Divorce Laws, Sex Ratios and the Marriage Market

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Abstract

Tying together law and economics literature on divorce laws and divorce rates with development economists' findings of a sex ratio which is often skewed, we examine how sex ratios interact with marriage, divorce and remarriage under mutual consent versus unilateral divorce. We find that the difference between divorce rates in unilateral and mutual consent divorce regimes is positively related to the degree of skewness of the sex ratio and we also find preliminary empirical evidence for this. In view of an increasingly skewed sex ratio in many countries, this provides predictions of the impact of future liberalization of the divorce regime in such countries. We also find that the jump in divorce rates after a regime shift is sharper for a small isolated population and that exogenous increases in divorce rates tend to improve the marriage market odds for the sex against whom the sex ratio is tilted, but less so when the sex ratio is sharply skewed.

JEL Classification : K36, J12,D82

1. Introduction

Recent research in law and economics has explored the impact of changes in divorce laws (notably from fault to no-fault, or mutual consent to unilateral divorce regimes) on other outcomes, including marriage market outcomes. An exogenous change in laws which alters the ease with which a divorce may be obtained can have implications on the frequency of marriage and divorce, particularly if models of Coasian bargaining within the family are considered unrealistic. Although there has been both theoretical and empirical research on this topic[2], the conclusions remain ambiguous, and there is no consensus on the direction or magnitude of the impact a liberalization of the divorce regime has on divorce rates, particularly in the long run.

A seemingly unrelated topic of much research among development economists has been imbalance in sex ratios – the phenomenon of "missing women" in China and India, for example. A poor sex ratio is a feature of many developing countries, some of which have faced a ratio

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[2] A literature review will follow.

which actually *deteriorates over time* (as in many Indian states). At the other extreme, some western countries have started facing the other type of imbalance – with too many women compared to men. When development economists have looked at sex ratios, they have mainly tried to work on possible *causes* of imbalance in sex ratios. Some have looked at whether sex ratios can be affected by changes in women's bargaining power or economic clout which might affect mothers' ability to care better for their daughters or to oppose female infanticide or deliberate malnutrition which daughters might otherwise face in societies marked by a strong preference for sons.

I propose to tie these two areas – divorce law changes and imbalances in sex ratios – together in the present paper. Instead of focusing on the *causes* of sex ratio imbalance, I focus on the *consequences* of unbalanced sex ratios, given that such imbalance is a current reality. It would be reasonable to suppose that an unbalanced sex ratio would affect interactions within a marriage, as well as the frequency of marriage and the likelihood of divorce conditional on marriage. One channel of influence would be that men and women would have different degrees of advantage in the marriage market – their differing numbers would imply different degrees of success in search for a partner. How does this tie up with divorce laws? When we consider that the possibility of remarriage after a divorce must be factored into the value of divorce as an "outside option" in a marriage, we can see that this outside option's value would also differ across the sexes. If one sex expects a much better chance of getting remarried in case of a divorce, it would affect this sex's willingness to get divorced. Divorce law regime becomes important here because a shift to unilateral divorce laws implies that a spouse may obtain a divorce easily even if his or her partner is unwilling. Conversely, if laws require mutual consent for divorce, the actual frequency of divorce will be dictated by the preferences of the partner who is less willing to divorce – partly perhaps due to poorer remarriage options.

Thus, our focus in this paper is *not* on whether and in which direction divorce regime liberalization affects the divorce rate in the short or long run – a topic on which there is much controversy – but on the role of sex ratio in a framework of marriage, divorce and remarriage and its interplay with shifts in the divorce regime. Our analysis yields certain testable implications for which we provide partial empirical evidence.

The rest of the paper is organized as follows. Section 2 contains a brief literature review. Section 3 contains our basic model and its solution, along with comparative statics on the effects

of varying sex ratios, regime shifts, and marriage market pools. Section 4 summarizes testable implications and contains some discussion of policy issues. Section 5 provides preliminary empirical evidence. Section 6 concludes.

2. Some Relevant Literature

This paper is related to two strands of research – that on the effects of divorce law on divorce rates, and that on sex ratio.

Theoretical research on the impact of divorce laws on divorce rates dates back to Becker (1977, 1981) who argued that a shift to a unilateral divorce regime should not impact divorce rates as it merely re-assigns "property rights" within a marriage. This assumed Coasian bargaining was possible between spouses.

However, later models [Parkman (1992), Stevenson and Wolfers (2006)] have questioned the assumption that Coasian bargaining applies to the marital framework. Clark (1999) and Fella et al (2004) have also shown that divorce law changes may impact divorce rates even in the absence of transaction costs and asymmetric information. Rasul (2006) has a matching model in which a shift to unilateral divorce increases divorce rates in the short run but in which this increase may taper off or even reverse over the long run.

Empirical work on this theme has also yielded mixed results. While Peters (1986,1992) found an effect of unilateral divorce laws close to zero in his study of US states, Allen (1992) found a marked effect of unilateral divorce laws in increasing the divorce rate, as did Friedberg (1998) : however Wolfers (2006) found that the effect was small particularly over the long run. While all these studies focused on the US, exploiting differences in the timing of divorce law changes across states, Gonzalez and Viitanen (2006) focus on Europe and find that divorce law liberalization accounts for about 20% of the increase in divorce rates in Europe between 1960 and 2002.

The focus of the present paper is however not on whether or by how much divorce rates change in response to shifts in divorce regimes. It is focused instead on how such change (or the lack of it) is influenced by the extent of skewness of the sex ratio. Thus the paper examines the interaction between divorce rates, divorce law shifts and the sex ratio.

Work on sex ratios within development economics is extensive. I only mention the most relevant here. Angrist (2002) empirically studies second generation Mexican immigrants in the

US. Using the fact that such immigrants have a high incidence of endogamy (marrying within the community) and skewed sex ratios, he studies the impact on women's marriage rates, as well as other outcomes like labor force participation and earnings. His findings are broadly consistent with the theory that a favorable sex ratio increases women's bargaining power within the household. However, divorce and incentives to divorce, or the impact of divorce laws, are not explored. Other work on sex ratios includes Edlund (1999) who shows that biased sex ratios may be caused by son preference and explores the relationship between unbalanced sex ratios and marriage patterns like spousal age gaps, hypergamy (women marrying up), within-caste marriages, and cousin marriages. Again, her focus is on the causes of a sex ratio imbalance, and she does not explore the link between sex ratios and divorce, or even between sex ratios and the *incidence* of marriage. Qian (2006) empirically sheds light on how greater bargaining power within the household for women can influence their capability to choose the sex ratio of their children. While relating sex ratios to within-marriage outcomes this study again looks at the *causes* rather than the consequences of sex ratio imbalances (unlike the present study).

3. A Model

3.1 Assumptions

We assume a multi-period model in which individuals – both males and females – have a probability 1-β of dying in any one period. The number of births in each period exactly matches the number of deaths so that the population remains constant. To begin with, we assume a stable steady state sex ratio of f (>1 without loss of generality, so that there are more females than males). To simplify things, we assume that this ratio is the same across all birth cohorts so that there is no difference between sex ratio at birth and the overall sex ratio in the population.[3] We also assume that both males and females enter the marriage market in the first period of life (at which time M new males and F new females enter the marriage market, and F = fM).

An important assumption is that men and women have *no* information *at the time of meeting a potential match* regarding their compatibility post-marriage with this match (as opposed to any other matches). Therefore, if a man or woman meets a potential match, nothing is to be gained by prolonging the search for a marriage partner, as information is not sufficient to distinguish the match they meet from any one else. Those who meet a match will marry, while

[3] We will later perform comparative static exercises to compute the effects of a change in sex ratio.

only those who cannot find a match (there are always some of these in our model due to a skewed sex ratio) will prolong their search into future periods. The only information known to men and women before marriage is a *distribution* of possible "post-marriage levels of satisfaction" denoted by the cdf G[ϕ] and density g(ϕ) where ϕ is any value of per-period post-marriage satisfaction[4] drawn from a distribution with support [$\underline{\phi}, \bar{\phi}$]. Thus men and women know the distribution and by implication also know the *average* level of per-period post marriage satisfaction they can obtain, E(ϕ) where

$$E(\phi) = \int_{\underline{\phi}}^{\bar{\phi}} \phi dg(\phi) \quad (1)$$

However they do not know the exact realization of ϕ that will obtain if they marry a particular partner.

After marriage, the married couple draws a realization of ϕ. This signal is an indication that for every period the marriage survives, they will continue to draw a per-period satisfaction level of ϕ.

The timing of the game is as follows. Every period, men and women on the marriage market attempt to find a match. Those that find a match get married. Married couples draw a realization, in the first period after marriage, of the per-period satisfaction they will continue to get conditional on the marriage remaining intact. They then form (differing) preferences on whether to continue with the marriage or to seek a divorce. The type of divorce law in place (unilateral or mutual consent) will determine the actual frequency of divorces given these preferences. Freshly divorced people join the marriage market and the cycle of search, marriage and possible divorce continues.

3.2 Solving the Model

M men are born in every period and enter the marriage market. These men are all assured of finding a partner due to a sex ratio that favors men. As search costs are zero and as people have no information about the relative merits of the potential matches they meet, no man has an incentive to prolong his search. Therefore, at any point in time, the marriage market only contains two types of men – those who have just entered it in their first period of life and those

[4] Note that this refers to satisfaction that obtains conditional on the marriage remaining intact.

who are freshly divorced (we denote this number by D : D will shortly be endogenized). There are no men who have been unsuccessful in finding a partner in previous periods. Moreover, all divorced men can also find partners by the end of any period. Partners have no preference between divorced and never-married potential matches, because divorce in our model conveys no signal of intrinsic unworthiness and only signals that the divorcee was incompatible with his or her previous match.

In contrast, not all women who enter the marriage market are assured of immediate success in finding a partner. Therefore, apart from women who have newly entered the marriage market, or from freshly divorced women, the marriage market at any point in time also contains (a) women who have never been married but who were unsuccessful in finding a partner in previous periods, and (b) women who were previously divorced but failed to find a partner. Again, at any point in time the number of freshly divorced women is D (to be endogenized later) as the number of newly divorced women must equal the number of newly divorced men. Let p be a woman's steady state probability of successfully finding a match in any given period (p will also be endogenized later). Then we have the following relationship :

$$\frac{fM + D}{1 - \beta(1 - p)} = \frac{M + D}{p} \tag{2}$$

We derive (2) as follows. The left hand side shows the number of women on the marriage market in any period. This includes not only women who have newly entered the marriage market (who number F = fM) and newly divorced women (numbering D), but also surviving never-married and divorced women who entered the marriage market in previous periods but were unsuccessful in finding matches. The denominator comes from adding these women. On the right hand side, the number of men on the marriage market is simply M+D (men who have freshly entered the marriage market, or freshly divorced men). The number of women on the marriage market must be a multiple 1/p of the number of men on the marriage market to result in a steady state probability p of a woman's finding a match in any period.

Manipulating (2), we get

$$M[(f - \beta)p - (1 - \beta)] = D(1 - p)(1 - \beta) \tag{3}$$

Willingnesses to Divorce

What determines a married man or woman's willingness to divorce? In the first period following marriage, the couple gets a realization ϕ. At this point, the couple is aware that if they stay

married, they will get a per-period satisfaction of ϕ ever after. The discounted value of future payoffs to staying married is therefore

$$V(M) = \frac{\beta\phi}{1-\beta} \tag{4}$$

This will be compared with the *expected* payoff from divorcing. For a man, the expected payoff from divorcing is simply equal to the expected payoff of a single man, as both are sure to find partners due to the skewed sex ratio. This is equal to

$$V(D_M) = \frac{\beta E(\phi)}{1-\beta} \tag{5}$$

Therefore, a man is *willing* to divorce whenever he draws realizations of ϕ that are smaller than $E(\phi)$. This is an occurrence which happens with probability G[$E(\phi)$].

A woman on the other hand has a different willingness to divorce. Her expected payoff from divorcing must take into account that her remarriage prospects are by no means certain, owing to a sex ratio which favours men. Therefore, if she divorces she may expect to get the expected payoff $E(\phi)$ (of a person who is about to enter into a fresh match) with less than probability one. The relevant probability in this case is one minus the probability of *never* finding a match : this is

$$1 - \frac{\beta(1-p)}{1-\beta(1-p)} = \frac{1-2\beta(1-p)}{1-\beta(1-p)}$$

Thus a woman is only willing to divorce for realizations of ϕ that are smaller than $V(D_F) = \frac{1-2\beta(1-p)}{1-\beta(1-p)} E(\phi)$. This happens with probability G[$\frac{1-2\beta(1-p)}{1-\beta(1-p)} E(\phi)$]. A woman therefore has lower willingness to divorce than a man does. The intuition for this is that she expects poorer remarriage prospects than a man in the event of divorce.

Note that in our model the *only* reason why men and women have different willingnesses to divorce is the skewness of the sex ratio. For a balanced sex ratio, women's willingness to divorce would equal men's as women would also be certain of finding a partner in the event of divorce.[5]

[5] Assuming away differences in *intrinsic* preferences (ie not allowing ϕ to vary by gender) enables us to isolate differences in willingnesses to divorce across gender that are *solely attributable* to a skewed sex ratio. We make the above abstraction in order to sharply focus on the effects of a skewed sex ratio.

Unilateral Divorce

In a unilateral divorce regime, the partner who is more eager to divorce gets his or her way, even if the other partner is unwilling. In our model, men have higher willingnesses to divorce due to our assumptions regarding the skewness of the sex ratio. Therefore, a unilateral divorce regime respects men's preferences about divorce. This enables us to endogenize D in a unilateral divorce regime :

$$D = G[E(\phi)]M \tag{6}$$

Every new cohort contains M men, all of whom find a partner. Of these a fraction G[$E(\phi)$] wish to divorce as explained above, and in a unilateral divorce regime this is precisely the fraction of men obtaining divorces.

Combining (3) and (6) allows us to endogenize p, a woman's steady state probability of successfully finding a match (in a unilateral divorce regime). We get

$$(f-\beta)p-(1-\beta) = G[E(\phi)](1-p)(1-\beta) \tag{7}$$

This gives us a linear equation in p which it is straightforward to solve. The left hand side of (7) is a straight line with positive slope (as f>1>β), a negative intercept –(1- β), and reaches a maximum (positive) value of f-1 at p=1. The right hand side is a straight line with a positive intercept of G[$E(\phi)$](1- β), a negative slope (of - G[$E(\phi)$](1- β)) and reaches zero at p = 1 (see Figure 1). The solution to (7) is

$$p^* = \frac{(1-\beta)(1+G[E(\phi)])}{f+G[E(\phi)]-\beta(1+G[E(\phi)])} \tag{8}$$

We can easily check that p* lies between 0 and 1 and approaches 1 as the sex ratio tends to 1. The interpretation is that for a balanced sex ratio women would be sure of finding a partner.

Mutual Consent

In a mutual consent divorce regime, both partners have to agree to a divorce. Therefore, in the context of our model, it is the women's (lower) preferences for divorce that are respected under mutual consent. Now the number of divorces is determined by

$$D = G[\frac{1-2\beta(1-p)}{1-\beta(1-p)}E(\phi)]M \tag{9}$$

The number of marriages in each cohort is M as before, and of these a fraction $G[\frac{1-2\beta(1-p)}{1-\beta(1-p)}E(\phi)]$ end in divorce – reflecting women's willingness to divorce. Thus the number of fresh divorces is smaller under mutual consent than under a unilateral regime. We also note that the number of divorces depends on p (which is endogenous) under mutual consent, while it was independent of p in a unilateral divorce regime. This is because women's willingness to divorce depends on their probability of finding a partner for remarriage, but in a unilateral regime this becomes irrelevant as only men's willingness to divorce matters and men are certain of finding partners.

Combining (3) and (9), we get

$$(f-\beta)p-(1-\beta)=G[\frac{1-2\beta(1-p)}{1-\beta(1-p)}E(\phi)](1-p)(1-\beta) \qquad (10)$$

Unlike the corresponding equation (7) for unilateral divorce, (10) is nonlinear in p. This nonlinearity reflects the effect of p on the number of divorces. The number of divorces in turn affects the supply of fresh divorcees on the marriage market, and therefore marriage market odds, feeding back into p.

The left hand side of (10) is identical to that of (7), and is a straight line of positive slope. Looking at the right hand side, we can immediately tell that it has an intercept of $G[\frac{1-2\beta}{1-\beta}E(\phi)](1-\beta)$ - (positive for $\beta<1/2$ and zero for $\beta>1/2$) and that it becomes zero at p=1. Differentiation tells us that its slope with respect to p is

$$\frac{\beta(1-\beta)(1-p)E(\phi)}{[1-\beta(1-p)]^2}g()-(1-\beta)G[] \qquad (11)$$

This is neither unambiguously positive or unambiguously negative, but depends on the value of p and on the shape of the G function. However, we can check that as p approaches 1, the derivative is unambiguously negative, and becomes equal to $-(1-\beta)G[E(\phi)]$. This indicates that for at least some range of p, the right hand side is falling. It may or may not be falling for very low values of p. Moreover, we can check that the second derivative is unambiguously negative, implying strict concavity and ruling out multiple intersections. Let p** denote the solution to (11). As (9) and (11) jointly determine D and p, we may obtain the number of divorces under mutual consent D** by plugging in p** for p in (9) (see Figure 2).

3.3 Comparison of Steady States in Different Divorce Regimes

As mentioned earlier, there are more divorces in a unilateral divorce regime than under mutual consent in our model : divorces under mutual consent only approach the number in a unilateral regime as p tends to 1. Can we say anything about the relative magnitudes of p* and p**, women's equilibrium probability of finding a match under unilateral and mutual consent regimes respectively? It turns out that we can. Totally differentiating (3) with respect to D and p, we derive

$$\frac{dp}{dD} = \frac{(1-p)(1-\beta)}{F(m-\beta)+D(1-\beta)} > 0 \qquad (12)$$

Thus women's equilibrium probability of finding a match increases in the number of divorces. More divorces add to the number of women as well as men on the marriage market, but in such a way as to increase women's odds of finding a partner. Since we have established already that divorces increase if we transit from mutual consent to a unilateral regime this indicates that p* > p** : women are more likely to find matches in a unilateral divorce regime as compared to mutual consent. However, the appearance of D in the denominator of (12) also indicates that any increase in divorces *after* a jump in divorce regimes from mutual consent to unilateral divorce will increase women's marriage market odds at a slower rate than would an increase in divorces under a mutual consent regime (because D is bigger to start with in a unilateral regime than in mutual consent).

3.4.1 Comparative Statics : Sex Ratio

We have assumed an unbalanced sex ratio of f > 1. What would be the impact of changes in the sex ratio on endogenous variables like D and p? We consider a *decrease* in the sex ratio such that the ratio of women to men becomes more balanced than before, while still favoring men slightly.

In a unilateral divorce regime, we can see immediately from (6) that the number of fresh divorces D is unaffected by sex ratio. This follows from the fact that sex ratio changes change women's odds of finding a partner, but not men's (this stays at 1 as long as we are not considering sex ratio *reversals*). Therefore, men's willingness to divorce is unaffected and so is the actual incidence of divorce.

However, p*, a woman's equilibrium probability of finding a match in unilateral divorce, *is* affected by sex ratio changes. A look at (8) instantly tells us that a fall in f raises p*. A more balanced sex ratio makes it likelier that a woman will find a partner. In terms of (7), the fall in f

pivots the line for the left hand side rightwards and downwards, so that the intersection with the line representing the right hand side now moves further to the right. See Figure 3 for a three-dimensional representation of the relationship between the functions in (7), p, and the sex ratio.

Under mutual consent, both p** and D** are affected by the change in sex ratio. First we look at the effect on p**. The fall in f pivots the line for the left hand side of (10) rightwards and downwards, without shifting the curve for the right hand side. This results in a new intersection point to the right of the previous one: p** increases so that a woman's probability of finding a match increases as the sex ratio becomes more balanced. From (9), we can see that plugging in a new higher value of p** also increases D**. Therefore, a more balanced sex ratio is associated with an increase in divorce rate in the mutual consent regime. Nonetheless, as long as p remains less than 1, the divorce rate in mutual consent stays lower than that in a unilateral divorce regime. Of course, if sex ratios became completely balanced so that both women and men were assured of finding partners, p would jump to 1 and there would be no difference in outcomes across divorce regimes. Figure 4 shows a three-dimensional relationship between the functions in (10), p and the sex ratio in a mutual consent divorce regime.

Therefore an implication of our model is that a more skewed sex ratio results in a *greater* difference in divorce rates between unilateral and mutual consent regimes: a more balanced sex ratio would cause this difference to shrink.

3.4.2 Interaction between sex ratio changes and distributional changes

Suppose that the divorce rate in *each* divorce regime rises due to exogenous changes in the distribution of post-marriage satisfaction. For example, consider the case where a small number of married couples are extremely happy together, positively skewing the distribution of post-marriage satisfaction, raising $E(\phi)$ and increasing the divorce rate irrespective of divorce regime. From (12), we see that an exogenous increase in divorce rates would raise p, women's odds of finding a marriage partner. However, we can easily check that this derivative is decreasing in f : so that a more balanced sex ratio (a fall in f) will increase the sensitivity of p to an exogenous increase in D. Thus we get the implication that a more skewed sex ratio tends to dampen improvements in women's marriage market odds when divorce rates increase for exogenous reasons.

3.4.3 Sex Ratio Reversals

What if there is a sex ratio reversal, such that f becomes smaller than 1 and there are more men than women? Essentially this means that the positions of men and women in our model will be interchanged. Women will be sure of finding a partner while men will not. The divorce rate under unilateral divorce would remain the same as before the sex ratio reversal, only now it would be determined by the preferences of women, who would be more willing to divorce than men. Under mutual consent, men's lower willingness to divorce would determine the divorce rate: the exact value of which would depend on the (new) degree of skewness in the sex ratio.

3.4.4 Marriage Market Pool

So far all our results were independent of the exact number of participants in the marriage market. However, consider the effects of living in a very small insular society with a small and recognizable pool of marriage market participants. In this type of society, assuming perfect recall of past matches, we may assume that an additional restriction binds: no one remarries his or her previous spouse. This would follow if the couple expects the same realization of ϕ to obtain if they remarry, as that which they received when they first married (and which was low enough to induce a divorce). In such cases, divorce rules out one potential remarriage partner for each spouse. However, for a strongly skewed sex ratio, men may still have no trouble finding a partner for remarriage: but women's odds would be lower here than when the pool of marriage market participants is very large and one partner is not enough to make a difference to the odds. The implication is that women's willingness to divorce would be even lower if the pool of potential matches is very small. This would impact the divorce rate under mutual consent but not under unilateral divorce (where only men's odds matter).

An implication of this is that for a small isolated society with a skewed sex ratio, transition from mutual consent to unilateral divorce regimes should result in a sharper jump in divorce rates than in a society with access to many potential partners (and where the sex ratio is still skewed). A corollary is that with greater ease of communication and search for partners (for example through the internet), the gap between divorce rates across mutual consent and unilateral divorce regimes should shrink, even if the sex ratio remains skewed.

4. Testable Implications and Policy Issues

The testable implications from our model are

(1) The gap in divorce rates between mutual consent and unilateral divorce regimes is sharper for a more skewed sex ratio. So if a country with a more skewed sex ratio transits from mutual consent to unilateral divorce, it will experience a bigger jump in divorce rates than if the sex ratio was more balanced. The jump is minimum when the sex ratio is 1 and again increases for a sex ratio reversal.

(2) The sex against whom the sex ratio is tilted has worse marriage market odds in a mutual consent divorce regime as compared to a unilateral divorce regime.

(3) The marriage market odds of this sex improve if divorces increase for exogenous reasons.

(4) However, this improvement is tempered if the sex ratio is skewed.

(5) The gap in divorce rates between mutual consent and unilateral divorce is larger when the marriage market pool is small as compared to a world with easy communication and search. This is true regardless of sex ratio.

The main *policy issue* emerging out of our analysis relates to two instruments policy makers may manipulate – the first being divorce rates and the second being the sex ratio. Divorce rates can be manipulated through a shift in divorce laws (for example, choice of a mutual consent or a unilateral divorce regime). The sex ratio can also be partly affected by policy makers, for instance, a sex ratio skewed towards males can be balanced through steps like campaigns aiming to weaken preference for sons, financial incentives to parents of girls or making access to sex-selective abortion more difficult. What implications does our analysis hold for a government which has these two instruments at its disposal?

In answering this question, policy-makers' attitude to divorce is important. Suppose policy makers take the stand that divorce rates should remain as low as possible. This would be in tune with a perception that divorce liberalization might lead people to divorce simply for relatively trivial reasons. Policy makers with such beliefs and values would prefer a mutual consent divorce regime to a unilateral one. Suppose a balanced sex ratio is also something that is considered desirable in its own right. However, a government will now face a *tradeoff* between achieving a more balanced sex ratio and achieving low divorce rates.

This is due to our result that under a mutual consent divorce regime, a more balanced sex ratio results in an increase in divorce rates. Thus balance in sex ratio and low divorce rates become outcomes among which a government must trade off.

On the other hand, suppose policy makers' attitude to divorce is that it is better to divorce than force people to stay in a marriage which would make at least one partner unhappy. These policy makers would favor a more liberal divorce regime, unilateral divorce as opposed to mutual consent divorce. This divorce regime might also be chosen if policy makers care about the fact that a unilateral divorce regime increases women's probability of finding a partner over their odds in a mutual consent regime. However, subject to a unilateral divorce regime being chosen, there is no conflict between a balanced sex ratio and divorce rates. This is because as our result shows, unilateral divorce rates are independent of the sex ratio: therefore the government can follow its preferences regarding sex ratio choice without worrying about a possible tradeoff with divorce rates.

These policy implications generate another testable hypothesis: we should observe a polarization between low-divorce societies with highly skewed sex ratios, where social norms and divorce laws both reinforce low divorce : and societies with possibly more balanced sex ratios, and high divorce and remarriage rates, bolstered by low social disapproval for divorce and liberal divorce laws.

5. Preliminary Empirical Testing

Of the testable implications mentioned above, a chief one is that the size of the jump in divorce rates following a transition in divorce law from mutual consent to a unilateral regime should be positively correlated with the degree of skewness of the sex ratio at the time of the law change. An unbalanced sex ratio should correspond to a larger increase in divorce rates following the regime shift.

We attempt to test this implication using data on European countries – to which we also add data from Australia and New Zealand. Our findings are merely meant to be suggestive, particularly as our sample of countries is small and we perform correlations rather than a full-fledged regression analysis with controls (for which we lack data at present). Our data on divorce rates in European countries at different points of time, as well as our data on which

of these shifted to unilateral divorce and when they did so, is drawn from Gonzalez and Viitanen (2006), supplemented by Eurostat data. Data on sex ratios is available from the World Development Indicators. Data on divorce rates and timing of laws in Australia and New Zealand is drawn from multiple sources.[6] Our method has been to correlate the size of long-term changes in divorce rates in countries after they transited to unilateral divorce, with the sex ratio prevailing in the relevant countries at the time of the regime shift.[7] Our sample included 14 European countries which had all transited to unilateral divorce regimes – Austria, Belgium, Denmark, Finland, Germany, Greece, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom; we also included Australia and New Zealand. Our choice of countries is dictated by data considerations : we were not able to find comparable data, particularly on timing of divorce law liberalization, for other countries.

We expressed the sex ratio as the number of women per 100 people (more than 50 in all the countries under consideration)[8], and computed the size of the long-term jump in divorce rates as the difference between the divorce rate some 20 to 25 years after the regime shift and the divorce rate immediately prior to the shift.[9] The correlation between these two variables was positive with a coefficient of 0.547, and the correlation was significant at the 5% level. We tabulate the relevant figures below:

[6] Data on divorce rates at the time of transition to unilateral divorce (1975 in Australia, 1981 in New Zealand) is drawn from the United Nations Demographic Yearbook (1968,1982). Data on recent (2002) divorce rates is from Americans for Divorce Reform and is available at http://www.divorcemag.com/statistics/statsWorld.shtml.
[7] Note that sex ratios in different countries have remained largely stable over time.
[8] Due to the stability of sex ratios over the time periods studied (as mentioned in the previous footnote), there is no reason to expect a marked difference between overall sex ratios and sex ratios at marriage. Thus the simplifying assumption maintained in our theoretical framework that sex ratios do not vary across birth cohorts is likely to be valid.
[9] The exception is Switzerland, which only experienced the regime shift in 2000. For Switzerland we computed the jump using the latest available divorce rate figures and subtracting the pre-2000 divorce rate.

Table 1

Country	Sex ratio as number of women per 100 population	Long term jump in divorce rates after transit to unilateral divorce
Austria	52.79	.2
Belgium	51.06	.2
Denmark	50.71	0
Finland	51.58	.2
Germany	52.59	.2
Greece	51.04	.1
Luxembourg	50.63	.2
Netherlands	50.13	.1
Norway	50.52	0
Portugal	52.46	.3
Spain	51.15	.2
Sweden	50.08	.2
Switzerland	51.1	.1
United Kingdom	51.54	.2
Australia	50.2	.17
New Zealand	50.2	-.1
Correlation coefficient	**.547**	
p value	.0464	

Data on change in divorce rates (expressed in terms of divorces per thousand mid-year population) is taken from Eurostat. Data on sex ratios is from the World Development Indicators (World Bank).

Our positive and significant correlation coefficient does not prove causality but does indicate a positive association between the size of the long-run jump in divorce rates following a shift to unilateral divorce laws, and the skewness of the sex ratio. Moreover, since we are looking not at absolute divorce rates, but at *changes* in divorce rates, time-invariant country-

specific factors become irrelevant. Exploring these relationships further, perhaps with a larger sample of countries and controls, remains part of a future agenda for research.

6. Conclusion

Our main purpose in this paper has been to examine the three-way interaction between sex ratios, divorce rates and divorce law changes. We have constructed a theoretical model in which people lack information about their potential matches until the time they actually marry them. However, they receive a signal in the first period of marriage regarding their future compatibility with the mate they have chosen. This, along with the expected payoff from divorce, into which potential remarriage prospects enter, determines each partner's willingness to divorce – a willingness which differs across partners owing to a skewed sex ratio. This in turn implies that the actual divorce rate will differ depending on whether mutual consent is required for divorce (in which case the less willing partner's preferences determine the divorce rate) or whether unilateral divorce is allowed.

The paper yields a number of testable implications. The chief among these is that the jump in divorce rates following a transition from mutual consent to unilateral divorce will be larger if the sex ratio is skewed: it will be relatively small for a more balanced sex ratio. We also provide some preliminary empirical evidence to support this in the form of a positive correlation between sex ratio skewness and long-term jumps in divorce rates following transitions to unilateral divorce in a sample of European countries. However much more remains to be explored in this direction. Other implications of our model include the fact that the jump in divorce rate following a transition to unilateral divorce is likely to be bigger when the marriage market pool is small, for instance in an isolated society, as compared to a society with easy communication and search, and access to many potential partners. We also find that the sex against whom the sex ratio is tilted has worse marriage market odds in a mutual consent divorce regime as compared to a unilateral divorce regime, and that its marriage market odds improve if divorces increase for exogenous reasons. However, this improvement is tempered if the sex ratio is skewed.

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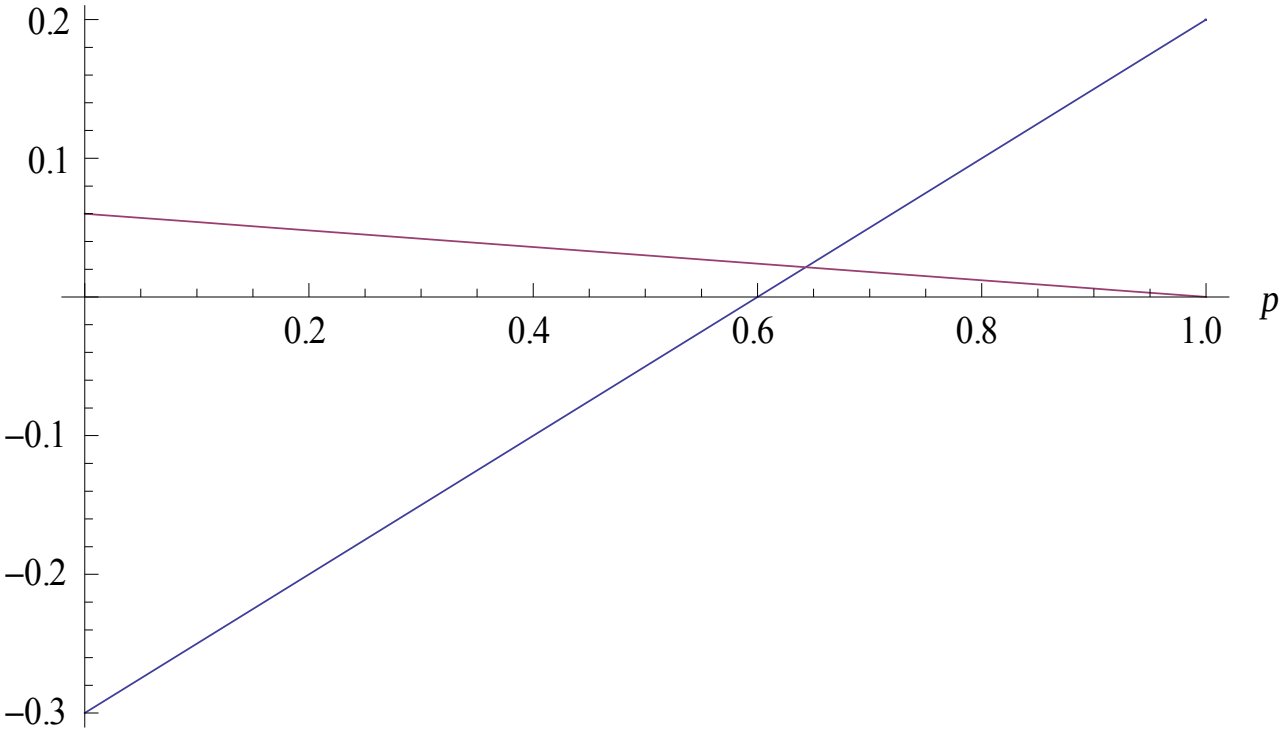
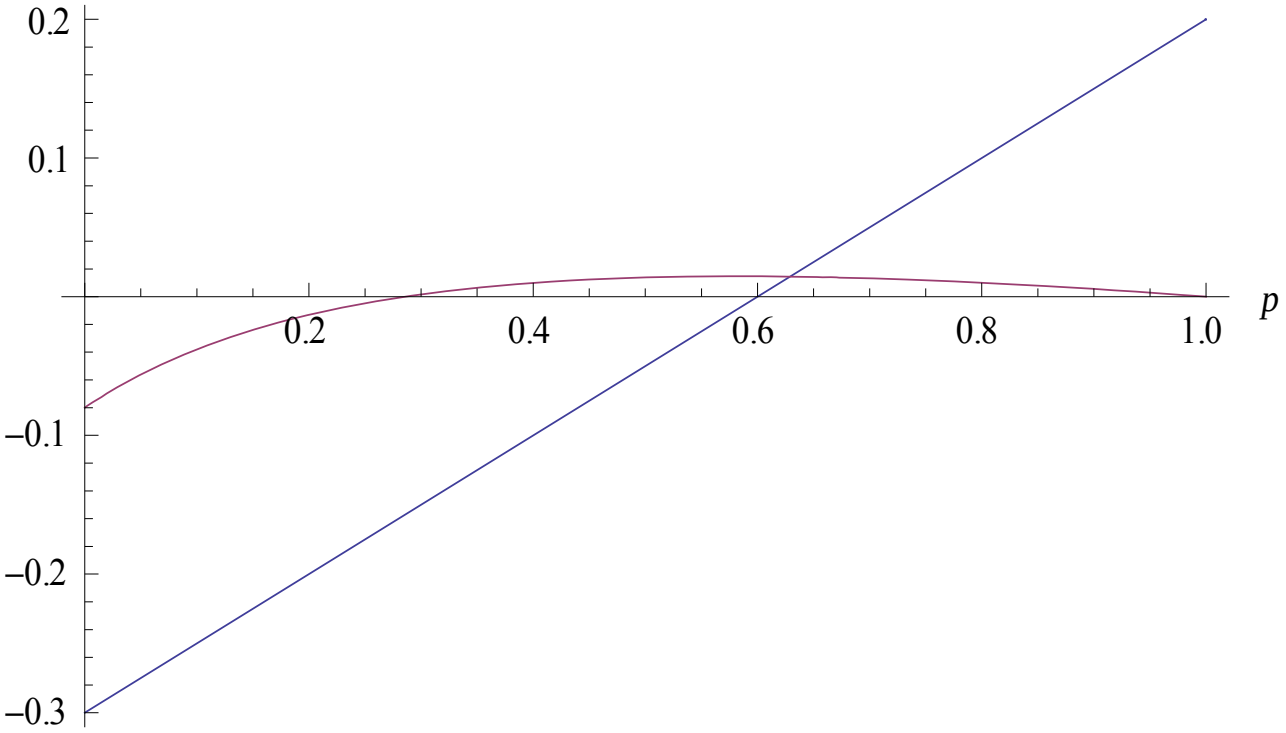
Figure 1



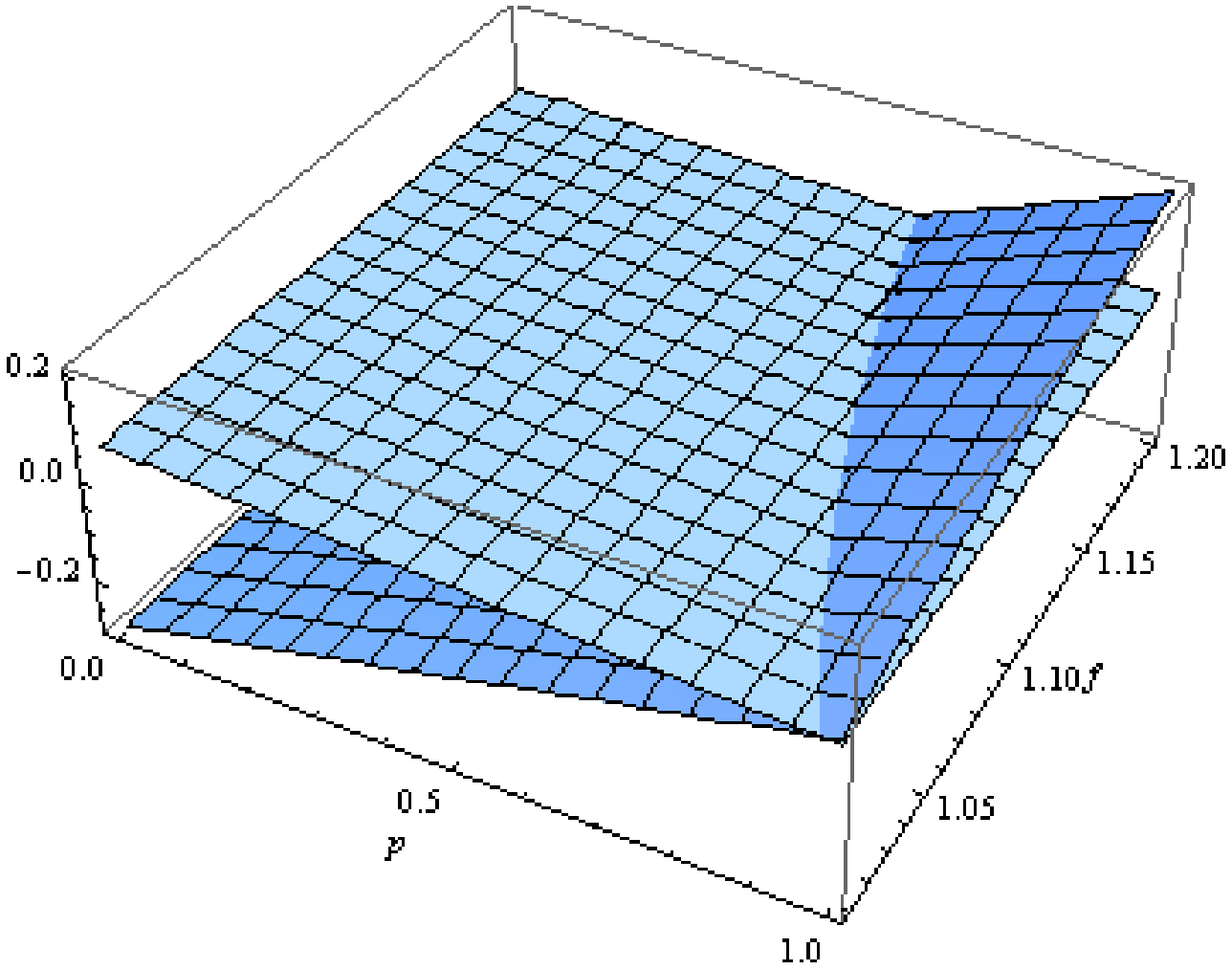
Note : This figure assumes parameter values of β=.7, f = 1.2, G( ) is assumed to be uniform and G(E(Φ)) = .2.

Figure 2



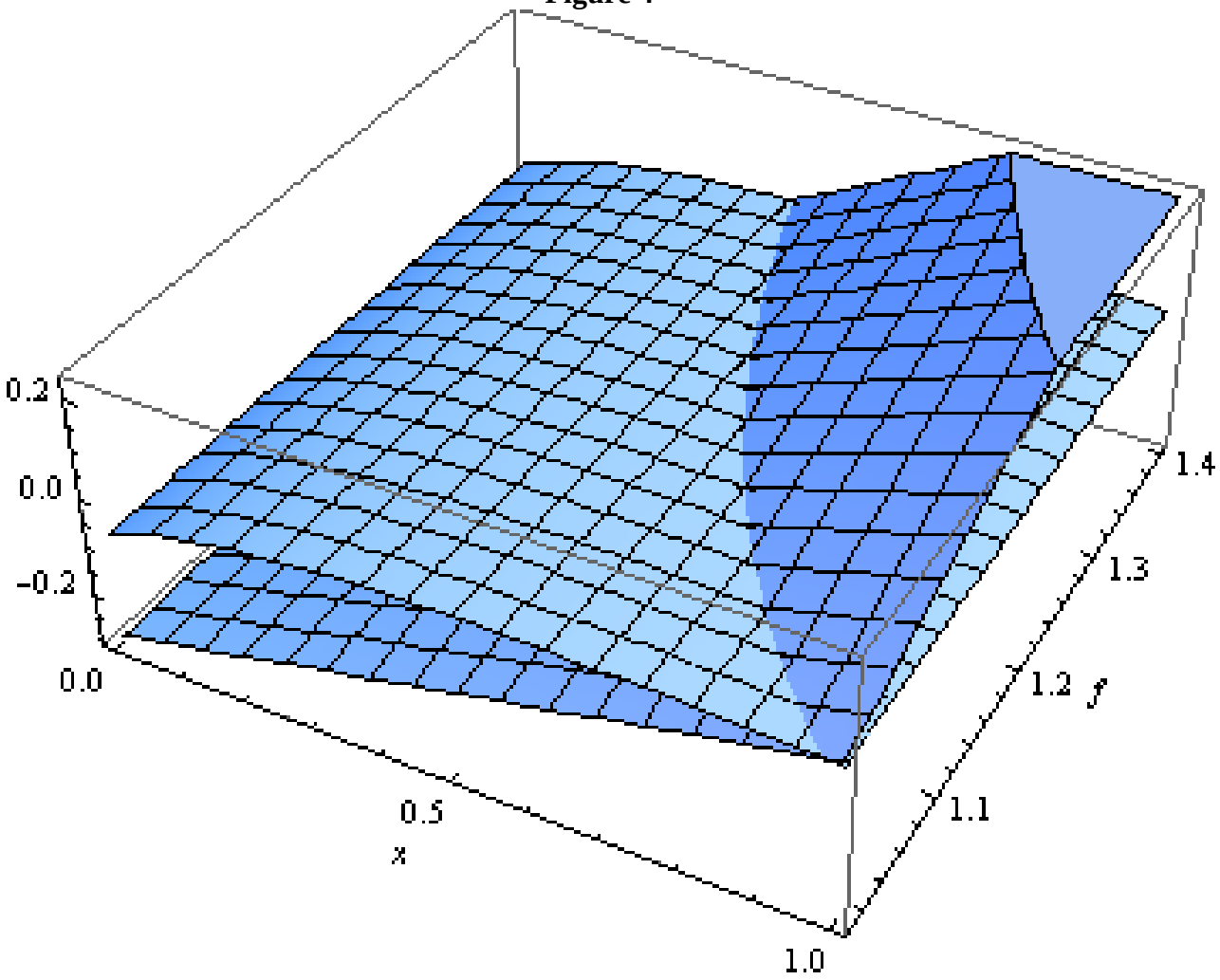
Note : This figure assumes parameter values of β=.7, f = 1.2, G( ) is assumed to be uniform and G(E(Φ)) = .2.

Figure 3



Note : This shows the three-dimensional version of Figure 1 allowing f to vary between 1.01 and 1.2.

Figure 4



This shows the three-dimensional version of Figure 2 allowing f to vary between 1.01 and 1.4.