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Divorce, fertility and the value of marriage¹

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April 2007

Abstract

Easier divorce has two effects on marriage rates and fertility. It dilutes the value of marriage, therefore reducing marriage rates and marital fertility and potentially increasing out of wedlock fertility. But easier divorce reduces also the commitment cost of marriage leading women to “try” marriage especially when in child bearing age or even already pregnant. We find that total fertility and out-of-wedlock fertility decline after the introduction of unilateral divorce. Women planning to have children marry more easily with an easier “exit option” from marriage. Thus, more children are born in the first years of marriage, while marital fertility does not change, probably as a result of an increase in divorce and marital instability. Therefore we find strong evidence consistent with the “commitment effect”

JEL classification: J12, J13

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1. Introduction

The introduction of unilateral divorce has been one of the most significant changes in the structure of the American family of the last thirty years. Unilateral divorce laws allowed one spouse to obtain dissolution of marriage without the consent of the other: divorce became easier.

Two are the possible effects of an easier divorce on fertility and marriage. First, if the value of marriage goes down, since it is “cheaper” to dissolve it, people marry less and marital fertility decreases because an easier divorce law lowers the propensity to invest in children (Becker, 1981; Becker, Landes and Michael, 1977). Since people marry less, they may also choose to have children out of wed lock. Let’s label this argument in short a “dilution” effect.

But there is another effect vastly ignored by the literature. With unilateral divorce the cost in terms of commitment of entering the “wrong” marriage is lower, because the exit option is easier. Let’s label this a “commitment” effect.

The two effects may coexist, but the second one has not been directly explored to the best of our knowledge. We do so in this paper and we find considerable support for it. Probably the strongest piece of evidence is the following. If the dilution effect dominated, marriage rates and in wedlock fertility should go down and out of wedlock fertility would stay constant or go up. Instead we find the opposite: out of wedlock fertility declines significantly after the introduction of unilateral divorce, while in wedlock fertility remains basically unaffected. Our interpretation is that a woman contemplating parenthood, or already pregnant, may choose to enter marriage more easily with unilateral laws because of the commitment effect; as a result, out of wedlock fertility goes down. Obviously this does not imply that couples stay married longer on average with unilateral divorce; on the contrary, some of these matches may be indeed “wrong” and end up in divorce.

We present additional supportive evidence for this story. First, contrary to previous findings, we do not find that marriage rates go down after the introduction of unilateral divorce². If anything they go up. Second, the number of never married women goes down with unilateral

² See Raul 2004. See below for a discussion of why our results are different.

divorce. Third, fertility rates for newly wedded couples (in the first two years of marriage) go up with the adoption of unilateral laws.

We use the legislative history of divorce liberalization across states in the US to identify the effects of this reform on fertility and marriage rates. Using births data from the Natality Files of the Vital Statistics of the US between the years 1968-1999, four decades of Census data and the Current Population Survey, we fully exploit cross state and year variation in the timing of adoption of unilateral divorce to identify the causal effect of a change in divorce laws on our outcomes of interest.

Others have also analyzed the effects of divorce laws on various variables. Many authors have studied the effects of these laws on divorce rates (Peters, 1986 and 1992; Allen, 1992; Friedberg, 1998; Wolfers, 2006), marriage (Rasul, 2004) and family formation (Dewrianka, 2006), children outcome (Gruber, 2004; Johnson and Mazingo, 2000) and marriage specific investments (Stevenson, 2006), labor supply (Chiappori, Fortin and Lacroix, 2002) and general well-being of the couple (Stevenson and Wolfers (2005) and Dee (1999)), with mixed results³.

The paper is organized as follows. After a brief overview of the legislative history of divorce laws in the USA, section two discusses the dilution and commitment effects of an easier divorce. Section three describes the data. Section four contains the main results and specification checks, section five and six investigates more in details the mechanisms underlying our results and section seven concludes.

³ The impact of unilateral divorce legislations on divorce rates remains an open question. Peters (1986, 1992), using a cross-section of data on women, finds no effect. Allen (1992) and Friedberg (1998) obtain the opposite result using an alternative model specification and panel data recording all the divorces by state and year respectively, while Wolfers (2006) finds only a small long run effect of unilateral divorce regulations. In a different line of research, Dee (1999) and Stevenson and Wolfers (2005) examine the impact of unilateral divorce on spousal murders, self-reported domestic violence and suicide, with opposite results. Using a different empirical strategy, both Gruber (2004) and Johnson and Mazingo (2000) find that exposure to unilateral divorce as a youth appears to worsen adult outcomes such as education, labor force participation and family income. Finally Chiappori, Fortin and Lacroix (2002) analyze the impact of divorce law on labor supply, finding substantial evidence of a change in bargaining associated with a change in the laws.

2 Divorce Laws, Marriages and Fertility

Between 1968 and 1977 the majority of the states in the US enacted several legal reforms that simplified legal difficulties in obtaining a divorce. Before that time, in most states marital fault was the only ground for divorce, but mutual consent was always permissible, given that willing conspirators could allege and admit to marital fault. With “no-fault” divorce laws, divorce could be obtained upon mutual consent of the parties involved. Immediately after, or contemporaneously, unilateral divorce statutes made it possible for one spouse to obtain a divorce without the consent of the other. Table 1 summarizes the changes in the law in all US states. This paper focuses on unilateral divorce.

One effect of the introduction of unilateral divorce (what we labeled the “dilution” effect) is the reduction in the value of marriage. If the value of marriage is lower, marriage rates should go down. Similarly, if children constitute “marital capital” (Becker, Landes and Michael, 1977) the decline in the value of marriage should imply lower fertility.⁴ These arguments would then predict a decline in marital fertility, while out-of-wedlock fertility should either go up or stay the same (the incentives for unmarried people remained either unchanged or there are more people who want to have children out-of-wedlock when the value of marriage is lower.)

However, there is also another effect, which has not received substantial attention so far, what we call the “commitment” effect. If the cost of exiting marriage goes down one may choose to enter marriage more easily. Reduction in the cost of exiting marriage will make more people “attempt” a marriage match, especially those who plan parenting. Thus out of wedlock fertility should decline because some of those who had children out of wedlock before may now choose to marry. This implication is directly in contrast with the dilution effect. An additional implication is that with unilateral divorce, marital fertility rates should go up or stay the same immediately after marriage: in fact some women will attempt marriage to have children in

⁴ Bargaining models (Brinig and Crafton, 1994, Mc Elroy and Horney, 1981, and Lundberg and Pollak, 1996) also imply a reduction in fertility: according to these models all family decisions are made in strategic ways that depend on the enforceability of the contract and the outside opportunities of each partner. With unilateral divorce outside options become more relevant since the contract is now non-enforceable. The spouse with outside option has a better bargaining position and is able to obtain a larger share of the couple’s joint production. For that reason the other spouse will prefer to invest in market activities or in human capital at the expense of marriage specific investments, including children.

wedlock, but others may postpone childbearing due to the instability of marriage; also the number of never married women should decline and the marriage rates should go up, because more matches are tried at every point in time. The effect on marital fertility is, on the other hand, ambiguous: more people attempting marriage could increase marital fertility but on the other marital instability could lead to a reduction of it.

3 Data

We use the births certificates from the *National Vital Statistics of the USA* to calculate different measures of fertility. The births certificates data contain individual records on every birth that took place in the United States between 1968 and 1999 to mothers ages 10 and older. Prior to 1968 micro data on birth certificates are not publicly available. Birth certificates contain information on mother's characteristic including age, race, marital status and education. We aggregate these data into cells defined by state of residence of the mother, race and age, to construct state level panel data of total fertility rates, birth rates, and the ratio of births-out-of-wedlock to total births and marital-non marital fertility from 1968 to 1999. The total fertility rate (TFR) is the standard way of measuring fertility. It estimates the number of children a cohort of 1,000 women would bear if they all went through their childbearing years exposed to the age-specific birth rates in effect for a particular time. The TFR is calculated using the methodology applied by the National Center for Health Statistics (described in the appendix). We construct state-year cells containing the average number of children for women in their childbearing age⁵. The birth rate is defined as the total number of childbirths observed per 1,000 women of the appropriate demographic group; it is a crude measure of fertility but it would allow us to study the impact of the law for marital status. The fraction of births out-of-wedlock is defined as the ratio of out of wedlock births over total births⁶.

⁵ Following the National Vital Statistics methodology (see details in the appendix for the construction of the total fertility rate), women in childbearing age are defined as women between 10 and 49 years old.

⁶ Some states did not report the information on legitimacy status prior to 1979, (See Appendix 1 for details)

We obtain population estimates and age and race composition from the Bureau of the Census for the period 1968-1999.⁷ Since the micro data on birth certificates are available only from 1968, we complement our analysis using four decades of Census from 1960 to 1990, to confirm that our results can be distinguished from pre-existing trends in fertility. We also use Census data from 1960 to 1980 to study the impact of divorce laws on the fertility rate in the first two years of marriage.

We also construct a comprehensive series of administrative data for marriages in the US from 1956 to 1995. Our data comes from the marriage certificates of the United States for the period 1968-1995 (the marriage certificate data cover roughly 44 states depending on the specific year, see Appendix for more details), moreover we complement the dataset with hand-entered data from the annual editions of the Vital Statistics for 1956-1967 and for those states that are not covered in the marriage certificates dataset for the period 1968-1995. The count of administrative data is used to construct crude marriage rates- the number of marriages per 1000 of the population⁸. Descriptive statistics for adopting and non-adopting states are reported in the appendix (Table A3.)

4 Total Fertility

We begin by examining the effects of changes in divorce laws on fertility. We then look at the impact of divorce laws on out wedlock fertility, and marriage which will allow us to distinguish between the dilution and the commitment effect of easier divorce.

We consider the following panel data regression of the log of the total fertility rate in state s at time t , $\log(f_{st})$, for the period 1968-1999:

$$\log(f_{st}) = \beta U_{st} + \chi_s + \gamma_t + \lambda X_{st} + \varepsilon_{st} \quad (1)$$

where U_{st} is a dummy equal to one if state s has a unilateral divorce regime starting from year t , χ_s and γ_t refer to state and year fixed effects and X_{st} is a set of controls. Prior to 1967,

⁷ Population estimates for the intercensal years are obtained by the U.S. Census Bureau at www.census.gov/popest/states

⁸ Data on the state population for the period 1956-1998 is obtained by Wolfers (2006) and Katz et al. (2003)

divorce required mutual consent in almost all the states in the US. Between 1967 and 1987 almost two thirds of the states introduced unilateral divorce. Hence the causal effect of unilateral divorce in our specification is identified from variation across states, time and between adopting and non-adopting states. Table I reports the year in which these laws were passed by state. We follow Gruber (2004) who codes divorce as unilateral when it requires the consent of only one spouse and is granted on grounds of irreconcilable differences. The impact of a change in divorce law is captured by the coefficient β , which represents the change in fertility rate attributable to the legal change.

Endogeneity is not our main concern. We can safely argue that fertility decisions do not affect the probability that a state passes a unilateral divorce law and influencing fertility trends did not seem a policy objective of the state legislatures. The more serious potential problem is the effect of coincident underlying social trends or omitted factors that have differential effects in adopting and non-adopting states. We address this issue below.

4.1. Basic results

Table II presents the main results on the total fertility rates. Column 1 shows that a change in divorce laws is associated with a decline in the fertility rates in adopting states. The effect is significant at the 1 percent level and the implied decline in fertility is about 3 percentage points. This specification controls only for the age composition of the state population and state and year fixed effects.

We then control for potential omitted factors by adding state specific trends to our specification, the coefficient remains highly significant and of the same magnitude (Column 2)⁹. Divorce laws were changed close to the time of legalization of abortion which of course could

⁹ We also tried as an alternative specification the inclusion of state specific characteristics, including female labor force participation and education. Our results, available upon request, are still robust. The problem with the inclusion of state-specific controls is the loss of many observations as the CPS covers only few states before 1977. Table A3 in Appendix also shows that there is not much difference in education, labor force status and other demographic characteristics in adopting and non-adopting states before and after 1972, which is the median year of the adoption of the unilateral law.

have an effect on fertility¹⁰, as pointed out by Levine et al. (1996). When we include in our regression a dummy for the introduction of abortion, we find that abortion liberalization has been associated with a decline in fertility (columns 3), consistent with what found by Levine et al. (1996), but its inclusion does not reduce either the significance or the magnitude of the impact of divorce laws on fertility.

Finally, during the same period in which unilateral divorce laws were implemented many states changed the laws on the division of property and assets. Many states removed fault as a consideration in property settlement (we refer to these laws as “no-fault” property laws in our regressions); moreover, by the end of the 1970s the majority of the states moved to a regime in which property was more equally divided. Before the 1970s, each spouse was normally entitled to the property that they owned before the marriage; after the 1970s laws were reformed in a way to guarantee a more equal division of property between spouses (we refer to these laws as “equitable” property laws). The years in which these laws were passed by states are in Table 1. In columns 3 we further control for “no-fault” and “equitable” property laws. We found that the introduction of no-fault property division increased fertility, while a more equitable regime reduces it. Those laws do not lower however the impact of unilateral divorce on fertility rates.

4.2. Robustness

Next we checked whether the change in fertility followed the change in divorce regime and not the opposite. Perhaps states adopting unilateral divorce legislation could be the one whose electorate has stronger preferences for marital dissolution (reflected in higher divorce, more unstable marriages and possibly lower fertility). We include leads dummies to our regression for whether unilateral divorce will be introduced in 2 to 3 years time, or 4 or more year’s time (the omitted category is the year before introduction). The estimated coefficients on the lead dummies (reported in Table II, column 4) are not significant and are very small, indicating that secular pre-trends are not responsible for the decline in fertility in adopting states.

¹⁰ Abortion was legalized in five states in the US in 1970 (Alaska, California, Hawaii, New York and Washington). Following the 1973 Supreme Court decision in *Roe v. Wade*, abortion became legal in all states

The unilateral divorce dummy remains significant at the 5% level and with a coefficient of similar magnitude.

There is also anecdotal evidence supporting the fact that the liberality of the States does not imply a higher marital dissolution. A story in the New York Times (based on an Associate Press report) highlights that the highest divorce rates are in the Bible Belt: "the divorce rates in these conservative states are roughly 50 percent above the national average of 4.2 per thousand people." The 10 Southern states with some of the highest divorce rates were Alabama, Arkansas, Arizona, Florida, Georgia, Mississippi, North Carolina, Oklahoma, South Carolina, and Texas. By comparison nine states in the Northeast were among those with the lowest divorce rates: Connecticut, Massachusetts, Maine, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont.¹¹

In our period of analysis fertility rates declined all over the US. One possible interpretation is that adopting states started from a higher level of fertility and that what we are capturing in our regression is a convergence in fertility rates between adopting and non-adopting states; in other words, regression to the mean may then simply explain why fertility declined more in adopting states. Column 5 controls for fertility level in 1968 interacted with a linear time trend. The effect of a change in divorce law remains negative and significant at the 1% level.

4.3. Dynamics

In our analysis we use a unilateral dummy to capture the total impact of divorce laws on fertility. Wolfers (2006) however points out how this simple dummy may not fully account for pre-existing trends and post law trends. We follow his strategy by imposing a more flexible structure in our specification, consisting of a series of dummy variables, for the first two years of the new law, for years three and four and so on. Thus we estimate the following regression:

$$\log(f_{st}) = \sum_j \beta_j U_{st}^j + \delta_s + \gamma_t + \lambda X_{st} + \varepsilon_{st} \quad (3)$$

where U_{st}^j consists of a series of dummy variables equal to one for the first two years of adoption, 3-4 years of adoption, 5-6 years and so on. We present the estimated effects of unilateral divorce for a series of years after the introduction of the law in column 6. There is a

¹¹ "Bible Belt Couples 'Put Asunder' More, Despite New Efforts", *The New York Times*, May 21st, 2001.

large and significant reduction in fertility rate following the introduction of divorce and the effect is constant over time and does not disappear until 15 years after the introduction of divorce.

4.4. A Longer Time period: Evidence from Four Decades of US Census Data

Given that there are only few observations before the policy change, they may not be sufficient to identify pre-existing state trends. Since there are no micro data available to extend our analysis starting from the beginning of the 1960, we used four decades of Census data (from 1960 to 1990). We run a specification collapsing state-year-age cells using as a dependent variable the number of children ever born to women age 15-44 residents in those states that adopted unilateral divorce.¹² We run these regressions with and without state-specific trends; we include state-specific trends for consistency with our previous regressions, however with census data the inclusion of state-specific trends is not a perfect solution since there are only four underlying time series observations (those trends are much better captured using the yearly panel data on fertility we constructed using the Vital Statistics).¹³ The specification is as follows:

$$fertility_{a,s,t} = \beta U_{st} + \phi race_{a,s,t} + \varphi_a + \chi_s + \gamma_t + \mu \varphi_a \gamma_t + (\delta_s \cdot t) + \varepsilon_{a,s,t} \quad (2)$$

where all the variables are defined as before, plus *race* representing the percentage of black and white in the age-state-year cells, φ_a and $\varphi_a \gamma_t$ are age dummies and age year interactions to control for differential time patterns by age.

Since the unilateral divorce dummy varies only by state and year, we control for clustering on state of residence*year. The coefficient of unilateral divorce dummy, with and without the inclusion of state specific trend is still significant at the 5% level (again census data cannot give us the same statistical power provided by the Vital Statistics which record all the births occurred in the US). As for the magnitude, it implies an elasticity of 3.5% of the impact of divorce law on fertility. A regression with fertility using the vital statistics implies an elasticity of 3.6% (but for the period 1968-1999) (See Table A4 column 2a and 2b).

¹² Our specification follows Gruber (2004) but we concentrate on women residents in states that introduced unilateral divorce laws and not to women exposed to unilateral divorce as a youth.

¹³ We use fertility rather than log fertility because in the Census data fertility is measured as number of children ever born to a woman (zero is then a possible outcome).

Overall, our results suggest that the introduction of unilateral divorce led to a significant and robust reduction in fertility rates. In the next section we show that the reduction in fertility derives almost exclusively from the decline in out-of-wedlock fertility, while marital fertility remained roughly constant.

5 The impact of divorce laws on out-of-wedlock fertility

Out of wedlock fertility is the ratio of illegitimate births over total births.¹⁴ Table III shows the same specifications we did for the total fertility rate for out wed lock. Column 1 controls only for state and year effects and age composition of the state population; the second adds state-specific trends¹⁵, the third controls for the existence of abortion laws and different type of property division. Columns 4 to 6 control for lead variables, regression to the mean and dynamic effects a la Wolfers. All our specifications show a significant decline in out-of-wedlock ratio following the adoption of unilateral divorce, with an elasticity of the order of 6%.

Note that the left hand side of the regressions of Table III is defined as out-of-wedlock births over total births, i.e. out-of-wedlock plus marital births. This ratio could go down if out-of-wedlock births go down or marital births go up. In order to address this issue we split our sample between marital births over the population of women in the age group 15-44 and out-of-wedlock births over the population of women in the age group 15-44¹⁶.

The impact of unilateral divorce laws on the out-of-wedlock rate is always significant at the 1% level, with or without the inclusion of state-specific trends, whereas the impact on the marital rate is always insignificant (Table A5).

¹⁴ Note that the number of observations for the out-of-wedlock regression is lower than the fertility regression, since marital status is missing for some states and years (Table A1 in the Appendix documents the availability of this information for each state and year).

¹⁵ As before, as a robustness check we include state-specific controls such as education and labor market status constructed from the CPS. The results (available from the authors) survive, however we loose a lot of observations since few states are identified in the CPS prior to 1977..

¹⁶ We also run regressions for marital and non-marital fertility (defined as the number of marital births and out-of-wedlock births divided by the population of married and non-married women). State-year level measures of the number of single and married people aged 15-44 are constructed from March CPS data. These measures are available from 1968 to 1999, but only the 12 largest states are covered during the 1970s; this has the drawback of reducing the precision of the previous specification, but the results are unchanged.

In summary: out of wed lock fertility goes down significantly when divorce become easier. Marital fertility is unaffected. We interpreted this result as an indication of the “commitment” effect of marriage: women get married to have children so out of wed lock fertility goes down. A pure dilution effect of the value of marriage would imply a decline of marital fertility, which instead we do not find. In what follows we explore additional implications of this commitment effect.

6. Choosing marriage to have children

6.1 Total Marriage Rates

The dilution effect should imply a reduction of total marriage rates as a result of easier divorce. The commitment effect an increase.

We study marriage rates by collecting a unique series on the total number of marriages from 1956 to 1995 which we have described in Section 3. We define marriage rate as the number of marriages for 1,000 population. The results of Table V show that the introduction of unilateral divorce significantly increases the marriage rate. Column 1 is the standard regression, column 2 introduces state specific trends, column 3 controls for abortion and division property laws, columns 4 to 6 control for lead dummies, regression to the mean and run a dynamic specification following Wolfers.¹⁷

The other existing paper on the impact of divorce laws on marriage (Rasul, 2004) reports a decline in the number of marriages as a result of unilateral divorce. Rasul (2004) uses the marriage certificates of the Vital Statistics for the period 1968-1995, complemented with the historical volumes of the Vital Statistics for the years 1960-1968 and 1995-2000. We use a richer series, including the seven states missed in the marriage certificates (details in the Appendix), correcting the series for California, whose number of marriages appears substantially

¹⁷ As noted by Rasul (2004), endogeneity could be an issue for marriage rates, as divorce laws were a non partisan issue. By instrumenting divorce laws with some state-varying political characteristics (including the age of the governor, whether there is a state election in one year’s time and a measure of the governor political ideology), Rasul shows that endogeneity is not a major concern.

underestimate in the marriage certificates, adding few years of data for Colorado, Minnesota and South-Carolina and going back to 1956.

The source of discrepancy with Rasul could alternatively be due to the fact that we include total population as a denominator, while Rasul do not consider people younger than 15. As fertility falls with unilateral divorce, (therefore the population under 15), this will mechanically cause a rise in the marriage rate with unilateral divorce when the marriage rate is calculated as a fraction of marriages over the total population. We replicate our results eliminating the population between 0 and 14 years old from the denominator. Our results still hold (column 7), although the significance level is slightly lower.

6.2 Never married women and newly married mothers

The commitment effect implies a reduction in the number of never married women, since they try marriage more easily with easier divorce. Moreover, fertility rates for newly married women should go up. When divorce becomes easier, attempting marriage is less costly, therefore *ceteri paribus*, women contemplating child bearing (or even already pregnant) choose to marry to avoid out-of-wedlock fertility, knowing that an unsuccessful marriage can be more easily broken.

We study the change in the number of never married women using data from the March supplement of the Current Population Survey from 1962-1999. We construct state-year cells containing the fraction of never married women for the age group 15-49. We regress these cell means on a dummy indicating the presence of unilateral divorce, age and race composition of the states, state and year effects. We also run a specification including education and labor market status as controls (Table VI). The results show that the number of never married women declines with the introduction of unilateral divorce. Our estimates imply an elasticity of around 4%. The results are robust to the inclusion of a full set of controls; however with the inclusion of state-specific trends the coefficient remains negative but not significant.

If women choose marriage to have children we would expect not only a decline in out-of-wedlock fertility, but also an increase in fertility rates for just married women (note that this effect could also be compensated from a decline in fertility in the first years of marriages coming from those people who decided not to have children since marriage is more unstable). To test this hypothesis we use three decades of Census data (from 1960 to 1980, the last year in which

the Census collect information about the age at first marriage). We use information on the age at first marriage and on the total number of children ever born to a woman and calculate the duration of marriage for women in their first marriage and see whether their fertility rates are higher in states with unilateral divorce. We run a specification collapsing state-year-age cells using as a dependent variable the number of children ever born to women age 15-44 residents in those states that adopted unilateral divorce. The specification is identical to equation (2), but we now simply restrict the sample to women in the first two years of marriage. As before, we control for clustering on state of residence*year. Table VII shows that fertility is higher in the first two years of marriage for women living in states with unilateral divorce, although the coefficient is significant only at the 10 percent level.¹⁸ This could be due to the fact that the dilution effect is also playing a role: some women will attempt marriage to have children, but some other will avoid having them since marriage is now more unstable.

7. Conclusions

The theory and empirics on the effect of divorce laws on marital stability and fertility has typically emphasized what we have labeled a “dilution” effect, namely a reduction in the value of marriage that should imply fewer marriages and lower marital fertility, and by implication potentially higher out-of-wedlock fertility. We emphasized another effect which we labeled a “commitment effect”. As divorce becomes easier, people feel less locked in when they marry. So when women consider having children (or are already pregnant) they are more willing to “try” marriage. Therefore out of wedlock fertility declines and marriage rates go up.

The welfare implications of our results are of course very hard to evaluate. Reduction of out of wedlock fertility may be a social good, but society may “pay” for it with an increase in bad marriages and more divorces.

¹⁸ The results differ from those found in Stevenson (2006). We do have a different specification, moreover we include teen-agers in our sample of women (Stevenson considers women 18 years and older), we also use three decades of the Census to being able to better identify the pre-trends, while Stevenson concentrate her attention to the 1970 and 1980. Note also that the author find that “when considering the timing of conception, we find a statistically significant *increase in the likelihood of having children conceived prior to the marriage* (pag. 16)”. This evidence is consistent with our story and could be a way of reconciling the differences in results.

Data Appendix

Birth Certificates data were obtained from the *National Vital Statistics System of the National Center for Health Statistics*. The births certificates data contain individual records on every birth that took place in the United States between 1968 and 1999. Prior to 1968 micro data are not publicly available.

The total fertility rate (TFR) estimates the number of children a cohort of 1,000 women would bear if they all went through their childbearing years exposed to the age-specific birth rates in effect for a particular time. We calculate the total fertility rate (TFR), using the methodology applied from the National Center for Health Statistics. According to this definition the “TFR is the sum of the birth rates by age of mother (in 5-year age groups) multiplied by 5. It is an age-adjusted rate because it is based on the assumption that there is the same number of women in each age group. A total fertility rate of 2,477 in 1968 for example means that if a hypothetical group of 1,000 women were to have same birth rates in each group that were observed in acute childbearing population in 1968, they would have a total of 2,477 children by the time they reached the end of the reproductive period (taken as age 49), assuming that all of the women survive at that age” (*Vital Statistics of the United States, 1968, Volume I, Natality, Technical Appendix*).

The birth rate is defined as the total number of childbirths per 1,000 women in a certain population group.

The fraction of births out-of-wedlock is defined as the ratio of illegitimate births over total births. The legitimacy status was not reported in several states from 1968 through 1979. The states not reporting legitimacy status are indicated in Table A1.

We use the March Supplement of the *Current Population* survey from 1968 to 1999 to construct our control variables, specifically race and age composition, labor market status and educational levels for women in the age group 15-49. We also use the CPS to construct the number of married and unmarried women by age and race. In 1962 the following states are missing: Alaska, Hawaii, Idaho, Maine, Montana, Nebraska, New Hampshire, North Dakota, South Dakota, Vermont, and Wyoming. From 1968 to 1972 the following states, plus the District of Columbia, are identified: California, Connecticut, Florida, Georgia, Illinois, Indiana, Kentucky, Louisiana, Maryland, Missouri, New Jersey, New York, Ohio, Oregon, Pennsylvania, Tennessee, Texas and West Virginia. Between 1973 and 1976 the following states, plus the

District of Columbia, are identified: California, Connecticut, Florida, Illinois, Indiana, Massachusetts, New Jersey, New York, North Carolina, Ohio, Pennsylvania and Texas. After 1976 and between 1963 and 1967 all states can be identified. All monetary variables are indexed at 1999 values.

Marriage Certificates data were obtained from the *National Vital Statistics System of the National Center for Health Statistics*. The marriage certificates data contain individual records on every marriage that took place in the United States between 1968 and 1995. The data for 1968-1995 covers around 44 states, depending on the exact year (see Table A2 for details). Marriage certificates data includes date of marriage, state of residency and occurrence, education, previous marital status, number of marriages and age of bride and groom. We calculate the number of total marriages for each state and year from the micro-data, and we complement our series by entering by hand the missing series. Specifically we have hand-entered data from the annual editions of the Vital Statistics for all the States for 1956-1967 and for the states missing from the micro-data for 1968-1995. We construct a very comprehensive series reflecting a total count of administrative data of marriages reported to the NCHS for the period 1956-1995. We then define marriage rate as the total number of marriage per 1,000 population. Data on state population from 1956 to 1995 are obtained by Wolfers¹⁹

¹⁹ <http://bpp.wharton.upenn.edu/jWolferss/data.shtml>

Table A1
States not reporting legitimacy status, by year

	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
California	X	X	X	X	X	X	X	X	X	X	X	X
Connecticut	X	X	X	X	X	X	X	X	X	X	X	X
Georgia	X	X	X	X	X	X	X	X	X	X	X	X
Idaho	X	X	X	X	X	X	X	X	X	X		
Maryland	X	X	X	X	X	X	X	X	X	X	X	X
Massachusetts	X	X	X	X	X	X	X	X	X	X		
Michigan											X	X
Montana	X	X	X	X	X	X	X	X	X	X	X	X
Nevada				X	X	X	X	X	X	X	X	X
New Mexico	X	X	X	X	X	X	X	X	X	X	X	X
New York	X	X	X	X	X	X	X	X	X	X	X	X
Ohio		X	X	X	X	X	X	X	X	X	X	X
Texas										X	X	X
Vermont	X	X	X	X	X	X	X	X	X	X		

Source: Vital Statistics of the United States

Table A2
States with marriage certificates micro-data available

State	Micro data available	State	Micro data available
Alabama	1968-1995	Montana	1968-1995
Alaska	1968-1995	Nebraska	1968-1995
Arkansas		Nevada	
Arizona		New Hampshire	1968-1995
California	1968-1995	New Jersey	1968-1995
Colorado	1979-1995	New Mexico	
Connecticut	1968-1995	New York	1968-1995
District of Columbia	1968-1995	North Carolina	1968-1995
Delaware	1968-1995	North Dakota	
Florida	1968-1995	Ohio	1968-1995
Georgia	1968-1995	Oklahoma	
Hawaii	1968-1995	Oregon	1968-1995
Idaho	1968-1995	Pennsylvania	1968-1995
Illinois	1968-1995	Rhode Island	1968-1995
Indiana	1968-1995	South Carolina	1971-1995
Iowa	1968-1995	South Dakota	1968-1995
Kansas	1968-1995	Tennessee	1968-1995
Kentucky	1968-1995	Texas	
Louisiana	1968-1995	Utah	1968-1995
Maine	1968-1995	Vermont	1968-1995
Maryland	1968-1995	Virginia	1968-1995
Massachusetts	1968-1995	Washington	
Michigan	1968-1995	West Virginia	1968-1995
Minnesota	1971-1995	Wisconsin	1968-1995
Mississippi	1968-1995	Wyoming	1968-1995
Missouri	1968-1995		

The micro data on marriage certificates data were obtained from the Vital Statistics of the United States for the period 1968-1995; data is hand-entered for the states with missing data in the period 1968-1995, and for all the states from 1956 to 1967.

Table A3
Descriptive Statistics for Adopting and Non-Adopting States
Women 15-44 Years old,
Means and Standard Deviations

Adopting States			
	1962-1972	1973-1999	Difference
Age	28.19 (.7689)	29.12 (1.068)	0.95
Single	.2551 (.0743)	.3388 (.0467)	0.0837
Married	.6716 (.0812)	.5440 (.0494)	-.1276
Separated	.0232 (.0239)	0.0251 (.0104)	0.0019
Divorced	.0420 (.0351)	.0849 (.0216)	0.0429
College and more	.2218 (.0620)	.4186 (.0955)	0.1968
Labor force partic.	.4280 (.0191)	.6382 (.0728)	0.2102
Fertility*	2.41 (.7269)	1.22 (.7140)	-1.19
Non-Adopting States			
	1962-1972	1973-1999	Difference
Age	28.49 (.7287)	28.95 (1.079)	0.46
Single	.2812 (.0512)	.3740 (.0751)	0.0928
Married	.6563 (.0649)	.5086 (.0816)	-.1477
Separated	0.0248 (.0198)	0.0371 (.0153)	0.0123
Divorced	.0272 (.0151)	.0714 (.0221)	0.0442
College graduate	.1748 (.0504)	.3782 (.1018)	0.2034
Labor force partic.	.3915 (.0721)	.5966 (.0824)	.2051
Fertility*	2.15 (.8644)	1.18 (.7298)	-0.97

Source: CPS- March Supplement, authors' calculations; fertility has been calculated using Census data for 1960 and 1990, respectively

Table A4
The Impact of Unilateral Divorce on the Total Fertility Rate
Census data and Vital Statistics

	Census 1960-1990: number of children ever born to women 15-44 years old		Vital Statistics 1968-1999: Total fertility rate	
	(1a)	(1b)	(2a)	(2b)
Unilateral Divorce	-.0511*** (.0165)	-.0446*** (.0134)	-.0728*** (.0228)	-0.058*** (.0106)
Elasticity	3.5%	3%	3.6%	2.9%
Year Effects	Yes	yes	yes	Yes
State Effects	Yes	yes	yes	Yes
State-specific trends	No	yes	no	Yes
Adjusted R^2	.98	.98	.88	.96
Number of observations	6113	6113	1632	1632

For the Census data: regressions based on IPUMS data from the 1960-1990 Censuses (1960 State 1% sample, 1970 Form one 1% state sample, 1980 and 1990 5% state sample). Women aged 15-44. All regressions control for race, state and age dummies and age*year dummy interaction and are weighted to reflect underlying micro data. Robust standard errors in parenthesis. ***, ** and * respectively denote 1%, 5% and 10% levels. Standard errors are clustered at the state*year level.

For the Vital Statistics Regressions: Panel data regression estimates, sample period 1968-1999. Estimated using state population weights. Robust standard errors in parenthesis. ***, ** and * respectively denote 1%, 5% and 10% levels. Total fertility rates are calculated using the *Vital Statistics* of the USA.

Table A5
The Impact of Unilateral Divorce on Births/Pop, by Marital Status
Women age 15-44

	Non Marital Births/Pop		Marital Births/Pop	
	(1)	(2)	(1)	(2)
Unilateral	-0.475	-0.440	-1.939	1.193
	(0.186)**	(0.174)**	(4.827)	(2.408)
Legalized abortion				
Up to 12 years of school.				
Some College				
Employed				
Unemployed				
State unemployment and state log income				
Age and Race Composition				
Year Effects	Yes	yes	yes	yes
State Effects	Yes	yes	yes	Yes
State-specific Trends		yes		yes
Observations	1481	1481	1626	1626
R-squared	0.94	0.96	0.42	0.79

Panel data regression estimates, sample period 1968-1999.

Estimated using as weights women population 15-44 years old. . Robust standard errors in parenthesis. ***, ** and * respectively denote 1%, 5% and 10% levels.

Source: Marital and out-of-wedlock births are calculated using the *Vital Statistics* of the USA.

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TABLE I
DIVORCE REGULATIONS ACROSS THE STATES

State	Unilateral Date	No Fault for Property Division and Alimony	Equitable Division of Property and Assets	State	Unilateral Date	No Fault for Property Division and Alimony	Equitable Division of Property and Assets
Alabama	1971	Fault	1980	Montana	1973	1975	1976
Alaska	1935	1974	Pre 1950	Nebraska	1972	1972	1972
Arkansas		1979	19779	Nevada	1967	1973	Pre 1950
Arizona	1973	1973	Pre 1950	New Hampshire	1971	Fault	1988
California	1970	1970	Pre 1950	New Jersey		1980	1971
Colorado	1972	1971	1972	New Mexico	1933	1976	Pre 1950
Connecticut	1973	Fault	1973	New York		Fault	1962
DC		Fault	1977	North Carolina		Fault	1981
Delaware	1968	1974	Pre 1950	North Dakota	1971	Fault	Pre 1950
Florida	1971	1986	1988	Ohio		fault	1990
Georgia	1973	Fault	1980	Oklahoma	1953	1975	1975
Hawaii	1972	1960	1955	Oregon	1971	1971	1971
Idaho	1971	1990	Pre 1950	Pennsylvania		Fault	1979
Illinois		1977	1977	Rhode Island	1975	Fault	1979
Indiana	1973	1973	1958	South Carolina		Fault	1979
Iowa	1970	1972	Pre 1950	South Dakota	1985	Fault	Pre 1950
Kansas	1969	1990	Pre 1950	Tennessee		Fault	1959
Kentucky	1972	Fault	1972	Texas	1970	Fault	1970
Louisiana		Fault	1978	Utah	1987	1987	Pre 1950
Maine	1973	1985	1972	Vermont		Fault	Pre 1950
Maryland		Fault	1969	Virginia		Fault	1982
Massachusetts	1975	Fault	1974	Washington	1973	1973	Pre 1950
Michigan	1972	Fault	1983	West Virginia		Fault	1984
Minnesota	1974	1974	1951	Wisconsin	1978	1977	1978
Mississippi		Fault	Pre 1950	Wyoming	1977	Fault	Pre 1950
Missouri		Fault	1974				

Source: Gruber, 2004 and Rasul, 2004

TABLE II
THE IMPACT OF UNILATERAL DIVORCE ON THE TOTAL FERTILITY RATE
DEPENDENT VARIABLE: LOG (TOTAL FERTILITY RATE)

	(1)	(2)	(3)	(4)	(5)	(6)
	Log(fertility)	Log(fertility)	Log(fertility)	Log(fertility)	Log(fertility)	Log(fertility)
Unilateral	-0.031 (0.011)***	-0.027 (0.005)***	-0.029 (0.009)***	-0.039 (0.018)**	-0.030 (0.011)***	
Abortion			-0.091 (0.022)***			
No fault for prop. div.			0.027 (0.007)***			
Equitable div. of prop.			-0.038 (0.006)***			
Years 1-2						-0.042 (0.017)**
Years 3-4						-0.052 (0.017)***
Years 5-6						-0.049 (0.014)***
Years 7-8						-0.042 (0.013)***
Years 9-10						-0.042 (0.012)***
Years 11-12						-0.030 (0.011)***
Years 13-14						-0.020 (0.011)*
Years 15 and more						0.000 (0.011)
Unilateral Div. adopted in 2-3 years time				-0.026 (0.021)		
Unilateral Div. adopted in 4 years time or more				0.015 (0.021)		
Fertility 1968*time trend					0.060 (0.080)	

Age composition	x	x	x	x	x	x
State effects	x	x	x	x	x	x
Year effects	x	x	x	x	x	x
State specific trends		x				
Observations	1632	1632	1632	1632	1632	1632
R-squared	0.88	0.96	0.89	0.88	0.88	0.89

Panel data regression estimates, sample period 1968-1999. Estimated using as weights women population 15-44 years old. ***, ** and * respectively denote 1%, 5% and 10% levels. Age composition is defined as the shares of the total female population in age group a where the age groups are 15-19, 20-24, 25-29, 30-34, 35-39, 40-44.

Source: Total fertility rates are calculated using the *Vital Statistics* of the USA. Population estimates are taken from www.census.org. Definition of total fertility rate is in the data appendix.

TABLE III
THE IMPACT OF UNILATERAL DIVORCE ON OUT-OF-WEDLOCK BIRTHS
DEPENDENT VARIABLE: OUT-OF-WEDLOCK RATIO

	(1)	(2)	(3)	(4)	(5)	(6)
	Out of wedlock	Out of wedlock	Out of wedlock	Out of wedlock	Out of wedlock	Out of wedlock
Unilatera	-1.279 (0.285)***	-1.190 (0.265)***	-1.024 (0.321)***	-1.403 (0.367)***	-1.165 (0.284)***	
Abortion			-0.853 (0.634)			
No fault for prop. div.			-0.753 (0.248)***			
Equitable div. of prop.			0.698 (0.218)***			
Years 1-2						-0.520 (0.415)
Years 3-4						-0.752 (0.436)*
Years 5-6						-1.064 (0.404)***
Years 7-8						-1.261 (0.355)***
Years 9-10						-1.583 (0.323)***
Years 11-12						-1.660 (0.320)***
Years 13-14						-1.889 (0.327)***
Years 15 and more						-1.844 (0.323)***
Unilateral Div. adopted in 2-3 years time				-0.211 (0.457)		
Unilateral Div. adopted in 4 years time or more				-0.204 (0.545)		
Out-wedlock 1968*time trend					-0.328 (0.083)***	

Age composition	x	x	x	x	x	x
State effects	x	x	x	x	x	x
Year effects	x	x	x	x	x	x
State specific trends		x				
Observations	1481	1481	1481	1481	1481	1481
R-squared	0.96	0.98	0.96	0.96	0.96	0.96

Out-of-wedlock ratio is defined as the ratio of births out-of-wedlock over total births. Coefficients multiplied by 100. Panel data regression estimates, sample period 1968-1999. Estimated using weight women population 15-44 years old. ***, ** and * respectively denote 1%, 5% and 10% levels. Source: Birth rates for married and unmarried women are calculated using the *Vital Statistics* of the USA.

TABLE IV
THE IMPACT OF UNILATERAL DIVORCE ON THE MARRIAGE RATE

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Marriage rate	Marriage rate	Marriage rate	Marriage rate	Marriage rate	Marriage rate	Marriage rate
Unilateral	0.217	0.210	0.177	0.271	0.178		0.247
	(0.092)**	(0.093)**	(0.098)*	(0.108)**	(0.088)**		(0.133)*
Abortion			-0.084				
			(0.192)				
No fault for prop. division			0.068				
			(0.093)				
Equitable div. of property			-0.335				
			(0.087)***				
Years 1-2						0.105	
						(0.114)	
Years 3-4						0.051	
						(0.126)	
Years 5-6						0.226	
						(0.124)*	
Years 7-8						0.359	
						(0.114)***	
Years 9-10						0.314	
						(0.122)**	
Years 11-12						0.395	
						(0.139)***	
Years 13-14						0.397	
						(0.139)***	
Years 15-16						0.177	
						(0.133)	
						(0.086)**	
Unilateral Div. adopted in 2-3 years time				0.169			
				(0.130)			
Unilateral Div. adopted in 4 years time or more				0.183			
				(0.143)			
Marriage 1956*time trend					0.709		
					(0.133)***		

State effects	x	x	x	x	x	x	x
Year effects	x	x	x	x	x	x	x
State specific trends		x					
Observations	1986	1986	1986	1986	1986	1986	1986
R-squared	0.79	0.89	0.79	0.79	0.81	0.79	0.78

Panel data regression estimates, sample period 1956-1995. Nevada is excluded from the sample. ***, ** and * respectively denote 1%, 5% and 10% levels.

Source: *Vital Statistics* of the United States. Columns 1-6 define marriage rates as number of marriages divided total population, column 7 defines marriage rate as number of marriages divided by the population older than 15 years of age.

TABLE V
 THE IMPACT OF UNILATERAL DIVORCE ON THE NUMBER OF NEVER MARRIED WOMEN
 DEPENDENT VARIABLE: FRACTION OF NEVER MARRIED WOMEN, AGE 15-44,
 CPS 1962-1999

Specification	(1)	(2)	(3)
Unilateral Divorce	-.0135*** (.0048)	-.0098*** (.0040)	-.0026 (.0052)
<i>Education and Empl. Status</i>			
Up to 12 years of schooling		-.3037*** (.0462)	
Some college		-.3129*** (.0597)	
Fraction Employed		-.1242*** (.0293)	
Fraction Unemployed		.0452 (.0817)	
Age and Race Composition		yes	Yes
Year Effects	yes	Yes	Yes
State Effects	yes	Yes	Yes
State-specific Trends	no	no	Yes
Elasticity	4%	3%	1%
Adjusted R^2	.79	.85	
Number of obs.	1564	1564	1564

Panel data regression estimates, sample period 1962-1999. Robust standard errors in parenthesis. ***, ** and * respectively denote 1%, 5% and 10% levels. Source: Fraction of never married women is calculated using the March Supplement of the Current Population Survey

TABLE VI
 THE IMPACT OF UNILATERAL DIVORCE ON FERTILITY DURING THE FIRST TWO YEARS OF MARRIAGE
 DEPENDENT VARIABLE: NUMBER OF CHILDREN EVER BORN TO WOMEN AGE 15-49,
 CENSUS 1960-1980

Specification	
Unilateral Divorce	0.064* (0.039)
White	-0.171 (0.197)
Black	0.923 (0.242)***
<i>Education and Empl. Status</i>	
Up to 12 years of schooling	0.702 (0.077)***
Some college	0.188 (0.109)*
Adjusted R^2	.29
Number of obs.	4,272

Census data 1960-1990. Women aged 15-49. All regressions control for race, state and age dummies and age*year dummy interaction. ***, ** and * respectively denote 1%, 5% and 10% levels. Standard errors are clustered at the state*year level.