce like everyone else) have taken it on themselves to offer useful hypotheses about the rest of it too. Economics is one of many academic disciplines to weigh in, particularly once important changes in marriage and divorce over the last several decades began to grab national attention. In this chapter, we will illustrate the insights offered by the economic approach to analyzing marriage and divorce.

For example, economists have studied whether divorce laws affect the divorce rate. Before 1970, many U.S. states required both spouses to agree before a divorce could take place; now, most states allow one spouse to initiate a divorce unilaterally. Under certain assumptions that economists have spelled out, the type of divorce law would not actually affect the number of divorces, even while it does affect the way that divorced couples share resources. Economists have tested this hypothesis and, to the extent possible, the assumptions it rests on. Furthermore, economists have shown that the type of divorce law affects how married couples share resources, even if they do not divorce, and, extending the ideas further, it might even influence how often they have sex.

In order to understand these ideas, we have to develop a model of both marriage and divorce (or, in other words, a model that allows for changes over time in the utility from marriage). In this chapter, we will set the stage for this analysis with a brief discussion in Section 1 of trends in marriage and divorce in the U.S. Then, to keep things simple, we will discuss separately the gains from marriage versus living together (in Section 2), the reasons why people marry (in Section 3), the nature of decisionmaking within marriages (in Section 4), and the nature of the decisions to marry and to divorce (in Section 5).¹

¹In most cases, our theories apply to state-sanctioned marriage, whether between two people of different or of the same genders. Without intending any bias against homosexuals, we will sometimes use gender-specific terminology.

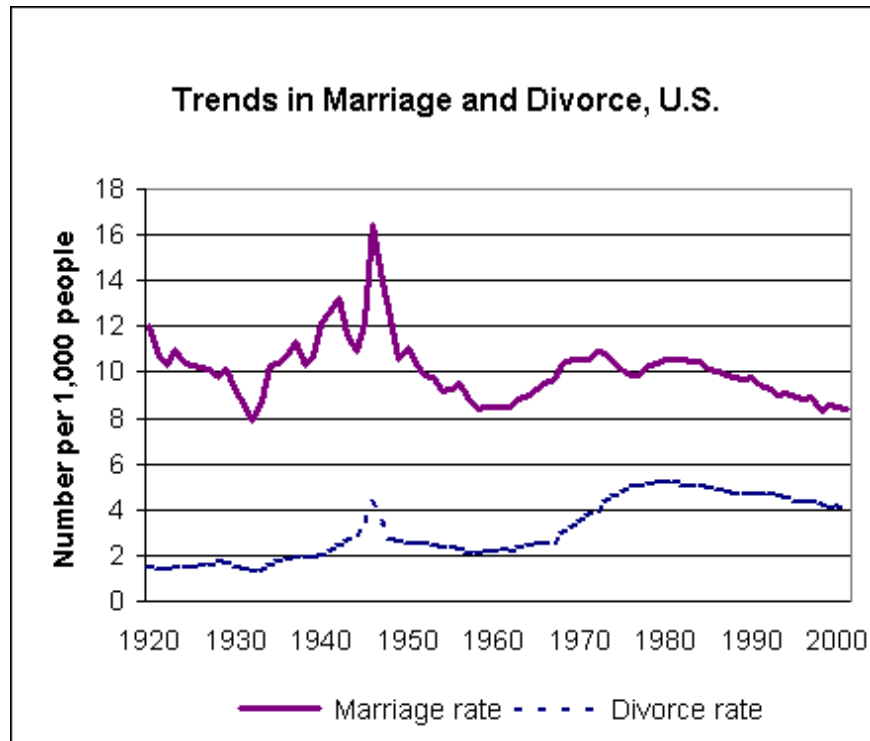


Figure 1:

1 Trends in marriage and divorce

Figure 1 illustrates trends in marriage and divorce in the U.S. The figure shows marriage and divorce *rates* by year – the number of marriages and divorces for each 1,000 people in the population. It would also be interesting to know the number relative to the eligible population, i.e., those available to marry (the unmarried) and divorce (the married). We are not able to report those statistics, however, because they are more difficult to come by and are not measured as accurately. It is apparent from Figure 1 that we need to distinguish between short and long-run patterns in the data. Over the long-run, the divorce rate has steadily increased while marriage rates have bounced up and down. The recent trends have been starker, however. The divorce rate more than doubled in the recent past, rising from 2.5 per thousand people in 1965 to 5.2 in 1980. It leveled off in the 1980s and then dropped back to 4.2 by 2000, but it remains the case that almost half of marriages end in divorce (Cherlin 1992). More recently, marriage rates have dropped off, falling by 20% from 10.6 in 1980 to 8.5 in 2000.

Looking at Figure 1, it is not entirely clear that these recent developments represent major breaks from past behavior. For example, the divorce rate rose steadily in the early part of the century and then plateaued in the 1950s, making the later increase look especially sharp. In fact, if it had risen at the same annual rate as occurred between 1920 and 1950, the divorce rate would have hit 5.0 in 1990, slightly *above* the actual rate of 4.7. Similarly, the marriage rate remains above the low of 8.4 that it hit in 1958, which followed a period of very high marriage rates. What distinguishes the recent period is not only the steady decline in marriage rates and continued high divorce rates, but also a number of contemporaneous trends that are entirely new, including an increased frequency of cohabitation, an increase in the age at first marriage, and a decline in the birth rate. The same trends have arisen in Europe and Canada as well.

While Figure 1 provides a useful backdrop, we will not offer a complete explanation for either the recent or long-term trends in this chapter. One reason is that laying out the basics of the economic approach to marriage and divorce will take up most of our space. Another reason is that there is little agreement in economics, or in any other discipline, about the causes and consequences of these trends. Did an increase in divorce rates make people more leary of marrying or more willing to marry, given the apparent decline in divorce costs? Did fertility rates drop because marriages have become less durable, or did it cause marriage to become less durable? One of the principal contributions of the economic approach to analyzing marriage and divorce is in making it clear how difficult it is to untangle the causes and consequences behind recent trends.

2 Marriage versus cohabiting

What is the difference between shacking up and getting hitched? Marriage is a contractual arrangement, with rules determined by church or state. For example, Jewish weddings are not complete until the bride and groom sign the *ketubah*, a marriage contract which “...spells out the husband’s obligations to the wife during marriage, conditions of inheritance upon his death, and obligations regarding the support of children of the marriage. It also provides for the wife’s support in the event of divorce.”² Brides in many cultures brought (or still bring) dowries to their husbands, with religious or secular law determining the disposition of the dowry in the event of death or divorce. In other cultures, husbands must provide a bride price to the bride or her father. With some exceptions, nonmarital relationships do not entail the same contractual obligations.³

Several aspects of marriage as a contract are important:

- First, marriage as a transaction may be costly in terms of time, effort, and/or money to enter into and to leave. It implies that the utility from

²From “Marriage”, *Judiasm 101*, <http://www.jewfaq.org/marriage.htm>.

³Most famously, “palimony” (alimony for a pal) has been granted by courts under relatively stringent conditions – the cohabiting relationship had to involve “an express or implied contract” (<http://www.palimony.com/7.html>).

marriage must exceed the utility from being apart *as well as* the costs involved in getting married, and, possibly, divorced (although we do not emphasize this in the model of getting married which we develop later).

- Second, divorce as the dissolution of a contract entails financial obligations between the spouses. For example, one spouse may be required to pay income support to the other, and property acquired during the marriage (or even before) must be split according to some rule, perhaps depending on behavior during the marriage. There are a few motives for these financial obligations associated with divorce. One is to provide support for children issuing from the marriage, although these rules affect childless couples as well. Another motive is to punish certain types of behavior which are viewed as violating the contractual obligations of marriage. An additional motive is to compensate spouses for some types of investments in the marriage which are undertaken with the belief that the marriage will last. We will elaborate on the motives for these “sharing rules” as we outline the reasons why people marry and subsequently divorce.
- Third, the nature of the marriage contract has varied greatly across religions, countries, and time periods. The Old Testament, for example, established a right of husbands to unilaterally divorce their wives, for any reason or no reason, although not without absolving all financial obligations. Subsequent Talmudic law (developed in oral form before Christ and in writing after) gave Jewish wives the right to unilateral divorce when the husband “...is physically repulsive because of some medical condition or other characteristic, when he violates or neglects his marital obligations (food, clothing and sexual intercourse), or, according to some views, when there is sexual incompatibility.”⁴ Jesus, in various gospels, recognized (though disapproved of) divorce, while the Roman Catholic church forbids it. Occasionally, legal and/or religious divorce law has changed in response to demands of influential society members (e.g., Henry VIII). We will discuss some reasons why the legal regime governing marriage and divorce has varied as the circumstances surrounding marriage have shifted.

3 What are the gains from marriage?

At the outset, we listed several reasons – love, sex, children, and money – why people might get married. Let’s consider in turn how each of them affects an individual’s utility, and moreover why the impact may depend on whether the couple marries instead of just living together.

⁴From “Divorce”, *Judiasm 101*, <http://www.jewfaq.org/divorce.htm>.

3.1 Love and sex

While love may be a many-splendoured thing, we will model it as a simple gain in utility from sharing your life with another. Love may matter because you enjoy being with the one you love, and it may matter because it causes you to care about the well-being of the one you love. In other words, love may be an argument of your utility function and it may change your utility function by placing weight on the utility of another person.

Next, there is sex. But is sex any different from love from a modeling point of view? They both require another, and they both offer utility, given the right partner. Sex may complement love, if emotional intimacy enhances sexual satisfaction. However, there are other important characteristics of sex. One which we will ignore in this chapter is that there is a relatively well-functioning market for sex (via prostitution), but not one for love, since sex is an act but love is an emotion which is difficult to transact. Another characteristic of sex is that it involves certain risks. It may be for the latter reason that sex is often associated with marriage.

One risk of sex is disease. Monogamy reduces the risk of disease, but how does one insure monogamy? First, both marriage and cohabitation increase physical proximity and hence the ability to monitor the partner. Second, marriage, as a legal contract, often specifies penalties which raise the cost of adultery. For instance, it may provide grounds for the other partner to end the marriage or affect the distribution of income and property after divorce.

Another risk of sex is pregnancy. The risk of pregnancy explains why sex within marriage may be preferred to sex outside of marriage – because the welfare of children, and so the welfare of parents who care about their children, is enhanced by making marriage difficult to end and by the financial obligations imposed by marriage (although these obligations may be imposed for children born out of wedlock as well).

Seen in this light, one can understand why the advent of effective contraception in recent decades – by reducing the risk of pregnancy resulting from sex – has reduced the frequency of marriage and increased the frequency of living together. While condoms have been around for over millenia, the introduction of the birth control pill has had a drastic effect, especially after legal decisions in the late 1960s allowed it to be distributed widely among unmarried women. That is because it allows women to control their fertility, and women bear more of the costs of childbearing than men do.⁵

3.2 Children

Sex naturally brings us to talk about children. There are a few reasons why people have kids besides the possibility that they are an accidental byproduct of

⁵ *The Economist* (12/31/1999) named the pill the greatest science and technology advance in the twentieth century. Goldin and Katz (2002) documented the consequences in terms of later marriage and increased investment by women in education and careers that followed the dissemination of the pill.

sex. One is that they feel a biological imperative. Another is that they enjoy kids. Those two reasons look the same in a simple economic model – they are things that raise an individual’s utility.

What makes kids interesting for our purposes is that one kid may raise the utility of *both* parents at the same time. Thus, kids are public, not private, goods. In other words, one kid provides utility to two parents, and the utility one parent gets from spending time with the kid is not diminished by the utility the other gets from spending time with the kid – as long as the parents live together. If not, then kids are more like other private goods, for example spaghetti – if one person eats the spaghetti, the other cannot. Since kids cost about the same whether they live with one parent or both, it is efficient, from this perspective, for parents to live together. We will not have a chance to say anything about the decision of *whether* to have kids, although it may have some of the same features as other types of marital decisions, which we will discuss below. Other interesting decisions which we will not discuss are how many kids to have, and the tradeoff between investing in child quantity (by having more kids) versus child quality (by spending more time or money on each kid).

3.3 Public goods

We already pointed out that kids are public goods. In a variety of other ways as well, it is likely that two can live as cheap as one. Kitchens can be used to provide two meals about as easily as one, and larger-sized bed linens are cheaper than two sets of smaller-sized bed linens. One spouse’s enjoyment of heat in the winter and air conditioning in the summer is little affected by the other’s as long as their preferences over the ambient temperature are not too different. The same applies to home decor (rugs and paintings) and to home entertainment (television sets, cable service, and stereos), once again provided that tastes are relatively similar – that is, both spouses like to watch *The Guiding Light*, or one does not mind taping the Knicks game to watch at a later time. Moreover, if being in love also means that your tastes are more similar, then that enhances the “public good” aspect of many household commodities.

Suppose that G stands for public goods associated with living together. We also will introduce X to stand for a private good, or bundle of private goods, which individuals consume. Consider a couple with similar incomes deciding whether to live together. If they live apart, then each faces a budget constraint like AB in Figure 2. With similar indifference curves, the best each alone can do is reach point D where the “best” indifference curve is tangent to the budget constraint. However, if they live together, then the cost per person of G is cut in half (because they can share it). Thus, the new budget constraint is CB, and they can pick a point like E (ignoring, for now, the possibility that they may have different preferences for G relative to X).

Kids provide a strong argument for marriage as opposed to cohabitation. Since kids require costly investments that take a long time to reach fruition, the

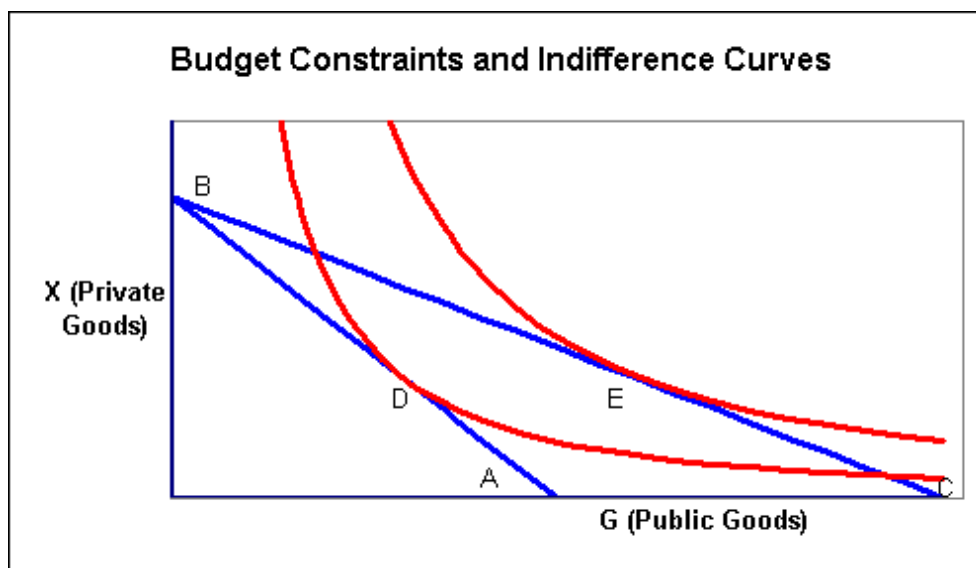


Figure 2:

contractual nature of marriage (the fact that it may be difficult to leave and that leaving it imposes continued financial obligations explicitly related to kids) increases one's willingness to invest in kids. The same can be said of other public goods – it is worth investing in furniture together if we are reasonably sure that the relationship will last – though with somewhat less force.

3.4 Time

There is another type of public good which is important to talk about separately. It originates with the idea that a person's *time* can be used to produce something that is a public good. For example, a clean house is a public good because both you and your spouse enjoy it, and the utility you get from it does not diminish the utility your spouse gets from it. Similarly, if you spend time teaching the kids to say "please" and "thank you," then both you and your spouse enjoy the outcome of polite kids.

What makes these examples different from the public goods discussed above is that time, rather than money, is used to produce them. However, money *is* being used indirectly, because using an hour of your time to clean the house has an opportunity cost – you could be working and earning a wage instead. That is why economists refer to activities of this sort as non-market or "household production" – it highlights the notion that you are using your time for something that is productive (it raises your utility) but is different from regular market production (by which you earn a wage to buy market goods that raise your

utility).⁶

The idea of household production gets even more interesting when we consider the following question: how should the burden of household production be divided between you and your spouse? Consider the time required to take care of an infant (since this is a starker example than cleaning the house, which does not require constant attention). One option is that you could spend all of your time taking care of the baby while your spouse works in the labor market full-time. A second option is that both you and your spouse could work and pay someone else to take care of your baby; this is possible for almost all types of household production except actually giving birth to a child. A third option is that both of you could split the child care and work part-time – you could take care of the baby in the morning and then go to work while your spouse takes over, or you could do it one day and then go to work the next day, or you could do it for one year and then go to work the next year.

The option that is least common is the last. There are two reasons why it is rare for both spouses to engage in part-time work, as opposed to at least one working full-time. One is that part-time jobs often pay much less per hour than full-time jobs. Thus, one spouse working in a full-time job will often earn considerably more than both spouses working half-time job. The other reason is that market work often involves a *career*, rather than simply a job. By a career, we mean a job that requires a long-term relationship with an employer or fellow workers, or a long-term investment in skills, since many skills (e.g., carpentry, surgery, computer programming) take time to acquire and deteriorate or grow obsolete when they go unused. Thus, “career” jobs typically pay more than short-term jobs.

All of this leads us to the notion of specialization – it may make sense for one spouse to specialize in market work and the other to specialize in household work. Again, the reasons are that part-time work is not highly remunerative and interrupts careers. Individuals on their own cannot specialize, but individuals in a relationship can, if one spouse provides the income (which also goes further when it is used to purchase public goods for two people) while the other spouse provides the time for household production. Moreover, marriage may be the preferred arrangement to foster specialization precisely because of the concern that, when one spouse specializes in household skills, they are giving up not just the current wage but a career and hence higher future wages. You would be more willing to do this if you receive some sort of commitment of compensation for the loss of your career in case the relationship ends. Alimony and property-sharing arrangements associated with divorce provide that commitment.

Consider a simplified model where utility depends upon consumption of potatoes as measured by X and the cleanliness of the house as measured by C , where $C = C_m + C_f$. C_m and C_f represent the proportion of time spent cleaning the house by the male and female, and $1 - C_m$ and $1 - C_f$ represent the proportion of time spent working. Let w_m be the daily wage of the male,

⁶The notion of “household production” was introduced by Gary Becker (1965), a Nobel-prize winning economist.

w_f be the daily wage of the female, and p be the price of potatoes. Further, assume that the couple maximizes $U(C, X_m) + U(C, X_f)$ subject to the budget constraint,

$$\sum_{i=m,f} w_i (1 - C_i) = p(X_m + X_f)$$

when married, while each member of the couple maximizes $U(C_i, X_i)$ subject to

$$w_i (1 - C_i) = pX_i$$

for $i = m, f$ when single.

Define (X_m^*, C_m^*) and (X_f^*, C_f^*) as the optimal choices of the male and the female when single. Note that the couple, when married, can choose $(X_m^*, X_f^*, C_m^*, C_f^*)$ (the same bundle) and get utility $U(C_m^* + C_f^*, X_m) + U(C_m^* + C_f^*, X_f)$, which is more than the sum of utilities when single. This occurs because they each benefit from the other's cleaning time as well as their own. Alternatively, the spouse with the higher wage can reduce his or her cleaning time and spend more time in the labor market allowing the couple to buy more potatoes. For example, the male could reduce his cleaning time to $C_m^{**} = \max(C_m^* - C_f^*, 0)$, which is either the difference between how much time he would spend if single (if $C_m^* > C_f^*$) or else zero. Consequently, both spouses would receive at least as much household production as when they were single, and the family would be able to buy more potatoes.

A last question arises when we consider housework. Why is it that women have historically specialized in household production and men in market production? A key reason is because women bear the children, so they have to withdraw from market work for a length of time. Another possible reason is that women are better at or care more about raising children, though this is far from being proven. In terms of the model, we could capture this idea by letting $C = aC_f + C_m$ where a now captures the productivity of women in household production relative to men. The statement that women are better at household production is equivalent to the statement that $a > 1$.

A third possibility is that men are more productive in market work as reflected in relative wage rates. In fact, the model suggests that all that really matters is the ratio of wages relative to the ratio of marginal products in the household. As w_f/w_m decreases relative to a , men will increasingly specialize in market activity and women will specialize in household production. While men's wages have historically exceeded women's wages by a lot, the gap has narrowed in recent years. In 2002, women's average pay was 76% of men's, down from 59% over a forty year period.⁷ At this point, it is unclear whether women continue to be paid less for equal work (and hence choose to specialize in household production more often), or whether the wage gaps persist because women continue to specialize in household production for other reasons.

⁷From "Fact Sheet: Equal Pay for Working Women", www.aflcio.org.

4 How do married couples make decisions?

The model we developed above showed the potential gains from getting married. Those gains are not only emotional but result from a more efficient use of time and resources enabled by two people living together. However, we have not yet said anything about how those resources are actually used. Is there a family utility function that gets maximized? Or do individuals continue to act in a self-interested way, even when they are married?

There are several sources of possible conflict that may get in the way of two spouses acting in concert to maximize a family utility function. Consider, for example, three types of decisions:

- Given a certain amount of money which is available to spend, how will couples decide whether to spend money on golf clubs or on Manolo Blahnik sandals? And what if another way to spend the money is on dinner at a nice restaurant? Or on a tricycle for the baby?
- How will labor supply decisions by each spouse affect how much is spent on golf clubs, sandals, or a tricycle? And how will spending possibilities affect each spouse's labor supply decisions?
- How will the couple decide whether to spend money on golf clubs, sandals, a tricycle, a nice dinner – or else save for the future?

These issues involve the allocation of money between private goods consumed exclusively by one spouse or the other (golf clubs, sandals, etc., designated X in our model above) and marital public goods enjoyed simultaneously by both spouses (dinner together, a tricycle, saving for future expenses, etc., designated G). They also involve the allocation of time between working in the market ($1 - C$ in our model above, which earns a wage w), working in household production (and producing marital public goods C , like a clean house), and taking leisure.

The available evidence, as well as introspection, tells us that individuals are not completely self-effacing or altruistic in marriage, and therefore spouses bargain over how to split shared resources. However, even as we make hard-hearted assumptions about the nature of bargaining, we can allow for the possibility that spouses get some utility from the well-being of their spouse.

4.1 How do families make decisions?

We assume that individuals maximize the utility gained from such decisions, subject to a budget constraint. Does a family act as a single decisionmaker, maximizing a family utility function? If so, the family utility function may depend on the total amount which the family spends on different goods regardless of who consumes them or on the utility of each family member. In these cases, we do not need to know how family members interact when these decisions are made. Interestingly, a model that is similar in spirit is one in which one member of the family is a dictator who makes all the decisions.

However, empirical analysis has rejected a key implication of these “unitary” models of family decisionmaking: the allocation of consumption within the family should not depend on who earns what within the family. In other words, unitary models imply that we would not have to know who brings home the bacon in order to predict whether high-fashion sandals, high-tech golf clubs, or a tricycle is purchased. However, two studies found that the share of income spent on men’s versus women’s and children’s clothing varied in Canadian families (Browning et al 1995) and in British families (Lundberg, Pollak, and Wales 1997), depending on the proportion of family income earned by husbands versus wives. Another study showed that, as the share of cash income accruing to women in Côte d’Ivoire rose, the share of spending on food rose and the share on alcohol and tobacco fell (Hoddinott and Haddad 1995).

4.2 Bargaining among family members

If families do not make decisions as a single unit, then we are back to the model of individual decisionmaking with which students of microeconomics are familiar. Nevertheless, being in a family still changes the way that decisions are made because family members share control over resources and are affected by actions of other family members. A natural way to model these types of interactions is using game theory.

Economists have focused on a particular type of game theory to explain family decisionmaking – games with cooperative bargaining between agents (or spouses, in this case). In order to understand the gains from cooperative bargaining, we will refer to R_i as the utility that individual i gets from a relationship, and S_i as the utility that i gets from being alone (or solo). When it matters whether individual i is male or female, we will use the subscripts m and f instead of i and j . R_i , the utility from marriage, arises from those factors we discussed earlier – love and sex, children, and other marital public goods.

As long as spouses can agree on how to split the *surplus*, $R_i + R_j - S_i - S_j$, from being together, then they will remain together. If they cannot cooperate, then the best they can do is get utility S_i and S_j from being apart – so these are the *threat points* in the cooperative bargaining game because each individual will prefer to get S rather than to stay in the relationship and get $R < S$. Their bargaining determines how the surplus will be split, and thus the actual values of R_i and R_j . Of course, they will both walk away if there is no surplus from marriage ($R_i + R_j - S_i - S_j < 0$), which is the same as saying that the threat points exceed the gains from marriage for both spouses ($R_i < S_i$ and $R_j < S_j$).⁸

John Nash, winner of a Nobel prize in Economics, demonstrated some important characteristics of the cooperative bargaining problem (Nash 1950). He showed that, under relatively general conditions, cooperative bargaining will yield an allocation that maximizes the product of each spouse’s surplus, $(R_i - S_i) * (R_j - S_j)$, subject to the household budget constraint. This solution is

⁸Manser and Brown (1980) and McElroy and Horney (1981) applied the Nash cooperative bargaining model to marriage and defined the threat points as the utility from separating.

Pareto efficient – neither spouse could be made better off without making the other worse off. As an example, suppose that the utility of each spouse when separated is $S_i = S_j = 0$, and the utility when they are together is $R_i = U(X_i)$ and $R_j = U(X_j)$, where $U(\cdot)$ is a standard utility function with decreasing marginal utility in X . Moreover, suppose that family income Y is going to get split so that $Y = X_i + X_j$. The solution that maximizes

$$\begin{aligned}(R_i - S_i) * (R_j - S_j) &= R_i * R_j \\ &= U(X_i) * U(X_j) \\ &= U(X_i) * U(Y - X_i)\end{aligned}$$

is $X_i = X_j = Y/2$ – each spouse gets half of Y . If we changed the problem so that $S_i = S_j = 1$, the solution would not change, as long as $Y/2 > 1$; if $Y/2 < 1$, then the spouses would separate. On the other hand, if we changed the problem so that $S_i = 0$ and $S_j = 1$, then the solution is $X_i = Y/2 - a$ and $X_j = Y/2 + a$ where the value taken by a is positive (so j gets more stuff than i) and depends on the actual form of the utility function $U(\cdot)$. It is important to note that the same results apply when $U(\cdot)$ depends not only on private consumption X but also on marital public goods and even on the other spouse's utility, so that spouses display some altruism (that is, they are willing to give up some of their own consumption in order to increase the utility of the other spouse).

The key result, then, is that the allocation of resources to each spouse increases with their threat points. Knowing that, we can begin to answer the questions posed above. Along the way, we will also consider whether separation is the appropriate threat point in all situations of marital dispute over resources.

4.3 Decisions involving spending

4.3.1 Golf clubs versus sandals

Suppose that all the money that the couple has is going to be spent immediately, and entirely on private goods. The choice of who gets more of the private goods (golf clubs versus sandals) depends on each spouse's bargaining power – that is, their threat points. If $S_i > S_j$, then spouse i gets more stuff.

What determines the threat points? There are a few factors involved in determining each individual's utility from being separate. One factor is how unhappy, emotionally, each partner would be when separated instead of together. If partner i would be much lonelier, while partner j has a lot of hobbies or is much more likely to attract a new romantic partner than i , then that reduces i 's bargaining power relative to j 's and hence i 's ability to lay claim to private goods X_i while married.

A second factor affecting utility from being separate is each partner's financial resources outside of marriage. That in turn depends on their earning power and on the legal regime that governs the separation of marital assets following divorce. For example, if one partner (the wife, say) gives up a career to

specialize in household production, that reduces her bargaining power over the distribution of resources within marriage. Why would she agree to this future loss in bargaining power? Perhaps she does it after extracting a large enough “payment” up front in terms of family resources (perhaps a diamond?) that it makes up for the loss in bargaining power later on.

Another possibility is that she can find a way to bind her husband to an initial agreement not to exercise his bargaining power later on. For example, the legal regime in many U.S. states now favors the partner who specializes in household production. In contrast, many states used to distribute property after divorce according to who had legal title to it, which at the time was generally the husband, and at one time some states even forbade women from owning property – which gave the husband most of the bargaining power within marriage.

A third factor affecting utility from being separate involves child custody. Custody laws that favor mothers will increase their bargaining power within marriage. However, it is becoming more common to assign joint custody following divorce.

4.3.2 Private goods versus dinner together

When we incorporate the possibility of marital public goods, we have to reconsider whether spouses make decisions in the same way. There are a couple of possibilities. If they bargain cooperatively, then they will choose the Pareto efficient level of marital public goods. The efficient level is dictated by adding together each partner’s marginal valuation of the public good, relative to private goods (whereas the efficient level of private goods is dictated by equating the marginal valuations).

However, public goods are subject to free-rider problems when agents act noncooperatively. The idea is that, if I think that you will provide some of the public good (by sweeping the floor, for example), then I will not bother supplying as much myself. Moreover, if you follow the same reasoning, then too little of the public good (a clean house) is supplied overall. Free-riding has been observed in many situations involving the private provision of public goods in nonmarital settings.

Which model is correct? In the case of child care, it appears that married parents tend to act cooperatively (the first model) while divorced parents tend to act noncooperatively (the second model) because it is difficult to monitor the other partners’ contributions (Weiss and Willis 1985). It may even be the case that the noncooperative bargaining outcome (underprovision of the public good) is the operative threat point in a cooperative bargaining setting – it may be more realistic than considering divorce during every conflict (Bergstrom, Blume, and Varian 1986, Woolley 1988, Lundberg and Pollak 1993).

There is also evidence that mothers care more about child welfare – and hence may contribute more to the public good, either in a cooperative or free-riding setting – than fathers. For example, unearned income given to Brazilian mothers is associated not only with increased fertility but also with greater

improvements in child health compared to unearned income given to fathers (Thomas 1990).⁹

4.3.3 Buying stuff today versus saving

Another option is not to spend – to save resources for the future. For example, an individual will save in case of a financial emergency or to finance retirement. It will be worth doing this if the value of consumption in the future is worth more than the value today.

However, a couple may make such decisions differently. This may happen in a situation where some of the future uses are public (benefiting both) and some are private (benefiting only one), yet both spouses may have control over financial assets (as is common today). Therefore, there is a risk that they decide to save for the future, but then one chooses to buy private goods later on. If both fear that the other will do this, then the free-riding result from above will hold here as well – the couple will undertake too little saving because they are not confident that the other will refrain from buying private goods for themselves later. A related concern is that financial assets will be divided in the event of divorce, in which case they cease to be a public good; thus, the increase in divorce rates in the U.S. may be a cause of the decline in private savings rates.

5 Transitions into and out of marriage

We have discussed the gains from marriage (and cohabitation) and the nature of decisionmaking by couples. At this point, we will talk about how couples decide whether to enter into or leave a relationship.

5.1 Getting together

Suppose a couple is considering forming a relationship of some type. Later, we will discuss different types of relationships (cohabitation, marriage) and how couples might choose among them. For now, we can abstract away from the type and just call it a relationship.

Again, define the value to the male of being in the relationship as R_m and the value of being separate as S_m . Similarly, assume that the value to the female of participating in the relationship is R_f and the value of not participating is S_f . R includes the benefits of relationships that we discussed earlier, and S includes the value of extra privacy and independence and the cost of loneliness along with any monetary effects. It may also be the case that R and S include dynamic components. For example, if you are in a relationship today, you need not incur costs associated with forming a new relationship tomorrow, but

⁹The indicators of child health were caloric intake, height, weight, and survival probabilities. Similar outcomes were found in Côte d'Ivoire (Hoddinott and Haddad 1995) and in Thailand (Schultz 1990).

you also may not be in a position to consider other new, exciting relationships tomorrow. Further, for now, assume that both the male and the female know the values of R_m , S_m , R_f , and S_f . These issues are discussed in more detail below.

Then, Becker's (1981) model of relationship formation says that a relationship will occur if and only if

$$(R_m + R_f) - (S_m + S_f) = R - S \geq 0. \quad (1)$$

In other words, the relationship will occur if the *total* value to the couple of forming a relationship is greater than the total value to the couple of being single. Define the left-hand side of equation (1) as the total net value of the relationship.

The condition defined in (1) is uncontroversial when both the male and female prefer being together ($R_m > S_m$ and $R_f > S_f$). Imagine, however, that

$$R_m - S_m > 0 > R_f - S_f;$$

i.e., the male wants to have the relationship and the female does not. If the total net value of the relationship is positive, then there is some *side payment* or transfer p that the male can pay to the female such that

$$\begin{aligned} R_m - S_m - p &> 0, \\ R_f - S_f + p &> 0; \end{aligned}$$

i.e., both would want to form a relationship. The side payment need only satisfy the conditions that

$$R_m - S_m \geq p \geq S_f - R_f.$$

If the couple sets $p = R_m - S_m$, then the male is willing to be in the relationship because $R_m - S_m - p = 0$, and the female is willing to be in the relationship because

$$R_f - S_f + p = (R_f - S_f) + (R_m - S_m) > 0$$

(because the total net value, as defined in (1), is positive). Similarly, if the couple sets $p = S_f - R_f$, then the female is willing to be in the relationship because $R_f - S_f + p = 0$, and the male is willing to be in the relationship because

$$R_m - S_m - p = (R_m - S_m) - (S_f - R_f) > 0$$

(again, because the total net value is positive). On the other hand, if the total net value is negative, then there is no side payment that will induce both partners to want to form a relationship; the payment required by one of the partners with a negative value is greater than the net benefit of the relationship of the other.

In sum, any value of p between $S_f - R_f$ and $R_m - S_m$ satisfies the conditions for a relationship to occur. What determines the actual value of p ? It may

be the outcome of the Nash bargaining game we described earlier, so that the side payment p increases with S_f and decreases with S_m . In other words, as the wife's value of being separated increases relative to the husband's, then the payment made from the husband to the wife (if $p > 0$) grows, or the payment made from the wife to the husband (if $p < 0$) shrinks closer to zero. Even if some other form of bargaining determines p , as long as it is efficient, it will not affect whether a relationship begins.

How does one partner make a side payment to the other? It may be in the form of allocation of household chores or relationship assets, as we discussed earlier, or it may be something less tangible like the payor being "extra nice" to the recipient of the side payment. One might argue that, in the real world, we do not see such side payments. However, sometimes the side payments may be difficult to observe (e.g., being "extra nice"). Also, we pointed out earlier that many empirical papers have found evidence of unequal allocations of resources within families, depending upon $R_m - S_m$ relative to $S_f - R_f$. A good example of such a side payment is that Stern was so anxious to work with Friedberg on this chapter that he agreed to let her have all royalties associated with the chapter.

5.2 Breaking up

Now consider a couple in a relationship – which implies that, at the time they chose to form the relationship, the total net value of the relationship defined in (1) was positive. What if, for some reason, the total net value changes later on? If the total net value of the relationship is still positive, then the couple may renegotiate the side payment p so that both continue to prefer remaining in the relationship (even if one would not without the side payment). If the total net value of the relationship is now negative, then there is no side payment that will make both members of the couple better off in the relationship than apart, and the relationship ends.

The key aspects of this decision are the following. First, the couple will not break up as long as nothing about the relationship changes, because the total net value remains positive. Thus, we have to think about what may change in the relationship in order to explain why divorces occur. Second, the model we have described so far assumes that all transitions into and out of relationships are *efficient*. A couple forms a relationship if and only if the total net value is positive, and they dissolve the relationship if and only if the total net value is negative. This is a key result about bargaining that was first proposed by Coase (1960), another Nobel-prize winning economist. His work made it clear that several assumptions are necessary for these transitions to occur efficiently. Later on, we will discuss the validity of these assumptions, some of which – most notably, perfect information and costless transitions – may not be reasonable when applied to marriage and divorce. Another implication of his work is that factors affecting the distribution of resources (and hence the utility of one partner relative to the other) will not influence whether a divorce occurs, as long as divorce occurs efficiently. We will discuss specific applications of this

result later on.

In the meantime, we will ask what factors may ultimately precipitate a divorce? Among economists, there have been three approaches to modelling the source of changes in the total net value of the relationship. One is to model a change in the characteristics of the relationship that determine R and S over time. A second approach is to model how partners may learn more about the true values of R and S over time. A third is to consider the possibility that actions taken by partners during marriage directly affect subsequent values of R and S . We will present evidence suggesting that, in fact, all of these probably occur.

5.2.1 Changes

What is it about a relationship that may change over time? We have to consider factors that affect at least one of the values R_m , S_m , R_f , and S_f . Some changes might arise because the characteristics or circumstances of one of the partners changes unforeseeably (due to, perhaps, job loss, or an inheritance, or the introduction of Viagra or Prozac) or some characteristic of the relationship itself changes (because, say, the TV breaks down, so the couple no longer spends time together watching *The Tonight Show*).

Consider an improvement in labor market opportunities for women. This probably raises R_m , R_f , and S_f . Both R_f and S_f rise because the female has new opportunities that previously were not available, so she is better off whether she is married or not. R_m would also rise as long as the husband gets some of the benefit from his wife's good fortune, perhaps because she purchases more marital public goods. Even though R_m , R_f , and S_f all increase, however, it is likely that S_f jumps the most (because now the female is less likely to have to rely on a male for those expensive sandals); it may be the case that S_f increases by more than the sum of $R_m + R_f$ (the value of marriage). If that is the case, there will be some couples in a relationship who will now separate because the total net value of the relationship becomes negative. There will also be some couples who would have formed a relationship in the past who are no longer willing to do so, again because the total net value of the relationship is now negative. Thus, the model suggests that the observed improvements in market opportunities for women should reduce the marriage rate and increase the divorce rate, as has happened.

Consider, instead, a new divorce law that requires husbands to pay alimony to wives (or, say, the partner with more income outside of marriage to pay the partner with less income). This will raise S_f while reducing S_m by the same amount, but it would *not* alter the total net value of the relationship, $(R_m + R_f) - (S_m + S_f)$. Consequently, if divorces occur efficiently, then it would not precipitate a divorce. Even though it makes separation more attractive to females, it makes it less attractive to males, so males will raise their side payments p to avoid divorce, which will satisfy females. Therefore, even though it would not cause a divorce, it would alter the distribution of resources within marriage.

This shows that, if divorces occur efficiently, we have to draw a distinction between those changes that alter the total net value of the relationship $R - S$, and those that shift resources within the relationship without altering the total net value. As we mentioned earlier, we will discuss the assumptions necessary for divorces to occur efficiently, and we will analyze the consequence of alimony laws if divorces occur inefficiently.

5.2.2 Learning

What happens if the couple learns about R_m and R_f over time? Consider a model where a couple meets and receives imperfect information – a *signal* – about $R = R_m + R_f$. For example, they spend time with each other and start to learn how much they like each other. Based on the signal, the couple updates their beliefs about the value of R and then choose whether to form a relationship. If they choose to form a relationship, then they enjoy each other’s company and next period receive another signal about the relationship. Again they update their beliefs about the value of R and make a new, possibly different decision. Such a model can help explain why we observe both cohabitation and marriage. The advantages of marriage relative to cohabitation include some legal, religious, or societal benefits, along with, perhaps, a greater level of commitment and intimacy; the disadvantage of marriage relative to cohabitation is the large cost associated with dissolving a marriage. Such a model suggests that couples who choose to marry without cohabiting received very good signals about the value of their match and are willing to risk a relatively small probability of future divorce to gain the advantages of marriage. Couples who choose to cohabit received a signal good enough to form a relationship but not good enough to commit to marriage. Cohabiting couples are using cohabitation as an “option” to commit in the future if, with better information, the couple discovers that it has a very good match.

This model of learning may help explain certain facts about cohabitation and marriage. Many empirical researchers have found that cohabitation leads to higher divorce rates (Brien, Lillard, and Stern 2002). More precisely, if we compare two apparently identical married couples, one of whom cohabitated prior to marriage, then the couple with who initially cohabited is subsequently more likely to divorce. This fact has led some conservative social commentators to argue that cohabitation is destroying the institution of marriage, which perhaps it does by somehow reducing the taste for marriage. The theory above suggests another story: those who marry right away received very good initial signals and, on average, have very good matches; while those who cohabit received initial weaker signals and, on average, have worse matches. Even though the ones with worse initial signals receive later signals good enough to induce them to marry, on average, they are not as good matches as those who received good enough signals to marry right away. An implication of this model is that, if everyone were forced to cohabit prior to marriage, then divorce rates would decline because the cohabitation period would have no direct effect on the quality of the subsequent marriage but it would serve as a learning period. During

the learning period, some couples would discover that they are not a good match and would not marry in the first place.

5.2.3 Commitment

Another potentially informative fact is that, the longer a couple is in a relationship, the less likely they are to end it. There are two popular hypotheses to explain this phenomenon. One hypothesis is that it is essentially a statistical phenomenon related to *selection*. Consider the learning model outlined above, in which couples learn over time about the true value of the relationship R . Each period, the couples who realize they have a negative total net value separate. Early on, all of the couples with negative match values separate. Over time, additional couples learn that they have a negative match value, but fewer do so over time because the remaining relationships have a higher average value of R . As this process continues, the separation rate for couples married at a certain point in time falls because the couples with lower values of R are selected out through divorce, even though there is no direct effect of duration on relationship quality.

The second hypothesis is that the relationship itself causes the value of the relationship to increase over time. In different words, the couple invests in their relationship as it develops. They invest by learning how to interact with each other, maybe by buying assets (such as a house) together, having children together, or in other ways intensifying their commitment to each other. Each time they invest in their relationship, they build a larger wedge between the total value of the relationship R and the total value of separating S , thus decreasing the probability of separation.

We can take the model one step further and note that these investments are sunk in the match itself, and if the relationship dissolves, then most, if not all, of the value of the investments is lost. For example, it may be very costly to children for a married couple to divorce, or there may be large transactions costs associated with dividing up the value of a house upon separation. An implication of this point is that couples with very good matches will be more likely to invest in their relationship than those with less good matches. The couples with mediocre matches will hesitate to invest because they know there is a significant probability of dissolution in the future. Moreover, married couples will invest more than cohabiting couples because a) they have better matches (see the discussion above) and b) separation costs are higher for marriage than for cohabitation, so separation is less likely. The phenomenon that the level of investment depends upon the quality of the match is called *endogenous investment*. It has the feature that investment increases the variability of match quality making the best relationships even better and not having much of an effect on mediocre relationships.

5.3 Breaking up is hard (or easy) to do

In the simple model above, we showed that all separations are efficient – they occur if and only if the total net value of the relationship $(R_m + R_f) - (S_m + S_f) = R - S$ turns negative. Most non-economists are not comfortable with this result, so it is useful to examine the underlying assumptions on which the result depends.

In this case, one offending assumption is that partners have perfect information: this requires that the male know as much about R_f and S_f as the female, and vice versa. Consider, instead, a model where each member of a relationship has some information about his or her own preferences not observable by the other member. The couple has to bargain about the size of any side payment p from one to the other. If each had perfect information about the other's preferences, they would know the range of side payments ($S_f - R_f$ and $R_m - S_m$) necessary to satisfy the condition that both would be better off in the relationship than not. However, if each has some unobservable information, then he or she has an incentive to lie about it to get a better deal. Knowing that, partners will still bargain, but now they will consider the trade-off between getting a bigger side payment (by exaggerating about the value of one's outside option S) against the loss associated with a possible separation if the other partner refuses a large side payment. In such a situation, some couples break up even though the total net value of the relationship is positive (so breaking up is too easy).

Another controversial assumption is that transitions are costless. Suppose instead that the government (or perhaps a religious authority) imposes a significant monetary or nonmonetary cost D on divorcing couples. The immediate effect of such a cost is to decrease S_m and S_f . For example, if the divorcing couple split the cost D equally, then the new values of being single are $S_m - \frac{1}{2}D$ and $S_f - \frac{1}{2}D$. Since S_m and S_f decline and there is no change in R_m and R_f , the total net value of the relationship increases. Thus, the effect of the divorce cost is, unsurprisingly, to decrease the number of couples who divorce (so breaking up is too hard).

It is important to note, however, that the allocation of the divorce costs between the male and female has no effect on whether a divorce occurs, since the decision to divorce depends only on the total net value (including divorce costs). A law that required the cost to be shared equally would not affect the total net value differently than a law that requires the husband, say, to pay the entire cost. All that would change would be the relative size of S_f and S_m . The husband would be willing to provide a larger side payment to stay married and avoid $S_m - D$, but the wife would only be willing to accept it if the total net value was positive. This is analogous to the result, presented above, that laws mandating alimony payments after divorce do not alter the incidence of divorce.

In the last few examples, we considered how changes in divorce laws affect the frequency of divorces (imposing a divorce cost reduces the incidence of divorce, but the allocation of the cost between partners does not). But how do

they affect the marriage rate? Consider a couple *deeply in love* – they are considering marriage and not worrying about the future. Following in the footsteps of other romantic couples before them, they compute the total net value of the relationship, and, if it is positive, negotiate side payments and marry. Divorce costs and alimony rules play no role in their decision of whether to marry because they do not consider possible changes in the value of the relationship. If, in contrast, they recognize that things may change and divorces do occur, then imposing future divorce costs essentially increases the cost of marrying today, thus decreasing the total net value. Therefore, the marriage rate would decrease, but also those marriages that do occur would be stronger (in the sense that the total net value of the marriage would be higher).

5.4 Policy interventions

As we have demonstrated, if divorces occur efficiently, then divorce laws affecting the distribution of resources will not affect whether a divorce occurs. Even divorce laws that do not directly determine the distribution of resources can be interpreted in the same way. Before 1970, most U.S. states required divorcing couples to demonstrate some fault – adultery, abuse, abandonment, etc. – in order to grant a divorce. This was implicitly a mutual divorce regime; if a couple wanted to divorce, they could lie about fault and obtain a divorce. Led by California in 1970, most U.S. states changed their law to allow both no-fault and unilateral divorce – so that one couple could instigate a divorce unilaterally and without alleging fault. This raises two questions: should this affect the divorce rate, and did it affect the divorce rate.

If divorces occur efficiently, then changing the law from mutual to unilateral divorce should not affect the divorce rate. Instead, it acts to redistribute resources from the spouse who wants to stay in the relationship (because $R_i > S_i$) to the spouse who wants to leave (because $R_j < S_j$). Under a mutual divorce law, the spouse who wants to leave will be willing to make a side payment that the spouse who wants to stay is willing to accept to agree to a divorce, as long as $S_i - R_i > R_j - S_j$, so the gain to spouse i from leaving the relationship exceeds the gain to spouse j from staying in the relationship. Rearranging terms, this implies that $(R_i + R_j) - (S_i + S_j) < 0$, or the total net value of the relationship is negative.

On the other hand, if the total net value is positive, then the payment that i is willing to make to obtain a divorce is smaller than the payment that j is willing to take in order to grant a divorce. Now, suppose that the divorce law changes to allow unilateral divorce – would i now go ahead and get that divorce? Because the total net value of the relationship is positive, j would now be willing to pay i to stay in the marriage, and the payment would be big enough to make j willing to stay. Thus, even though the law now allows i to leave unilaterally, i would not go unless the total net value of the relationship is negative – so the divorce rate would be unchanged, even though it looks like the law change has made divorce easier. What changes would be the direction of payments, from the spouse who wants to leave the marriage to the spouse

who wants to stay.

However, empirical evidence suggests that the divorce rate rose in U.S. states after they changed their divorce laws (Friedberg 1998). This suggests that divorces do not occur efficiently. This belief is widespread among policymakers, who have recently reacted by discussing policies that would increase the cost of divorce. Recently, a number of states in the United States have proposed giving people a choice of two marriage types: a regular marriage or a “covenant marriage.” A covenant marriage has extra costs associated with divorce. The Catholic Church has suggested it will approve only covenant marriages in states that provide them.

The analysis in our perfect information model suggests that such government interference is misguided because all marital separations are efficient. In this subsection, we consider various possible reasons why it might be welfare improving for the government to discourage divorce.

The most obvious possibility is the effects of divorce on children. A large empirical literature shows that children suffer in many ways when their parents divorce. If the divorcing parents do not take into account the cost of divorce to their children, then it might be appropriate for the government to increase divorce costs to simulate the costs to the children. While this argument has some merit, it also has problems. First, it is difficult to measure the effect of divorce on children. The relevant counterfactual is the welfare of the children with unhappy parents who would like to be divorced. In other words, discouraging the divorce of an unhappy couple with children does not magically create a happy couple. Second, parents do care about their children, and maybe they give equal weight to their own happiness and their children’s happiness in making divorce decisions. We have no measures of how much they internalize such costs. Finally, divorce costs are imposed on couples without children when such an argument is irrelevant. In fact, if anything, such an argument should lead the government to encourage divorce among couples without children so that they do not divorce once children arrive.

Another possibility that has been discussed in the literature is that, when a couple divorces, it changes the size and the distribution of people in the marriage market. The increase in the number of single people provides a benefit for those already single, and this benefit is not internalized by the divorcing couple. The effect on the quality distribution of single people is harder to sign. In any case, because there is an externality, the government may play a role. The problem with this argument is that the externality goes the wrong way! Since divorce provides a benefit to others not internalized by the divorcing couple, the government should provide a subsidy to divorcing couples.

The final possibility is that increased divorce costs reduce divorce probabilities, causing couples to invest more and improve their relationships. Consider a case where a new husband and wife bargain over sending the wife to medical school while the husband supports her. He is more likely to agree to such a plan if he knows that she will not be able to divorce him later after she has her medical degree. Without high divorce costs, it may be difficult for her to credibly commit to not divorcing later. We can tell a similar story about the couple

investing in efficient division of labor. As discussed above, it may be efficient for the wife to specialize in household production and the husband in market production. Without a commitment not to divorce, the wife may not be willing to specialize because she knows that, if they later divorce, she will need to develop market skills. The problem with this argument is that the best solution here is not an imposed divorce cost; rather it is an efficient contracting mechanism. In the first example, the husband and wife should sign a binding contract determining how the proceeds from a medical education will be shared between them if a divorce occurs. In the second example, the husband and wife should agree upon divorce-contingent alimony at the time they are bargaining about specialization. An efficient contract solves the commitment problem without causing bad marriages to remain intact. One might wonder why such contracts are not that common or how the government could encourage such contracts. It might be that current divorce law has default asset distribution rules that are not that different from what most couples would negotiate. Thus, the cost of negotiation would not be worth the extra benefit of a more customized contract.

6 Conclusions

In this chapter, we have aimed to demonstrate that economic tools can help us understand how individuals make decisions related to marriage and divorce. Economists have not only developed models to explain but also have found evidence to support several hard-hearted theories. One is that the gains to marriage are not simply from sharing love and affection but from a more efficient use of resources (both money and time). Another is that the distribution of those resources within a marriage depends at least in part on the bargaining power of each spouse. A third is that divorces may occur efficiently, so that religious or social laws governing divorce do not affect whether divorces occur but do affect the distribution of resources within marriage.

As we mentioned early on, even economists have not yet come up with definitive explanations for the recent trend away from marriage. One reason is that, as we have argued, many different factors affect decisions to marry and divorce, and these factors can interact in complicated ways. A second reason is that it is difficult to control for all of these relevant, and changing, factors when attempting to test competing theories.

For example, we can write down a model showing that married women are working more because the increased probability of divorce raises the gains to investing in their careers, and another model showing that an increase in married women's labor supply raised divorce rates by augmenting friction within marriages. To test whether either, or both, explanations are valid, we need to find exogenous reasons why women are working more (to see whether that led to more divorce) and why divorce rates have risen (to see whether that led to increased labor supply). Did recent increases in women's wages exogenously cause women to work more? Perhaps, or else an increase in married women's labor supply, which boosted their investments in education and careers and their

incentive and power to fight gender discrimination, raised women's wages. Did the shift in divorce laws in the early 1970s – from requiring mutual agreement by spouses to divorce to allowing one spouse to leave unilaterally – exogenously cause more divorce? Perhaps, or else laws were changed in response to pressure from people who increasingly wanted to exit their marriages.

In sum, challenges remain for economists – who are in turn challenging researchers in other disciplines – to provide coherent explanations and empirical tests of marriage and divorce behavior.

7 References

References

- [1] Becker, Gary (1974). “A Theory of the Allocation of Time.” *Economic Journal*. 75: 493-517.
- [2] Becker, Gary (1981). *A Treatise on the Family*. Cambridge, MA: Harvard University Press.
- [3] Bergstrom, Theodore, Larry Blume, and Hal Varian (1986). “On the Private Provision of Public Goods.” *Journal of Public Economics*. 29(1): 25-49.
- [4] Brien, Michael, Lee Lillard, and Steven Stern (2002). “Cohabitation, Marriage, and Divorce in a Model of Match Quality.” Unpublished manuscript, University of Virginia.
- [5] Browning, Martin, François Bourguignon, Pierre-André Chiappori, and Valérie Lechene (1994). “Incomes and Outcomes: A Structural model of Intra-Household Allocation.” *Journal of Political Economy*. 102(6): 1067-1096.
- [6] Cherline, Andrew (1992). *Marriage, Divorce, Remarriage*. Cambridge, MA: Harvard University Press.
- [7] Coase, Ronald (1960). “The Problem of Social Cost.” *Journal of Law and Economics*. 3(1): 1-44.
- [8] Friedberg, Leora (1998). “Did Unilateral Divorce Raise Divorce Rates? Evidence from Panel Data.” *American Economic Review*. 88(3), pp. 608-627.
- [9] Goldin, Claudia, and Lawrence Katz (2002). “The Power of the Pill: Oral Contraceptives and Women's Career and Marriage Decisions.” *Journal of Political Economy*. 110(4): 730-770.
- [10] Hoddinott, John and Lawrence Haddad (1995). “Does Female Income Share Influence Household Expenditures? Evidence from Côte d'Ivoire.” *Oxford Bulletin of Economics and Statistics*. 57(1): 77-96.

- [11] Lundberg, Shelly and Robert Pollak (1993). "Separate Spheres Bargaining and the Marriage Market." *Journal of Political Economy*. 101(6): 988-1010.
- [12] Manser, Marilyn, and Murray Brown (1980). "Marriage and Household Decision Making: A Bargaining Analysis." *International Economic Review*. 21, pp. 31-44.
- [13] McElroy, Marjorie, and Mary Horney (1981). "Nash-Bargained Decisions: Toward a Generalization of the Theory of Demand." *International Economic Review*. 22(2): 333-349.
- [14] Nash, John (1950). "The Bargaining Problem." *Econometrica*. 18(1): 155-162.
- [15] Schultz, T. Paul (1990). "Testing the Neoclassical Model of Family Labor Supply and Fertility." *Journal of Human Resources*. 25(4): 599-634.
- [16] Weiss, Yoram, and Robert Willis (1985). "Children as Collective Goods in Divorce Settlements." *Journal of Labor Economics*. 3(3): 268-292.
- [17] Woolley, F. (1988). "A Non-Cooperative Model of Family Decision Making." LSE Working Paper, TIDI/125.