Trapped in Purgatory? The Effects of Divorce Legislation on Female Welfare with Marital Separation*

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Abstract

We present new stylized facts showing that separation has been a significant outcome of American relationships over the last century and that women fare worse in separation than in divorce. To capture this phenomenon, we introduce unilateral separation into a transferable-utility model of marriage and divorce. We show that equilibrium outcomes and welfare implications of divorce legislation depend critically on recognizing separation as a relevant outcome alongside marriage and divorce. Consistent with our model's predictions, women in more economically valuable marriages initiate divorce when they anticipate a high likelihood of separation, and negative selection into separation intensifies under unilateral divorce. We also find that the adoption of unilateral divorce induced a shift from separation to divorce, particularly those from socioeconomically disadvantaged backgrounds. Using US data, we calibrate the model under a mutual-consent divorce regime and demonstrate that it replicates the observed effects of divorce liberalization on divorce and separation rates. Moreover, we find heterogeneous welfare effects for women: while some experience losses, those women whose husbands would otherwise have separated under mutual-consent rules see welfare gains under unilateral divorce. These gains are concentrated among those with lower education, who experience increases equivalent to 14–30% of their annual income. Finally, very short desertion laws, which allow a woman in a mutual-consent regime to file for divorce unilaterally after being abandoned, yield even larger welfare improvements for women overall.

Keywords: Marriage Markets, Divorce, Separation, Female Welfare, Gender Gaps.
JEL Codes: J12, J11, N32.

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1 Introduction

Over the last century, family legislation in the United States and around the world has focused on making divorce more accessible. During the 1960s and 1970s, most U.S. states shifted from a mutual-consent divorce regime (MCD)—requiring agreement from both spouses—to a unilateral divorce regime (UD), allowing one spouse to file for divorce without the other's consent. However, a paradox arises in discussions of these legal changes: while women initiate divorce more frequently, they and their children often face greater economic losses afterward (Gruber, 2004; Smock et al., 1999; Hoffman and Duncan, 1988). The sociology literature (e.g., Rosenfeld, 2018) suggests that women suffer more in unhealthy relationships and thus avoid remaining in unhappy marriages. Yet these discussions often overlook the possibility that women (and their children) may fare even worse under separation or estrangement than under formal divorce.

Separation—when a married couple is no longer together but not legally divorced—is relatively common among American couples. According to the 2010 Census, 6.3% of ever-married Americans reported being separated, which is about one-third the share who reported being divorced. Historically, separation was even more prevalent: until 1970, more individuals in U.S. Censuses reported being separated than divorced. In 1950, the median length of separation exceeded four years, indicating that it was not just a short-term status. Furthermore, although obligations for separated parents are more consistently enforced today, that was not the case in the past. As a result, children of separated parents were less likely to receive financial support from their nonresident parent than children whose parents were legally divorced.

Despite the prevalence of separation as a living arrangement among Americans, few analytical household models treat separation as a relevant outcome. Research on whether unilateral divorce has increased divorce rates (Friedberg, 1998; Wolfers, 2006) refers to a possible "pent-up" demand for divorce, but these studies focus primarily on married couples rather than on separated couples.[1] Likewise, most models that analyze the effects of divorce on intra-household bargaining (Voena, 2015) or on marital formation (Reynoso, 2024) consider only marriage and divorce. Although Lundberg and Pollak (1993) discuss the possibility of spouses defaulting to a non-cooperative bargaining arrangement within marriage rather than divorcing, they also do not consider the option of separation. Our paper aims to fill this gap in the literature, by considering separation as a relevant marital outcome, alongside divorce.

In the first part of the paper, we present novel and previously overlooked stylized facts about separation and divorce. First, we demonstrate that separation is a prevalent marital outcome in the

[1] For a more comprehensive account of how changes in divorce legislation historically affected women's welfare, see (as in Fernández and Wong, 2017).

United States. Second, we show that women initiate divorce more often than men—-even though divorce frequently leaves them economically worse off compared to marriage, which we show occurs, even after accounting for selection.

Next, we construct a unified household model of marriage and divorce that explicitly incorporates the possibility of unilateral separation. In this model, the key distinction between divorce and separation is that divorce involves court-mandated transfers between spouses, while transfers during separation occur voluntarily. Also, our model allows individual costs of separation and divorce to differ, reflecting asymmetries related to tax liabilities, access to a spouse's health insurance, and the necessity of alternative living arrangements.

We identify and characterize equilibrium outcomes under two distinct divorce regimes: mutual consent divorce (MCD) and unilateral divorce (UD). We show that under MCD, the option of separation mitigates the traditional hold-up problem since one spouse can unilaterally leave the marriage if the other refuses divorce. However, under this regime, women who would prefer marriage or divorce to separation may nonetheless become trapped in long-term estrangement if their husbands prefer separation and refuse to consent to divorce. Under unilateral divorce, however, the ability of one spouse (typically men) to use separation—or the threat of separation—to extract additional resources from the marriage is eliminated. This occurs because women now have the option to respond by filing for divorce unilaterally, which can significantly improve their welfare.

Using our model, we show that divorce liberalization—the transition from mutual consent divorce (MCD) to unilateral divorce (UD)—leads to higher divorce rates and fewer separations, but its effects on overall marital stability remain ambiguous. Moreover, our model demonstrates that the welfare consequences of shifting from MCD to UD crucially depend on whether separation is an alternative. Specifically, if unilateral separation is not an option, women who are relatively better off within marriage compared to their husbands lose from the transition to UD. However, in a world with unilateral separation, women who would otherwise have been abandoned by their husbands benefit, as men can no longer separate or credibly threaten separation to extract additional resources. Moreover, when separation is possible, the efficiency gains typically associated with divorce liberalization—stemming from the reduction of the hold-up problem—become uncertain, as new inefficiencies (akin to "over judicialization") arise. Finally, we show that desertion laws, which permit individuals abandoned by their spouses under MCD to file for divorce unilaterally, generate larger welfare gains for women.

We empirically verify the testable implications of our model. First, we show that women are more likely to file for divorce in marriages with higher economic value (such as those with children or longer duration), from which they can potentially secure greater transfers. By doing

so, they also shorten the time they spend in separation. Second, we document negative selection into separation, a pattern that worsens following the adoption of unilateral divorce (UD). Finally, leveraging the staggered adoption of UD laws across US states and over time, we confirm our model's predictions: UD legislation led to a 1 percentage-point decline in separation rates and a 2.8 percentage-point increase in divorce rates, ultimately resulting in reduced marital stability. These effects are especially pronounced among socioeconomically disadvantaged women, including those with lower education and racial minorities, as predicted by our model.

Finally, we use U.S. data to calibrate the parameters of our model to match empirical moments under MCD and the observed decline in separation rates following the adoption of UD legislation. Leveraging this calibrated model, we quantify the distributional consequences of transitioning from MCD to UD in the United States. We first show that, consistent with empirical evidence, the overall decline in separation and the corresponding increase in divorce primarily reflect changes in family arrangements among women with lower education—moments that were not directly targeted in our analysis. Regarding welfare outcomes, the average woman benefits from the transition but with heterogeneous effects: women who previously held up their husbands in marriage under MCD generally experience welfare losses under UD. Conversely, women who would have otherwise been abandoned by their spouses under MCD experience significant welfare gains following divorce liberalization. These benefits are predominantly concentrated among low-educated women, who enjoy welfare improvements equivalent to 14–30% of their annual income, depending on their spouse's characteristics. Finally, we ask whether an alternative policy could induce welfare gains for some women without generating losses for others. Simulating desertion laws within our mutual consent divorce regime, we show that this policy when the required length of desertion is short enough can be even better than UD on average, as it generates gains for those previously abandoned by their spouses, without generating losses for the women who remained married under MCD.

Overall, our findings indicate that incorporating the possibility of separation into a model of marriage and divorce modifies established results from previous literature. In our model, UD could harm lower-income or secondary-earner partners (typically wives) when separation is not an option, consistent with findings by Fernández and Wong (2017). However, we demonstrate that unilateral divorce can enhance the welfare of lower-income partners when separation is an alternative. This aligns with empirical evidence from Stevenson and Wolfers (2006), who document that divorce liberalization improved the bargaining power and outcomes for victims of domestic violence. Thus, we highlight the importance of considering separation when evaluating the welfare implications of different divorce policies.

The rest of our paper is organized as follows. Section 2 documents stylized facts about separation and divorce. Section 3 proposes a model where separation is introduced within a standard dynamic

household framework of marriage with divorce, and derives predictions from this model. Section 4 empirically tests the model's predictions, including those of the effects of divorce liberalization. We discuss the model calibration and simulate the effects of the introduction of Unilateral Divorce in Section 5. Section 6 concludes.

2 Stylized Facts

2.1 Data

We use a variety of data sources to document stylized facts on separation, as well as to test the predictions of our model. We describe them below.

First, we use US Census data to look at outcomes such as marital status and income. We mostly employ the microdata from Ruggles et al. (2021), but we also rely on published volumes of the Census. Starting in 1950, the Census includes a specific category to classify the marital status of separated individuals. However, until 1940, separated individuals were included in the 'married, spouse absent' category. Hence, in order to maintain comparability over time, we combine the 'separated' category with one labeled 'married, spouse absent' for our analysis when we need to use data prior to 1940.[2] From the Census data, we also obtain pre-marital characteristics of individuals such as literacy (which only exists in the censuses before 1930), education, and age at first marriage (which is only available in some years). We also obtain data on family income, individual wage incomes and whether the person is below the poverty threshold.

Some of our analysis requires longitudinal data to track changes in individuals' marital status. We focus on two different datasets. The first one is the Panel Study of Income Dynamics (PSID), a longitudinal survey initiated in 1968, with a nationally representative sample of over 18,000 individuals living in 5,000 families. These individuals, as well as their spouses and descendants, are followed annually between 1968 and 1997, and biannually after 1999. From this data, we measure transitions across marriage, separation, and divorce. We also use data on family income, labor supply, and transfers, as well as individual demographic characteristics.

The second longitudinal data we use is the National Longitudinal Survey of Mature Women (NLS-MW) which interviewed 5,083 women who were between the ages of 30 and 44 in 1967. The survey followed them annually or biannually from 1967 to 2003. The advantage of this survey is that

[2] While "status" is self-reported, the questionnaire in the 1950 census instructs, "If, however, the respondent raises a question as to the meaning of "separated," explain that the term refers only to those married persons who have a legal separation or who have parted because of marital discord. Those who have parted temporarily because of employment of a spouse elsewhere or because the husband is in the armed forces or for similar reasons other than marital discord, should be reported as married." Hence, this category should identify and capture couples who have not formally ended their relationship although they no longer live together because of some marital rift.

it allows us to look at cohorts who were married before unilateral divorce laws were implemented. As with the PSID, we measure transitions across marriage, separation and divorce, and obtain information on family income, labor supply, transfers, and individual's demographic characteristics. Both surveys appear to be based on self-reporting of the marital status of a couple.

Finally, in order to examine divorces in more detail, we rely on US divorce certificates. These data were compiled by the National Center for Health Statistics and they are provided by the NBER from individual state records. They include all records for states with small numbers of cases and a representative sample of records for states with larger case numbers. Our sample consists of 893,770 individual divorce decrees between 1968 and 1995. The information contained in the divorce certificates includes the month and year of marriage, its duration, the number or children under 18, the custody arrangements, the number of previous marriages, age, race, education level, and state residency of both spouses. These divorce certificates also record the time from separation to the decree, which is a key piece of information for our analysis. We use these data to quantify the duration over which couples remained separated until they officially divorced.

2.2 Stylized Facts on Divorce and Separation

In this section, we document some important facts about marital separation that have been overlooked in some way in the previous literature.

2.2.1 Separation is a Prevalent Marital Status

First, one can easily document that separation has been a nontrivial outcome of marriages in the United States since the 1950s. Table 1 shows that around 5 percent of ever-married individuals in the United States report being separated in a given Census year. Due to changes in definition over the years, this pools individuals who are married with spouse absent together with those who officially claim to be separated.[3] This corresponds to a higher fraction than those divorced for all years until 1980. When focusing only on those who officially report being separated, and examining the data through 1960, we observe that this still comprises of a larger group than those who report they are divorced. Although spousal separations have increased over time, they have not seen the same explosive trends involving divorce. When comparing men and women, we find that women have a higher probability of being separated than men starting in 1950. This is consistent with separated men moving on to new cohabiting relationships with greater frequency than women. We

[3]From 1950 on, the Census allows one to distinguish between the two categories. Over that period, about half of those reported were officially separated. However, because of the legal framework for determining someone as "separated" is unclear, we think it is still more appropriate to pool both categories even when one can distinguish between these two marital outcomes.

also find that separation is a more likely outcome for those who are non-white and for those with less education, something we shall revisit when we test our model.

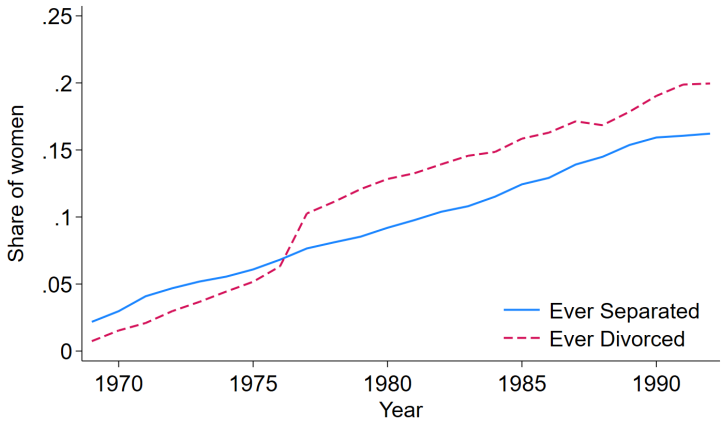
Table 1: Marital status of ever married individuals (1880-2010)

Marital status	1880	1900	1920	1940	1960	1980	2000	2010
Married, spouse present	84.45	83.12	83.17	81.19	81.93	76.78	71.81	68.77
Separated	3.76	3.93	4.39	5.58	4.83	4.54	5.51	6.27
Divorced	0.45	0.61	1.01	2.06	3.20	8.36	13.73	16.06
Widowed	11.35	12.34	11.43	11.17	10.05	10.32	8.95	8.90

Notes: US Census (1880-2010).

Even in the more recent PSID cohorts, we observe again that separation is not an uncommon outcome. Figure 1 shows that, in the earliest years of the survey, separation was even a more likely outcome than divorce. This reversed around the time of divorce liberalization, which will be the focus of our analysis. However, even after divorce became easier legally, a significant fraction of American women were still experiencing separation some time over their life-times, with this being more prevalent among less educated women (see Figure A1.)

Figure 1: Fraction of women reporting ever being separated or divorced

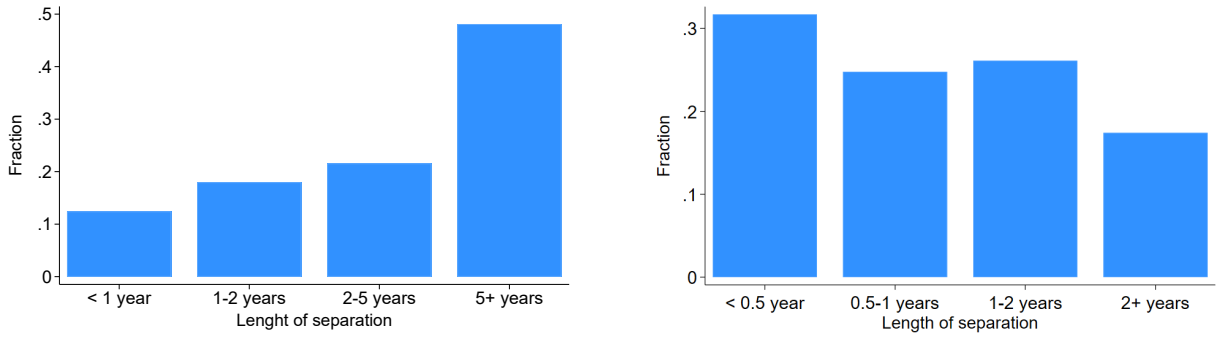


Notes: PSID (1968-1992). The figure plots women who were "ever divorced" or "ever separated" from their first marriages, independently of the final outcome of the marriage. For instance, a woman who first separated and then divorced, will be both counted as "ever separated" and "ever divorced".

It is possible that this is because divorce involves a transition period, in which case at least some of the observed levels of separation could be couples in transition to a divorce. However, the data suggest otherwise. In 1950, the Census recorded the duration of the current marital status, including the separation period. Results presented in Figure 2 show that very short separations

are relatively rare in the data. Less than 20 percent of all separated individuals in the 1950 Census reported having been so for less than a year. Almost 50 percent of all separated individuals reported having been in that status for more than 5 years. The fraction of individuals is actually increasing in the length of separation. Using data from the PSID, which includes more recent cohorts, we find that, among women who eventually divorce, 48 percent are separated for at least one survey period.[4] Moreover, 20 percent of separated women report having been so for more than two years (panel (b) of Figure 2).

Figure 2: Fraction of separated individuals by length of separation



(a) 1950 US Census

(b) PSID (1968-1992)

In the NLS-MW data, around 11% of women surveyed reported at least one period of separation during their survey period. Conditional on having ever been separated, women reported being in that status around 27% of the time they were interviewed. This suggests again that, for those cohorts, separation was neither a rare occurrence nor a short-lived arrangements.

2.2.2 Women File for Divorce with Higher Likelihood

We now document that women are more likely to be plaintiffs in divorce. To see who initiates divorce, we use NBER's dataset on US divorce records, which has data starting after 1974. As we show in Table 2, 64% of divorce procedures are initiated by women, while only 31% are done so by men (with another 5 percent of divorces being initiated by both spouses).

Table A1 in Appendix A shows that this is a generalized pattern across US states. The only states where the majority of cases are not filed by women are those where joint presentation is more frequent.

[4] This number jumps to almost 70 percent when using the full marital history.

Table 2: Plaintiff in divorce filings

Plaintiff	Fraction of filings
Husband	30.95
Wife	63.54

Notes: National Center for Health Statistics (1974-1988). Case-specific weights employed. Other answers include "both" and "other person".

2.2.3 Women Fare Worse in Separation

We have shown above that women are more likely to be plaintiffs in divorce, despite abundant evidence showing that divorce is correlated with worse outcomes than marriage for women and their children. While the literature has discussed whether these negative impacts have a causal interpretation (Painter and Levine, 2000; Bedard and Deschênes, 2005), McLanahan et al. (2013) concludes that even the strategies that are the most careful about causality find negative (albeit smaller) impacts. More recently, Frimmel et al. (2024) and Holm et al. (2023) estimate a significantly negative "divorce penalty" on children's outcomes. If women put more weight on the utility of their children than men, this would indicate that women would suffer more from divorce. There is also much evidence that the financial burden of divorce is borne mainly by women (Leopold, 2018). Gruber (2004) documents a negative impact of divorce liberalization on children and their mothers in the United States while González and Viitanen (2018) do so in Europe (for girls).[5] Finally, Fernández and Wong (2017) estimates that unilateral divorce is, on average, bad for women in terms of material welfare.

However, differences between the outcomes of separated and divorced women have received little to no attention. In this section, we document that women fare worse in separation than in divorce, which could explain why they would be more likely to file for divorce.

We start by looking at Census data and document the poverty rates of women by their marital status. As shown in Table 3, the poverty rates of men and women are the lowest for those married with spouse present. However, they are highest for separated individuals. While differences between divorced and separated men are minimal, the poverty rates among separated women are significantly higher than among divorced women.

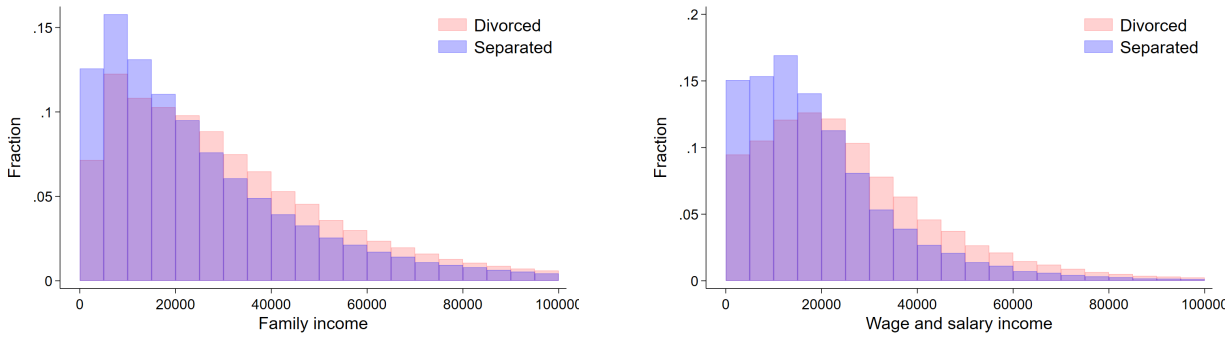
[5] Corak (2001) finds a negative impact of unilateral divorce in Canada on marriage age and marital stability but not on economic outcomes.

Table 3: Poverty rate by marital status for ever married individuals, by gender

Poverty rate	Women	Men
Married, spouse present	5.9	6.0
Separated/married, spouse absent	32.1	16.4
Divorced	20.2	14.4

Notes: Data from IPUMS Census of Population and ACS (1950-2019)

Figure 3: Distribution of female income in divorce and separation: (a) family income; (b) own wages.



Notes: Data from IPUMS. Sample includes all women aged 16+. Negative incomes were given the value of 0 and incomes above 100K were capped at 100k. All incomes and wages have been adjusted to 1999 real terms using the Consumer Price Index (CPI).

This can also be seen more throughout the income distribution. Figure 3 shows the distribution of income for women who are separated and those who are divorced. In panel (a), we present family income while in panel (b), we have wage income. We can clearly see that the distribution of family income of separated women is much more skewed to the left than that of divorced women. Moreover, panel (b) indicates that women who are separated also have lower wage earnings than those who are divorced. Therefore, these women do not seem to respond to the lack of support of their ex-partners by increasing their own wage incomes.

Although one could be worried that the differences between separated and divorced women are entirely due to differences in premarital characteristics, we show in Appendix A that separated women have $3,400 less in family income than their divorced counterparts even controlling for demographic characteristics (see Table A2). It is also telling that we do not observe a similarly marked pattern for men, with divorced and separated men having much more similar family incomes (as shown in Figure A2 and Table A2 in Appendix A).

Table 4: Separation vs. divorce: difference in female income by source, longitudinal analysis

	PSID		NSL-Mature Women		
	Taxable income	Total family income	Total family income	Wage income	Child support income
	(1)	(2)	(3)	(4)	(5)
	Panel A: Without individual level fixed-effects				
Separated	-989.53^{***}	-876.64^{***}	$-1,360.11^{***}$	$-1,910.56^{***}$	-65.78^{***}
	(179.31)	(178.67)	(381.46)	(390.12)	(21.98)
N	5,036	5,038	6,902	6,715	4,911
Year FE	Yes	Yes	Yes	Yes	Yes
Demographic Controls	Yes	Yes	Yes	Yes	Yes
	Panel B: With individual level fixed-effects				
Separated	-805.71^{***}	-676.31^{***}	$-1,047.42^{*}$	$-1,436.31^{**}$	-144.72^{**}
	(235.41)	(208.16)	(589.51)	(681.72)	(70.57)
N	5,036	5,038	6,902	6,715	4,911
Year FE	Yes	Yes	Yes	Yes	Yes
Demographic Controls	Yes	Yes	Yes	Yes	Yes

Notes: For PSID: Demographic controls include: state fixed effects, women's age, race, education attainment, presence of children in the household, age of the youngest child, and years since the end of marriage. We restrict our attention to women who are below 55 years old. Our sample consists both of the CRC and SEO samples from 1969-1997, and we include individual weights in the regressions. *'Taxable income'* includes all taxable income from the head or partner originated from earnings, assets, and net profits from farm or business. *"Total family income"* is the aggregate income of the household in which the individual resides at time t. Standard errors clustered at the state level in parentheses. *For NSL-Mature Women:*Demographic controls include: women's age, race, education attainment, number of own children of different age groups, and region of residence. *"Total family income"* is the aggregate income of the household in which the individual resides at time t (includes income of other members of the family unit). "*Wage income*" represents labor earnings of the respondent. Child support income is reported by the respondent. For both datasets, sample includes all women who are separated or divorced of their first marriage Incomes are expressed in adult equivalent scales (using the OECD scale). Since information on income is collected retroactively, we combine marital status and demographic information from period t with income data from period $t+1$. Standard errors clustered at the woman level in parenthesis. *** p<0.01, ** p<0.05, * p<0.1

Such observations indicate that, in separation, women fare worse economically than those who are divorced. However, this could still be influenced by selection, albeit with the controls for observables we included. In particular, women who remained separated may have been worse in their unobservables before separation than those who are divorced. To alleviate these concerns, we rely on our panel data from the PSID and the NLS-MW , where we can observe transitions among marriage, separation and divorce.

We start by analyzing how family incomes differ between separated and divorced women in the PSID, where we can follow women over their marital transitions. We focus on the first marriage and look at the periods when a woman describes being either separated or divorced from that same

marriage. We next compare her reported income in the periods when she is separated with those when she is divorced. The results in columns (1) and (2) of the first panel of Table 4 indicate that women in separation have on average $989 less per adult in taxable income, and $876 less in household income, relative to women who are divorced. As we report in panel B, results are consistent even after we include individual fixed effects in the regressions, with the magnitudes only slightly decreasing. This suggests that the differences highlighted in the Census are not only due to selection and that women's material wellbeing is lower in separation than in divorce.

The PSID has limited information about transfers between spouses (e.g., child support). Therefore, we turn to the NLS-MW dataset.[6] We look again at first marriages only, and contrast the outcomes of women when they report being separated and divorced, respectively. We report the results in the last four columns of Table 4. Our results indicate that women who are separated have significantly lower total family incomes than those who divorce. This is in part due to around $1,500 less in wage income but also around $100 less in child support income, as reported in column (5). Again, we find that including individual fixed effects slightly affects the magnitudes but does not alter the main qualitative conclusions. Overall, we conclude that women's economic welfare is lower in separation than in divorce, in part because they receive less transfers from their ex-spouses in that status.

3 The Model

We have thus far documented that (a) separation is not a rare occurrence; (b) women are more likely to be plaintiffs in divorce cases; and (c) women fare worse economically in separation than in divorce.

In what follows, we build a collective model of the household with transferable utility in marriage (hereafter, TUM), but non-transferable utility in divorce (hereafter, $NTUD$). The model allows for the possibility of unilateral separation, which is not regulated by state laws. We then ask if a model that includes separation alongside marriage and divorce can not only replicate the above-documented stylized facts, but also yield other insights, including why women can be the ones lobbying for and benefiting from unilateral divorce reform.

[6] We do not use data on alimony payments because even in divorce, only a small share of women report positive transfers from that source, making the results very noisy.

3.1 The Setting and Key Assumptions

The economy is made up of individuals who live for two periods. All individuals are married during the first period and there is no time discounting.

Endowments and Preferences: In each period, individuals derive utility from consumption, u^i, $i = m, f$. They are born with an idiosyncratic efficiency units of labor endowment, y for men and z for women. The endowments of men, y, are distributed over the support $[\underline{y}, \overline{y}]$ according to a distribution G_m with pdf $g_m > 0$. Similarly, the endowments of women, z, are distributed over the support $[\underline{z}, \overline{z}]$ according to the distribution G_f with pdf $g_f > 0$.

Now consider a man with an endowment of y who is matched with a woman with an endowment of z. The 'marital production' technology is given by $h(y, z)$. Thus, a couple (y, z) can generate the intratemporal output $h(y, z)$, allocated to individual utilities, u^m and u^f. We assume h to be increasing in each argument and exhibiting supermodularity in y and z.[7] Utility is fully transferable between spouses in marriage *(TUM)*, a property that drastically simplifies our analysis.[8]

If a man with an endowment of y remains single, his intratemporal output is given by $h(y, 0) \equiv y$ and if a woman with an endowment of z remains single, her intratemporal output is given by $h(0, z) \equiv z$. By h supermodularity, $h(y, z) > h(y, 0) + h(0, z) = y + z$.

At the beginning of the second period, a couple j experiences a marital quality shock, θ_j which is drawn from a uniform distribution F over $[\underline{\theta}, \overline{\theta}]$, with $\mathbb{E}(\theta) = 0$.

Second-period Choices: Marriage, Divorce, and Separation: If the marital quality shock, θ_j, is moderate, the couple j can choose to stay married in the second period. In this case, the wife's payoff will be $V_2^{fM}(y, z) = \beta^M h(y, z) + \theta_j$ while that of the husband will equal $V_2^{mM}(y, z) = (1 - \beta^M)h(y, z) + \theta_j$. The joint marital payoff of a couple who remains married in the second period will be given by:

$$V_2^M(y,\ z) = h(y, z) + 2\theta_j \tag{1}$$

However, if their marital quality shock is sufficiently negative, then the couple j can choose to divorce or separate. As we shall illustrate soon below, the couple's decision will hinge upon the rankings of their individual payoffs in each state (i.e., in marriage, separation, and divorce). In turn, those payoffs will be driven by the extent to which divorce laws redistribute family income between the spouses. Moreover, differences in the divorce regime—whether partners have to divorce by

[7] We assume that the function $h(y, z)$ satisfies the following conditions: $\forall y \in [\underline{y}, \overline{y}]$ and $\forall z \in [\underline{z}, \overline{z}]$, $h(y, z) > y + z$ with $h_y(y, z) > 1$ and $h_z(y, z) > 1$.

[8] See Chiappori, Iyigun and Weiss (2015) for a precise investigation of the transferability issue.

mutual consent or can file for divorce unilaterally—will also influence the couple's choices between separation and divorce.

Separation is costly and couples incur a cost of c in order to live separately while they are still legally married. Separation does not necessarily entail redistribution between the spouses although any couple can voluntarily agree to some related arrangement. Letting β^S denote the share of the household endowments that accrues to a wife based on the agreed upon separation arrangements, the husband and wife, respectively, get $y^S = (1-\beta^S)(y+z)$ and $z^S = \beta^S(y+z)$ in separation. They can also choose, in principle, how to share the separation cost c. Then, the joint value in period 2 for a couple that separates is given by:

$$V_2^S(y,\ z) = y + z - c \tag{2}$$

Divorce is also costly and it entails a cost of C_j for a couple j, where C_j is drawn from a distribution N with $C_j \in [\underline{C}, \bar{C}]$. As is typical, divorce occurs in the shadow of the law. Therefore, we assume that both the share of the family income, β^D, that accrues to the wife in divorce, as well as the share α of the divorce costs incurred by the wife, are dictated by divorce laws. Following this, a divorced woman will have a payoff of $V_2^{fD} = \beta^D(y+z) - \alpha C_j$, while a divorced man will receive $V_2^{mD} = \beta^D(y+z) - (1-\alpha)C_j$. Then, for the couple that divorces in the second period, the joint payoff will be given by:

$$V_2^D(y,\ z) = y + z - C_j \tag{3}$$

In what follows, we assume that, for a given couple j, $y_j > z_j$, which may reflect gender gaps in labor force participation, gender gaps in pay, or social norms, etc. (Blau and Kahn, 2017; Altonji and Blank, 1999; Goldin, 2014; Bertrand et al., 2015; Bertrand et al., 2010; Kleven et al., 2019). We further assume that, as separation is not regulated by law, separated couples default to their singles' endowments, namely that $y^S = y$ and $z^S = z$. We let the cost of separation be borne by each spouse equally (i.e., both the husband and the wife incur a cost of $c/2$ at separation, independently of who initiates it). Finally, we assume that divorce laws are more redistributive than the allocations that materialize in separation. Consequently, we have not only divorce allocations that are more favorable to the wives (i.e., $\beta^D(y+z) > z$ and $(1-\beta^D)(y+z) < y$), but also due to which husbands are mandated to cover a larger burden of the cost of divorce (i.e., $\alpha < 1/2$).[9] This assumption is based on the facts we documented earlier according to which women appear to have lower incomes

[9]While our choice of $c/2$ as the share of women's separation cost is somewhat arbitrary, the essential feature involves women bearing a relatively lower share of the cost of divorce than the cost of separation. In particular, the qualitative nature of the key results we present below would remain intact as long as the cost of separation borne by women is at least equal to α. That is, our results would still go through in their entirety as long as women's separation cost is in the interval $(\alpha c, c]$.

when they are separated than divorced.

3.2 Determinants of Individual Choices

As discussed in Section 3.1, a couple's decision in the second period will depend on their realization of the marital shock, θ_j, and their couple-specific cost of divorce C_j.

In this section, we will define the individual decision-making problem, as well as the thresholds of θ_j that determine the rank orders amongst marriage, divorce and separation. Then, in subsection 3.4, we will characterize the optimal choices under different scenarios.

Separation vs. Marriage: As we already noted, separation is always a unilateral decision, which does not require spousal consent. Therefore, one or both partners will want to separate rather than stay married if the realized θ_j is such that the payoffs they receive in separation is higher than their payoffs in marriage:

$$\theta_j < \max\{z - \beta^M h(y,z), \quad y - (1-\beta^M)h(y,z)\} - \frac{c}{2} \quad \text{and} \quad y, z \geq c \tag{4}$$

Given the initial marital allocation, β^M, it is possible that one of the partners would prefer to separate upon observing the marital shock, while the other would like to remain married. In this case, the couple would renegotiate the marital allocation, in the spirit of Voena (2015). The partner who prefers to stay married will transfer resources to the partner for whom the participation constraint becomes binding, in order to convince them to stay in the marriage. The marriage will be sustained for values of β_j^M that satisfy:

$$\frac{z - c/2 - \theta_j}{h(y,z)} \quad \leq \quad \beta_j^M \quad \leq \quad \frac{h(y,z) - y + c/2 + \theta_j}{h(y,z)} \tag{5}$$

However, renegotiation would not be feasible when no β_j^M exists within the range defined by (5). This would occur for realizations of $\theta_j < \theta^S$:

$$\theta^S \equiv \frac{y + z - h(y,z) - c}{2} \tag{6}$$

Turning now to the couple's divorce decision vis-a-vis marriage, we entertain two scenarios: a *mutual consent divorce regime*—in which the consent of both spouses is required for divorce—and a *unilateral divorce regime*—under which one partner has the right to file for divorce regardless of the consent of their spouse.

Divorce vs. Marriage under Mutual Consent Laws: Under mutual consent divorce

laws, couples can only divorce when both partners agree to it. Therefore, divorce would occur for realizations of θ_j such that:

$$\begin{aligned}\theta_j < \min\{&\beta^D(y+z) - \beta^M h(y,z) - \alpha C_j, \\ &(1-\beta^D)(y+z) - (1-\beta^M)h(y,z) - (1-\alpha)C_j)\}, \quad y,z \geq C_j\end{aligned} \tag{7}$$

Note that since divorce requires mutual consent, no renegotiation will take place and the marriage will continue if one of the spouses wants to divorce but the other one prefers to remain married. We further assume that, due to the inherent issue of time consistency and given that divorce allocations are dictated by the law, the spouse who would like to divorce cannot credibly promise to compensate their spouse in order for the latter to agree to divorce.[10]

No partner will hold-up the marriage when the two terms on the right-hand-side of (7) coincide. By setting β^M such that the arguments on the right hand side of (7) are identical in value, one can derive the threshold intra-marital allocations of the wife, $\overline{\beta^M}_j$, with which sufficiently bad marital shocks would generate an agreement to divorce by both spouses:

$$\overline{\beta^M}_j = 0.5 + \frac{(2\beta^D - 1)(y+z) + (1-2\alpha)C_j}{2h(y,z)}. \tag{8}$$

The husband would be the one holding up a divorce when marital allocations are favorable to him, such that $\beta^M < \overline{\beta^M}_j$. The wife will hold up the divorce when $\beta^M > \overline{\beta^M}_j$. Since the RHS of (8) is strictly increasing in the cost of divorce C_j, the range of wives' marital allocations with which he would hold up a divorce decision would also rise with C_j.

We must also consider the possibility that separation could be used as a threat (since divorce cannot be employed for that purpose when mutual-consent divorce laws are in effect). Whether this happens depends on how the marital output is allocated and on the divorce costs.

Specifically, when marital allocations are relatively favorable to men, such that

$$\beta^M < \widehat{\beta^M}_j \equiv 0.5 + \frac{z - (1-\beta^D)(y+z) + (1-\alpha)C_j - c/2}{2h(y,z)} \tag{9}$$

women would wish to separate before their husbands would agree to divorce.

By contrast, when marital allocations are more favorable to women, namely when

$$\beta^M > \widetilde{\beta^M_j} \equiv 0.5 + \frac{\beta^D(y+z) - y - \alpha C_j + c/2}{2h(y,z)} \tag{10}$$

[10] Of course, such commitment problems could be overcome through upfront payments from the spouse who would like to divorce to their partner. In the context of our analysis, however, we assume those payments away due to, for instance, binding credit constraints.

men would want to separate before their wives would want to divorce.

Thus, whenever marital allocations are biased towards one partner such that the other wants to separate, they will engage in renegotiation in favor of the partner who wants to leave, until there is no more surplus left to redistribute.

In the case when the husband wishes to separate first, the range of β_j^M under which these marriages can be sustained is given by

$$\frac{\beta^D(y+z) - \alpha C_j - \theta_j}{h(y,z)} \leq \beta^M \leq \frac{h(y,z) - y + c/2 + \theta_j}{h(y,z)}.$$

However, the wife will prefer to grant the divorce than to continue to renegotiate in marriage whenever:

$$\theta_j < \frac{\beta^D(y+z) + y - h(y,z) - \alpha C_j - c/2}{2} \tag{11}$$

A similar argument can be made in the case where the wife is so unhappy in marriage that she threatens with separation. The husband would be willing to renegotiate until there is no more surplus left or when

$$\theta_j < \frac{(1-\beta^D)(y+z) + z - h(y,z) - (1-\alpha)C_j - c/2}{2} \tag{12}$$

Putting all these together, in a mutual consent divorce regime, divorce would be chosen by the couple over marriage whenever

$$\theta_j < \theta^{MCD} \equiv \begin{cases} 0.5\left((1-\beta^D)(y+z) + z - h(y,z) - (1-\alpha)C_j - \frac{c}{2}\right) & \text{if } \beta^M < \widehat{\beta_j^M} \\ (1-\beta^D)(y+z) - (1-\beta^M)h(y,z) - (1-\alpha)C_j & \text{if } \widehat{\beta_j^M} < \beta^M < \overline{\beta_j^M} \\ \beta^D(y+z) - \beta^M h(y,z) - \alpha C_j & \text{if } \overline{\beta_j^M} < \beta^M < \widecheck{\beta_j^M} \\ 0.5\left(\beta^D(y+z) + y - h(y,z) - \alpha C_j - \frac{c}{2}\right) & \text{if } \widecheck{\beta_j^M} < \beta^M \end{cases} \tag{13}$$

Divorce vs. Marriage under Unilateral Divorce Laws: When couples can divorce unilaterally, a couple would prefer divorce over marriage when:

$$\begin{aligned} \theta_j < \max\{&\beta^D(y+z) - \beta^M h(y,z) - \alpha C_j, \\ &(1-\beta)^D(y+z) - (1-\beta^M)h(y,z) - (1-\alpha)C_j) \quad y,z \geq C_j\} \end{aligned} \tag{14}$$

As in the case of separation, we can define the range of potential values of β_j^M that would

sustain the marriage given the realization of θ_j:

$$\frac{\beta^D(y+z) - \alpha C_j - \theta_j}{h(y,z)} \quad \leq \quad \beta_j^M \quad \leq \quad \frac{h(y,z) - (1-\beta^D)(y+z) + (1-\alpha)C_j + \theta_j}{h(y,z)} \tag{15}$$

Again, renegotiation would be unfeasible if the range defined by (15) is empty, which occurs for realizations of θ_j below θ_j^{UD}:

$$\theta_j^{UD} \equiv \frac{y + z - h(y,z) - C_j}{2} \tag{16}$$

Divorce vs. Separation: The assumptions we made imply that, for a couple j, the wife will be worse off in separation than the husband, since $y - \frac{c}{2} \quad > \quad z - \frac{c}{2}$. Moreover, women would be worse off in separation than in divorce vis-a-vis men. This is due to the fact that, based on our assumptions, divorce laws redistribute in favor of the lower-income spouse:

$$\beta^D(y+z) - z - \alpha C_j \; + \; \frac{c}{2} \quad > \quad (1-\beta^D)(y+z) - y - (1-\alpha)C_j \; + \; \frac{c}{2} \tag{17}$$

Whether partners will prefer to divorce or separate will depend on the cost of separation versus that of divorce. First, if the husband prefers divorce over separation, then his wife would also do so given equation (17). For this scenario to unfold, the cost of divorce would need to be relatively low. Specifically,

$$\frac{(1-\beta^D)(y+z) - y + \frac{c}{2}}{1-\alpha} \equiv C^L > C_j \tag{18}$$

Since men have higher incomes in separation than in divorce ($y > (1-\beta^D)(y+z)$) and they must pay more than half of the cost of divorce ($1-\alpha > 1/2$), this implies that $c > C^L$.

Second, both partners may prefer separation to divorce, which occurs when the cost of divorce is relatively high:

$$\frac{\beta^D(y+z) - z + \frac{c}{2}}{\alpha} \equiv C^H < C_j \tag{19}$$

Since women have higher incomes in divorce than in separation ($\beta^D(y+z) > z$) and they pay less than half of the divorce costs ($\alpha < 1/2$), this implies that $c < C^H$. Combining both, we obtain that $C^L < C^H$.

Finally, it could be the case that the wife would prefer to divorce rather than separate, whereas the husband would like to separate rather than get divorced. This would occur when C_j is relatively moderate:

$$C^H > \quad C_j \quad > C^L \tag{20}$$

In what follows, we will organize our analysis based on these three potential cases.[11]

3.3 Efficient Decisions

Consider a social planner who decides for the couples once their marital shocks materialize.[12] Such a social planner would always pick divorce over separation when $C_j < c$ and vice-versa. Marriages would be sustained up to the point there is no surplus compared to the second-best alternative (separation or divorce). This, in turn, would imply that couples would remain married provided that $\theta_j > \theta^S$ whenever $c < C_j$, and $\theta_j < \theta_j^{UD}$ when $C_j > c$.

If separation were not an option, it is easy to show that unilateral divorce will generate efficient decisions as individuals will renegotiate in marriage until they exhaust all of the surplus. Only then, would they divorce. On the other hand, inefficient marriages could sustain under mutual consent laws, as has been already highlighted and documented by the literature (Reynoso, 2024; Voena, 2015).

However, the fact that separation and divorce coexist generates additional sources of inefficiencies that have neither been identified nor explored before. Because separation and divorce are decisions that spouses can take individually and unilaterally, divorce may arise as the equilibrium even when the couple's joint payoff is greater in separation than in divorce (and vice-versa). This is on account of the fact that, while utility is transferable *within* marriage, partners cannot transfer utility in separation or divorce. Moreover, this can also impact the decision to remain married. If a partner threatens with unilateral divorce when separation is efficient (i.e., produces a higher joint payoff than divorce), marriages with a joint payoff below that of separation but above that of divorce will survive. If only separation or divorce were available unilaterally but not simultaneously, this lack of transferability would not generate inefficiencies since marriages would be sustained until they become inefficient.

3.4 Equilibria

Upon observing the realization of their match quality shock θ_j at the beginning of the second period, a couple would decide to stay married, separate, or divorce. Based on the assumptions we laid out previously, any given couple j's optimal choices can be classified and analyzed under one of three cases we outlined in Section 3.2, depending on whether the cost of divorce relative to that of separation is (i) high, (ii) low or (iii) moderate. Moreover, we will analyze these three cases under

[11] Our assumptions allow us to rule out another case in which the wife prefers separation to divorce, while the husband is better off in divorce than in separation (i.e., we shall not consider the case in which (17) is reversed).

[12] Note that such a social planner would focus on maximizing the total welfare of both spouses and not on their individual welfare. Regardless of their marital status, they would determine Pareto efficient transfers between spouses.

two different divorce-law regimes: mutual consent divorce (Section 3.4.1), and unilateral divorce (Section 3.4.2). Then, in Section 3.5, we shall discuss the implications of a transition from a mutual consent to a unilateral divorce regime, along with other testable implications of our model. In the main body of the paper, we present the propositions and offer some intuitions. The full proofs of the propositions can be found in Appendix B.

3.4.1 Outcomes under Mutual Consent Divorce Laws

Proposition 1 *Under a mutual consent divorce regime, the equilibrium will be such that:*

(a) Couples who would divorce are those for whom $C_j < C^L$ and $\theta_j < \theta^{MCD}$. Couples who would separate are those for whom $\theta_j < \theta^S$ and $C_j \geq C^L$. All other couples will remain married.

(b) There will be inefficiently high number of separations, as well as marriages.

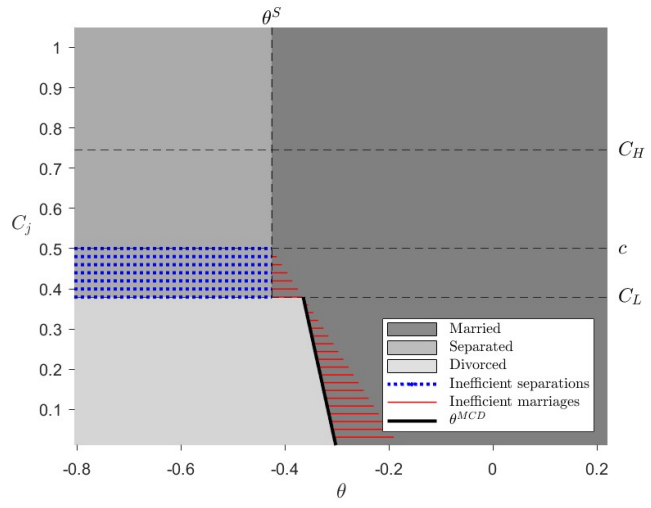
(c) It is unclear whether couples higher in the assortative (income) rank will be more likely to be divorced or separated. However, couples that face a smaller gender gap will be less likely to be separated than married.

Proof. *See Appendix B.* ■

To offer some intuition, note that a couple would divorce under the mutual consent regime if both spouses agree that divorce is their highest ranked option (over remaining married and being separated). It is well documented (Voena, 2015; Reynoso, 2024) that mutual-consent divorce laws could trigger a hold-up problem, whereby a spouse does not consent to divorce despite the fact that their partner desires to do so. All such marriages would remain intact although they would be inefficient in a Pareto sense. However, when one embeds the possibility of separation as we do here, there are two other possible and novel cases which affect the equilibrium outcomes.

First, the threat of a hold-up and its impact become weaker because a spouse who would like to divorce and who is being held-up by their partner could always abandon their spouse and separate. This, in turn, allows such a spouse to use separation as a threat to renegotiate the marital terms in their favor. When such a renegotiation unfolds due to the threat of separation, partners who are being subject to a hold-up would either extract more beneficial marital terms or they would successfully get their spouse to consent to a divorce. Renegotiation would carry on up to the point where there is no surplus left to distribute in marriage compared to divorce, at which point divorce would become the highest-ranked option for both spouses. This is more likely to occur when the initial marital allocation is more unequal. Second, there must be couples among whom divorce is

Figure 4: Outcomes under mutual consent, according to C_j and θ



Notes: The figure presents the results of simulations in which we set the model's parameters to $\beta^M = 0.5$, $y = 0.85$ $z = 0.5y$, $c = 0.5$, $\alpha = \beta^D = 0.33$ and $h(y, z) = (y + z)^2$.

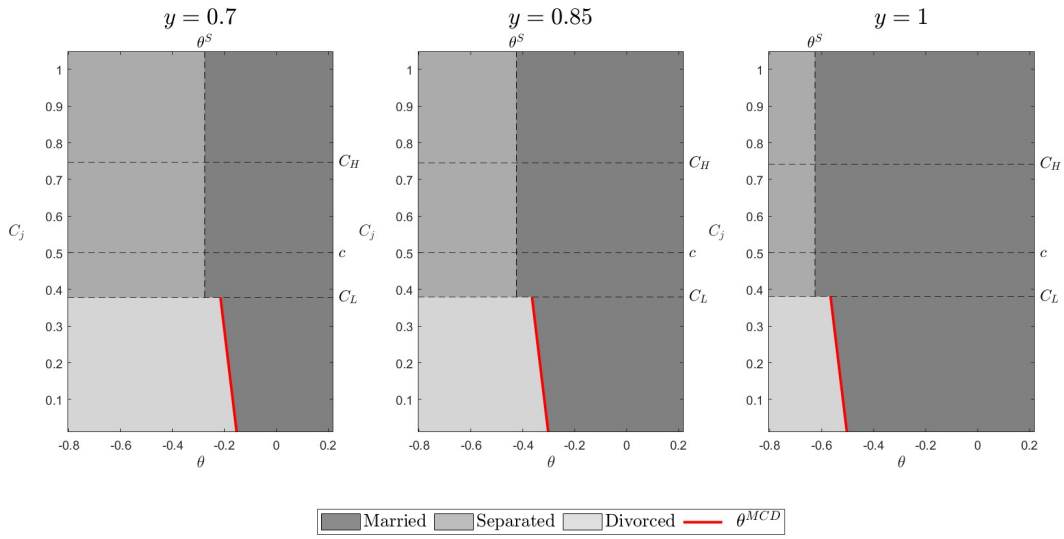
preferred to separation by one partner but not by the other. These couples would never jointly agree to divorce, and since a spouse can individually decide to separate, their partner will be condemned to separation, an equilibrium outcome that is dominated by divorce for the latter.

We simulate our model to further illustrate the results of Proposition 1.[13] In our simulations, we set the parameters to $\beta^M = 0.5$, $y = 0.85$, $z = 0.5y$, $c = 0.5$, $\alpha = \beta^D = 0.33$, and $h(y, z) = (y+z)^2$. Figure 4 shows the regions in the space (θ, C_j) where each outcome (marriage, divorce, and separation) is realized. We observe that divorce is restricted to couples for whom divorce costs are relatively low and match-quality shocks are relatively bad. For those with relatively high divorce costs, separation is the outcome for low marital quality shocks. Marriage is the outcome for those with higher θs irrespective of C_j.

In Figure 4, we also show the zones of inefficient marriages and separations (those couples represented by the dashed areas). These are essentially couples for whom divorce cost is low but the marital match quality shocks, θ, is moderate. Under mutual consent divorce, these represent marriages and separations that are not efficient, as they produce a joint surplus lower than the value of divorce. However, as divorce requires mutual consent from both partners and utility is not transferable in divorce and separation, partners can make inefficient decisions unilaterally. First, there are couples with $c > C_j > C^L$ and $\theta < \theta^S$ for whom divorce is efficient but they instead

[13] Note that the descriptive nature of the equilibrium will remain intact for all parameter values. Hence, the figure will be of the same form irrespective of the parameters selected, although the size of each area will vary. This is on account of the fact that, as we show in part (b) of the proof to Proposition 1, $\theta^S < \theta^{MCD} < \theta^{UD}$

Figure 5: Outcomes under mutual consent, by income level



Notes: The figure presents the results of simulations in which, in all panels, we set the model's parameters to $\beta^M = 0.5$, $z = 0.5y$, $c = 0.5$, $\alpha = \beta^D = 0.33$ and $h(y, z) = (y + z)^2$. We vary y across panels, as indicated on the panel title.

choose to separate, as the husband can do so unilaterally and the wife cannot use divorce as a threat. These are couples in the blue-dotted rectangle of the figure. Second, there are inefficient marriages in the lower red-dotted triangle $\theta^{MCD} < \theta < \theta^{UD}$ and $C_j < C^L$. These couples should be divorced, but the typical hold-up problem occurs, with one of the partners not agreeing to grant the other the divorce. Finally, for the couples in the upper red-dotted triangle, the husband threatens to separate but the wife prefers to renegotiate and remain married. Divorce cannot be agreed upon as the the husband always prefers to separate unilaterally rather than consenting to divorce, even when $\theta < \theta^{UD}$. As $\theta^S < \theta < \theta^{UD}$, they remain married instead.

In Figure 5, we replicate the simulation in Figure 4 for three other levels of spousal incomes. As shown, the divorce rate falls and marriages become more likely to be sustained as household incomes rise. For separation, while the cut-off C_L above which couples separate falls, leading to more separation, the threshold θ over which separations occur also falls, leading to fewer separations. Which effect dominates depends on the distribution of couples in the graph.[14]

3.4.2 Outcomes under Unilateral Divorce Laws

Proposition 2 *If divorce is granted unilaterally, the equilibrium will be such that*

[14]Note that, under the parameters specified in Figure 5, changes in income have a negligible effect on the vertical cutoff, C_L, as a consequence of which changes in θ^S, for the most part, drive changes in separation.

(a) *Couples for whom* $\theta_j < \theta_j^{UD}$ *and* $C_j < C^H$ *will divorce. Couples for whom* $\theta_j < \theta^S$ *and* $C_j \geq C^H$ *will separate. Everyone else will remain married.*

(b) *There will be inefficiently high numbers of divorces as well as marriages.*

(c) *Couples higher in the assortative (income) rank will be more likely to be married than separated but not necessarily divorced. A larger gender wage gap will increase the probability of divorce.*

Proof. See Appendix B. ■

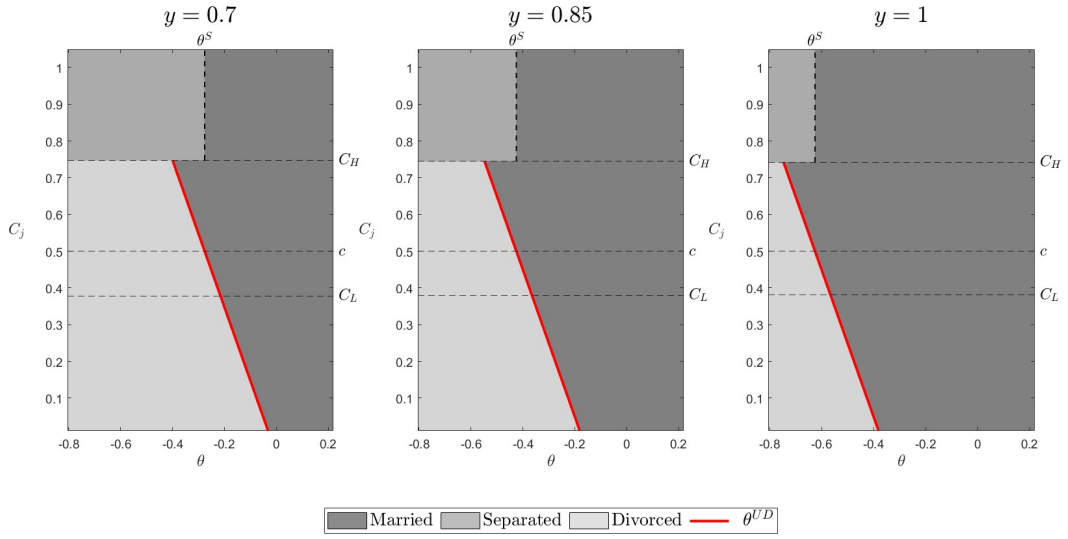
Recall that, when mutual-consent divorce laws are in effect and separation is an option, the threat of a hold-up and its impact on equilibria are weaker because a spouse who would like to divorce could always and unilaterally separate from their spouse. Then, as we highlighted above, a partner can improve their intra-marital welfare or convince their spouse to divorce by using separation as a counter-threat.

As Proposition 2 establishes, however, the threat of separation would not impact outcomes and equilibria when unilateral divorce laws are in effect. In particular, unilateral divorce laws eliminate the effects of spousal hold-up on the sustenance and efficiency of marriages along the lines we established in Proposition 1. As a consequence, the threat of separation could not be used as a counter-threat against a potential hold-up when unilateral divorce laws are in effect. Moreover, a partner who ranks separation over divorce cannot use separation as a credible threat to renegotiate the marital terms in their favor, as the other spouse can always file for divorce unilaterally. Finally, separation cannot be sustained, unless both partners agree to it.

To illustrate the impact of unilateral divorce laws on equilibrium outcomes, we use the same parameters as in the case of mutual consent divorce above, and simulate the model under unilateral divorce. We show in Figure 6 how couples make different decisions in the space (C_j, θ_j). Married couples are those whose match-quality shock is not too negative. Separation is now restricted to couples with very high divorce costs, and for whom both partners rank separation over divorce. Divorce is the option for all couples with low enough match-quality shocks and with divorce costs below C^H.

In the same graph, we also emphasize the regions where inefficiencies occur. When $C^H > C_j > c$, we will have inefficient divorces and marriages when the efficient outcome will be separation. First, there are couples for whom $\theta < \theta^{UD}$. These couples will select divorce over separation even when $C_j > c$. This is because since the wife prefers divorce to separation and cannot be compensated by her ex-husband (since utility is not transferable in separation or divorce), she will always initiate divorce if separation is the alternative. Additionally, couples with $\theta^{UD} < \theta < \theta^S$ will now remain

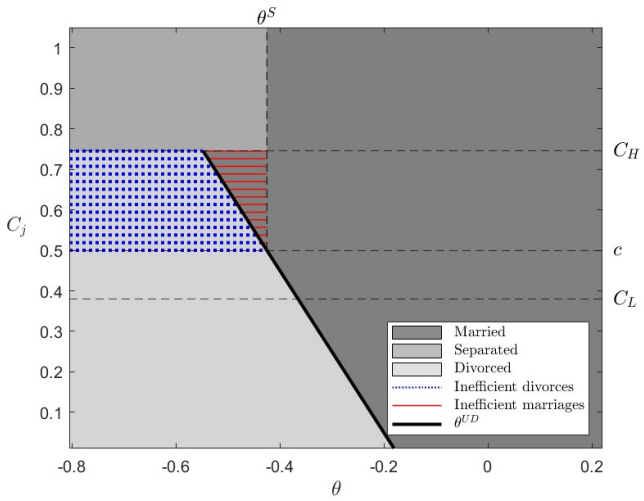
Figure 7: Outcomes under unilateral divorce, by income level (y)



Notes: The figure presents the results of simulations in which, in all panels, we set the model's parameters to $\beta^M = 0.5$, $z = 0.5y$, $c = 0.5$, $\alpha = \beta^D = 0.33$ and $h(y, z) = (y + z)^2$. We vary y across panels, as indicated on the panel title.

married instead of separating, since as soon as the husbands threatens to separate, the wife will respond by filing for divorce.

Figure 6: Outcomes under unilateral divorce, according to C_j and θ



Notes: The figure presents the results of simulations in which we set the model's parameters to $\beta^M = 0.5$, $y = 0.85$ $z = 0.5y$, $c = 0.5$, $\alpha = \beta^D = 0.33$, and $h(y, z) = (y + z)^2$.

Finally, in Figure 7, we show graphically the impact of an increase in income rank of each couple.

We see that couples separate less when they have higher incomes, as an increase in income reduces θ^S and pushes it to the left. The impact on divorce is more ambiguous since the threshold θ^{UD} falls, while the threshold of C_j increases. Which effect dominates will depend on the distributions of C_j and θ in the population.[15]

3.5 The Transition from Mutual Consent to Unilateral Divorce: Implications of Separation

Having described the equilibrium arising under both types of divorce regimes, we now turn to deriving some testable implications of our model, as well as the effects of a transition from a mutual-consent to an unilateral divorce regime.

We first investigate, theoretically, the effects of the transition from MCD to UD, in a world in which separation is not a possibility.

Proposition 3 *If separation were not an option, the transition from a mutual consent to a unilateral divorce regime would lead to: (a) an increase in the divorce rate; (b) a reduction in the marriage rate; (c) lower welfare for women in terms of their individual payoffs when* $\beta^M > \overline{\beta_j^M}$*; (d) an increase in efficiency, and; (e) a larger increase in divorce rates among couples with a higher income rank* y*.*

Proof. See Appendix B. ■

Regarding the transition from MCD to UD in a world without separation, the standard analysis in the literature applies. Unilateral divorce will eliminate the hold-up problem, as spouses will be able to divorce without the consent of their partners. Therefore, under a UD regime, divorce will increase (since $\theta^{UD} > \theta^{MCD}$) and the share of couples that remain married will decrease, as we show in Figure A3 (left panel) in Appendix C. All inefficient marriages will end in divorce under unilateral divorce, and so, the change in regime will improve efficiency. In a scenario in which $\beta_j^M > \overline{\beta_j^M}$, women's welfare will deteriorate with the transition to unilateral divorce, as shown in Figure A3 (right panel) in the Appendix C.

However, Proposition 4 shows, in our model, the effects of the transition from MCD to UD change when we consider the possibility of unilateral separation, even in a MCD regime.

Proposition 4 *Allowing for separation, the transition from a mutual consent to a unilateral divorce regime would lead to: (a) an increase in the divorce rate and a fall in the separation rate; (b) an*

[15] As discussed above, the effect of changes in y on the threshold levels C_L and C_H is very small under our parameterization and, thus, changes in the divorce rate are driven by the shift in the θ^{UD} threshold.

uncertain impact on the likelihood of remaining married; (c) an uncertain impact on women's welfare as measured by their individual payoffs, even when their marital allocations are relatively favorable such that $\beta^M > \overline{\beta_j^M}$*; (d) an ambiguous effect on efficiency, and; (e) a larger decrease in separation among couples with lower income rank, y—as long as* C^H *and* C^L *respond less than* θ^S *to variations in income—and potentially a higher increase in divorce for those as well.*

Proof. See Appendix B. ■

We illustrate these effects in Figure 8. First, the left panel compares Figures 4 and 6 and shows how separation, divorce, and marriage change in the transition from *MCD* to *UD*. Clearly, there are more divorces and less separations after unilateral divorce is implemented. This is due to the fact that couples with $C^L < C_j < C^H$, who separate under *MCD*, instead get divorced under *UD*. This occurs because, under *UD*, the husband cannot unilaterally separate, since the wife will unilaterally file for divorce (which is her preferred option in this range). However, the impact on marriage in this range of divorce costs is ambiguous. On the one hand, some couples that (inefficiently) stayed together under mutual-consent divorce laws would now divorce, shown by the shift to the right of θ^{UD} (Figure 6) relative to θ^{MCD} (Figure 4). Moreover, some of the couples in which one partner prefers separation over divorce who stayed together when separation was too costly (as for them, $C_j < c$), may now divorce under UD—as their marital shocks are below θ^{UD} in Figure 6, but were aboveθ^S in Figure 4. On the other hand, some couples who used to separate under *MCD*—because it was the preferred choice of one partner but not the other—will now stay married. This occurs because, as discussed above, separation is no longer a credible threat under the unilateral divorce regime, and a transition to it will immediately trigger the other partner filing for divorce. These are couples for whom divorce is relatively expensive (with $C_j > c$). While the marital shocks were below θ^S in Figure 4 for such couples, they are not below θ^{UD} in Figure 6. Thus, the total impact on marriage rates will depend on which of these effects dominates.

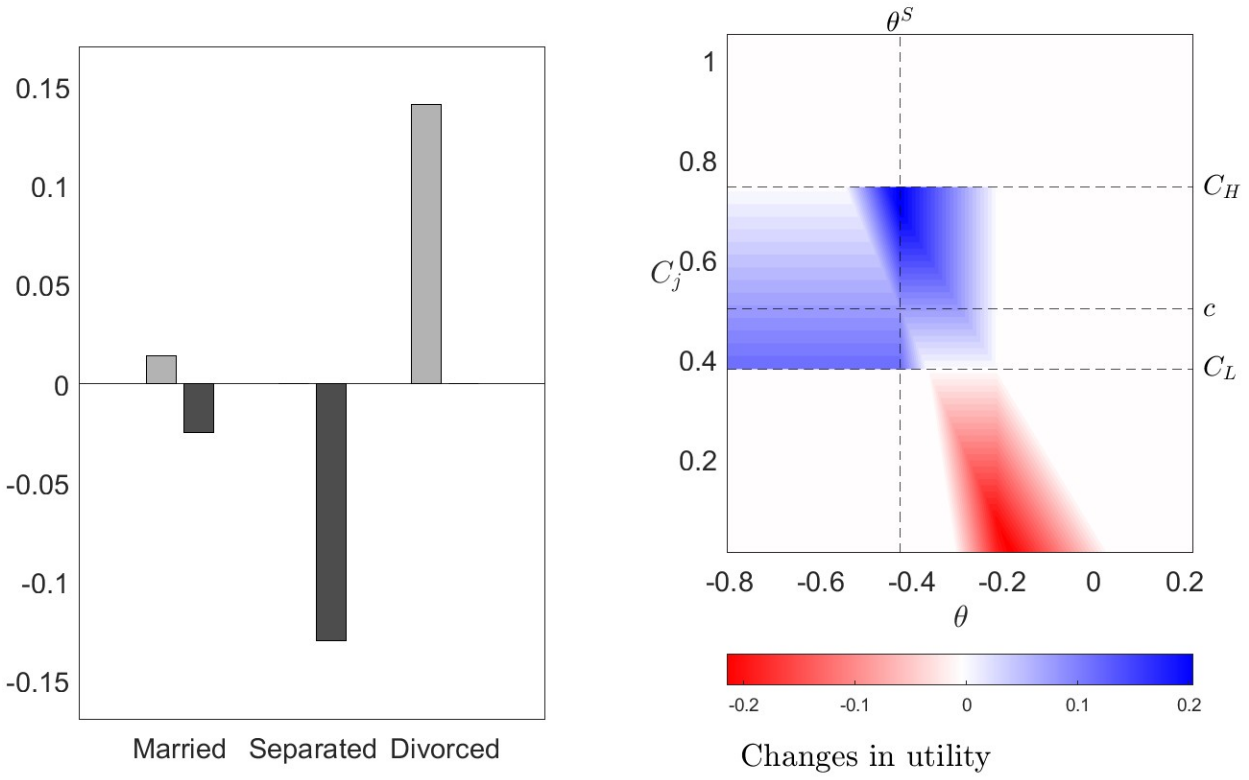
Second, the right panel of Figure 8 shows the impact of the transition from mutual consent to unilateral divorce on women's welfare, over the space (θ, C_j). Our results show that, for couples among whom $C_j < C^L$, women experience welfare losses (in our example, those in the range of $\beta^M > \overline{\beta_j^M}$)—represented by the red region. With the transition to unilateral divorce, these couples renegotiate their marital terms in favor of men, as women cannot continue holding up marriages that are not beneficial for their husbands. However, women in couples with $C^L < C_j < C^H$ will be better off, as shown by the utility gains in the blue region. This occurs because all such women who were separated in mutual consent divorce because it was their husband's preferred choice, now are able to file for divorce unilaterally.

Overall, our model implies that whether women benefit from the transition from MCD to UD

would greatly depend on the distribution of divorce costs across the population of couples. Women in couples with low divorce costs are likely to suffer welfare losses (when the marital allocation are in their favor), while those in couples with moderate divorce costs are likely to be better off.

Regarding efficiency, we have already discussed that none of the relevant regimes on which we focus is fully efficient. Mutual-consent divorce laws produce too many separations, while unilateral divorce laws lead to too many divorces vis-a-vis the Pareto efficient case. Both regimes also lead to inefficient marriages. Whether the transition of mutual consent to unilateral divorce improves and hinders efficiency depends on the distribution of couples in the (θ, C_j, y) space.

Figure 8: The effect of the transition from *MCD* to *UD* on equilibrium outcomes: marital status (left panel) and female welfare (right panel)



Notes: The figure presents the results of simulations in which we set the model's parameters to $\beta^M = 0.5$, $y = 0.85$ $z = 0.5y$, $c = 0.5$, $\alpha = \beta^D = 0.33$ and $h(y, z) = (y + z)^2$. The left panel shows the changes in marital status in the transition from mutual consent to unilateral divorce. Note that for changes in marriage rate, we separately display the increase in marital stability for couples that used to separate but remain married in UD, and the decline in marital stability for couples that inefficiently stayed together. Under this value of parameters, the net effect is negative. The right panel displays the change in female welfare in UD relative to MCD. Blue(red) represents female welfare gains (losses), with a darker tone associated with higher gains (losses).

Finally, while without separation, a move to UD would lead to higher income-rank couples to

divorce because those were more likely to face a hold-up problem, this is much less clear once separation is added. That is because divorces increase not just because of the elimination of the hold-up problem but also because of the substitution between separation and divorce. Since these separations occurred more in low-income rank couples, the reduction in separation will be larger for that group, possibly increasing divorce more for that group as well.

We finally use our model to establish how, when separation is an option, even those partners who prefer marriage to divorce may file for divorce.

Proposition 5 *When separation is not an option, no spouse would file for divorce if they are better off in marriage than in divorce. However, when separation is an option and unilateral divorce laws are in effect, a spouse whose welfare is lower in divorce than in marriage may still file for divorce.*

Proof. See Appendix B. ■

It suffices to note here that when a spouse cannot be subject to the threat of separation, then they would always choose to stay married if doing so yields them higher welfare than in divorce. However, if a spouse could be subject to estrangement in a world of unilateral divorce, then they may be better off in divorce than in separation. In such cases, a spouse would file for divorce when they are subject to the threat of separation even though they may be strictly better off in marriage. This speaks to the puzzle existing in the literature, were women file for divorce under UD even when they are the ones suffering more from it.

The formal proofs of propositions 3, 4 and 5 can be found in Appendix B. We empirically test these model predictions in Section 4. Before doing so, however, we investigate in Section 3.6 whether, even under MCD, there is an alternative policy that could be welfare improving for women.

3.6 A better policy than UD for women's welfare? Desertion Laws

As discussed in Section 3.5, the transition from mutual consent to unilateral divorce has an ambiguous effects on female welfare when separation is an option. Even in cases in which there are aggregate welfare gains from this transition, we showed in Figure 8 that for women in couples with $C_j < C_L$, the adoption of UD is associated with welfare losses, as they husbands can now unilaterally divorce. For couples with $C_L < C_j < C_H$, women win from the adoption of UD, as now they can always file for divorce unilaterally if their husbands threaten with or initiate separation.

Is there a different policy that could replicate the welfare gains for these women without generating welfare losses for the women below C_L? We show now that, in the presence of separation,

desertion laws that allow an individual to unilaterally divorce after being abandoned by their spouse could generate these results if the desertion period is short enough.

To implement desertion laws in our model, we allow for the possibility that, when one of the spouses *abandons* the marriage unilaterally and remains separated for a t^S fraction of period 2, the *other* spouse becomes eligible to unilaterally file for divorce.

Under this scenario, the second period utility, V_2^{iSD} for $i \in \{m, f\}$ will be given by:

$$V_2^{mSD} = \underbrace{t^S\left[y - 0.5c\right]}_{\text{Value in Separation}} + \underbrace{(1-t^S)\left[(1-\beta^D)(y+z) - (1-\alpha)C_j\right]}_{\text{Value in Divorce}} \tag{21}$$

for men, and

$$V_2^{fSD} = \underbrace{t^S\left[z - 0.5c\right]}_{\text{Value in Separation}} + \underbrace{(1-t^S)\left[\beta^D(y+z) - \alpha C_j\right]}_{\text{Value in Divorce}} \tag{22}$$

for women, respectively. As reflected in (21) and (22), we make the assumption that spouses pay separation and divorce costs as before, but proportionally to the length of the second period they spend in each state (i.e., estranged versus divorced).

In Proposition 6 we explore, theoretically, how desertion laws affect the equilibrium outcomes under *MCD*.[16]

Proposition 6 *Under a mutual consent divorce regime, desertion laws will lead to: (a) an increase in the rate of divorce relative to separation; (b) an ambiguous impact on the probability of marriages remaining intact; and (c) an increase in women's welfare. As the length of the desertion period t^s required for a unilateral divorce filing increases, the effects of these laws are attenuated.*

Proof. See Appendix B. ■

Under mutual consent divorce but no desertion laws, we showed in Proposition 1 that when separation is the preferred option of one of the partners, they can separate unilaterally, even when the other partner would be better-off in divorce. Without the possibility of unilateral divorce, women are likely to be condemned to permanent separation with no transfers.

The introduction of legally-mandated desertion laws—according to which a spouse who has been "deserted" by their partner is granted divorce after a certain "desertion period"—provides an "escape clause" to the abandoned spouse and, when due to which, they are worse off vis-a-vis both marriage and divorce. Thus, the introduction of such laws would lead to a spike in divorces,

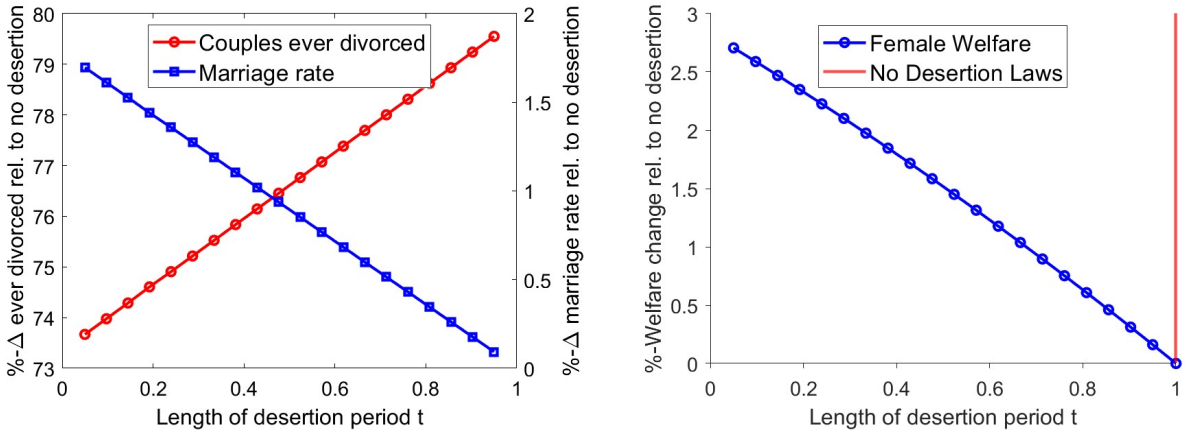
[16] In principle, we can also investigate the effect of this legislation empirically. However, while there is variation in the cross section in terms of desertion regulation, there are very little changes in this legislation during the pre-unilateral divorce period.

as "abandoned" partners will be able to unilaterally file for a divorce after a certain time t^s. The newly-won right to divorce could also affect the optimal choices of the partner who would otherwise abandon their spouse. Therefore, it is possible that marital stability would increase, which depends on the relative cost of separation vis-a-vis divorce.

In terms of welfare, desertion legislation benefits the spouses that were deserted by their partners—typically women. This is because they will either be divorced rather than separated (which is better for them), or they will remain in more beneficial marriages, as men cannot fully use the separation threat to extract marital resources. These are the women in couples with $C_L < C_j < C_H$, who also benefit from the transition from MCD to UD. However, desertion laws have no impact on women in couples with $C_j < C_L$, since it does not affect the outcomes of those in intact marriages. Therefore, the welfare effects of this policy are unequivocally positive for women.

Setting the parameters to the same values as above, we simulate the model under different values of t^s. We report the results in Figure 9. This exercise suggests that, relative to the mutual consent baseline ($t = 1$), the share of couples that eventually divorce increases sharply (left panel, left axis). Moreover, the share of couples that eventually divorce *increases* as the mandated desertion period lengthens, counteracted by a decline in marital stability (left panel, right axis). As the mandated desertion time shortens ($t \to 0$), marital stability increases compared to the baseline, since separation will trigger divorce sooner, making it costly for men. Welfare gains for women also increase as t^s falls (right panel), as women can file for divorce sooner, rather than stay separated.

Figure 9: Impact of desertion laws on equilibrium outcomes: marital status (left panel) and female welfare (right panel)



Notes: The figure presents the results of the simulations for values of t^s between 0.05 and 0.95, when the other parameters are set to $\beta^M = 0.5$, $y = 0.85$, $z = 0.5y$, $c = 0.5$, $\alpha = \beta^D = 0.33$, and $h(y, z) = (y + z)^2$. The horizontal axis represents t^s, the length of the mandated desertion time before one partner can use abandonment as a ground for unilateral divorce, expressed as a share of the second period. In the left panel, the baseline divorce rate, when $t^s = 1$ is equal to 0.16.

A formal proof of the proposition can be found in Appendix B.

In what follows, we empirically test some of the model predictions in Section 4. We then calibrate the model to the US MCD world, and quantify the welfare effects of introducing UD legislation and contrast it with desertion legislation.

4 Testing the Model's Predictions

In this section, we test the model's predictions from Section 3.4 as it pertains to separation and divorce.

4.1 Women Initiate Divorces When the Marriage Is More Valuable

As stated in Proposition 5, women could be the ones who petition for divorce even if divorce is worse for them than marriage. This would be the case when they wish to stay in the marriage but their spouse wants to separate and when divorce would thus be a better option for them than separation. We have already shown that women are more likely to be the plaintiff in for divorce, but in this section, we look for what types of relationship they want to exit when they do so.

First, we can differentiate the probability that wives are the plaintiffs depending on the types of legislation they face. "Common property divorce" is perceived by most experts as being more generous towards women at the moment of the separation of marital assets than "equitable division" (Chiappori et al., 2002; Gray, 1998; Voena, 2015). We find that wives are 1.3 percent more likely to be the plaintiff when the divorce is petitioned in a state that has a "common property divorce regime" instead of a "equitable division." This seems to indicate that women are more likely to ask for divorce when they are in a divorce regime that grants them more transfers. This would be in agreement with our framework.

We next look at what types of relationships women are exiting when they are asking for divorce. To demonstrate this, we regress the probability that the woman is the plaintiff on marriage characteristics and include fixed effects by state and year of divorce. We present the coefficients of these regressions in Table 5 below. Our results show that wives are 9 percentage points more likely to be the plaintiff when the couple had children compared with childless couples. They are also more likely to the plaintiff when the marriage has had a longer duration. The probability that the wife is the plaintiff increases by 5 and 5.3 percentage points respectively when the relationship has lasted 1-4 years or more than 5 compared to less than 1 year. Women are also more likely to be the plaintiff when they married young. These do not appear to be relationships from which a woman

would be running away from but rather where the relationship is very relevant for the woman and where transfers could be more likely to be expected at the moment of divorce. Finally, in that line, we also find that women are more likely to be the plaintiff when the partners still reside in the same state, suggesting that divorce transfers are more likely to be enforceable in that case.[17]

Table 5: Correlations between wife being the plaintiff and relationship's characteristics

Wife is plaintiff	(1)	(2)	(3)	(4)
Couple has children	0.089***			
	(0.004)			
Marriage has lasted 1-4 years		0.050***		
		(0.004)		
Marriage has lasted 5 years or more		0.053***		
		(0.004)		
Wife's age at marriage			-0.001***	
			(0.000)	
Spouses live in different states				-0.040**
				(0.017)
N	3,611,253	8,516,408	7,397,763	6,999,942

Notes: Data from the National Center for Health Statistics (1974-1988). *** p<0.01, ** p<0.05, * p<0.1

Finally, we show in Table 6 that when women are the ones filing for divorce, the divorce process is shorter compared to when men are the plaintiff. This is consistent with women filing for divorce when they benefit more from it, and hence, having incentives to finalize the divorce process sooner. The difference is between one and 2 months of duration and is robust for controls for the divorce regime or when restricting the sample only to states that have unilateral divorce regimes.

Overall, we find that this seems to indicate that women who petition for divorce are those identified in our model who recur to divorce to obtain transfers and shorten the duration of separation more than women who are benefiting materially from a divorce compared to marriage.

[17] Correlations with relationships characteristics do not seem to differ in states with common property rules compared to others, as shown in Table A4 in Appendix A.

Table 6: Correlations between wife being the plaintiff and length of separation

	(1)	(2)	(3)	(4)
Wife is the plaintiff	-1.257***	-1.213***	-1.212***	-1.190***
	(0.345)	(0.322)	(0.323)	(0.195)
N	4,817,773	3,455,894	3,454,927	1,095,037
State-Year FE	Yes	Yes	Yes	Yes
Demographic controls	No	Yes	Yes	Yes
Divorce regime	No	No	Yes	Yes
Sample restriction	none	none	none	UD states

Source: National Center for Health Statistics (1974-1988).

4.2 Negative Selection into Separation

Our model suggests that separated couples will be negatively selected, particularly when unilateral divorce is imposed. To study this, we first compare ever-married women by current marital status—married, divorced or separated—in the Census data. We focus on characteristics that should be predetermined before marriage such as human capital, race, and age at marriage. Table 7 shows the relationships observed between each of these characteristics and the probability of being divorced or separated. While it has been previously noted that divorced women are negatively selected vis-a-vis married women (Bedard and Deschênes, 2005; Holden and Smock, 1991), separated women are, under most criteria studied below, from a more vulnerable population than those who are divorced. We document in Panel A of Table 7 that having a high school degree does not impact the likelihood of a woman being divorced but reduces the likelihood of begin separated by 3.3 percentage points. Each additional year of education is correlated with a 0.5 percentage point lower likelihood of being separated but not being divorced. Women from racial minorities are 7.5 percentage points more likely to be separated than white women, while the difference is only 2.8 percentage points for divorce. Only for age at first marriage where we have much smaller sample size do we find that marrying one year earlier increases the probability of being separated by 0.1 percentage point while it is 0.3 for divorce. Overall, we clearly demonstrate that women are negatively selected into separation post-UD, even more than in divorce itself.

The next panel of Table 7 compares men who are still married, separated or divorced using the same variables as women. We see an extremely similar pattern as the one described for women. Men who have not graduated from high school, have fewer years of education, non-white, and those who married at an earlier age are all more likely to be separated than men with better socio-economic background. This holds when we compared separated men to those who are currently married, but

also to those who report being divorced. Thus, there is negative selection into separation for men and women in the United States over the 20th century.

Table 7: Correlations between individuals' marital status and pre-marital characteristics after UD

	At least HS	Years of education	Non-white	Age at first marriage
	(1)	(2)	(3)	(4)
		Panel A: Women		
Separated	-0.033^{***}	-0.005^{***}	0.075^{***}	-0.001^{***}
	(0.000)	(0.000)	(0.000)	(0.000)
Divorced	0.000	0.000^{***}	0.028^{***}	-0.003^{***}
	(0.000)	(0.000)	(0.000)	(0.000)
N	4,102,869	4,102,869	4,102,869	1,920,767
		Panel B: Men		
Separated	-0.018^{***}	-0.003^{***}	0.049^{***}	-0.001^{***}
	(0.000)	(0.000)	(0.000)	(0.000)
Divorced	-0.008^{***}	-0.002^{***}	0.010^{***}	-0.001^{***}
	(0.000)	(0.000)	(0.000)	(0.000)
N	3,599,532	3,599,532	3,599,532	1,678,820

Notes: Data from IPUMS Census 1960-2000. Sample restricted to states that had implemented unilateral divorce at the moment of the Census and ever-married individuals who are 55 years or younger. All regressions include fixed effects for year of Census and for state of residence of the respondents. Person-specific weights used. Finally, we have information for *Age at first marriage* only until 1980. In all columns, the difference between the coefficients for *Separated* and *Divorced* is statistically significant at 1%.

We next use the NBER divorce data to show that conditional on asking for divorce, women who experience longer separations are also negatively selected. In Table 8, we report the coefficients of regressing the length of separation on demographic characteristics. Column (1) shows that women who married younger experienced longer separations. Column (2) shows that being from a racial minority increases the length of separation by 11 months, conditional on filing for divorce. Finally, column (3) shows that each additional year of education reduces the length of separation by roughly a month.

We find similar patterns using the 1950 Census, which recorded the length of separation for those who reported being separated, and so, it does not condition on filing for divorce. The results in columns (4)-(6) of Table 8 suggest that women who are socio-economically disadvantaged have longer lengths of separation on average (conditional on being separated), although the racial differences are not significant in that sample.

Table 8: Correlations between length of separation and women's characteristics

	NBER divorce records			1950 Census		
Length of separation	(1)	(2)	(3)	(4)	(5)	(6)
Age at marriage	-0.059***					
	(0.013)					
At least high school				-2.270***		
				(0.395)		
Non-white		11.463***			0.233	
		(1.305)			(0.480)	
Years of education			-0.622***			-0.484***
			(0.071)			(0.046)
N	5,574,364	5,257,916	4,847,545	3,725	3,812	3,812

Notes: Columns (1) to (3) use data from the National Center for Health Statistics (1974-1988). Columns (4) to (6) use data from the Census of Population (1950). *** p<0.01, ** p<0.05, * p<0.1

4.3 The Impact of Unilateral Divorce on Marital Status

We explore now how the transition from mutual consent to unilateral divorce regimes impacted separation and divorce choices. In order to do this, we exploit the staggered implementation of UD legislation across states and over time in the US, following the codification of Voena (2015).

We start by looking at these effects in the Census, where we observe the marital status of individuals. We focus on the period 1960-2000, where most states transitioned from MCD to UD. For an individual i, on state s and year t we estimate

$$\text{Marsta}_{ist} = \alpha + \beta\, \text{UD}_{st} + \gamma X_{ist} + \delta_s + \eta_t + \lambda_{st} + \varepsilon_{ist}, \tag{23}$$

where Marsta is an indicator that corresponds to either divorce or separation and X_{ist} control for other demographic characteristics of the individuals. Our main variable of interest, UD_{st} is an indicator that takes value 1 when the state of residence of an individual has adopted UD by year t. We include state and year fixed effects, denoted by δ_s and η_t, respectively. Following Wolfers (2006), we also include state linear trends in some specifications.

The results of estimating equation (23) on Census data are reported on Panel A of Table 9. Our results in columns (1) and (2) indicate that the transition from MCD to UD legislation in the state of residence reduces the probability of a woman reporting to be separated by approximately 0.4 percentage points, more than offset by an increase of 0.6 percentage points in the probability of divorce. The results are robust to including state linear trends in columns (3) and (4).

As the Census data are decennial, it only allows us to look at variation across decades and in

stocks of those declaring to be divorced or separated. Remarriage will also reduce the divorce rate as measured by the Census. To alleviate these concerns, we now estimate model (23) using data from the PSID. The results, reported in Panel B of Table 9, are consistent with those reported in Panel A. The introduction of unilateral divorce reduced the likelihood of being separated by 1 percentage point, while increased the divorce probability by 2.8 percentage point. This suggests that the probability of remaining married decreased as well.

Table 9: Impact of unilateral divorce laws on the likelihood of separation and divorce (women)

	Separated (1)	Divorced (2)	Separated (3)	Divorced (4)
		Panel A: Census Data		
Unilateral divorce	-0.004**	0.006***	-0.003**	0.005**
	(0.002)	(0.002)	(0.001)	(0.002)
N	6,096,854		6,096,854	
		Panel B: PSID Data		
Unilateral divorce	-0.010**	0.028*	-0.011**	0.015
	(0.005)	(0.016)	(0.005)	(0.011)
N	31,086		31,086	
Year FE	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes
State*Time trend	No	No	Yes	Yes

Notes: Panel (A) uses data from the IPUMS Census 1960-2000. Sample restricted to ever-married individuals who are 55 years or younger. We exclude from the definition of separation those who report being married but living apart from the spouse. Our results are robust to using the state of birth instead of state of residence. Panel (B) uses data from the PSID. We restrict the sample to women 55 years old and younger who married before the implementation of UD. Demographic controls include female age, education, number of children and race. In both panels, person-specific weights used and standard errors clustered at the state of residence are reported in parentheses.

The results in Table 9 are consistent with the theoretical predictions in Proposition 4, which imply that unilateral divorce should lead to fewer separations and more divorces. However, this proposition also implies that these effects should be more pronounced among individuals who are relatively lower ranked in the income distribution. In order to test this, we use demographic information on education and race both in the Census and the PSID, that may correlated with the income rank of the individuals. Along each of these dimensions, we split our sample in two groups: Low- and High-educated, and Non-White and White. In each case, we associate the first group with relatively lower socio-economic status, and the second one with relatively higher socio-economic status.

The results of Table 10 indicate that the reduction in the probability of separation and the increase in the probability of divorce induced by unilateral divorce are stronger among those with lower socio-economic background. Both in the Census (Panel A) and the PSID (Panel B), the

Table 10: Impact of unilateral divorce laws on the likelihood of being separated and divorced by socio-economic characteristics

	Low Educated		High Educated		Non-White		White	
	Sep	Div	Sep	Div	Sep	Div	Sep	Div
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
				Panel A: Census Data				
Unilateral divorce	-0.003**	0.005***	-0.002	0.000	-0.009**	0.016**	-0.002**	0.003*
	(0.001)	(0.002)	(0.001)	(0.002)	(0.004)	(0.007)	(0.001)	(0.001)
N	3,911,385		2,185,469		843,713		5,253,141	
				Panel B: PSID Data				
Unilateral divorce	-0.015**	0.018*	-0.003	0.022	-0.054**	0.047**	-0.009*	0.015
	(0.006)	(0.010)	(0.010)	(0.021)	(0.023)	(0.019)	(0.005)	(0.012)
N	19,626		11,460		9,625		21,461	
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State*Time trend	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Census data (1960–2000) in Panel A; PSID data in Panel B. Sample restrictions and controls are the same as in Table 9. "Low-educated" includes women with at most high school degree. "High-educated" includes women with at least some college. Standard errors clustered at the state level in parentheses.

coefficients are larger in magnitude and more more statistically significant in columns (1) and (2), and columns (5) and (6), which include women with lower education, and who are non-white. This is in line with the theoretical predictions of our model, which suggests that groups with worse endowments are more likely to respond to unilateral divorce legislation by reducing separations and increasing divorces.

5 Quantifying the Welfare Effects of Unilateral Divorce Legislation

We showed in Section 4 that the theoretical predictions of our model are in line with the empirical evidence. In this section, we calibrate our model to a MCD regime, and use the model to quantify the the distributional welfare effects of unilateral divorce legislation when separation is an option.

For the calibration, we set the model parameters based on previous literature or to match the PSID data for a pre-UD regime. In these cases, we use data from MCD states before 1980.

We set $\beta^M = 0.5$ based on Reynoso (2024) estimates.[18] Next, we use the mean annual income of

[18] Reynoso (2024) estimates the intra-household allocation for 9 different types of couples. Since we only have four

male and female (7,500 and 4,900 USD, real terms in 1970) among single, divorced, and separated individuals, from the PSID.[19] Using these values, we compute β^D to match the 800 USD decline in income for separated compared with divorced women, reported in the first two columns of Table 4.[20] We set $\alpha = 1/3$, such that women pay less than men but that they do face some relevant costs of divorcing.[21]

We parameterize the household payoff function as $h(y, z) = (y+z)^m$ as in Iyigun and Lafortune (2023). We assume that couples draw θ from a uniform distribution centered around 0, over the interval $[-\theta_{max}, \theta_{max}]$. They also draw C_j from a uniform distribution between 0 and $C_H + \delta$.

We then use the model to internally calibrate four parameters under a MCD regime: the economies scale from marriage, m, the separation cost, c, the parameter θ_{max} of the distribution of marital shocks, and the parameter δ of the distribution of divorce costs. Note that each parameter plays a different role in our model. The separation cost c shifts the distribution of divorce versus separation among couples who want to exit their relationship. θ_{max} increases the fraction of couples who do not remain married, irrespective of whether they separate or divorce. The economies of scale from marriage determine how relevant is total income for the divorce/separation decision, and hence is associated to differences in separation and divorce rates across couple types. Finally, δ increases the amount of separation that remains in UD (since only those between C_H and C_{max} separate in that case).

To calibrate the model we proceed as follows. We first simulate the model on a fine grid of values of c between 0 and 10,000 USD, θ_{max} between $-\theta^S$ and $-\theta^S + 1$, and m between 1 and 2. For a given value of m, we select the combination of c and θ_{max} that can matches the fraction of couples from the PSID that separate and divorce in mutual consent regimes: 1.9% and 3.1% respectively. We find that the model is well-behaved and that c and θ_{max} play a different role in modifying the fraction of separation and divorce generated by the model. For each value in the grid of m, we can obtain a unique combination of c and θ_{max} that perfectly matches the aggregate fractions of divorce and separation.

To pin down m (and hence the corresponding values of c and θ_{max}), we then allow for heterogeneity by couple type, defined by the partners' educational attainment. This is because m mostly

types of couples, we set our parameter β^M to the average among the perfectly assorted couples—which in our setting represent 75% of the couples in the economy. This is also in line with other work calibrating the intra-household allocation of resources, such as Adamopoulou et al. (2024).

[19] For simplicity we express all incomes in 1,000 of dollars.

[20] The income of a woman in separation is z while her income in divorce is $\beta^D(y+z)$. If she has 800 fewer dollars when separated than divorced, we must have that $z + 0.8 = \beta^D(y+z)$. Replacing for the values of income of men and women, this leads us to estimate $\beta^D = 0.45$. Thus, a separated woman would get 40 percent of the couple's total individual income (z=0.4*(y+z)) but a divorced women, 45 percent of that sum.

[21] We have found no reference in the literature for the share of divorce costs that women bear. We show in Appendix C that our results are robust to setting $\alpha = 0.25$ or $\alpha = 0.4$.

matters for the role of income and we can measure heterogeneity in education in the PSID. We consider two educational groups: those with at most a high school graduates and those with at least some college education. For each type of men and women, we compute the average annual earnings in the PSID. We also compute, for each couple type, the fraction of women who separate and divorce. We choose the tuple (m, c, and θ_{max}) that better matches the targeted heterogeneity in divorce and separation rates by education groups.

Finally, we repeat the above simulations for a grid of values of δ—the parameter that determines the upper bound of the distribution of C_j. We calibrate δ (and hence m, c, and θ_{max}) to match in our model the impact on separation rates of the transition from MCD to UD, reported on Panel B of Table 9. A larger maximum value of divorce costs allows for higher separation rates in UD and thus generate a smaller decrease in separation post UD adoption.

The calibrated parameters using this procedure are reported in Table 11. Table 12 summarizes the empirical moments targeted in the estimation, as well as their model counterparts.

Table 11: Parameter Values

Parameter	Symbol	Value
Separation cost ($000)	c	3.564
Maximum taste shock	$\theta_{\max}$	2.269
Economies of scale in marriage	m	1.024
Upper bound of divorce costs ($000)	δ	4.200

We calibrate a separation cost c of 3,500 USD, below the annual average earnings of women (4,900). The parameter governing the complementarities between types in marriage, m, is relatively small, suggesting that returns to education in the marriage exist but are not overbearing, in agreement with the results of Iyigun and Lafortune (2023). The marital quality shock ranges between -2.269 and 2.269, while the divorce costs, C_j, vary between 0 and 11,585 USD (given by $C_H + 4,200$). This implies that for some couples the costs of divorce are larger than the sum of the spousal annual incomes, but not by a large amount. This is needed for some couples to still wish to separate once divorce becomes unilateral.

Table 12: Targeted Moments

Moment description	Data	Model
Separation rate in MCD	1.9%	1.9%
Divorce rate in MCD	3.1%	3.1%
Separation rate in MCD (low-educ wife, low-educ husband)	2.3%	3.9%
Separation rate in MCD (low-educ wife, high-educ husband)	1.5%	2.8%
Separation rate in MCD (high-educ wife, low-educ husband)	4.0%	1.7%
Separation rate in MCD (high-educ wife, high-educ husband)	0.6%	0.6%
Divorce rate in MCD (low-educ wife, low-educ husband)	3.3%	3.0%
Divorce rate in MCD (low-educ wife, high-educ husband)	1.5%	0.4%
Divorce rate in MCD (high-educ wife, low-educ husband M)	8.6%	4.4%
Divorce rate in MCD (high-educ wife, high-educ husband M)	1.8%	3.0%
Impact of UD on separation	-0.11	-0.11

Notes: Data moments estimated from the PSID, using MCD states prior to 1980.

We perfectly match the separation and divorce rate in MCD at the aggregate level, as well as the impact of UD on separation. Our outcome by educational types are less accurate. We predict correctly the separation rate for couples where both are highly educated but we overestimate that of low-education wives and underestimate that of high-education wife and low-educated husband. For divorce, our model reproduces well the empirical patterns, and closely matches the divorce rate of positively assorted couples, which represent most of the couples in our data.

Using the calibrated model, we then assess the distributional consequences of the transition from MCD to UD. We present the results of this exercise in Table 13 below. We find that the transition between MCD and UD led to 1.1% fewer separation on average, a moment targeted in the above analysis. Our model allows to assess how this fall in separation varies across different couples. We find that this fall in separation rates is concentrated among women with lower education, who experience a decline in separation of 2.5 percentage points, while high-educated women barely see an impact on their separation rates. Moreover, the model predicts an increase in the divorce rate of 3.6 percent, which overestimates the corresponding data moment. However, consistent with the empirical evidence, the effect on divorce rates is larger than the effect on separation. We also replicate the heterogeneity across educational groups, with more pronounced changes in the divorce rate among less educated women.

On average, the transition from MCD to UD improves women's welfare. The aggregate impact is relatively small, equivalent to a transfer of 100 annual dollars when separated/divorced or about 2 percent of their own income. However, consistently with the results above, we observe large variation across educational types. Women who gain the most are those with less education married

Table 13: Simulated impact of unilateral divorce laws on women's welfare

	Average	Low Educated		High Educated	
		Low educ. husb.	High educ. husb.	Low educ. husb.	High educ. husb.
	(1)	(2)	(3)	(4)	(5)
Δ Separation	-0.011	-0.027	-0.028	-0.000	-0.003
Δ Divorce	0.050	0.060	0.084	0.008	0.048
Δ Avg. Welfare	0.100	0.180	0.556	-0.006	0.051
Δ Avg. Welfare (-)	-0.248	-0.205	-0.285	-0.210	-0.274
Δ Avg. Welfare (+)	0.706	0.894	1.212	0.211	0.583

Notes: Results of simulation of model with $\beta^M = 0.5$, $\beta^D = 0.45$ and $\alpha = 1/3$. Other parameters are set to the calibrated values from Table 11. C_j is randomly drawn from $[0, 11.585]$ and θ from $[-2.2685, 2.2685]$. Changes in welfare measure changes in utility terms.

to more educated husbands. Under MCD, these women are more likely to be separated. The transition to UD allows them to obtain transfers from their husbands through divorce. Low-educated women married to low-educated men also benefit because their income gap is larger than that of high-educated women when married to high-educated men. A small positive effect is found for high-educated women married to higher educated spouses. For the minority of women who marries "down" in terms of education, there is a small negative impact on welfare of the transition, as anticipated. This is consistent with our model if the region between C_L and C_H is large enough.

Even within education group, the average effects hide marked heterogeneity. Those with $C_j < C_L$ lose when UD is implemented, since they are no longer able to hold-up their husbands in marriage. However, those with $C_j > C_L$ gain since they can now divorce instead of being separated, according to our framework.

For a majority of women the transition has no effect since they remain married, separated or divorce as before, without renegotiating their marital allocations. We thus next focus on the welfare change for women who do experience either a loss or a gain. Women who lose from the transition lose on average 250 dollars, which represents nearly 5% of their annual income. The loss is relatively uniform across the different type of women, with those married to higher educated husband losing more. This suggests that the main difference across educational group is not on how much one lose from the legal change but rather the fraction of women being subject to the change because they were holding up their husbands in MCD. On the other hand, women who gain from the legislation change tend to benefit a lot. These are mostly women who were separated in MCD—those in couples with $C_L < C_j < C_H$—and now can unilaterally ask for divorce. These women experience welfare gains of nearly 700 dollars annually (14% of their own income). The less educated women

married to high educated men gain 1,200 dollars annually, about a third of their own income. Only highly educated women married with low-educated men see limited gains because they rarely face separation and those separations are less costly to them than for other types of women.

Some have argued that given that women could suffer when it is too easy for their husband to divorce them, unilateral divorce should be more difficult to obtain. One measure to achieve that involves adding "cool-off" periods, mandating couples to stay separated for some time after filing for divorce before obtaining the decree. However, as we show in Appendix D these laws have, theoretically, an ambiguous effect on women welfare. Simulating the introduction of cool-off periods in our calibrated model, we show in Table A7 that mandated cool-off periods have negative consequences for women, attenuating the welfare gains for the group of women who gain from the implementation of UD, and increasing the losses for those who suffered in terms of welfare.

5.1 Could Women Do Better under Mutual Consent Divorce?

Our simulations above show that, on average, women benefited from the adoption of unilateral divorce. However, this result hide heterogeneity, with some women experiencing welfare losses due to divorce liberalization. Is there a different policy that can make the women who benefited from UD gain in a similar way but without generating the costs for the others? In line with Section 3.6, we show here that under MCD, desertion laws unambiguously generate welfare gains for women. They may even, when short enough, be better than UD.

To do this, we introduce the possibility of desertion laws in our calibrated model above. We consider three different lengths, $t_s = \{0.1, 0.2, 0.5\}$. We report the welfare change between this policy and a MCD regime without desertion ($t_s = 1$) in Table 14. We only report the total change in welfare, and not the split between gains and losses, as no women losses from this policy.

Our results show that women experience, on average, sizable welfare gains relative to MCD. This gains are typically lower than the gains associated to UD adoption from Table 13. This is because while no woman loses from desertion laws, they gain less from them as they are still required to stay separated for some time. However, for really short desertion periods ($t_s = 0.1$), desertion laws generate welfare gains even larger than UD. The patterns of who benefit from this policy are similar in both cases: low-skill women, particularly those married to high educated husbands are the ones who see the highest utility gains.

Therefore, while the transition from mutual consent to unilateral divorce leads to overall welfare gains for women, some women actually lost from the implementation of UD. These welfare losses are similar across educational groups, as all types of women do hold-up in our simulations, particularly when married to higher-income partners. These welfare losses for women could be avoided by

Table 14: Simulated impact of desertion laws on women's welfare

	Average	Low Educated		High Educated	
		Low educ. husb.	High educ. husb.	Low educ. husb.	High educ. husb.
	(1)	(2)	(3)	(4)	(5)
$t_s = 0.1$	0.103	0.177	0.537	0.003	0.060
$t_s = 0.2$	0.099	0.170	0.516	0.003	0.058
$t_s = 0.5$	0.084	0.143	0.440	0.000	0.049

Notes: Results of simulation of model with $\beta^M = 0.5$, $\beta^D = 0.45$ and $\alpha = 1/3$. Other parameters are set to the calibrated values from Table 11. C_j is randomly drawn from $[0, 11.585]$ and θ from $[-2.2685, 2.2685]$. Changes in welfare measure changes in utility terms.

instead implementing desertion laws within a MCD regime. However, this also reduces the benefits, by imposing that women will have to remain separated for a given period before being able to ask for divorce.

6 Conclusion

This paper demonstrates that separation is (and particularly was) a common relationship outcome in the United States, typically leaving women worse off compared to divorce. Incorporating separation into a standard model of marriage and divorce significantly alters conclusions about divorce liberalization obtained by previous literature. Without separation, unilateral divorce is efficient but detrimental to women; however, when separation is an option, unilateral divorce may no longer enhance efficiency, yet it can substantially benefit certain groups of women. This helps reconcile the fact that while women do worse in divorce than in marriage, they are more likely than men to start divorce procedures. Thus, we highlight the importance of considering separation when evaluating the welfare implications of different divorce policies.

Using US data, we empirically confirm that unilateral divorce legislation significantly reduced separation rates, especially among women from lower socioeconomic backgrounds. By calibrating our model to match a mutual consent divorce (MCD) regime, we find that unilateral divorce, on average, improved welfare for American women, despite leaving some women worse off. Finally, we demonstrate that desertion laws represent an alternative policy option that could replicate some of the benefits of UD without penalizing a subset of women.

Our work abstract from remarriage, temporary shocks to a relationship and matching. These may generate interesting interactions that we leave to future research. The observation that fewer women "marry up" following the adoption of unilateral divorce (UD) laws (Reynoso, 2024) may

arise not only because divorce becomes costlier for higher-earning men, but also—and perhaps more importantly—because, under mutual consent divorce (MCD), these couples were precisely those for whom separation was as likely an outcome as divorce.

Even when almost all states in the US have implemented UD, our analysis remains highly policy-relevant today. Some states still enforce mandatory "cool-off" periods, and many countries around the world have tightened their divorce legislation—for example, by introducing waiting periods when children are involved or when only one partner petitions for divorce. We argue that policy debates surrounding these issues should explicitly consider the perspective of couples who respond to such measures not by remaining together, but instead by choosing informal separation to avoid the formalities and paperwork associated with official divorce.

Our work also also connects to the debate about protecting cohabiting couples when relationships end. While some countries have extended similar rights and obligations to cohabiting couples as those granted to married couples, others have avoided imposing such regulations altogether. Our findings highlight for policymakers that non-divorce relationship break-ups could benefit from rules designed to safeguard the welfare of the economically weaker partner.

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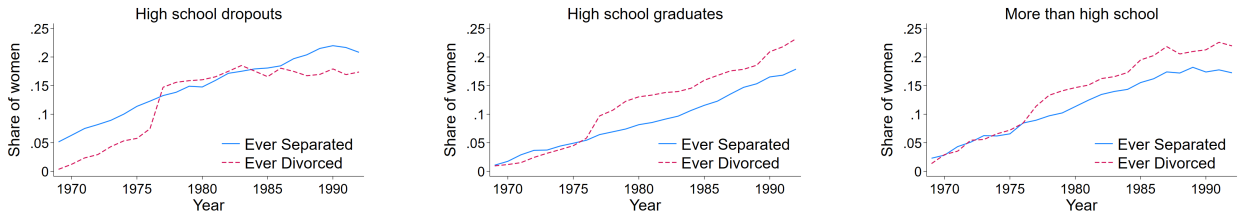
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A Additional Tables and Figures

Table A1: Fraction of divorces depending on the plaintiff, by state

State of Divorce	Husband	Wife	Husband and wife	Total
Alabama	31.0	67.1	1.9	100.0
Alaska	20.4	36.1	43.5	100.0
California	34.0	66.0	0.0	100.0
Connecticut	32.2	67.8	0.0	100.0
Delaware	41.2	58.3	0.5	100.0
DC	41.2	57.1	1.7	100.0
Georgia	32.3	66.9	0.8	100.0
Hawaii	37.8	61.6	0.6	100.0
Idaho	32.8	67.1	0.0	100.0
Illinois	30.0	69.4	0.6	100.0
Iowa	29.9	70.1	0.0	100.0
Kansas	29.7	69.3	1.0	100.0
Kentucky	30.7	65.7	3.7	100.0
Maryland	40.5	59.5	0.1	100.0
Massachussetts	26.9	66.7	6.3	100.0
Michigan	33.1	66.2	0.7	100.0
Missouri	30.6	64.2	5.3	100.0
Montana	25.6	61.2	13.2	100.0
Nebraska	28.7	70.7	0.6	100.0
New Hampshire	34.9	65.1	0.0	100.0
New York	37.3	62.6	0.2	100.0
Ohio	15.6	46.4	38.0	100.0
Oregon	30.1	61.1	8.8	100.0
Pennsylvania	38.6	61.2	0.1	100.0
Rhode Island	28.2	71.6	0.1	100.0
South Carolina	33.0	67.0	0.0	100.0
South Dakota	28.4	71.5	0.1	100.0
Tennessee	28.6	71.0	0.4	100.0
Utah	27.9	71.0	1.1	100.0
Vermont	31.8	67.5	0.6	100.0
Virginia	39.0	61.0	0.0	100.0
Wisconsin	23.8	68.1	8.1	100.0
Wyoming	32.4	67.1	0.5	100.0
Virgin Islands	41.9	57.9	0.2	100.0
Total	32.9	64.8	2.3	100.0

Figure A1: Fraction of women reporting ever being separated or divorced by education



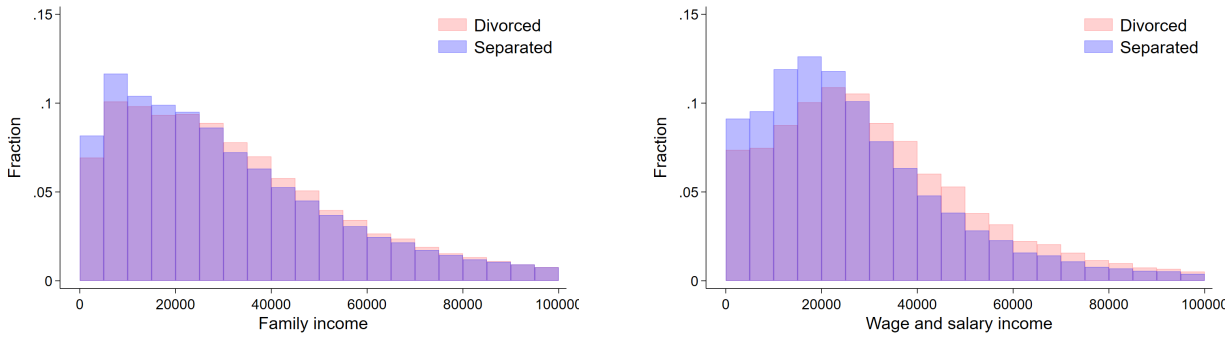
Notes: PSID (1968-1992). "Ever separared" and "Ever Divorced" are defined as in Table 1.

Table A2: Difference in income between divorced and separated individuals, including controls

	Family income		Own wage income	
	Women	Men	Women	Men
	(1)	(2)	(3)	(4)
Separated	-3,408.24***	-829.85***	-3,902.47***	-1,841.04***
	(28.00)	(36.46)	(23.17)	(35.20)
Demographic Controls	Yes	Yes	Yes	Yes
State and Year FE	Yes	Yes	Yes	Yes
Period	1950-2019	1950-2019	1950-2019	1950-2019
Observations	3,918,056	2,632,018	3,914,871	2,629,213
R-squared	0.10	0.10	0.17	0.15

Notes: IPUMS. Controls include age, race, years of education, state and year of census fixed effects. Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Figure A2: Distribution of male income in divorce and separation: (a) family income; (b) own wages.



Notes: IPUMS. Sample includes all men aged 16+. The left panel includes men with incomes above -20K and below 100K. The right panel includes all men with positive wages under 100K. All incomes and wages have been adjusted to 1999 real terms using the Consumer Price Index (CPI).

Table A3: Separation vs. divorce: difference in female household income (income per adult equivalent reported in survey year)

	(1)	(2)	(3)	(4)
	Taxable Inc	Household Inc	Taxable Inc	Household Inc
Separated	-1,041.15***	-80.71	-910.92***	492.42**
	(189.58)	(211.13)	(229.49)	(238.65)
Observations	2,577	2,576	2,577	2,576
R-squared	0.34	0.31	0.73	0.69
Demographic Controls	Yes	Yes	Yes	Yes
State and Year FE	Yes	Yes	Yes	Yes
Individual FE	No	No	Yes	Yes
Period	1969-97	1969-97	1969-97	1969-97

Notes: Standard errors clustered at the state level in parentheses. *** p<0.01, ** p<0.05, * p<0.1 Demographic controls include: women's age, race, education attainment, presence of children in the household, age of the youngest child, and years since the end of marriage. Taxable Income includes all taxable income from the head or partner from earnings, assets, and net profits from farm or business. HH Income is the aggregate income of the household in which the individual resides, as reported to the time of the survey which corresponds to year $t-1$ (includes income of other members of the family unit). Income variables have been converted to adult equivalent scales (using the OECD scale). The main variable of interests is relative now to the marital status with respect to first spouse. This may imply that some of those classified as 'divorced' are remarried as of period t.

Table A4: Correlations between wife being the plaintiff and relationship's characteristics, only common property states

Wife is plaintiff	(1)	(2)	(3)	(4)
Couple has some children	0.092***			
	(0.006)			
Marriage has lasted 1-4 years		0.054**		
		(0.009)		
Marriage has lasted 5 years or more		0.065**		
		(0.012)		
Wife's age at marriage			-0.001	
			(0.000)	
Spouses live in different states				-0.046**
				(0.010)
N	135,203	831,023	810,909	531,285

Notes: National Center for Health Statistics (1974-1988). *** p<0.01, ** p<0.05, * p<0.1

B Proofs of Propositions

In what follows, we structure most of the proofs to the propositions around three cases defined by (18), (19) and (20). These cases determine how partners rank divorce relative to separation.

Proof of Proposition 1.

For part (a), we discuss three different cases in turn, that determine the relative rankings of divorce and separation.

Case I: $C_j < C^L$: In this scenario, both partners prefer divorce to separation. Therefore, in this case, separation will never be an equilibrium. Divorce will be preferred by the couple to marriage whenever $\theta < \theta^{MCD}$. Couples with $\theta \geq \theta^{MCD}$ will remain married.

Looking at how the values of θ^{MCD} in Equation (13) depend on the range of β^M, we see that the two extreme values do not depend on marital sharing while the middle ones do. Note that whenever $\beta^M = \widetilde{\beta_j^M}$,

$$0.5\left(\beta^D(y+z) + y - h(y,z) - \alpha C_j - c/2\right) = \beta^D(y+z) - \beta^M h(y,z) - \alpha C_j. \tag{24}$$

The same is true for the last two expressions of θ^{MCD}. Since the right-hand side of (24) is decreasing in β^M, as marital sharing becomes relatively more favorable to women, the probability of divorce falls. A similar argument can be made when marital sharing disproportionally favors women. Thus divorce will occur more often whenever initial marriage sharing is extreme than when it is more equal.

Note that for extreme values of β^M, one of the partners may want to separate before the other partners wants to divorce. However, separation will not occur, as the partner who wishes to stay in the marriage will be willing to renegotiate the marital terms in favor of the partner for whom the participation constraint becomes binding. In this case, the renegotiation will continue until it exhausts all of the surplus in marriage, at which point the couple would divorce by mutual consent, as defined by (11) and (12).

Case II: $C_j > C^H$: In this scenario, both partners rank separation above divorce. If (4) holds, at least one of the partners would be better off in separation than in marriage. If this is the case, they would renegotiate the marital terms in favor of the partner who wants to separate, up to the point they become indifferent between separation and marriage. This renegotiation will not be possible and the couple would separate if the realized marital shock is below θ^S.

Case III: $C^L < C_j < C^H$: Finally, under this scenario, the husband prefers separation to divorce while the opposite is true for the wife. Even for shock realizations that will make the wife

prefer divorce to marriage, it will never be an outcome in a mutual consent regime, as the husband ranks separation over divorce (and so he will never agree to grant the divorce, but instead would separate unilaterally). As in Case II, when the realization of θ_j is such that either partner prefers separation (as defined by (4)), that partner will threaten to leave the relationship. This will lead to a renegotiation of the marital terms in their favor, as long as θ_j is above θ^S. Otherwise, the couple will separate, as no renegotiation will be possible.

Note that if the marital division is highly against the wife $\beta^M < 1/2 + (z-y)/2h(y,z)$, she may be the one threatening to separate, even if in *Case III* she prefers divorce to separation. This will trigger renegotiation in her favor (increase of β^M), up to the point where θ equals θ^S.

For (b), note that, for $C_j > c > C^L$, we will observe the same outcomes as the efficient ones. Separation will occur when the joint surplus of marriage compared to separation is negative. However, when $c > C_j > C^L$, we will observe separations when divorce would be more efficient, given that the husband can separate unilaterally. As we elaborated in subsection 3.3, the fact that separation and divorce coexist generates additional sources of inefficiencies that have not been explored before. Because, even in a mutual consent regime, separation can be decided individually and unilaterally by one spouse, it may arise as the equilibrium even when the couple's joint payoff is greater in divorce. This is on account of the fact that, while utility is transferable *within* marriage, partners cannot transfer utility in separation or divorce. This also generates inefficient marriages. Only relationships where the marital quality shock is below θ^S separate, but the efficient outcome would be that all couples with θ^{UD} end their marriages. Because in the range where $c > C_j > C^L$, $\theta^S < \theta^{UD}$ separations will occur less often than efficient divorces—as divorce can only be obtained by mutual consent—leading to inefficient marriages surviving, as discussed in part (a) of the proof. This is because the woman cannot threaten unilaterally to divorce and thus, the man prefer to remain married than to agree to divorce.

When $C_j < C^L$, divorce will occur both in the efficient case and our equilibrium. However, we can show that $\theta^{MCD} < \theta^{UD}$ for divorce costs in that range. For the two extreme cases of θ^{MCD} in (13), this is easy to show as the θ^{MCD} threshold measures the surplus from one partner divorcing and the other separating compared to marriage. Since whenever $C_j < C^L$ both partners prefer divorce to separation, that joint surplus is below that of both partners divorcing compared to marriage, which corresponds to θ^{UD}. For the two values of θ^{MCD} for intermediate values of β^M, we can show that

$$\beta^D(y+z) - \alpha C_j - \beta^M h(y,z) < \beta^D(y+z) - \alpha C_j - \overline{\beta_j^M} h(y,z) = \frac{y+z-h(y,z)-C_j}{2} = \theta^{UD}$$

and

$$(1-\beta^D)(y+z)-(1-\beta^M)h(y,z)-(1-\alpha)C_j < (1-\beta^D)(y+z)-(1-\overline{\beta_j^M})h(y,z)-(1-\alpha)C_j = \theta^{UD}.$$

Therefore, $\theta^{MCD} < \theta^{UD}$. This implies that some efficient divorces will not take place, as unilateral divorce is not available.

Finally, for (c), note that those couples with low marital-match quality shocks and for whom $C_j < C^L$ will divorce, namely

$$\int_{\underline{\theta}}^{\theta_j^{MCD}} \int_{\underline{C}}^{C^L} f(\theta)n(C_j)d\theta dC_j$$

Note that, holding constant the gender (endowment) gap λ, higher y (which increases z by λ) has a negative impact on C^L

$$\frac{\partial C^L}{\partial y} = \frac{\partial \frac{(1-\beta^D)(y+\lambda y)-y+\frac{c}{2}}{1-\alpha}}{\partial y} = \frac{(1-\beta^D)(1+\lambda)-1}{1-\alpha} < 0.$$

This is driven by our assumption that divorce always offers less income to men than separation.

Furthermore,

$$\frac{\partial \theta^{MCD}}{\partial y} = \begin{cases} 0.5\left((1-\beta^D)(1+\lambda)+\lambda-h_y-\lambda h_z\right) & \text{if } \beta^M < \widehat{\beta_j^M} \\ (1-\beta^D)(1+\lambda)-(1-\beta^M)(h_y+\lambda h_z) & \text{if } \widehat{\beta_j^M} < \beta^M < \overline{\beta_j^M} \\ \beta^D(1+\lambda)-\beta^M(h_y+\lambda h_z) & \text{if } \overline{\beta_j^M} < \beta^M < \widetilde{\beta_j^M} \\ 0.5\left(\beta^D(1+\lambda)+1-h_y-h_z\lambda\right) & \text{if } \widetilde{\beta_j^M} < \beta^M \end{cases} \tag{25}$$

The last term is negative because for this range of β^M to be feasible, we must have that $\beta^D(1+\lambda) < 1 + h/y + (\alpha C_j - c/2)/y$ since without that $\widetilde{\beta_j^M} > 1$. Using that constraint on β^D and the fact that when $\beta^M > \beta_j^M$, $\alpha C_j < c/2$ since men prefer divorce to separation, we are able to show that this is negative.

We can show that $\beta^D(1+\lambda)-\beta^M(h_y+\lambda h_z) < \beta^D(1+\lambda)-\left(0.5+\frac{(2\beta^D-1)(y+z)+(1-2\alpha)C_j}{2h}\right)(h_y+\lambda h_z) < \beta^D(1+\lambda)(1-y(h_y+\lambda h_z)/h)-0.5(1-(y+z)/h)(h_y+\lambda h_z) < 0$ since h displays increasing returns to scale.

The second term will be negative whenever β^M is low enough. Namely whenever $(1-\beta^D)(1+\lambda)-(1-\beta^M)(h_y+\lambda h_z) < 0$.

Finally, since $(1-\beta^D) < \frac{1}{1+\lambda}$, then $0.5\left((1-\beta^D)(1+\lambda)+\lambda-h_y-\lambda h_z\right) < 0.5(1+\lambda-h_y-$

$\lambda h_z) < 0$.

Thus, couples in the higher income rank will divorce at lower values of θ whenever $\widetilde{\beta_j^M} > \beta^M > \overline{\beta_j^M}$ and $\widehat{\beta_j^M} > \beta^M$, but the results are ambiguous in the other cases. In simulations, we were unable to find instances where higher income individuals were less likely to divorce.

Thus, the threshold of divorce costs that makes divorce the preferred choice will lead to fewer divorces when a couple is of a higher income rank but it is unclear whether the threshold of θ at which couples will want to divorce will also make divorce more likely as y increases.

For separation, selection is also unclear. On the one hand,

$$\frac{\partial \theta^S}{\partial y} = \frac{1}{2}(1 + \lambda - h_y - \lambda h_z) < 0$$

and thus, the threshold of θ under which individuals will choose to separate will fall with y, leading to fewer separations. On the other hand, the share of couples where separation will be the outcome instead of divorce will increase, as C^L falls. Thus, the results about which force will dominate are ambiguous.

Finally, given that

$$\frac{\partial C^L}{\partial \lambda} = \frac{(1 - \beta^D)y}{1 - \alpha} > 0$$

a larger λ—which implies a reduction in the gender wage gap—will lead to an increase in C^L and thus to fewer separations compared to divorces. This is because he benefits more from divorce relative to separation as the gender wage gap closes, and thus he agrees to divorce. Furthermore, a larger λ will lead to a fall in θ^S. The combination of both imply that separation will be less likely when λ increases. The impact on divorce is less clear as C^L increases but θ^{MCD} can increase or decrease with λ. ■

Proof of Proposition 2. For (a), we once again turn to studying three cases separately, as we did in the proof to Proposition 1.

Case I: $C_j < C^L$: In this scenario, both partners prefer divorce to separation. The spouses will remain married with the initial allocations in effect until one of the spouses prefers to divorce (which is governed by (14)). As divorce now is a credible unilateral threat (which was not the case under mutual consent), they will renegotiate the marital terms in favor of the partner for whom the participation constraint is binding. Renegotiation will not be possible when there is no surplus to redistribute in marriage relative to divorce, which will occur when $\theta_j < \theta_j^{UD}$. Renegotiation will favor men when $\beta^M > \overline{\beta^M}_j$ and will favor women otherwise.

Case II: $C_j > C^H$: Under this scenario, both partners prefer separation to divorce. One of

the partners will trigger separation when the marital shock realization is such that (4) holds. If one of them threatens to leave, the marital allocations will be renegotiated in favor of the partner for whom the participation constraint is binding, up to the point in which they become indifferent between marriage and separation. No such β_j^M will exist if $\theta_j < \theta^S$. The husband will be the one threatening with separation when $\beta^M > 1/2 + (z-y)/2h(y,z)$.

Case III: $C^L < C_j < C^H$: Under this scenario, even if the husband wishes to separate, he will not be able to execute that threat since if he does, his wife can immediately ask for divorce, which she prefers over separation.

The only credible threat is the one where one of the spouses wishes to divorce which is given by (14). Who will benefit from renegotiation is as in Case I. Renegotiation will occur until there is no surplus in marriage, i.e., when $\theta_j < \theta_j^{UD}$.

Note that once divorce is unilateral, separation becomes a non-credible threat (except when both partners agree to it), and the husband will not be able to renegotiate the marital terms in his favor based on it (even when separation is his highest ranked option). Divorce is the only credible threat in this setting that can trigger renegotiation.

For (b), note that whenever $C_j > C^H$ or $C_j < c$, separation, divorce, and marriage decisions will replicate the efficient outcome. However, whenever $c < C_j < C^H$, we will have divorce when the efficient outcome for couples with low marital-quality shocks would be separation. As the spouses rank divorce and separation differently, these divorces occur because divorce is unilateral and renegotiation of division of resources in divorce or separation is not possible. Furthermore, note that

$$\theta^{UD} = \frac{y+z-h(y,z)-C_j}{2} < \frac{y+z-h(y,z)-c}{2} = \theta^S$$

in that range. Thus, there will be couples who remain married when it would be efficient for them to separate. This occurs because for those couples, unilateral separation cannot be used anymore as a threat by the husband since the wife would then respond immediately by asking for divorce, which she prefers to separation. The husband prefers marriage to divorce and thus does not exert his threat. The marriage thus survives until there is no more surplus relative to divorce. This would occur for worse values of θ than what would be observed if separation could be guaranteed as the only way to exit the marriage.

Finally, for (c), note that, for a given y, divorce occurs when couples face low enough marital

quality shocks and have $C_j < C^H$, namely

$$\int_{\underline{\theta}}^{\theta_j^{UD}} \int_{\underline{C}}^{C^H} f(\theta) n(C_j) d\theta dC_j,$$

where f is the pdf of F and e is the pdf of E. We can find that the threshold of θ changes with income (keeping the gender gap fixed) such that

$$\frac{\partial \theta^{UD}}{\partial y} = \frac{1 + \lambda - h_y - \lambda h_z}{2} < 0,$$

because of the complementarities in the household production function $h(y, z)$. Thus, higher income couples will need more negative shocks to divorce and will instead remain married.

However, since

$$\frac{\partial C^H}{\partial y} = \frac{\beta^D (1 + \lambda) - \lambda}{\alpha} > 0$$

as income increases, a couple will be more likely to divorce than to separate. This implies an ambiguous effect of higher incomes on divorce probability.

For separation, since $\frac{\partial \theta^S}{\partial y} < 0$ and $\frac{\partial C^H}{\partial y} > 0$, both forces will make higher income couples less likely to be separated.

Finally, since

$$\frac{\partial C^H}{\partial \lambda} = \frac{(\beta^D - 1) y}{\alpha} < 0$$

a lower gender gap will imply that couples with lower values of C_j will choose to divorce. Since, in addition

$$\frac{\partial \theta^{UD}}{\partial \lambda} = \frac{y(1 - h_z)}{2} < 0$$

couples with worse θ will now select to divorce instead of marrying when the gender gap closes. Both forces will lead to fewer divorces when the gender gap is smaller.

■

Proof of Proposition 3. For (a), if separation was not possible, the only marriages that would end in divorces under mutual consent divorce would be those with shocks below the middle two values (13). After a transition to unilateral divorce, marriages with shocks below (16) would end, irrespective of the comparison between C_j and c, since separation is not possible. Divorce would thus increase since some divorces that were efficient ($\theta < \theta^{UD}$) now are occurring when they were avoided before because (13) was more stringent.

For (b), as separation is not an option, the increase in divorce will unequivocally imply a

reduction in the marriage rate.

For (c), for couples that go from marriage to divorce after the reform, welfare of women would fall if $\beta^M > \overline{\beta_j^M}$ and would increase in the opposite case. For couples who remain married, while before there was no room for renegotiation, women will now have to redistribute resources to their husbands whenever $\beta^M > \overline{\beta_j^M}$ and vice versa.

For (d), a mutual consent divorce regime can lead to inefficiencies, as some marriages would not dissolve even if the couple would be jointly better off divorced than married (due to one partner holding-up the other in the marriage—see Proposition 1). On the other hand, unilateral divorce laws under *TUM* would replicate the assignment that maximizes joint utility and, hence, would be efficient. Therefore, the transition from a mutual consent to a unilateral divorce regime would improve efficiency, if separation was not an option.

For (e), we need to show the increase in the probability of divorce generated by UD is larger for higher income individuals, relative to low income individuals. We showed before that the probability of divorce for an individual with income y under the Unilateral Divorce (UD) regime is:

$$P(\text{Divorce} \mid y)^{UD} = \int_{-\infty}^{\theta^{UD}(y)} f(\theta)\, d\theta. \tag{26}$$

Similarly, the probability of divorce under the Mutual Consent Divorce (MCD) regime is:

$$P(\text{Divorce} \mid y)^{MCD} = \int_{-\infty}^{\theta^{MCD}(y)} f(\theta)\, d\theta. \tag{27}$$

Since $\theta^{MCD}(y) < \theta^{UD}(y)$, we define the difference in the divorce probabilities (26) and (27) as:

$$\Delta P(\text{Divorce} \mid y) = P(\text{Divorce} \mid y)^{UD} - P(\text{Divorce} \mid y)^{MCD} = \int_{\theta^{MCD}(y)}^{\theta^{UD}(y)} f(\theta)\, d\theta. \tag{28}$$

As θ is distributed uniformly, this simplifies to:

$$\Delta P(\text{Divorce} \mid y) = f(\theta) \cdot (\theta^{UD}(y) - \theta^{MCD}(y)). \tag{29}$$

Next, we analyze how the difference in divorce probability defined by (29) varies with income y:

$$\frac{d}{dy}\Delta P(\text{Divorce} \mid y) = f(\theta)\left(\frac{d\theta^{UD}(y)}{dy} - \frac{d\theta^{MCD}(y)}{dy}\right), \tag{30}$$

which is positive when:

$$\frac{d\theta^{UD}(y)}{dy} - \frac{d\theta^{MCD}(y)}{dy} > 0.$$

This is either $0.5*(1-2\beta^D)(1+\lambda)-(1-2\beta^M)(h_y+\lambda h_z))$ or its negative depending on whether β^M is above or below $\overline{\beta^M}$. This will be positive whenever $\beta^M > 0.5+(1-2\beta^D)(1+\lambda)/2(h_y+\lambda h_z)$ and $\beta^M > \overline{\beta^M}$ or whenever $\beta^M < 0.5+(1-2\beta^D)(1+\lambda)/2(h_y+\lambda h_z)$ and $\beta^M < \overline{\beta^M}$. If β^D is low enough, $\overline{\beta^M}$ will fall as y increases. In that case, the derivative will be positive for all β^M where the woman is doing the hold-up and when β^M is small but around the point where $\overline{\beta^M}$ moves, it may be negative. The opposite will be true when $\overline{\beta^M}$ increases with y which happens when β^D is large enough. In that case, the derivative will be positive for all cases where the husband is holding up and for all β^M that are very large. But for values close to $\overline{\beta^M}$, the derivative may be positive. ■

Proof of Proposition 4. For (a), in *Case II*, as both partners prefer separation to divorce and θ^S determines the limit between marriage and separation in both contexts, we have the same proportion of couples picking separation under both regimes. In *Case I*, since both partners prefer divorce to separation, what will matter is how θ^{MCD} compares to θ^{UD}. As we have already shown that $\theta^{MCD} < \theta^{UD}$, we will observe an increase in the number of divorces under unilateral divorce and no change in the number of separations. In *Case III*, we had separations under mutual consent but all splits are now divorces. We will thus observe a fall in the number of separations and an increase in the number of divorces.

For (b), we consider whether there are more or fewer marriages than before. In *Case II*, that number is unchanged. In *Case I*, since $\theta^{MCD} < \theta^{UD}$, we would observe that couples that (inefficiently) stayed together will now divorce, leading to a fall in marriage rates among couples in that group. In *Case III*, what matters is how θ^{UD} compares with θ^S. It is easy to show that $\theta^{UD} < \theta^S$ whenever $c < C_j$ and vice versa. Thus, there will be a decrease in marital stability for couples with $C_j < c$. This couples will now divorce but under mutual consent they used to remain married, since separation was too costly and hence $\theta_j > \theta^S$. However, there will also be an increase in marital stability for couples for whom $C_j > c$. These couples used to separate but will now remain married, as separation is not a credible threat under unilateral divorce and $\theta_j > \theta^{UD}$. This leads to an ambiguous effect in terms of marital stability after the switch from mutual consent to unilateral divorce.

For (c), *Case II* will be identical in terms of welfare. For *Case I*, some additional marriages will end in divorce (since no partner can hold-up the other one in the marriage) and if $\beta^M > \overline{\beta_j^M}$, this will lead to worse outcomes for the wife. Furthermore, renegotiation will occur in marriage towards the partner who is the first one to wish to divorce. If $\beta^M > \overline{\beta_j^M}$, this will lower her welfare as she will have to transfer utility to her spouse to convince him to stay in the marriage.

For couples for whom *Case III* holds, women's welfare increases. If, on the one hand, he wanted to separate before she wanted to divorce ($\beta^M > \widetilde{\beta_j^M}$), they were either separating or renegotiating the marriage under mutual consent. If they were separating, they will either divorce or remain married—both being welfare-improving for her. If they were renegotiating the marriage, the man will no longer be able to threaten with separation and will only be able to ask for divorce. That threat will only operate at more negative values of θ which will increase women's sharing in marriage, since $\theta^{UD} < \theta^S$. If, on the other hand, she preferred divorce before he preferred separation in mutual consent ($\beta^M < \widetilde{\beta_j^M}$), she was unable to threaten with divorce and they were remaining in marriage with the original shares. Under unilateral divorce, she can now threaten with divorce and thus be better off. Note that if $\beta^M > \overline{\beta_j^M}$, then we are automatically in the first case.

Welfare's impact is thus uncertain as women in Case I will see their welfare decrease when $\beta^M > \overline{\beta_j^M}$ but their welfare increase when $\beta^M < \overline{\beta_j^M}$. Women in *Case III* will also benefit from the transition to unilateral divorce. The total impact when marriage allocation is skewed towards women will thus depend on the density of women in each of the regions of costs of divorce.

For (d) note than when separation is allowed, none of the two regimes is fully efficient. Compared to the efficient case, in mutual consent divorce (Proposition 1) there are too many separations. In unilateral divorce (Proposition 2), there are too many divorces. In both cases, there are extra marriages that the efficient outcome would not generate. Whether the transition from mutual consent divorce to unilateral divorce improves efficiency or not will depend on the distribution of couples across the parameter space.

Finally, for (e), we need to show that the probability of separation decreases more in UD for low-income couples than for higher-income couples, compared to MCD. The probability of being separated under UD is given by

$$P(\text{Sep} \mid y)^{UD} = \int_{-\infty}^{\theta^S(y)} \int_{C^H(y)}^{\bar{C}} f(\theta) n(C_j)\, dC_j d\theta. \tag{31}$$

Similarly, the probability of being separated under the Mutual Consent Divorce (MCD) regime is:

$$P(\text{Sep} \mid y)^{MCD} = \int_{-\infty}^{\theta^S(y)} \int_{C^L(y)}^{\bar{C}} f(\theta) n(C_j)\, dC_j d\theta. \tag{32}$$

Since $C^L < C^H$, we define the difference in separation probabilities between (31) and (32) as:

$$\Delta P(\text{Sep} \mid y) = P(\text{Sep} \mid y)^{UD} - P(\text{Sep} \mid y)^{MCD} = -\int_{C^L(y)}^{C^H(y)} \int_{-\infty}^{\theta^S(y)} f(\theta) n(C_j)\, dC_j d\theta. \tag{33}$$

Note that this is negative and equal to the area between C_H and C_L to the left of θ^S.

Next, we analyze how the difference in separation probabilities across regimes changes with income y:

$$\frac{d}{dy}\Delta P(\text{Sep} \mid y) = -\frac{\partial \theta^S}{\partial y}\int_{C^L(y)}^{C^H(y)} n(C_j)\, dC_j - \left(\frac{\partial C^H}{\partial y} - \frac{\partial C^L}{\partial y}\right)\int_{-\infty}^{\theta^S(y)} f(\theta)\, d\theta. \tag{34}$$

We have already shown that the first term in (34) is positive since as income increases, the threshold of θ leading to separation becomes more negative. The second term in (34) is negative since C^H increases in income while C^L falls, as shown previously. Thus, the transition from MCD to UD will make separation less likely and that this fall in separation will be smaller for higher income couples, as long as the effect of income on the thresholds of Cs is limited, as seen in our simulations. Said differently, given that the area between C_H and C_L to the left of θ^S is bigger for lower income couples, these couples will see the fraction of couples separating fall by more than those with more resources.

In the case of divorce, the probability of facing such an outcome is:

$$P(\text{Divorce} \mid y)^{UD} = \int_{-\infty}^{\theta^{UD}(y)} \int_{\underline{C}}^{C^H(y)} f(\theta) n(C_j)\, dC_j d\theta. \tag{35}$$

Similarly, the probability of divorce under the Mutual Consent Divorce (MCD) regime is:

$$P(\text{Divorce} \mid y)^{MCD} = \int_{-\infty}^{\theta^{MCD}(y)} \int_{\underline{C}}^{C^L(y)} f(\theta) n(C_j)\, dC_j d\theta. \tag{36}$$

The difference between (35) and (36) is given by

$$\Delta P(\text{Divorce} \mid y) = \int_{\underline{C}}^{C^L(y)} \int_{\theta^{MCD}(y)}^{\theta^{UD}(y)} f(\theta) n(C_j)\, dC_j d\theta + \int_{C^L(y)}^{C^H(y)} \int_{-\infty}^{\theta^{UD}(y)} f(\theta) n(C_j)\, dC_j d\theta. \tag{37}$$

The derivative of (37) with respect to y is given by

$$\begin{aligned} &\int_{\underline{C}}^{C^L} f(\theta)\left(\frac{d\theta^{UD}(y)}{dy} - \frac{d\theta^{MCD}(y)}{dy}\right) n(C_j)\, dC_j + \\ &\frac{\partial C^L}{\partial y}\int_{\theta^{MCD}(y)}^{\theta^{UD}(y)} f(\theta) d\theta + \left(\frac{\partial C^H}{\partial y} - \frac{\partial C^L}{\partial y}\right)\int_{-\infty}^{\theta^{UD}(y)} f(\theta)\, d\theta + \frac{\partial \theta^{UD}}{\partial y}\int_{C^L(y)}^{C^H(y)} f(\theta) n(C_j)\, dC_j. \end{aligned} \tag{38}$$

We see that the first term in (38) is equivalent to the one derived when separation was not feasible and its sign will be unclear. The second term in (38) will be negative as C^L falls in income. The third term in (38) will be positive, as shown in (34). Finally, the last term in (38) will be

negative as the threshold of θ for divorce falls as income increases. This last term corresponds to the equivalent of the argument for separations. Since there were more separations in MCD for poorer individuals and those separations are replaced by divorce in this range of C under UD, the increase is larger for poorer household. Even if the effect on C^L and C^H is very small (and so the effects from the second and third terms are close to zero), we still cannot sign the above expression. It depends on the relative density of couples in the C_j space.

■

Proof of Proposition 5. Without the possibility of separation, partners would only choose between marriage and divorce. A partner would trigger divorce when it gives them a higher payoff than marriage. Under unilateral divorce, divorce will always be efficient, as we state in Proposition 4. Under mutual consent divorce, it would never be threatened or filed by someone who prefers marriage to divorce, and it may not be granted if one of the partners is better off in marriage.

When separation is possible—and under unilateral divorce laws—divorce will be used as a threat in Case I of Proposition 2 by the partner who ranks divorce above marriage at the initial marital allocations. As in the case without separation, this will trigger a renegotiation of the marital terms in favor of this partner. Efficient divorces will actually take place, while other marriages will continue at the renegotiated marital terms.

However, in this case, divorce may also be used as a threat by a partner who is worse-off in divorce than in marriage. This would occur if the alternative without that threat would be separation instead of marriage. For couples under *Case III* ($C^L < C_j < C^H$) of Proposition 2, if the husband wishes to separate before the wife wishes to divorce, the wife can use the threat of unilateral divorce even when she is better-off in marriage. As long as the husband prefers the current marriage to divorce, this threat will deter him from separation and will make him stay in the marriage. If he ranks divorce over the current marriage, and he triggers separation, the couple will renegotiate the marital terms as long as there is surplus in marriage relative to divorce. For marital quality shocks below θ_j^{UD}, the couple will divorce.

This is not true in the case of mutual consent divorce, as divorce cannot be used as a credible threat because it requires the consent of the other partner. ■

Proof of Proposition 6.

Couples in which both partners prefer divorce to separation (Case I) will not be affected by divorce legislation (relative to the results in Proposition 1). Partners will threaten with separation when $\beta^M > \widetilde{\beta^M}_j$ or $\beta^M < \widehat{\beta^M}_j$. However, as they have no ability to ask for divorce after deserting the marital home (only the abandoned partner can do that), the length of t^s will have no

impact in that decision. For couples under *Case II* —in which both partners prefer separation to divorce—desertion laws will will not change their decisions either.

However, desertion laws may impact couples on *Case III*. Without desertion laws, divorce would never be an outcome for these couples, as one partner (the husband) prefers separation to divorce, and so, he will not grant the divorce to his wife. However, when desertion laws are in place, after the husband separates, the wife can unilaterally file for divorce after a fraction of time t^s.

Anticipating this, now the husband will only separate if

$$\theta_j < t^s(y - c/2) + (1 - t^s)((1 - \beta^D)(y + z) - (1 - \alpha)C_j) - (1 - \beta^M)h(y, z). \tag{39}$$

As his value of separation is higher than the value of divorce, he will threaten with separation for lower realizations of θ_j relative to a scenario without desertion (which can be seen by comparing (39) to the second term of (4)).

If the husband threatens with separation, the couple will renegotiate the marital allocation in his favor, up to the point in which he is better-off in the marriage compared to separation followed by divorce (as divorce will be triggered by the wife unilaterally after a fraction of time t^s). The value of β^M at which he will be indifferent between staying in the marriage or initiating the separation will be given by

$$\beta_j^M = \frac{h(y, z) + \theta_j - t^s(y - c/2) - (1 - t^s)((1 - \beta^D)(y + z) - (1 - \alpha)C_j)}{h(y, z)} \tag{40}$$

Again, as for him the value of divorce is lower than the value of separation, then the value of β_j^M defined by (40) will be higher than the value of β_j^M defined by the upper bound of (5). Therefore, once desertion laws are in place, he will not be able to extract as much surplus within the marriage, even when he threatens with separation.

Finally, renegotiation will not be feasible, and the marriage will end when

$$\theta_j^{SD} < \frac{(y + z) - t^s c - (1 - t^s)C_j - h(y, z)}{2} \tag{41}$$

It is easy to show that $\theta^{SD} > \theta^S$ when $C_j < c$ and $\theta^{SD} < \theta^S$ when $C_j > c$. However, with desertion laws in place the equilibrium outcome will be divorce rather than separation after a fraction of time t^s.

Using this, we can thus demonstrate each element of the proposition.

(a) Divorce and separation decisions will remain the same in *Case I* and *II*. However, for *Case III*, we will now have for for couples with $\theta < \theta^{SD}$ the outcome will be separation followed by

divorce at $t > t^s$. This will lead to more divorces and fewer separations, compared to a world without desertion laws in place.

(b) For couples in *Case I* and *II*, there will be no difference in the fraction of marriages that do not continue. However, in *Case III*, we will now have that all unions where $\theta < \theta_j^{SD}$ will break up. Since $\theta_j^{SD} > \theta^S$ when $C_j < c$ and $\theta_j^{SD} < \theta^S$ when $C_j > c$, the effect on marital stability will be ambiguous and will depend on the distribution of couples in the (θ, C_j) space.

(c) Women's welfare will remain intact for couples in *Case I* and *II*. In *Case III*, female welfare will increase in couples that remain married. This is because the value of θ at which the husband asks to renegotiate the contract is now defined by (39), which is lower than in a world without desertion, leading to better outcomes within marriage for her. Moreover, couples that before were separated will now divorce, which also increases female welfare. Therefore, compared to the transition to UD, desertion laws only modify the welfare of women in *Case III*, for whom we have shown before that their utility increases with divorce.

As the legislation requires a longer desertion period before granting a spouse the possibility of filing for divorce unilaterally, the effects of these laws will be attenuated. Female welfare will decrease, as the share of the marital value $(1 - \beta_j^M)$ that the husband requires to stay in the marriage (defined by (40)) will increase:

$$\frac{\partial \beta_j^M}{\partial t^s} = -(y - c/2) + (1 - \beta^D)(y + z) - (1 - \alpha)C_j < 0$$

Moreover, as t^s increases, couples in case III with $\theta < \theta^{SD}$ will still end up in divorce, but they will spend a larger share of period 2 in separation, which further reduces female welfare.

Finally, as $\frac{\partial \theta_j^{SD}}{\partial t^s} = -c + C_j$, separation will be initiated at higher values of θ_j^{SD} when $C_j > c$ and at lower values of θ_j^{SD} when $C_j < c$. Therefore, a higher desertion period would mitigate the effects of desertion laws on marital stability (which sign was ambiguous, based on (b)).

Note that in the extreme case in which $t^s \to 1$, then the results are analogous to mutual consent case. On the other hand, as $t^s \to 0$, the wife can file for divorce right away, making the analysis analogous to *Case III* under UD (where separation is not indeed a credible threat). ■

Proof of Proposition 7.

For (a) and (b), we have that, for couples under *Case II*, both partners will prefer separation to divorce, and the cool-off legislation will have no effects for them.

For couples under *Case I*, both partners prefer divorce over separation when $t^s = 0$. However, with mandated cool-off periods ($t^s > 0$), divorce will only be initiated for lower realizations of the

shock relative to (14). This is because being forced to spend time separated reduces the value of divorce in period 2 ($V_2^{iSD} < V_2^{iD}$). This will increase both (a) the share of couples that spend time separated, as they are forced to do so before filing for divorce, and (b) marital stability, as less couples will initiate a divorce.

As before, the partner that wants to divorce first will trigger a renegotiation of the marital allocation. However, as cool-off periods reduce the value of the outside option, the renegotiation will stop at less favorable terms for the partner that threatens with divorce first, relative to a setting with $t^s = 0$. When $\beta^M > \overline{\beta^M}$, women will benefit from the policy while men will do so when $\beta^M < \overline{\beta^M}$. The threshold of θ_j under which renegotiation will not be feasible is again given by (41).

Cool-off legislation will also affect couples in *Case III*. Without cool-off periods, one of the partners could threaten to divorce and obtain a renegotiation of the marital shares in their favor. If there was no surplus relative to divorce, these couples would divorce.

However, if a cool-off period is imposed and men wanted to divorce before women did ($\beta^M > \overline{\beta_j^M}$), men in *Case III* will actually want to exert the threat at higher levels of θ since their value of separation is higher than their value of divorce. They will thus renegotiate more often in their favor, which reduces women's welfare. If $C_j < c$—which implies that $\theta^{UD} > \theta^{SD}$—, divorce will occur less often and women will lose as they will have to provide more resources to their spouse within marriage than what they were previously obtaining in divorce. If $C_j > c$—which implies that $\theta^{UD} < \theta^{SD}$—, marriage will end more often than before and this will lower woman's welfare since they were better off in marriage than in divorce in that range.

If the wife wants to divorce before the husband did ($\beta^M < \overline{\beta_j^M}$), she will now be forced to wait t^s share of period 2 before filing the divorce. This reduces the value of her outside option, and hence, the value of θ_j that will trigger renegotiation will decrease. Upon renegotiation, she will extract less of the marital surplus (which reduces her welfare). Finally, when $C_j > c$, and hence $\theta_j^{SD} > \theta_j^{UD}$, larger shocks relative to the $t^s = 0$ setting will make the marriage unfeasible (and so will not give her a possibility to renegotiate). The opposite will be true when $C_j < c$ and marital break-up will happen more often than before which will also reduce her welfare.

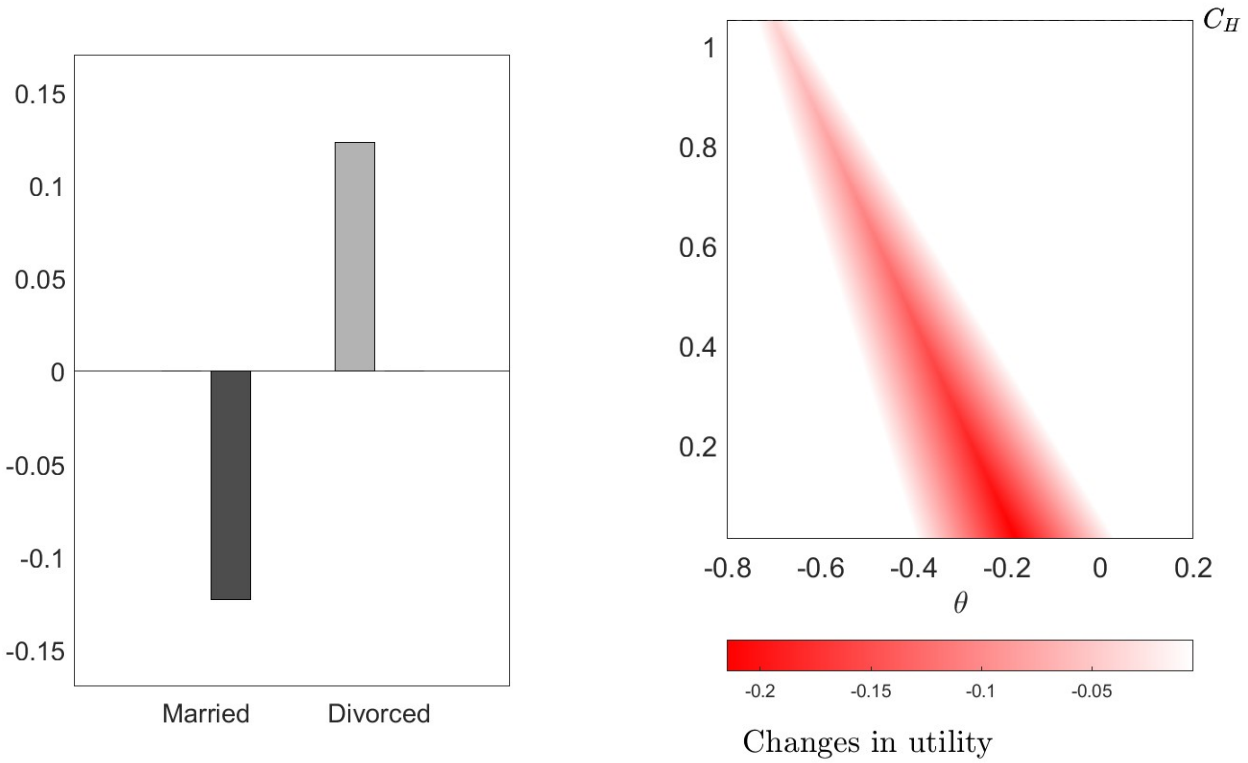
To summarize, under UD, cool-off periods lead to (a) couples spending relatively more time in separation than in divorce (even when the share of couples that remain permanently separated does not change); (b) The effect on marital stability is uncertain as these policies increase break-up among couples in *Case III* with $C_j > c$ but reduce separation/divorce for those with $C_j < c$, as well as for couples in *Case I*; Finally, (c) the effect on women's welfare are uncertain, as cool-off periods help women in *Case I* with $\beta^M < \overline{\beta_j^M}$ and hurt women in *Case I* with $\beta^M > \overline{\beta_j^M}$, as well

as women in *Case III*.

As the length of the cool-off period increases, the share of time couples spend in separation relative to divorce increases as well. Moreover, an increase in t^s will increase or decrease θ_j^{SD} depending on whether $c < C_j$ or $c > C_j$, reinforcing the effects on marital stability discussed above. Finally, as t^s increases, women in Case I with $\beta^M > \overline{\beta^M}$ will gain relatively more (as the renegotiation will end at relatively more favorable terms for them), while those with $\beta^M < \overline{\beta^M}$ will lose relatively more. Also, women in Case III will experience higher welfare losses as t^s increases, as the value of the male outside option increases and the value of the female outside option increases, exacerbating the effects of the cool-off periods. ■

C Additional simulations

Figure A3: The effect of the transition from MCD to UD on equilibrium outcomes when separation is not an option: marital status (left panel) and female welfare (right panel)



Notes: this figure presents the results of simulations in which we set, in all panels, the model's parameters to $\beta^M = 0.5$, $y = 0.85$ $z = 0.5y$, $\alpha = \beta^D = 0.33$ and $h(y, z) = (y + z)^2$. To eliminate separation, we set c significantly high, relative to C_j ($c = 5$ in this exercise). The left panel shows the changes in marital status upon transition from mutual consent to unilateral divorce. Without separation, the decline in marriage is exactly off-set by the increase in divorce.

Table A5: Simulated impact of unilateral divorce laws on women's welfare with $\alpha = 0.4$

	Average	Low Educated		High Educated	
		Low educ. husb.	High educ. husb.	Low educ. husb.	High educ. husb.
	(1)	(2)	(3)	(4)	(5)
Δ Separation	-0.011	-0.026	-0.025	-0.003	-0.003
Δ Divorce	0.036	0.044	0.065	0.023	0.033
Δ Avg. Welfare	0.103	0.204	0.694	-0.021	0.041
Δ Avg. Welfare (-)	-0.277	-0.230	—	-0.244	-0.306
Δ Avg. Welfare (+)	0.645	0.791	1.169	0.041	0.521

Notes: Results of simulation of model with $\beta^M = 0.5$, $\beta^D = 0.45$, $\alpha = 0.4$, $c = 3.033$, $m = 1.019$, $\delta = 2.8$. C_j is randomly drawn from $[0, 8.2913]$ and θ from $[-1.9077, 1.9077]$.

Table A6: Simulated impact of unilateral divorce laws on women's welfare with $\alpha = 0.25$

	Average	Low Educated		High Educated	
		Low educ. husb.	High educ. husb.	Low educ. husb.	High educ. husb.
	(1)	(2)	(3)	(4)	(5)
Δ Separation	-0.011	-0.022	-0.021	-0.005	-0.005
Δ Divorce	0.025	0.030	0.044	0.023	0.033
Δ Avg. Welfare	0.103	0.204	0.694	-0.021	0.041
Δ Avg. Welfare (-)	-0.277	-0.230	—	-0.244	-0.306
Δ Avg. Welfare (+)	0.645	0.791	1.169	0.041	0.521

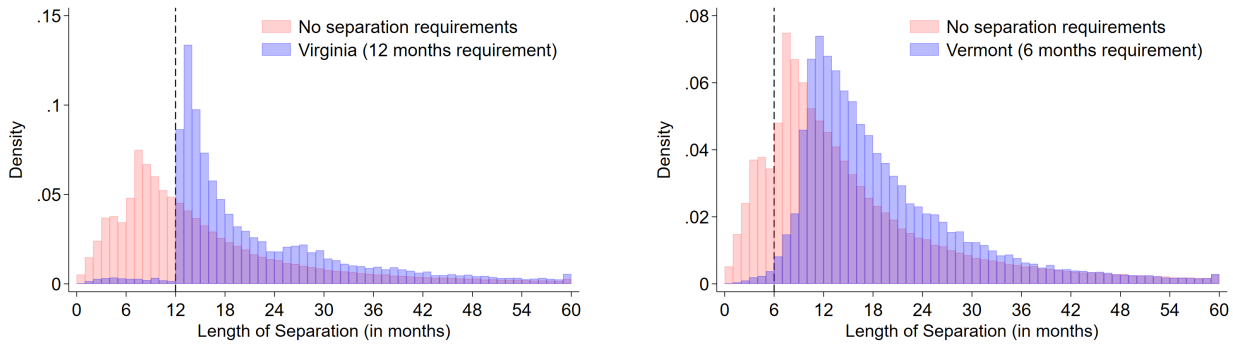
Notes: Results of simulation of model with $\beta^M = 0.5$, $\beta^D = 0.45$, $\alpha = 0.25$, $c = 4.5145$, $m = 1.020$, $\delta = 7$. C_j is randomly drawn from $[0, 18.749]$ and θ from $[-2.6929, 2.6929]$.

D Unilateral Divorce with Cool-off Periods

In this Section, we first discuss theoretically the effects of legislation that introduces UD but with a mandated cool-off period. We then introduce this legislation in the calibrated model presented in Section 5. We show that cool-off mandates have negative effects for women, compared to the introduction of unrestricted UD.

Note that the spirit of this legislation is different from that of desertion laws. While the latter are intended to protect an individual (typically the wife) from spousal abandonment, the former aim to give partners time to re-consider their decisions before officially filing for divorce. Using data from two states—Virginia and Vermont—that implemented UD with cool-off mandates, we show in Figure A4 suggestive evidence of binding cool-off periods, with these laws increasing the length of separation relative to UD states with no cool-off mandates in place.[22]

Figure A4: Length of separation by minimum separation requirements



Notes: Data from the National Center for Health Statistics (1968-1985). Sample includes divorces in all unilateral divorce states with no separation requirement, and those in the states of Virginia (12 months separation requirement) or Vermont (6 months separation requirement). The sample is restricted to divorce processes that started between 1970 and 1980, and that obtained a decree within 60 months. The dash black line indicates 12 months (left panel) or 6 months (right panel) length between separation and decree.

In the model, we introduce cool-off mandates by forcing spouses to wait for a fraction t^s of time in period 2, before being able to file for divorce (either unilaterally or if both agree to it). When $t^s > 0$, the second period payoffs for spouses who separate and then divorce will be defined by (21) and (22). The following proposition formally establishes the role of cool-off periods on outcomes in

[22] As we discussed in the case of Desertion Laws, we classify states into those that implemented unrestricted unilateral divorce and those that imposed cool-off periods, following Olivetti and Rotz (2017). Unfortunately, since the NBER divorce records dataset only has data on separation length for less than a handful of states that adopted cool-off periods, and since most states adopted them at the same time they adopted unilateral divorce, we cannot exploit variation in the data to assess the impact of these laws on the length of separation or other outcomes.

unilateral divorce regimes.

Proposition 7 *Under Unilateral Divorce laws, cool-off periods will: (a) increase the share of couples that spend time in separation; (b) have ambiguous effects on the probability of marriages remaining intact; and (c) have ambiguous effects on women's welfare. As the mandated length t^s of the cool-off period increases, the effects on separation, marital stability and women's welfare will be exacerbated.*

Proof. See Appendix B. ■

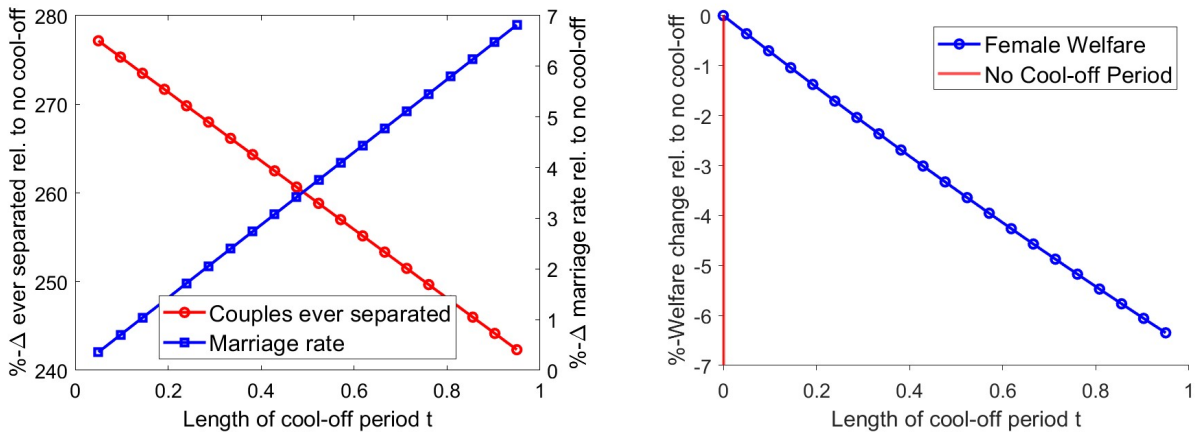
The introduction of cool-off periods—according to which spouses need to wait a certain mandated time before they can legally file for divorce, either by mutual consent or unilaterally—has no impacts for couples in which both partners prefer to separate. However, for couples for which at least one spouse would prefer to divorce, these laws force couples to spend at least some time in separation before formalizing the divorce. This increases the share of couples that spend at least some time in separation, relative to a unilateral divorce regime with no cool-off requirements. For couples in which both partners rank divorce above separation, this legislation would increase marital stability, as it forces them to spend time in a less desirable state if they were to break-up. Therefore, they would only end the marriage when the marital quality shock is sufficiently low. However, for couples in which one partner (typically the man) ranks separation over divorce, cool-off laws allow them to spend at least some time separated before their spouses unilaterally file for divorce, which increases their welfare. This either helps the husband to use the threat of separation as a way to improve his allocation within the marriage, or to actually spend some time in separation. The effects on marital stability for these couples are uncertain, as they depend on whether separation is cheaper vis-a-vis divorce.

Once again, we simulate the equilibrium of our model under different cool-off lengths. Once cool-off periods are implemented, the share of couples that are ever separated increases sharply, as now all divorcees transition at least a short period of separation. However, under our parameters, we show in Figure A5 (left panel) that the share of ever separated couples falls with the length of the mandated cool-off period, counterbalanced by an increase in marital stability. This is driven by couples for whom separation is costly relative to divorce, and hence, the longer mandated cool-off periods deter them from ending the marriage.

Finally, the mandated cool-off periods increase the welfare of women when they prefer to stay married but they husbands unilaterally divorce, as it now becomes more costly for men to do so. However, it decreases the welfare of women who either wanted to initiate the divorce themselves, or who use divorce as a counter-threat when their husbands want to separate. In our simulations,

the later effects dominate. As we show in Figure A5 (right panel), the women's welfare falls with the implementation of cool-off periods. This fall is more pronounced as the mandated waiting time lengthens. A formal proof of the proposition can be found in Appendix B.

Figure A5: Impact of cool-off periods on equilibrium outcomes: marital status (left panel); and female welfare (right panel)



Notes: The figure presents the results of the simulations for values of t^s between 0.05 and 0.95, when the other parameters are set to $\beta^M = 0.5$, $y = 0.85$, $z = 0.5y$, $c = 0.5$, $\alpha = \beta^D = 0.33$, and $h(y,z) = (y+z)^2$. The horizontal axis represents t^s, the length of the mandated cool-off period before partners can formally obtain the divorce, expressed as a share of the second period. In the left panel, the baseline separation, when $t^s = 1$ is equal to 0.11.

We use our calibrated model to simulate the adoption of UD with cool-off periods for different values of t_s. We report the aggregate changes in female welfare, as well as those disaggregated by couple type, in Table A7. Our results show that UD with cool-off periods is still on average better than MCD (column (1)), but a longer length of the cool-off period reduces the average gains associated with this transition. Given that UD without cool-off periods is equivalent to $t_s = 0$, the welfare impacts of imposing cool-off periods within a UD regime reduce the average benefits of this transition for women. Some women that gain from the adoption of unrestricted UD (see Table 13), lose when cool-off periods are implemented, as they are forced to spend a longer time in separation. These losses are concentrated among high-educated women married to high-educated men (column (5)). High-educated women matched to low-educated men experienced average welfare losses under unrestricted UD, which are now exacerbated with cool-off periods. Low-educated women still benefit on average, but at a lesser extent.

Table A7: Simulated impact of cool-off periods on women's welfare (compared to MCD)

	Average	Low Educated		High Educated	
		Low educ. husb.	High educ. husb.	Low educ. husb.	High educ. husb.
	(1)	(2)	(3)	(4)	(5)
$t_s = 0.1$	0.090	0.168	0.543	-0.006	-0.018
$t_s = 0.2$	0.081	0.156	0.528	-0.010	-0.037
$t_s = 0.5$	0.064	0.132	0.503	-0.018	-0.083

Notes: Results of simulation of model with $\beta^M = 0.5$, $\beta^D = 0.45$ and $\alpha = 1/3$. Other parameters are set to the calibrated values from Table 11. C_j is randomly drawn from $[0, 11.585]$ and θ from $[-2.2685, 2.2685]$. Changes in welfare measure changes in utility terms.