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ABSTRACT

Trapped in Purgatory? The Impact of Divorce Laws on Women's Welfare with Separation*

We show that separation has been a relevant outcome of American relationships over the last century and that separated women have worse economic outcomes than those divorced. A transferable-utility model of marriage, separation and divorce indicates that the welfare effects of divorce legislation depend on considering separation as an alternative. Empirically, the adoption of unilateral divorce laws reduced separation and increased divorce, particularly among low-educated women. A calibrated model indicates heterogeneous welfare effects of unilateral divorce with gains being concentrated among women with lower education. Desertion laws with very short duration generate similar gains for women.

JEL Classification: J12, J11, N32

Keywords: marriage, divorce, separation, female welfare, gender gaps

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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 easier. During the 1960s and 1970s, most states in the US shifted from a mutual-consent divorce regime (MCD)—under which divorce requires the consent of both spouses—to a unilateral divorce regime (UD)—which allows one spouse to file for divorce without the other's consent. However, most discussions about the benefits and costs of such changes lead to a paradox: Whereas women tend to be the ones petitioning for divorce more often than their spouses (Alemán, 2023), they are also the ones—along with their children—who suffer more from divorce, from an economic point of view (Gruber, 2004; Smock et al., 1999; Hoffman and Duncan, 1988). The sociology literature (e.g., Rosenfeld, 2018) has argued that women suffer more in bad relationships and are thus unwilling to remain in unhappy marriages. However, these discussions overlook the fact that women (and children) may be worse off in separation or estrangement than in divorce.

Being separated while still legally married is relatively common among American couples—and was even more so in the past. According to the 2010 Census, 6.3% of ever-married Americans reported being separated, roughly one-third the share of those who were divorced. Moreover, for many couples, separation is not merely a brief transition to divorce; instead, they remain separated for extended periods of time. Furthermore, while the obligations of separated parents are more strictly enforced nowadays, this was not the case in the past. Therefore, children of separated parents (who typically live with their mothers) were less likely to receive financial compensation from their estranged parents compared with children of legally divorced parents.

Despite the prevalence of separation as a living arrangement among Americans, there is a dearth of analytical models of the household which consider separation as a relevant outcome. The literature that accounts for whether unilateral divorce laws raised divorce rates (Friedberg, 1998; Wolfers, 2006) refers to a potential "pent-up" demand for divorce, but this literature focuses mainly on married couples and not on those who were separated at the time of the legal change[1] Most models that examine how divorce may impact intra-household bargaining (Voena, 2015) or marital formation (Reynoso, 2024) also ignore separation and consider only marriage and divorce. Lundberg and Pollak (1993) introduce the possibility of spouses defaulting to a non-cooperative bargaining mode within marriage instead of choosing to divorce, but does not entertain the potential for separation. Alemán (2023) does not

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

include separation but models who files for divorce to explain why women would be more often the filer.

In what lies ahead, we first present novel and previously overlooked stylized facts about separation and divorce. We show that separation is a prevalent outcome of marriage in the United States. Moreover, we document that women petition for divorce more often than men—even when they are materially worse off in divorce than in marriage. We then illustrate that women fare worse *economically* in separation than in divorce, even after taking into account selection into those marital status.[2]

Next, we present a unified household model of marriage and divorce alongside the possibility of unilateral separation. In our model, the main difference between separation and divorce is that transfers between spouses are entirely voluntarily in separation, while they are mandated by courts in divorce. We also let individual costs of separation and divorce vary across couples, which may reflect a host of factors such as asymmetries in tax liabilities, access to spousal health insurance, and the need for alternative living arrangements.

After presenting our dynamic household model with endogenous divorce and unilateral separation, we characterize the equilibria under two different divorce regimes: mutual consent divorce (MCD) and unilateral divorce (UD). We show that, under a mutual consent regime, separation can alleviate the typical hold-up problem, as one partner can unilaterally leave the marriage if their spouse does not agree to a divorce. However, those who prefers marriage or divorce over separation may be condemned to long-term estrangement if separation is the preferred alternative for their partners. Under unilateral divorce laws, by contrast, the ability of a partner to either separate or use separation as a threat to extract more resources within the marriage is eliminated. This is due to the fact that the other spouse can respond to such actions by unilaterally filing for divorce, an option that unambiguously helps to improve their material outcomes.[3]

Using our model, we show that divorce liberalization—the transition from MCD to UD—

[2]There may be cases in which the non-economic value of staying married is very negative for one of the spouses, which pushes them to end the marriage even when they would be worse off economically. This would occur, for example, when one spouse is a victim of domestic violence. Given that women are more likely than men to be victims of domestic violence (Adams-Prassl et al., 2024), incorporating these non-economic factors within our model would unequivocally make the adoption of unilateral divorce legislation improve women's welfare (as suggested by Stevenson and Wolfers, 2006), bolstering our findings that unilateral divorce laws benefit women. In what lies ahead, we do not take a stance on which spouse may be trapped in a bad marriage for non-economic reasons when mutual consent laws are in effect. Hence, we move forward with the assumption of symmetric marital shocks for both spouses, as discussed in Section 3.

[3]In our model, men are typically the ones that initiate separation or threaten to separate. However, gender simply captures income gaps. Thus our predictions for men and women would apply to higher- and lower-income partners in general.

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 this transition crucially depend on whether separation is an alternative. Specifically, if unilateral separation is not an option, women who are relatively better off in marriage compared to their husbands lose from the *UD* adoption. However, in a world with unilateral separation, women who otherwise would have been abandoned by their husbands benefit from *UD*, as men can no longer separate or credibly threaten to do so in order to extract a higher share of the marital surplus. Moreover, when separation is possible, the efficiency gains typically associated with divorce liberalization—which stem from the reduction of the hold-up problem—become uncertain, as new inefficiencies (leading to too many divorces) arise. Finally, we show that desertion laws, which permit abandoned spouses to file for divorce unilaterally under mutual-consent divorce laws, generate welfare gains to some women and no losses to those who suffer in UD.

Next, we test the empirical implications of our model. 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), and from which they can potentially secure greater transfers. By doing so, they also shorten the time they spend in separation. We then document negative selection into separation under UD. Finally, leveraging the staggered adoption of *UD* laws across states and over time, we confirm our model's key predictions: *UD* legislation led to about a one percentage point decline in separation rates and a 3.1 percentage points increase in divorce rates, ultimately resulting in reduced marital stability. As predicted by our model, these effects are especially pronounced among socioeconomically disadvantaged women, such as those who have lower education or who are racial minorities.

Finally, we use US data to calibrate the parameters of our model to match empirical moments under *MCD* regimes 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, on average women benefit from the transition but the effects are heterogeneous: those who previously held up their husbands in marriage under *MCD* generally experience welfare losses under *UD*. By contrast, women who would otherwise have been abandoned by their spouses under *MCD*, experience significant welfare gains after the liberalization of the divorce. These benefits are concentrated predominantly among low-educated women, who

enjoy welfare improvements equivalent to 8–32% of their annual income, depending on the characteristics of their spouses. Finally, we ask whether an alternative policy could induce welfare gains for some women without generating losses for others. We simulate desertion laws within a mutual consent divorce regime—which allow a spouse to unilaterally file for divorce after their partner has separated without agreement. We show that they can be even better than *UD*, on average, when the required length of desertion is short enough. This is because desertion laws generate gains for those women 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 significantly alters results established by the previous literature. In our model, *UD* could harm lower-income or secondary-earner partners (who are often the wives) when separation is not an option, a finding that is consistent with those of Fernández and Wong (2017). However, we demonstrate that *UD* can enhance the welfare of lower-income partners when separation is an alternative. 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 in which separation is introduced within a standard dynamic household framework of marriage with divorce. This section then derives predictions of the model. Section 4 empirically tests the model's predictions, including those of the effects of divorce liberalization. Section 5 discusses the model calibration and simulates the welfare effects of the introduction of unilateral divorce laws. Section 6 concludes.

2 Stylized Facts

We begin by describing our data sources in Section 2.1. We then document stylized facts on separation in Section 2.2.

2.1 Data

We use data from four main sources. First, we use microdata from the US Census for the period 1880-2010 Ruggles et al. (2021), which contains information on marital status, income, and pre-marital demographic characteristics. After 1950, it records separation as a

specific marital status, which is fundamental for our analysis.[4]

Second, some of our analysis requires longitudinal data to track changes in individuals' marital status. For this, we use data from the Panel Study of Income Dynamics (PSID) (Panel Study of Income Dynamics, 2024) and the National Longitudinal Survey of Mature Women (NLS-MW) (Bureau of Labor Statistics, U.S. Department of Labor, 2004). The PSID follows a representative sample of 5,000 families and their descendants, starting in 1968. The NLS-MW follows a cohort of 5,083 women who are between 30 and 44 years old in 1967. Both datasets allow us to observe transitions across marriage, separation, and divorce, as well as the demographic characteristics of the respondents in addition to their family incomes, transfers, and labor market outcomes. Importantly, both datasets allow us to look at cohorts who married under a mutual consent divorce regime, whereas the PSID further includes data on cohorts married under unilateral divorce legislation.

Finally, we rely on administrative data from US divorce certificates. These are data compiled from state records by the National Center for Health Statistics and provided by the National Bureau of Economic Research (NBER) (National Center for Health Statistics, 2002, 1997). Our sample consists of 893,770 divorce decrees obtained between 1968 and 1995. These divorce certificates include information on the date and length of marriage, who initiated the divorce, and the length of the separation period before finalizing the divorce—a key piece of information for our analysis.

We provide further details on our data sources in Appendix A.1.

2.2 Stylized Facts on Divorce and Separation

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

2.2.1 Separation is a Prevalent Marital Status

First, we document that separation has been a nontrivial outcome of marriages in the United States. As shown in Table 1, about 5% of ever-married individuals in the US report being separated in a given Census year. This share has been rising over time, and corresponds

[4]After 1950, we can distinguish in the Census those who report being separated from those who are married with spouse absent, but they are pooled together before 1950. When we can distinguish them after 1950, about half of the pooled sample is reported as being officially separated. However, because the legal framework for determining someone as "separated" is unclear, we consider it more appropriate to pool both categories even after 1950 when using data before and after 1950 in the same analysis.

to a higher fraction than those divorced for all years until 1980—when divorce rates saw an explosive increase, not mirrored by separation. Moreover, separation is more likely for non-college-educated and non-white individuals—a pattern we revisit in Section 4.

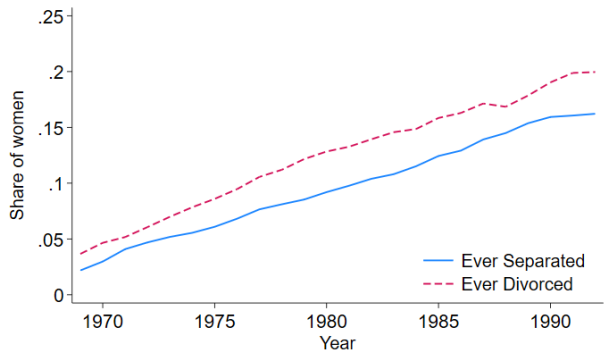
Table 1: Marital status of ever married individuals (1880-2010)

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). We pool individuals who report being separated with those who report being married with spouse absent.

Even for the more recent PSID cohorts, separation is a fairly common outcome. Figure 1 shows that, in the earliest years of the survey, separation was almost as likely as divorce. The gap widened around the period of the divorce liberalization, which will be the focus of our analysis below. Even after divorce became easier, a significant fraction of American women still experience separation over their lifetimes, with separation being a more prevalent outcome among the less educated, even today (see Figure A.1 in Appendix A).

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

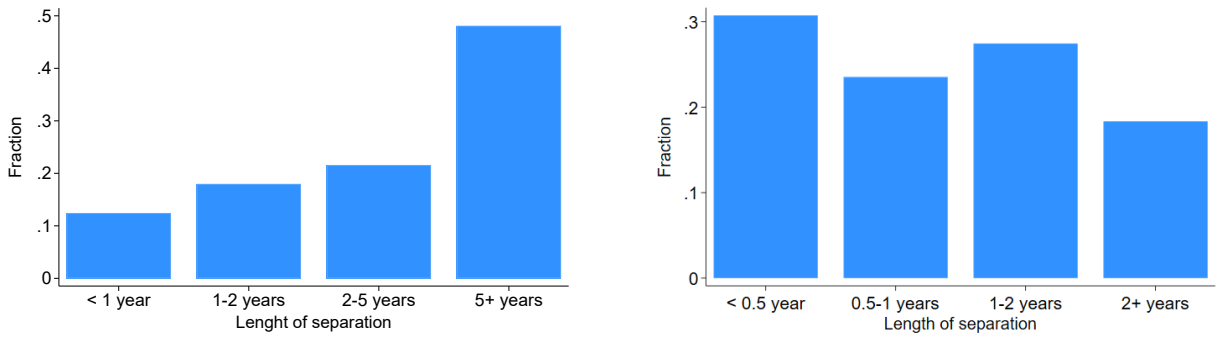


Notes: PSID (1968-1992). The figure plots women who were "ever divorced" or "ever separated" from their first marriages, independently of the final outcome of the marriage. For instance, a woman who first separated and then divorced, will be both counted as "ever separated" and "ever divorced".

It is possible that most of these separations correspond to short transitions toward divorce. However, the data suggest otherwise. Figure 2 (panel (a)) shows that in the 1950 Census—when we have data on the duration of current marital status—very short separations are relatively rare. Almost half of all separated individuals reported having been

separated for more than 5 years. 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 arrangement. For relatively more recent cohorts, the PSID shows that a significant share of the women who ever separated remained separated for at least one year (Figure 2 (panel (b)). Finally, the NBER's US Divorce records show that 50% of couples spend at least 1 year in separation, while 9% of couples experience separations longer than 4 years before finalizing the divorce.

Figure 2: Fraction of separated individuals by length of separation



(a) 1950 US Census

(b) PSID (1968-1992)

Notes: Panel (a) uses data from the 1950 Census, which reports the length of time individuals have been in the marital status they report by the time of data collection. Panel (b) uses data from the PSID 1968-1992. We construct the length of separation conditional on being ever separated, but unconditional on whether women eventually divorced. We use data from both the CRC and the SEO sample. Individual survey weights are used to compute the frequencies.

2.2.2 Women File for Divorce with Higher Likelihood

Using data from the NBER's US Divorce records, we also see that women are more likely than men to be plaintiffs in divorce, with two-thirds of divorce procedures initiated by the wives (Table 2).[5]

We do not have reliable information on who initiates the separations. However, using the 1950 and 1960 Census, we see that almost 10% of men who are separated live in non-institutional group quarters, while that number is only 2.7% for women. While 54% of separated women are household heads, that number is only 36.5% for men. Reversely, only

[5]This is a generalized pattern across US states, with the exception of Alaska and Ohio in which both spouses appear as joint plaintiff in almost 40% of divorce cases. The results are also robust when we restrict the sample only to states that had implemented *UD* legislation.

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".

11% of separated women live with non-relatives while that number rises to 27% for men. Together, this suggests different living arrangement for men than women post-separation that may be indicative that men are more likely to initiate separation and move out of the family home.

2.2.3 Women Fare Worse Economically in Separation

We have documented above that women are more likely to be plaintiffs in divorce. This is despite abundant evidence showing that divorce is correlated with worse economic outcomes than marriage for women and their children, although there is a discussion about the causal nature of this relationship (Painter and Levine, 2000; Bedard and Deschênes, 2005; McLanahan et al., 2013). More recently, Frimmel et al. (2024), Holm et al. (2023) and González and Viitanen (2018) estimate a significantly negative "divorce penalty" on children's outcomes. If women put more weight on the utility of their children than men (Duflo, 2000; Attanasio and Lechene, 2014), they would thus suffer more from divorce. There is also evidence that the financial burden of divorce is borne mainly by women (Leopold, 2018). Looking at the impact of divorce liberalization, both reduced form and structural work document negative impact of unilateral divorce on women's material welfare on average (Gruber, 2004; Fernández and Wong, 2017).[6]

However, differences between the outcomes of separated and divorced women have received little to no attention. We document here that women fare worse in separation than in divorce, which could explain why they are more likely to file for divorce even when they are better off in marriage.

First, using Census data, we show in Table 3 that poverty rates are the highest for separated individuals (followed by divorcees). Although the differences between divorced

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

and separated men are minimal, separated women have significantly higher poverty rates than their divorced counterparts.

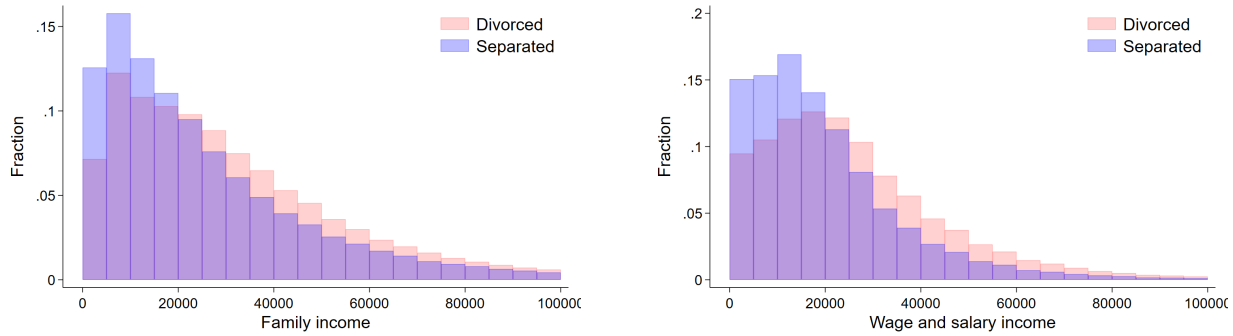
Table 3: Poverty rate by marital status for ever married individuals, by gender

Poverty rate	Women	Men
Married, spouse present	5.9	6.0
Separated	35.2	18.3
Divorced	20.2	14.4

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

Moreover, the distribution of family income is much more skewed to the left in separation, relative to divorce (Figure 3, panel (a)). This is also true when we look at female earnings (panel (b)). This indicates that separated women do not seem to make up for the lack of their estranged husband's support with an increase in their own wage incomes.

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



Notes: Data from IPUMS 1940-2019. Sample includes all women aged 16+. We winsorize incomes at the bottom and at the top, at 0 and 100K, respectively. All incomes and wages are expressed in 1999 real terms using the Consumer Price Index (CPI).

Of course, one concern is that these differences are entirely driven by selection into divorce and separation. To alleviate these concerns, we first show in Table A.1 in Appendix A.2, that separated women have $3,400 less in annual family income than their divorced counterparts even controlling for a host of demographic characteristics. It is also telling that we do not observe a similar pattern for men, with divorced and separated men having much more similar family incomes (Figure A.2 and Table A.1 in Appendix A.2).

We also take advantage of the panel structure of the PSID and NLS-MW, where we can

observe the same women in separation and divorce and compare their outcomes in both marital statuses.

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

	PSID		NSL-Mature Women		
	Taxable income (1)	Total family income (2)	Total family income (3)	Wage income (4)	Child support income (5)
	Panel (a): Without individual level fixed-effects				
Separated	-803.21^{***}	-748.03^{***}	$-1,360.11^{***}$	$-1,910.56^{***}$	-65.78^{***}
	(176.22)	(176.44)	(381.46)	(390.12)	(21.98)
N	4,865	4,867	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	-630.19^{***}	-520.19^{***}	$-1,047.42^{*}$	$-1,436.31^{**}$	-144.72^{**}
	(234.22)	(207.11)	(589.51)	(681.72)	(70.57)
N	4,865	4,867	6,902	6,715	4,911
Year FE	Yes	Yes	Yes	Yes	Yes
Demographic Controls	Yes	Yes	Yes	Yes	Yes

Notes: The first two columns use data from the PSID CRC and SEO samples, from 1969-1997. Our sample includes women who are younger than 55. All regressions control for 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. Individual survey weights are used 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. Columns (3) to (5) use data from the 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.

Columns (1) and (2) of Table 4 (panel (a)) indicate that women who are separated after their first marriage have on average $803 less taxable income per adult equivalent and $748 less family income, relative to those who are divorced. The results are robust (and only slightly smaller in magnitude) to including individual fixed effects in panel (b). This suggests that the differences highlighted in the Census are not only due to selection and that women's material well-being is lower in separation than in divorce.

We complement our analysis with the data from the NLS-MW which has additional information on transfers.[7] Consistent with the results from the PSID, the last three columns of Table 4 indicate that NLS-MW women who are separated from their first spouses have significantly lower total family and wage incomes than those who are divorced. They also

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

receive lower transfers, as shown in column (5). Again, the results are robust to including individual fixed effects in the regressions in panel (b).

Overall, we conclude that women's economic welfare is lower in separation than in divorce, in part because they receive fewer 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 reforms.

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 the utilities of the husband and the wife as u^m and u^f, respectively. We assume h to be increasing in each argument and exhibiting supermodularity in y and z.[8] Utility is fully transferable between spouses in

[8]We assume that the function $h(y, z)$ satisfies the following conditions: $\forall y \in [\underline{y}, \overline{y}]$ and $\forall z \in [\underline{z}, \overline{z}]$, $h(y, z)$

marriage *(TUM)*, a property that drastically simplifies our analysis.[9]

For men and women of endowments y and z who divorce or separate, the intratemporal outputs will be given by $h(y,0) \equiv y$ and $h(0,z) \equiv z$. Due to the supermodularity of h, $h(y,z) > h(y,0) + h(0,z) = y + z$.[10]

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. In the second period, couples decide whether to stay married, separate, or divorce. If they stay married, the second period payoff for the wife will be $V_2^{fM}(y,z) = \beta^M h(y,z) + \theta_j$, while that of the husband will be $V_2^{mM}(y,z) = (1-\beta^M)h(y,z) + \theta_j$. The second-period joint marital payoff will be given by $V_2^M(y,\ z) = h(y,z) + 2\theta_j$.

Couples incur a cost if they divorce or separate, and do not derive value from the match quality, θ_j. If couples separate while still legally married, they incur a cost c, which is common across all couples. 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. This couple can also choose, in principle, how to share the separation cost c.

The cost of divorce is couple-specific, and given by C_j, where C_j is drawn from a distribution N with $C_j \in [\underline{C}, \bar{C}]$. Unlike separation, divorce is regulated by the law. We assume that both the share of the total income $(y+z)$ that accrues to the wife in divorce, β^D, as well as the share of the divorce costs incurred by the wife, α, are dictated by courts. On that basis, the payoff of a divorced wife and husband will be given by $V_2^{fD} = \beta^D(y+z) - \alpha C_j$ and $V_2^{mD} = \beta^D(y+z) - (1-\alpha)C_j$, respectively.

Then, for couples that separate or divorce, the joint payoff will be given by the sum of the partner's endowments net of either the separation cost c or the couple-specific divorce cost, C_j. As we shall show in the next section, whether the cost of divorce is higher or lower than the cost of separation will determine whether the total payoff in divorce is below or above the total payoff in separation.

$> y + z$ with $h_y(y,z) > 1$ and $h_z(y,z) > 1$.

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

[10] We could easily extend our model to allow separated and divorced individuals to still enjoy some public good, as long as the extent under which spouses share public consumption in separation and divorce is less than in marriage.

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; 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 $z^S = z$ and they equally share the separation cost (i.e., both the husband and the wife incur a cost of $c/2$ at separation).[11] 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 husbands are mandated to cover a larger burden of the cost of divorce (i.e., $\alpha < 1/2$).[12] This assumption is based on the facts we documented earlier according to which women appear to have lower incomes when they are separated than divorced.

We next show in section 3.2 how couples choose between the choices described above.

3.2 Determinants of Individual Choices

The couple's decisions between marriage, separation, and divorce will depend on their realization of the marital shock, θ_j, and their couple-specific cost of divorce C_j. Here, we define the individual decision-making problem, as well as the thresholds of θ_j that determine the relative rankings of marriage, divorce and separation. We characterize the optimal choices in section 3.4.[13]

Marriage vs. Separation: 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

[11] We make these assumptions to simplify the exposition of our analysis. However, anything that would make separation less redistributive than divorce would replicate our main results.

[12] 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 results we present below would remain intact as long as the cost of separation borne by women is at least equal to αc.

[13] We assume that the marital shocks are common to both spouses. While this is a strong assumption, it is innocuous for most of the analysis. The decision between divorce and separation is independent of the marital shocks. The decision between marriage and separation only depends on the sum of the shocks, as does that of unilateral divorce. It is only in the case of mutual consent divorce that the relative magnitude of the shock would matter for decisions, as it would modify the thresholds of equation (8). When the shocks are less favorable to women, they would be the ones "trapped" in a bad marriage, similar to the case in which β^M is relatively low.

in separation are higher than their payoffs in marriage:

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

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 favor of the partner who wants to separate (Mazzocco, 2007; Voena, 2015; Reynoso, 2024). However, renegotiation would not be feasible when there is no surplus left in the marriage, and so, there is no β_j^M such that both partners would prefer marriage over separation. This would occur for realizations of $\theta_j < \theta^S$, with θ^S defined by (2):

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

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.

Marriage vs. Divorce under Mutual Consent Laws: Under *MCD* laws, couples can only divorce when both partners agree to it. Therefore, divorce would occur for realizations of θ_j such that:

$$\begin{aligned} \theta_j < \min\{&\beta^D(y+z) - \beta^M h(y,z) - \alpha C_j, \\ &(1-\beta^D)(y+z) - (1-\beta^M)h(y,z) - (1-\alpha)C_j)\}, \quad y, z \geq C_j. \end{aligned} \tag{3}$$

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, for the latter to agree to divorce.[14]

No partner will hold-up the marriage when the two terms on the right-hand-side of (3) coincide. By setting β^M such that the arguments on the right hand side of (3) are identical in

[14]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.

value, one can derive the threshold of 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:

$$\overline{\beta^M}_j = 0.5 + \frac{(2\beta^D - 1)(y+z) + (1-2\alpha)C_j}{2h(y,z)}. \tag{4}$$

The husband would hold up a divorce when marital allocations are favorable to him, such that $\beta^M < \overline{\beta^M}_j$. The wife will hold up a divorce when $\beta^M > \overline{\beta^M}_j$. Since the RHS of (4) is strictly increasing in the cost of divorce C_j, the range of wives' marital allocations β^M with which the husband would hold up a divorce decision would also rise with C_j.

Moreover, while divorce requires mutual consent, one spouse could still use separation as a threat to renegotiate the marital allocations on their favor (or convince the other partner to divorce). When marital allocations are relatively favorable to men, women would wish to separate before their husbands would agree to divorce. This will occur when

$$\beta^M < \widehat{\beta^M}_j \equiv 0.5 + \frac{z - (1-\beta^D)(y+z) + (1-\alpha)C_j - c/2}{2h(y,z)}. \tag{5}$$

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

$$\beta^M > \widetilde{\beta^M_j} \equiv 0.5 + \frac{\beta^D(y+z) - y - \alpha C_j + c/2}{2h(y,z)}, \tag{6}$$

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. As before, we can define the thresholds for θ below which the marriage cannot be sustained, when the husband or the wife threatens with separation:

$$\theta_j < \begin{cases} \dfrac{\beta^D(y+z) + y - h(y,z) - \alpha C_j - c/2}{2}, & \text{if husband threatens separation,} \\ \dfrac{(1-\beta^D)(y+z) + z - h(y,z) - (1-\alpha)C_j - c/2}{2}, & \text{if wife threatens separation.} \end{cases} \tag{7}$$

Putting this altogether, in a mutual consent divorce regime, divorce would be chosen by the couple over marriage whenever

$$\theta_j < \theta^{MCD} \equiv \begin{cases} 0.5\left((1-\beta^D)(y+z)+z-h(y,z)-(1-\alpha)C_j-\frac{c}{2}\right) & \text{if } \beta^M \leq \widehat{\beta_j^M} \\ (1-\beta^D)(y+z)-(1-\beta^M)h(y,z)-(1-\alpha)C_j & \text{if } \widehat{\beta_j^M} < \beta^M \leq \overline{\beta_j^M} \\ \beta^D(y+z)-\beta^M h(y,z)-\alpha C_j & \text{if } \overline{\beta_j^M} < \beta^M \leq \widetilde{\beta_j^M} \\ 0.5\left(\beta^D(y+z)+y-h(y,z)-\alpha C_j-\frac{c}{2}\right) & \text{if } \widetilde{\beta_j^M} < \beta^M. \end{cases} \tag{8}$$

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

$$\begin{aligned} \theta_j < \max\{&\beta^D(y+z)-\beta^M h(y,z)-\alpha C_j, \\ &(1-\beta^D)(y+z)-(1-\beta^M)h(y,z)-(1-\alpha)C_j) \quad y,z \geq C_j\}. \end{aligned} \tag{9}$$

As in the case of separation, we can define a range over β^M that would allow to sustain the marriage. Renegotiation will be unfeasible when such β^M does not exist, which occurs when the marital shock is below θ^{UD} defined by

$$\theta_j^{UD} \equiv \frac{y+z-h(y,z)-C_j}{2}. \tag{10}$$

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 $y-\frac{c}{2} > z-\frac{c}{2}$. Moreover, women would be better off being divorced than separated vis-a-vis men, since divorce laws redistribute in favor of the lower-income spouse:

$$\beta^D(y+z)-z-\alpha C_j + \frac{c}{2} > (1-\beta^D)(y+z)-y-(1-\alpha)C_j + \frac{c}{2}. \tag{11}$$

Whether a couple would prefer to divorce or separate depends on the relative costs of separation and divorce. First, if the husband prefers divorce over separation, then his wife would also do so given equation (11). For this scenario to unfold, the cost of divorce would need to be relatively low. Specifically,

$$\frac{(1-\beta^D)(y+z)-y+\frac{c}{2}}{1-\alpha} \equiv C^L > C_j. \tag{12}$$

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 $C^L < c$.

Second, both partners may prefer separation to divorce, which occurs when the cost of

divorce is relatively high:

$$\frac{\beta^D(y+z) - z + \frac{c}{2}}{\alpha} \equiv C^H < C_j. \tag{13}$$

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 $C^L < c < C^H$.

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, with $C^H > \quad C_j \quad > C^L$.

In what follows, we will organize our analysis around these three potential cases.[15]

3.3 Efficient Decisions

Consider a social planner who decides for the couples once their marital shocks materialize.[16] 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 left compared with 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 *UD* would 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 *MCD* laws, as has been already highlighted by the literature (Reynoso, 2024; Voena, 2015).

However, the fact that separation and divorce coexist generates additional sources of inefficiencies that have hitherto neither been identified nor explored. 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

[15] 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., the case in which (11) is reversed).

[16] Note that such a social planner would focus on maximizing the total welfare of both spouses and not their individual welfare. This would be on the basis that, once the path that maximizes the couples' joint welfare is chosen by the planner, the couple would settle on Pareto-efficient transfers between spouses.

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, the equilibria under these three cases need to be analyzed under two different divorce-law regimes: mutual consent divorce (Section 3.4.1), and unilateral divorce (Section 3.4.2).

After we present these analyses in this section, 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 Section 3.5.[17]

3.4.1 Outcomes under Mutual Consent Divorce Laws

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

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

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

(c) Whether couples higher in the assortative (income) rank are more likely to be divorced or separated is ambiguous. However, couples that face a smaller gender gap are 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

[17] We present the propositions and offer some intuitions in the main body of the paper but the full proofs of the propositions can be found in Appendix B.

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.

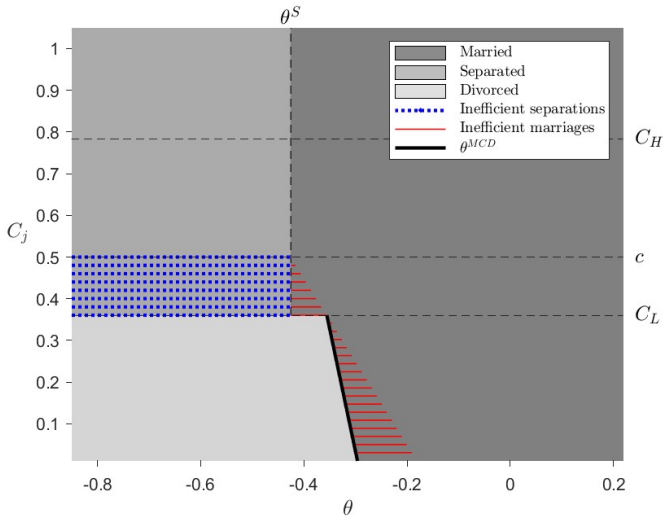
First, the threat of a hold-up and its impact become weaker because a spouse who would like to divorce and who is being held-up by their partner could always abandon their spouse and separate. This, in turn, allows such a spouse to use separation as a threat to renegotiate the marital terms in their 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 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.[18] In our simulations, we set the parameters to $\beta^M = 0.5$, $y = 0.85$, $z = 0.5y$, $c = 0.5$, $\alpha = \beta^D = 0.34$, 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 (below C_L) 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 blue-dotted and red-lined areas). These are essentially couples for whom divorce costs are low but the marital match quality shocks, θ, are 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, a partner

[18] 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 4: Outcomes under mutual consent divorce, according to C_j and θ



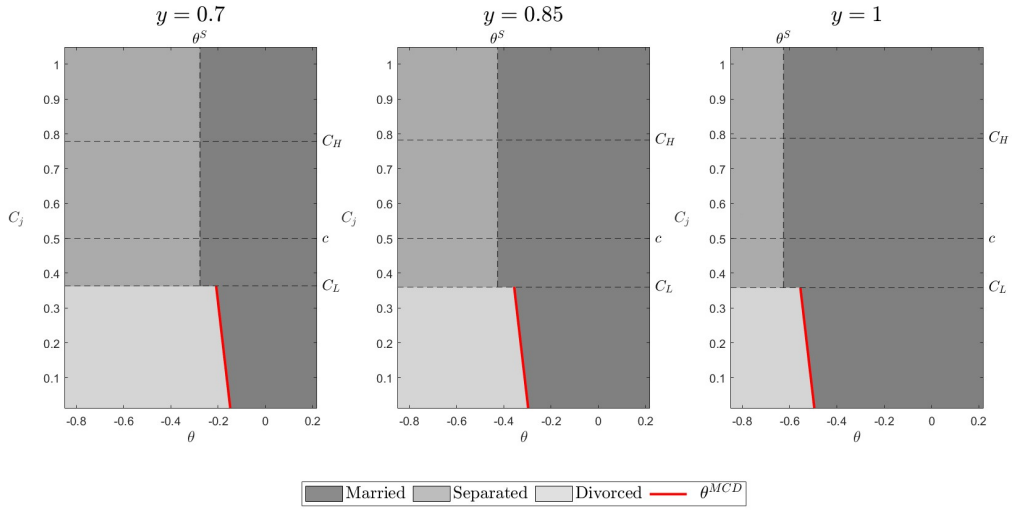
Notes: The figure presents the results of simulations over (θ, C_j). We set the rest of the model's parameters to $\beta^M = 0.5$, $y = 0.85$ $z = 0.5y$, $c = 0.5$, $\alpha = \beta^D = 0.34$ and $h(y,z) = (y+z)^2$.

in such a union can make an inefficient decision unilaterally. First, there are couples with $c > C_j > C^L$ and $\theta < \theta^S$ for whom divorce is efficient but they instead 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. Second, there are inefficient marriages in the lower red-lined triangle where $\theta^{MCD} < \theta < \theta^{UD}$ 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 such a husband prefers to separate unilaterally rather than consenting to divorce, even when $\theta < \theta^{UD}$. Since $\theta^S < \theta < \theta^{UD}$ for such couples, the wife makes some intra-marital transfers to sway her husband and they remain married instead.

In Figure 5, we replicate Figure 4 varying the level 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' incomes.[19]

[19]Note that, under the parameters specified in Figure 5, changes in income have a negligible effect on the vertical cutoff, C_L. Therefore, changes in separation are mostly driven by changes in θ^S.

Figure 5: Outcomes under mutual consent, by income level



Notes: The figure presents the results of simulations of the equilibria under a mutual consent regime over (θ, C_j), where we vary y across panels, as indicated on the panel title. The rest of the parameters are set to the same values as in Figure 4.

3.4.2 Outcomes under Unilateral Divorce Laws

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

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

(b) There are inefficiently high numbers of divorces as well as marriages.

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

Proof. See Appendix B. ■

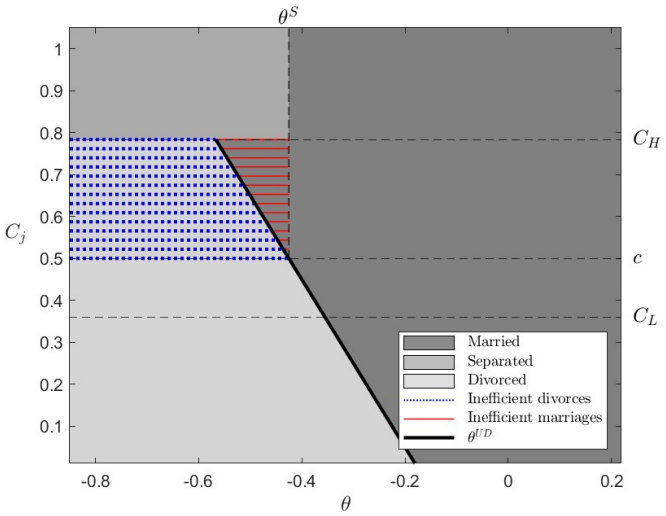
Recall that, when mutual-consent divorce laws are in effect and separation is an option, the threat of a hold-up and its impact on equilibria are weaker because a spouse who would like to divorce could always and unilaterally separate from their spouse. Then, as we highlighted above, a partner can improve 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 (including the use of separation as a counter-threat) on the sustenance and efficiency of marriages along the lines we established in Proposition 1. 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 equilibrium outcomes under unilateral divorce, we use the same parameters as in the case of mutual consent divorce above, and simulate the model under the *UD* regime. We show in Figure 6 how couples make different decisions in the space $(C_j,\ \theta_j)$. Married couples are those whose match-quality shock is not too low. Separation is now restricted to couples with very high divorce costs (above C_H), 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.

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



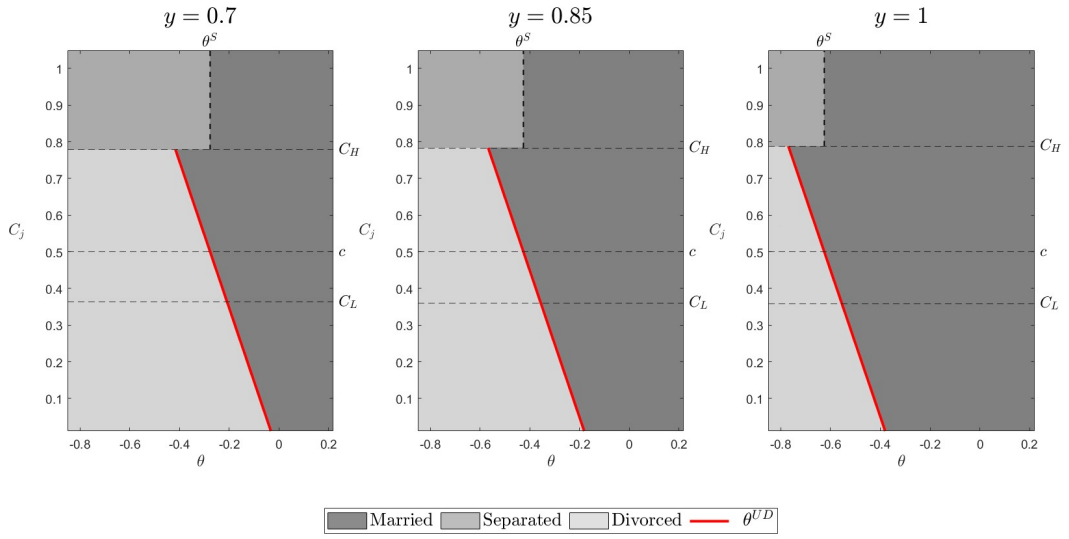
Notes: The figure presents the results of simulations of a unilateral divorce regime over (θ, C_j). We set the rest of the parameter to the values specified in Figure 4.

We also emphasize in Figure 6 the regions where inefficiencies occur. When $C^H > C_j > c$, there will be inefficient divorces and marriages when the efficient outcome is separation. First, there are couples for whom $\theta < \theta^{UD}$. These couples will select divorce over separation even when divorce is too costly (i.e., $C_j > c$). 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 married instead of separating, since as soon as the husbands threatens to separate, the wife will respond by filing for divorce.

Finally, in Figure 7, we show graphically the impact of an increase in a couple's income rank on marital outcomes. 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.[20]

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



Notes: The figure presents the results of simulations of the equilibrium under a unilateral divorce regime over (θ, C_j), where we vary y across panels, as indicated on the panel title. The rest of the parameters are set to the same values as in Figure 4.

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 additional testable implications of our model, as well as the effects of a transition from a mutual consent to a unilateral divorce regime.

We first investigate, theoretically, the effects of the transition from *MCD* to *UD*, in a

[20] 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.

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 A.3 (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 A.3 (right panel) in the Appendix C.

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

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 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 if he threatens to do so (which is her preferred option in this range of divorce costs). However, the impact of the adoption of *UD* 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 couples for whom one partner prefers separation over divorce who stayed together when separation was too costly (for whom $C_j < c$), may now divorce under *UD*—as their marital shocks are below θ^{UD} in Figure 6, but were above θ^{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.

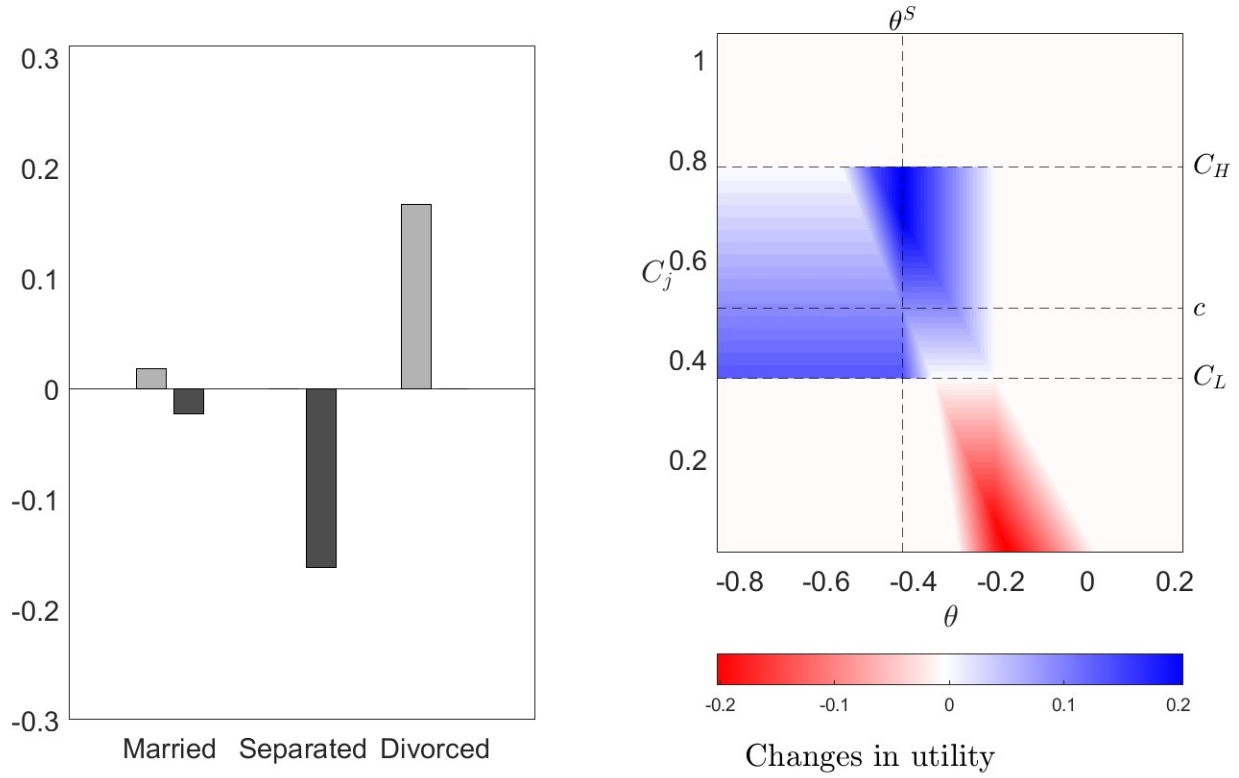
Second, the right panel of Figure 8 shows the impact of the transition from mutual consent to unilateral divorce on women's welfare, over the space (θ, C_j). Our results show that, for couples among whom $C_j < C^L$, women experience welfare losses (in our example, those in the range of $\beta^M > \overline{\beta_j^M}$ and 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, wives in marriages with $C^L < C_j < C^H$ will be better off, as shown by the utility gains in the blue region. This is explained by two different groups of women: First, women who were separated in a mutual-consent divorce regime because it was their husbands' preferred choice, and who can now file for divorce. Second, women whose husbands used separation as a threat to renegotiate the marital terms in their favor but who cannot do so anymore (since these women can counter their husband's move by filing for divorce under *UD*).

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 married couples. Wives in marriages with low divorce costs are likely to suffer welfare losses (when the marital allocations are in their favor), while those in marriages with moderate divorce costs are likely to be better off.

Regarding efficiency, we have already discussed that none of the 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 from mutual consent to unilateral divorce improves or 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 of the model over (θ, C_j), in which we set the model's parameters to the same values as in Figure 4. 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 divorce increases not just because of the elimination of the hold-up problem, but also due to the substitution of divorce for separation. Since these separations are observed more among low-income rank couples, the reduction in separation—and thus possibly the increase in divorce—will be larger for that group.

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 threatened with 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 abandoned by their partner in a world of unilateral divorce, then the former 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 sheds light on the puzzle in the existing literature, according to which women file for divorce under *UD* even when they are the ones suffering more materially from it.

The formal proofs of Propositions 3, 4 and 5 are in Appendix B. We shall empirically test our model's predictions in Section 4. Before doing so, we investigate next whether, even under *MCD*, there is an alternative policy that could be welfare improving for women.

3.6 Are "Desertion Laws" Better for Women?

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

Is there an alternative policy, within an *MCD* regime, that could replicate the welfare gains for these women without subjecting those below C_L to welfare losses (as *UD* does)? Desertion legislation allows a spouse to unilaterally divorce within a mutual consent regime, after being abandoned by their spouse for a legally specified period of time. We show in

this section that such laws could, in fact, achieve the desired outcome, provided that these mandated periods of separation are relatively short.

To model desertion laws within a mutual consent regime, 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:

$$V_2^{mSD} = \underbrace{t^S\left[y - 0.5c\right]}_{\text{Value in Separation}} + \underbrace{(1-t^S)\left[(1-\beta^D)(y+z) - (1-\alpha)C_j\right]}_{\text{Value in Divorce}} \tag{14}$$

for men, and

$$V_2^{fSD} = \underbrace{t^S\left[z - 0.5c\right]}_{\text{Value in Separation}} + \underbrace{(1-t^S)\left[\beta^D(y+z) - \alpha C_j\right]}_{\text{Value in Divorce}} \tag{15}$$

for women. As reflected in (14) and (15), we assume that, as before, spouses incur separation and divorce costs, but only in proportion to the length of the second period spent in each state (i.e., estranged versus divorced).

In Proposition 6 we theoretically explore how desertion laws affect the equilibrium outcomes under *MCD*.[21]

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 *MCD* with 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.

[21] In principle, we can also investigate the effect of this legislation empirically. However, while there is variation in the cross section across states in terms of desertion regulation, there is very little change in these laws during the pre-unilateral divorce period.

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. Thus, when separation is worse for one partner vis-a-vis both marriage and divorce, these laws would lead to more divorces, as these "abandoned" partners will be able to unilaterally file for a divorce after 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 costs of separation and divorce.

In terms of welfare, desertion laws benefit the spouses who were abandoned 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 marriages with $C_L < C_j < C_H$, who also benefit from the transition from *MCD* to *UD*.[22] However, desertion laws have no impact on women in marriages with $C_j < C_L$, since it does not affect the outcomes of those in intact marriages.[23] Therefore, the welfare effects of this policy are unequivocally positive for women.

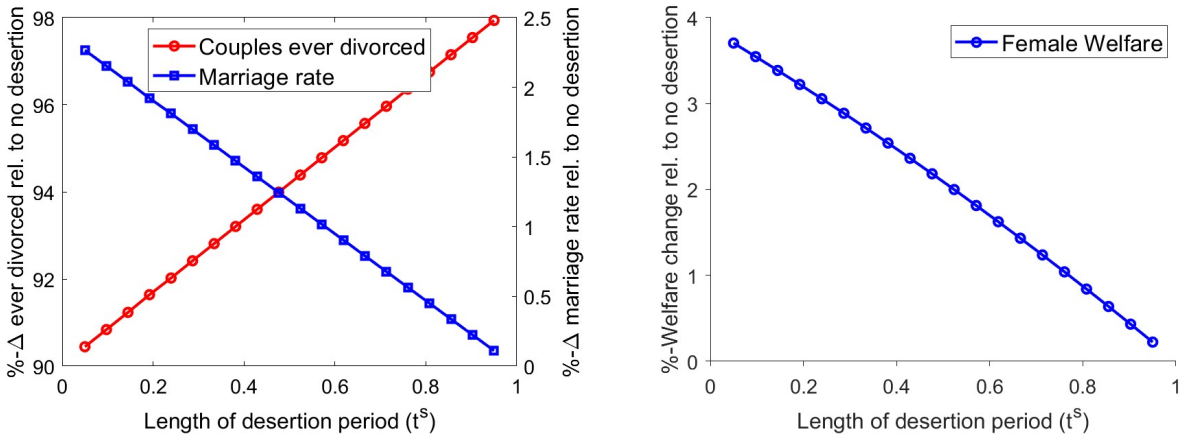
Setting the parameters to the same values as above, we simulate the model under different values of t^s. We report the results in Figure 9. This exercise suggests that, relative to the mutual consent baseline ($t = 1$), the share of couples that eventually divorce increases sharply (left panel, left 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. 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

[22]Note that, in the presence of desertion laws, the thresholds C_H and C_L are not affected by t^S, and so the share of couples in each region does not change with the introduction of desertion laws. This is because husbands compare the value of divorce to a weighted average of separation and divorce, where the weight of separation is given by t^s, the fraction of time couples need to be separated for a partner to be able to file for divorce using desertion as a ground. As t^s cancels out in this comparison, C_L is determined based on the comparison between separation and divorce, as in Equation (12). Analogously, C_H is unaltered relative to (13) when women compare the value of separation to the weighted sum between separation and divorce.

[23]As we demonstrate in the proof to the proposition in Appendix B, for couples below C_L, both partners prefer divorce to separation, and so, no partner will use separation to force the other to file for divorce on the basis of desertion.

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 1, when the other parameters are set to the same values as in Figure 4. 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.

then calibrate the model for the *MCD* regime in the United States, 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 Divorce Even When They Prefer Marriage

As stated in Proposition 5, women would be more likely to 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 divorce would thus be a better option for them than separation.

We have already shown in Section 2.2 that women are more likely to be the plaintiffs in divorce, but we now identify the type of relationships they want to exit when they initiate divorce under *UD*. To do this, we regress the probability that the woman is the plaintiff in divorce on marriage characteristics and state and divorce year fixed effects. Our results in

Table 5 show that wives are more likely to be the plaintiffs when the couple has children (column 1), when they have been married for longer (column 2), or when they married younger (column 3). These relationships are likely to have more economic value for women, and so, it is less likely they would be "running away" from them.[24] Instead, by asking for divorce, they may be ensuring more transfers than if they remain separated. These transfers are expected to be relatively larger when the marriage produced more value.[25]

Table 5: Correlations between wife being the plaintiff and marriage's characteristics in *UD*

Wife is the plaintiff	(1)	(2)	(3)
Couple has children	0.091***		
	(0.003)		
Marriage has lasted > 3 years		0.018***	
		(0.004)	
Wife's age at marriage			-0.001***
			(0.000)
N	1,979,735	1,992,409	1,876,453

Notes: Data from the National Center for Health Statistics (1974-1988). The dependent variable, *Wife is the plaintiff*, is an indicator that takes value one when the wife is recorded as the plaintiff in the divorce decree. All regressions include state and year fixed effects. The sample is restricted to divorce records in states that had implemented unilateral divorce at the time of the divorce decree. Case-specific weights are used in the regressions. *** p<0.01, ** p<0.05, * p<0.1

We then show in Table 6 that when women are the ones filing for divorce the divorce process is about 1.2 months shorter than when men are the plaintiffs. This is consistent with women filing for divorce when they benefit more from it, and hence, have incentives to finalize the process sooner. These results are robust to restricting the sample to only those states that have implemented unilateral divorce (column 3), in which women can unilaterally shorten separation when filing for divorce, in line with our model.

Overall, as our model predicts, the evidence suggests that women are more likely to be the plaintiffs in divorce when their marriage has higher surplus. While this may sound counterintuitive, according to our model, it may be driven by the fact that their husbands

[24] We also find that women are more likely to be the plaintiff when the partners still reside in the same state, which may be driven by divorce transfers being more enforceable in that case. For example, during the period of analysis only between one-third and two-thirds of states had adopted long-arm statutes, which allowed a state to pursue men in other states to obtain child support (Case, 1998).

[25] Wives are also 1.3 percent more likely to be the plaintiffs when divorce is petitioned in a state that has a "common property" divorce laws—perceived as more generous towards women in the distribution of marital assets than "equitable division" laws (Chiappori et al., 2002; Gray, 1998; Voena, 2015). From the lens of our model, men in these regimes would have higher incentives to separate, as divorce is more costly for them. Instead, women would have higher incentives to ask for divorce rather than remain separated, as separation is relatively more costly for them vis-a-vis divorce.

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

	Dep. variable: length of separation		
	(1)	(2)	(3)
Wife is the plaintiff	-1.257***	-1.216***	-0.971***
	(0.345)	(0.323)	(0.136)
N	2,682,644	2,195,849	1,106,624
State-Year FE	Yes	Yes	Yes
Demographic controls	No	Yes	Yes
Sample restriction	–	–	UD states

Notes: Data from the National Center for Health Statistics (1974-1988). *Wife is the plaintiff* is defined as in Table 5. The dependent variable is the length in month between the couple's separation and the finalization of divorce decree, measured in months. *** p<0.01, ** p<0.05, * p<0.1.

choose to separate. By filing for divorce, they minimize precisely the separation period during which they are worse off and receive no transfers.

4.2 Negative Selection into Separation

Proposition 2 suggests that separated couples will be negatively selected in endowments (y and z) when unilateral divorce is imposed.

To study this, we first examine how the marital status of women—divorced or separated—correlates with certain demographic characteristics in the Census data. To keep women's observable attributes comparable across marital status, we focus on characteristics that are likely to be determined before marriage, such as human capital, race, and age at marriage. Our results, reported in Table 7, are consistent with the previous literature in that divorced women are negatively selected vis-a-vis married women (Bedard and Deschênes, 2005; Holden and Smock, 1991). However, we see that separated women are from an even more vulnerable population than divorced women across most of the characteristics we consider. As we show in columns 1 and 2, women with a high school degree or more are 3.6 percentage points less likely to be separated (relative to being married or divorced). However, high school completion has almost no quantitative impact on the likelihood of being divorced (even though the coefficient in column 2 is statistically significant). Women from racial minorities are 7.9 percentage points more likely to be separated than white women, but only 3.2 percentage points more likely to be divorced. The results are less clear for age at first marriage: marrying a year later reduces the probability of being separated by 0.1

percentage points whereas it reduces the probability of being married by 0.3 percentage points. Overall, as our model predicts, we demonstrate that separated couples in *UD* regimes are negatively selected—even more so than divorced couples—in terms of socio-economic traits that correlate with income.

Table 7: Correlations between women's marital status and pre-marital characteristics in *UD*

	Separated	Divorced	Separated	Divorced	Separated	Divorced
HS degree +	-0.0358***	-0.0030***				
	(0.0002)	(0.0004)				
Non-white			0.0794***	0.0324***		
			(0.0002)	(0.0003)		
Age at marriage					-0.0013***	-0.0031***
					(0.0000)	(0.0001)
N	3,995,579	3,995,579	3,995,579	3,995,579	1,864,588	1,864,588

Notes: Data from IPUMS Census 1960-1990. 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 and not widowed. *HS degree +* is an indicator that takes value one when a woman has at least a high school degree. *Non-white* is an indicator that takes value one when the individual's race is recorded as non-white in the Census. *Age at marriage* measures the age in years of the woman at the time of the first marriage. All regressions include fixed effects for year of Census and state of residence of the respondents. Person-specific weights used.

We next use the NBER's divorce records to show that, conditional on asking for divorce, women who experience longer separations are also negatively selected in terms of demographic characteristics that are likely to correlate with income. In Table 8, we report the coefficients from the regression of the length of separation on women's demographic characteristics. Our results show that women who married younger experience longer separations (column (1)). 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. 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.

4.3 The Impact of Unilateral Divorce on Marital Status

We next explore how the transition from an *MCD* to a *UD* regime impacted the choices between separation and divorce. To do so, we exploit the staggered implementation of *UD*

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

	NBER divorce records (months)			1950 Census (years)		
Length of separation	(1)	(2)	(3)	(4)	(5)	(6)
Age at marriage	-0.059***					
	(0.013)					
HS degree +				-1.434***		
				(0.283)		
Non-white		11.463***			0.067	
		(0.242)			(0.480)	
Years of education			-0.622***			-0.287***
			(0.071)			(0.033)
N	2,822,357	2,751,848	2,598,486	3,276	3,276	3,276

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). Sample for the Census of population is restricted to those aged 55 or less. The variables Age at marriage, HS degree + and Non-white are defined as in Table 7. *Years of education* records the years of education of an individual, either in the Census or the divorce decree. The dependent variable, *length of separation*, measures the time a woman states being in her current marital status (separation) in the Census (in years), and the time from the separation to the divorce decree in the NBER divorce records (in months). We drop from our sample divorce records in which the reported separation time is longer than 100 months. All regressions include case specific weights. *** p<0.01, ** p<0.05, * p<0.1

legislation across the United States over time by 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 between 1960 and 1990, a period when most states transitioned from *MCD* to *UD*. For an individual i who lives in state s in the year t we estimate

$$Marsta_{ist} = \alpha + \beta\ UD_{st} + \gamma X_{ist} + \delta_s + \eta_t + \lambda_{st} + \varepsilon_{ist}, \tag{16}$$

where *Marsta* is an indicator that corresponds to either divorce or separation and X_{ist} includes other demographic characteristics of the individuals. Our main variable of interest, UD_{st}, is an indicator that takes value of 1 when the individual's state of residence has adopted *UD* by year t, and 0 otherwise. The regressions include state and year fixed effects, denoted by δ_s and η_t, respectively. Following Wolfers (2006), we include state linear trends in some specifications.

The results of estimating equation (16) with the Census data are reported in Panel (a) of Table 9. 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. These results are robust to including state linear trends, as shown in columns (3) and (4).

Since the Census data are decennial, it only allows us to look at variations across decades and in the 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 next estimate model (16) 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 0.9-1.2 percentage points (columns 1 and 3), while it increased the divorce probability by 1.8-3.1 percentage points (columns 2 and 4). 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

	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	-0.009*	0.031*	-0.012**	0.018
	(0.005)	(0.017)	(0.005)	(0.012)
N	33,761		33,761	
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 1960–1990. 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 (1968–1997). 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.

Table 10: Impact of *UD* 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	-0.014**	0.020*	-0.008	0.028	-0.082***	0.068**	-0.009*	0.017
	(0.005)	(0.012)	(0.010)	(0.020)	(0.029)	(0.031)	(0.005)	(0.013)
N	20,849		12,912		10,495		23,266	
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 (1960–1990) in Panel A; PSID (1968-1997) 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.

The results of Table 10 indicate that the reduction in the probability of separation and the increase in the probability of divorce induced by *UD* are more pronounced among those with lower socio-economic background. Both in the Census (Panel (a)) and the PSID (Panel (b)), the coefficients are larger in magnitude and statistically more significant for low-educated (columns (1) and (2)) and non-white women (columns (5) and (6)). This is in line with the theoretical predictions of our model, which suggest that groups with worse incomes or endowments are more likely to respond to *UD* legislation by separating less and divorcing more.

5 Quantifying the Welfare Effects of Unilateral Divorce Legislation

Section 4 showed that the theoretical predictions of our model are in line with the empirical evidence. We now use data from the PSID to calibrate our model to an *MCD* regime and use it to quantify the distributional welfare effects of *UD* legislation when separation is an option.[26]

[26]While it is theoretically possible to use the Census data for this exercise, we follow the literature that favors longitudinal over cross-sectional data to compute relevant moments to estimate the impact of changes

5.1 Parameter Selection and Calibration

We preset some of the model parameters and men's and women's endowments (y and z) based on previous literature or using data from the PSID. The full list of preset parameters and their sources, as well as the endowments obtained from the data can be found in Section A.2 of Appendix D.1.

Preset parameters and external calibration. We use mean annual incomes (expressed in thousands of real 1970 dollars) of single, divorced, and separated individuals from the PSID to calibrate the average incomes $y = 7.9$ and $z = 4.7$, as well as the income levels of low- and high-education groups (defined as in Table 10). We set $\beta^M = 0.5$ based on the estimates in Reynoso (2024).[27] We calibrate β^D to match the \$630 lower income for separated women compared with divorced women, reported in the first column of Table 4 (panel (b)).[28] We set $\alpha = 1/3$, such that women pay less than men but still a meaningful portion of the cost of divorce.[29] Finally, following Iyigun and Lafortune (2023), we parameterize the household payoff function as $h(y, z) = (y + z)^m$. 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 $C_H + \delta$.

Internal Calibration. We implement a grid search algorithm to internally calibrate four parameters under an *MCD* regime: the economies of 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, driving the choice of moments we target in the calibration. The separation cost c shifts the distribution of divorce versus separation among couples who want to exit their relationship. The lower- and upper-bounds of the interval over which individuals draw marital

in divorce legislation (Voena, 2015; Fernández and Wong, 2017; Reynoso, 2024).

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

[28] The income of a separated woman is z while that of a divorced woman is $\beta^D(y + z)$. Therefore, we compute $\beta^D = \frac{(z+0.63)}{y+z} = 0.423$. Thus, the income of a separated women equals 37.3% of the sum of the couple's individual incomes, while the income of a divorced women is about 42.3% of that sum. We assume that β^D remains constant across divorce regimes since Table 4 includes *MCD* and *UD*. Note that we assume that there is no income sharing in separation, and each partner keeps their own endowment. However, our results are not driven by this assumption, as we calibrate a wife's share of income in divorce *relative* to her income in separation, regardless of whether there are some spousal transfers in separation as well.

[29] We have found no reference in the literature for the share of divorce costs that women bear, and we have no data available that would allow us to properly estimate these costs. We show in Tables A.3 and A.4 in Appendix D.3 that our results are qualitatively robust to varying the value α although our fit by education groups is slightly worse with alternative values of α than in our main specification.

quality shocks, wholly defined by θ_{max}, impact 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 total income is for the divorce/separation decision, and hence it is associated with differences in separation and divorce rates across couple types. Finally, δ has an impact on the share of separated couples that remains in *UD* (since only those between C_H and C_{max} separate in that regime). We provide details on the internal calibration grid search algorithm in Appendix D.2. The full set of targeted moments is in Table 12.

5.2 Calibration Results

Calibrated Parameters. The calibrated parameters obtained from the internal calibration exercise described in Section 5.1 are reported in Table 11.

Table 11: Parameter Values

Parameter	Symbol	Value
Separation cost ($000)	c	2.032
Maximum taste shock	$\theta_{\max}$	1.074
Economies of scale in marriage	m	1.001
Upper bound of divorce costs ($000)	δ	2.400

We calibrate a separation cost c of approximately $2,000. The parameter governing the economies of scale from marriage, m, is relatively small, suggesting that returns to education in marriage exist but are not overbearing, in agreement with the results of Iyigun and Lafortune (2023). The marital quality shock ranges between -1.07 and 1.07. Divorce costs, C_j, range from virtually 0 to $7,374 (given by $C_H + \delta = 4,974 + 2,400$). This maximum represents 52% of the total income of high educated spouses and 67% of that of low educated spouses. This contributes to explain that some couples still wish to separate once divorce becomes unilateral.

Model Fit. Table 12 shows the fit of the model with respect to the moments targeted in the estimation.

Our model perfectly matches the aggregate separation and divorce rates in the *MCD* regime, as well as the impact of *UD* on separation that we estimate in Section 4.3. We also match very well the education-specific moments, except for the divorce rate of low-educated

Table 12: Targeted Moments

Moment description	Data	Model
Separation rate in *MCD*	1.8%	1.8%
Divorce rate in *MCD*	3.0%	3.0%
Impact of *UD* on aggregate separation	-1.2%	-1.2%
Separation rate in *MCD* (low-educ women)	2.0%	2.1%
Separation rate in *MCD* (high-educ women)	1.5%	1.5%
Divorce rate in *MCD* (low-educ women)	2.5%	0.0%
Divorce rate in *MCD* (high-educ women)	3.7%	4.0%

Notes: Data moments estimated from the PSID, using *MCD* states prior to 1980. Low-educated includes women with a high school degree or less. High-educated includes women with some college or more.

women. Given our parameters, $C_L < 0$ for these women. So, the divorce rate is zero for all values of m.

5.3 Distributional Welfare Effects of Divorce Legislation

We next use the calibrated model to assess the distributional consequences of the transition from *MCD* to *UD*. The results of this exercise are in Table 13.

The first column presents the results at the aggregate level, ignoring differences in income across couple-types, while the last four columns simulate the model for our four different couple types, based on spousal education (and, hence, income) levels.

We find that the transition from *MCD* to *UD* led to 1.2% fewer separations on average, a moment that we targeted in the calibration. Our model allows us to assess how this fall in separation varies across different couples. We find that the reduction in separation rates is concentrated among women with lower education who experience a decline in separation of 1.3 to 2 percentage points (depending on their partner type). By contrast, high-educated women barely see an impact on their separation rates. This matches very well our estimates from Table 10, reported in the second row of Table 13, which are not targeted in our calibration.

The model also predicts an increase of 4.1% in divorce rates, which overestimates the corresponding data moment (1.8%). However, consistent with the empirical evidence, the positive effect on divorce rates is larger than the effect on separation. This is explained by the fact that some marriages that remained intact under *MCD* dissolve into divorce under *UD*, as the possibility of hold-up disappears. We also overestimate the increase in divorce for different types of couples, and particularly so for the low educated. However, this larger effect

is in line with the empirical finding that the increase in divorce was statistically significant only for low-educated women.

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	-0.012	-0.018	-0.020	-0.001	-0.006
Δ Separation (Data)	-0.012	-0.014		-0.008	
Δ Divorce	0.041	0.071	0.071	0.037	0.028
Δ Divorce (Data)	0.018	0.020		0.028	
Δ Avg. Welfare	0.315	0.746	1.296	-0.047	0.058
Δ Avg. Welfare (−)	-0.167	–	–	-0.374	-0.313
Δ Avg. Welfare (+)	0.708	0.925	1.298	0.157	0.476

Notes: Results of simulation of model with $\beta^M = 0.5$, $\beta^D = 0.42$, $\alpha = 0.33$, $c = 2.032$, $m = 1.001$, $\delta = 2.4$. C_j is randomly drawn from [0, 7.374] and θ from [-1.074, 1.074]. Changes in welfare measure changes in utility terms. No low educated wife sees their utility decrease post *UD*.

Next, we turn to look at the effects of the transition from *MCD* to *UD* on women's welfare. The aggregate impact is relatively small, equivalent to a transfer of $315 annually when separated/divorced or about 6.7% of women's average income. However, consistently with the results above, we observe large variations across educational groups. Women who gain the most are those with low education married to more educated husbands. Under *MCD*, these women only separate. The transition to *UD* allows them to obtain transfers from their husbands through divorce. This leads to an average welfare gain of 31.6% for women in this group. Women in positively assorted marriages also benefit from the transition, but the low-educated women married to low-educated men gain more than the high-educated women matched with high-educated men. This is because the gender gap in income for the former group is larger than for the latter—and, hence, they see higher gains when they can transition from separation to divorce. For the minority of women who marry "down" in terms of education, the transition to *UD* leads to a small negative impact on welfare. This is consistent with our model if the region below C_L is large enough (see Figures 4 and 6 for an illustration).

The average effects discussed above—even within educational groups—hide marked heterogeneity. Overall, those women in marriages with $C_j < C_L$ lose on average when *UD* is implemented, since they are no longer able to hold up their husbands in marriage if they

want to divorce. However, those with $C_H > C_j > C_L$ gain as they can now divorce instead of being separated, according to our framework.

Of course, the individual-specific impact depends on the realization of the marital quality shock, θ. For a majority of women the transition has no effect since they remain married, separated or divorced as before, without renegotiating their marital allocations. We, thus, next focus on the welfare implications for women who experience either a loss or a gain as a result of the change in the divorce legislation. Women who are worse off from the adoption of *UD* lose on average \$167—nearly 3.5% of women's average annual income. The loss is relatively uniform for high educated women in different types of marital matches, ranging from 4% to 8%. Low-educated women, on the other hand, never lose from the transition to *UD*. This is driven by the fact that women in these couples never hold-up their husbands in marriage since $C_L < 0$ in our calibration, as pointed in Section 5.2.

At the other end of the spectrum, women who gain from *UD* tend to benefit a lot. These are mainly women who were separated in *MCD*—those in marriages with $C_L < C_j < C_H$—and now can unilaterally ask for divorce. On average, women in these marriages experience welfare gains of nearly \$700 annually (15% of their own income). The range between C_L and C_H in which separation is attractive for men but not for women, is particularly large for low-educated women married to high-educated men, as both lower z and higher y contribute to a reduction in C_L and an increase in C_H. Women in these marriages gain \$1,300 annually, about a third of their own income. Only highly educated women married to low-educated men see limited gains because they rarely face separation, since the area between C_L and C_H is smaller for these couples. Moreover, separations were less costly for this group of women in *MCD*, given the smaller wage gap.

Cool-off Legislation. Given that women suffer from divorce, it has been argued that implementing *UD* would have negative consequences for women. In order to overcome such difficulties and as a compromise, several states introduced "cool-off" periods when they adopted *UD*. These "cool-off periods" mandate couples to remain separated for some time before being able to obtain a divorce decree. The length of the cool-off periods varies across states, but is typically between 6 months and 3 years (Olivetti and Rotz, 2017). However, as we show in Appendix D.4, these laws have theoretically ambiguous effects on women's welfare. Simulating the introduction of cool-off periods in our calibrated model, we show in Table A.5 that mandated cool-off periods have, if anything, negative consequences for women, attenuating the average welfare gains from the implementation of *UD*. Once looking at heterogeneity by education, we find that the only ones that benefit from the cool-off periods are high-educated women married to low-educated husbands. Those were the women who

lost from the adoption of unrestricted *UD* (Column (4) of Table 13), and for whom cool-off periods actually reduce slightly their losses.

5.4 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 masks a significant degree of 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 be better than *UD* provided that their mandated lengths are relativey short.

To show this, we introduce desertion laws in our calibrated model. We consider three different lengths of the desertion period (expressed as the share of time of period 2): $t^s = \{0.1, 0.2, 0.5\}$. We report the change in welfare relative to a *MCD* regime without desertion ($t^s = 1$) in Table 14. Since no women lose from this policy, we do not split the results between gains and losses.

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 that are on average similar to those of *UD* but where there are only positive impacts. High educated women see higher average benefits from this policy than from *UD* since they faced more losses in the range $C < C_L$ which now disappear.

Therefore, while the transition from *MCD* to *UD* leads to welfare gains on average, some women (across all education groups) lose from divorce liberalization as it limits their possibility to hold up their husband (and particularly the high-educated ones) in the marriage. These welfare losses for women could be avoided by 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.

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)
$t^s = 0.1$	0.310	0.723	1.264	0.004	0.084
$t^s = 0.2$	0.297	0.697	1.226	0.004	0.079
$t^s = 0.5$	0.238	0.584	1.041	0.000	0.057

Notes: Results of simulation of model with the same parameters as Table 13. Changes in welfare measure changes in utility terms relative to *MCD* with no desertion laws ($t^s = 1$).

6 Conclusion

This paper demonstrates that separation was—and continues to be—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 the conclusions on the impact of divorce liberalization on women's welfare, compared to the 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—as new sources of inefficiencies arise—, 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, in what lies above, 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 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—that allow a partner to unilaterally file for divorce in mutual consent regimes if they were abandoned by their spouses—represent an alternative policy option that could replicate some of the benefits of *UD* without penalizing a subset of women.

Our work takes who is married to whom as given. However, Reynoso (2024) shows that the adoption of *UD* altered marital sorting. Incorporating separation in such a model may

lead to further insights. We leave to future research studying these interactions, as well as the inclusion of remarriage and marital shock dynamics in a marriage model with divorce and separation.

Moreover, 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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Online Appendix to "Trapped in Purgatory?: The Impact of Divorce Laws on Women Welfare with Separation" (Not for Publication)

A Empirical Results

A.1 Data

Here we provide additional details on the data sources described in Section 2.1.

US Census Data: We use micro data from the 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.[30] 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.

Panel Study of Income Dynamics (PSID): This survey follows a representative sample of 5,000 families and their descendants, starting in 1968. The survey was conduced annually until 1997 and it became bi-annual after that. The data allow us to observe the marital status of the individuals, including separation and divorce. Using marital histories, we can identify the first marriage of each individual, as well as their subsequent marriages. Moreover, we observe the state of residence of each household, which allows us to assign them the divorce legislation to which they are subject every year.

National Longitudinal Survey of Mature Women (NLS-MW): This survey follows a cohort of 5,393 women who were 30-44 years old as of March of 1967. This sample was

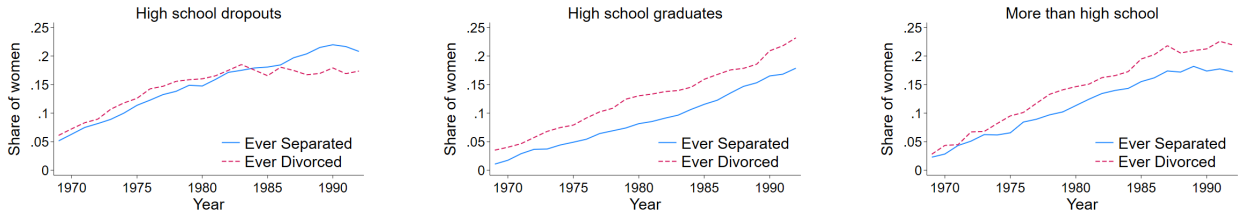
[30] While "status" is self-reported, the questionnaire in the 1950 census instructs, "If, however, the respondent raises a question as to the meaning of "separated," explain that the term refers only to those married persons who have a legal separation or who have parted because of marital discord. 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.

representative of the civilian, non-institutionalized population of women in that age group that were living in the United States in that year. These women were followed until 2003, with 21 rounds of data collected. As with the PSID, it is possible to use marital histories to identify the marital status of the individuals, as well as their marital transitions.

Divorce Decrees: Our data on divorce decrees include all divorce records for states with small numbers of cases and a representative sample of records for states with larger case numbers. The records contain data on the month and year of marriage, its duration, the number or children under 18, the custody arrangements over those children, the number of previous marriages, and the age, race, education level, and state residency of both spouses.

A.2 Additional Tables and Figures

Figure A.1: Fraction of women reporting ever being separated or divorced by education



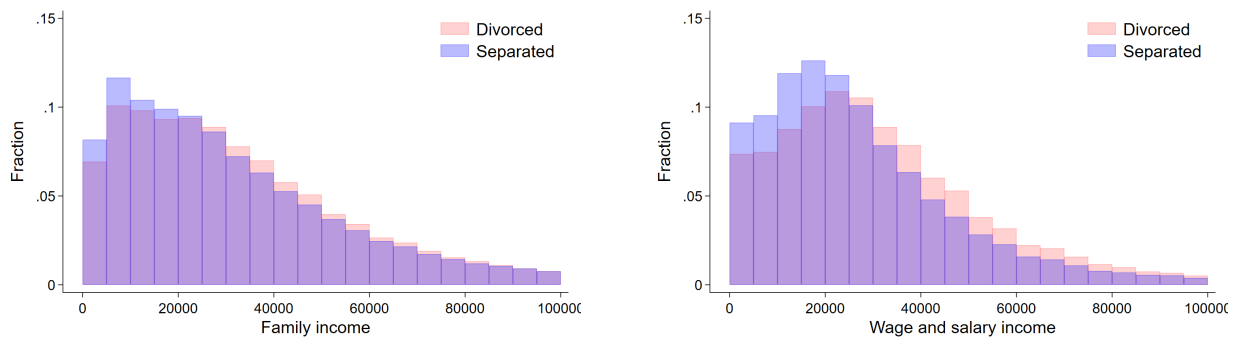
Notes: PSID (1968-1992). This figure replicates Figure 1 for women with different education attainments: high school dropout (left panel), high school graduates (middle panel), and some college and more (right panel). "Ever separared" and "Ever Divorced" are defined as in Figure 1.

Table A.1: Difference in income between divorced and separated individuals, including controls

	Family income		Own wage income	
	Women	Men	Women	Men
	(1)	(2)	(3)	(4)
Separated	-3,655.60***	-420.03***	-4,143.59***	-1,108.16***
	(32.08)	(41.93)	(30.61)	(53.98)
Demographic Controls	Yes	Yes	Yes	Yes
State and Year FE	Yes	Yes	Yes	Yes
Period	1950-2019	1950-2019	1950-2019	1950-2019
Observations	4,062,076	2,785,112	4,058,891	2,782,307
R-squared	0.11	0.12	0.13	0.11

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 A.2: Distribution of male income in divorce and separation: (a) family income; (b) own wages.



Notes: IPUMS 1940-2019. Sample includes all men aged 16+. We winsorize incomes at the bottom and at the top, at 0 and 100K, respectively. All incomes and wages have been adjusted to 1999 real terms using the Consumer Price Index (CPI).

B Proofs of Propositions

In what follows, we structure most of the proofs of the propositions around three cases defined by the cutoffs (12) and (13). 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 (8) 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 $\beta^M = \widetilde{\beta_j^M}$,

$$0.5\left(\beta^D(y+z) + y - h(y,z) - \alpha C_j - c/2\right) = \beta^D(y+z) - \beta^M h(y,z) - \alpha C_j. \tag{A.1}$$

The same is true for the last two expressions of θ^{MCD}. Since the right-hand side of (A.1) 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 (7).

Case II: $C_j > C^H$: In this scenario, both partners rank separation above divorce. If (1) holds, at least one of the partners would be better off in separation than in marriage. If this is the case, the couple 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 (so he would never agree to grant the divorce, and he would instead separate unilaterally). As in Case II, when the realization of θ_j is such that either partner prefers separation (as defined by (1)), 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, with $\beta^M < 1/2 + (z - y)/2h(y, z)$, she may be the one threatening to separate, even if she prefers divorce to separation in *Case III*. This will trigger renegotiation in her favor and leading to an increase in 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 section 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. Thus, it may arise as the equilibrium even when the couple's joint payoff is greater in divorce. This is due to the fact that while utility is transferable *within* marriage, partners cannot transfer utility in separation or divorce. This also generates inefficient marriages. Only relationships for which

the marital quality shock is below θ^S end in separation, although the efficient outcome is one in which all couples with θ^{UD} or less dissolve their marriages. This is because in the range where $c > C_j > C^L$ and $\theta^S < \theta^{UD}$, separations will occur less often than efficient divorces, as the latter can only be obtained by mutual consent. Hence, inefficient marriages survive, as discussed in part (a) of the proof and because wives in such marriages cannot unilaterally threaten to divorce while their husbands prefer to remain married rather than to divorce.

When $C_j < C^L$, divorce will occur both in the efficient case and our equilibrium. However, when divorce costs are in that range we can show that $\theta^{MCD} < \theta^{UD}$. For the two extreme cases of θ^{MCD} in (8), 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 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 redistributes income away from men, while separation does not.

Furthermore,

$$\frac{\partial \theta^{MCD}}{\partial y} = \begin{cases} 0.5\left((1-\beta^D)(1+\lambda)+\lambda-h_y-\lambda h_z\right) & \text{if } \beta^M < \widehat{\beta_j^M} \\ (1-\beta^D)(1+\lambda)-(1-\beta^M)(h_y+\lambda h_z) & \text{if } \widehat{\beta_j^M} < \beta^M < \overline{\beta_j^M} \\ \beta^D(1+\lambda)-\beta^M(h_y+\lambda h_z) & \text{if } \overline{\beta_j^M} < \beta^M < \widetilde{\beta_j^M} \\ 0.5\left(\beta^D(1+\lambda)+1-h_y-h_z\lambda\right) & \text{if } \widetilde{\beta_j^M} < \beta^M. \end{cases} \tag{A.2}$$

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 is supermodular in its inputs.

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 as the income rank increases, 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 for whom separation will be the outcome instead of divorce will increase as C^L falls. Thus, which of these two

forces will dominate is 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 a husband benefits more from divorce relative to separation as the gender wage gap closes, making him more agreeable to a divorce. Furthermore, a larger λ will lead to a fall in θ^S. The combination of both implies 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 higher 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 up to the point where one of the spouses prefers to divorce (which is governed by (9)). 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 (1) 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 where 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 (9). 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

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

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 terminate the marriage.

Finally, for (c) and a given y, divorce occurs when couples face low enough marital quality shocks and they 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 divorce under mutual consent divorce laws would be those with shocks below the middle two values in (8). After a transition to unilateral divorce, marriages with shocks below (10) 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 ($\theta < \theta^{UD}$) are now occurring when they were avoided before because (8) was more stringent.

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

In (c), for couples who transition from marriage to divorce after the reform, welfare of women would fall if $\beta^M > \overline{\beta_j^M}$ and it would increase in the opposite case. For couples who remain married, while there was no room for renegotiation before, women will now have to transfer 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:

$$P(\text{Divorce} \mid y)^{UD} = \int_{-\infty}^{\theta^{UD}(y)} f(\theta)\, d\theta. \tag{A.3}$$

Similarly, the probability of divorce under the mutual consent divorce (MCD) regime is:

$$P(\text{Divorce} \mid y)^{MCD} = \int_{-\infty}^{\theta^{MCD}(y)} f(\theta)\, d\theta. \tag{A.4}$$

Since $\theta^{MCD}(y) < \theta^{UD}(y)$, the difference in the divorce probabilities (A.3) and (A.4) is

$$\Delta P(\text{Divorce} \mid y) = P(\text{Divorce} \mid y)^{UD} - P(\text{Divorce} \mid y)^{MCD} = \int_{\theta^{MCD}(y)}^{\theta^{UD}(y)} f(\theta)\, d\theta. \tag{A.5}$$

As θ is distributed uniformly, this simplifies to:

$$\Delta P(\text{Divorce} \mid y) = f(\theta) \cdot (\theta^{UD}(y) - \theta^{MCD}(y)). \tag{A.6}$$

Next, we analyze how the difference in divorce probability (A.6) varies with income y:

$$\frac{d}{dy}\Delta P(\text{Divorce} \mid y) = f(\theta)\left(\frac{d\theta^{UD}(y)}{dy} - \frac{d\theta^{MCD}(y)}{dy}\right), \tag{A.7}$$

which is positive when:

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

This term 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 $\overline{\beta^M}$. It 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 wife is holding 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 boundary between marriage and separation in both contexts, we have the same proportion of couples choosing 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}. Since 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 those separations 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 $C_j < c$. These 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 laws.

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 for the benefit of the partner who first wishes to divorce. If $\beta^M > \overline{\beta_j^M}$, this will lower the wife's welfare as she will have to transfer utility to her spouse in order to convince him to stay in the marriage.

For couples for whom *Case III* holds, women's welfare increases. If, on the one hand, the husband wanted to separate before his wife wanted to divorce ($\beta^M > \widetilde{\beta_j^M}$), they were either separating or renegotiating the marriage under mutual consent. If they were separating prior to the change in divorce laws, they will either divorce or remain married afterwards—both being welfare-improving for the wife. If they were renegotiating the marriage prior to the change in laws, the husband will no longer be able to threaten 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 share in marriage, since $\theta^{UD} < \theta^S$. If, on the other hand, she

preferred divorce before he preferred separation in the mutual-consent regime ($\beta^M < \widetilde{\beta_j^M}$), she was unable to threaten divorce and they were remaining married with the original spousal allocations in place. Under unilateral divorce, she can now threaten divorce and thus be better off. Note that if $\beta^M > \overline{\beta_j^M}$, *Case I* applies automatically.

The impact of welfare is therefore uncertain as women in *Case I* will see their welfare decrease when $\beta^M > \overline{\beta_j^M}$ but their welfare increases 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 over the support of the costs of divorce.

For (d), note that when separation is allowed, none of the two regimes is fully efficient. Compared to the efficient case, under mutual consent divorce (Proposition 1), there are too many separations. Under unilateral divorce (Proposition 2), there are too many divorces. In both cases, there are extra marriages that are inefficient. 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

$$P(\text{Sep} \mid y)^{UD} = \int_{-\infty}^{\theta^S(y)} \int_{C^H(y)}^{\bar{C}} f(\theta) n(C_j)\, dC_j d\theta. \tag{A.8}$$

Similarly, the probability of being separated under an *MCD* regime is

$$P(\text{Sep} \mid y)^{MCD} = \int_{-\infty}^{\theta^S(y)} \int_{C^L(y)}^{\bar{C}} f(\theta) n(C_j)\, dC_j d\theta. \tag{A.9}$$

Since $C^L < C^H$, the difference in separation probabilities between (A.8) and (A.9) is

$$\Delta P(\text{Sep} \mid y) = P(\text{Sep} \mid y)^{UD} - P(\text{Sep} \mid y)^{MCD} = -\int_{C^L(y)}^{C^H(y)} \int_{-\infty}^{\theta^S(y)} f(\theta) n(C_j)\, dC_j d\theta. \tag{A.10}$$

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:

$$\frac{d}{dy}\Delta P(\text{Sep} \mid y) = -\frac{\partial \theta^S}{\partial y}\int_{C^L(y)}^{C^H(y)} n(C_j)\, dC_j - \left(\frac{\partial C^H}{\partial y} - \frac{\partial C^L}{\partial y}\right)\int_{-\infty}^{\theta^S(y)} f(\theta)\, d\theta. \tag{A.11}$$

We have already shown that the first term in (A.11) is positive since the threshold of θ leading to separation becomes more negative as income, y, increases. The second term in (A.11) 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 decrease in separation will be smaller for couples with higher income, as long as the effect of income on the thresholds of Cs is limited, as seen in our simulations. Put differently, given that the area between C_H and C_L to the left of θ^S is larger for lower-income couples, these couples will see their rates of separation fall by more than those with more resources.

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

$$P(\text{Divorce} \mid y)^{UD} = \int_{-\infty}^{\theta^{UD}(y)} \int_{\underline{C}}^{C^H(y)} f(\theta) n(C_j)\, dC_j d\theta. \tag{A.12}$$

Similarly, the probability of divorce under the *MCD* regime is:

$$P(\text{Divorce} \mid y)^{MCD} = \int_{-\infty}^{\theta^{MCD}(y)} \int_{\underline{C}}^{C^L(y)} f(\theta) n(C_j)\, dC_j d\theta. \tag{A.13}$$

The difference between (A.12) and (A.13) is given by

$$\begin{aligned}\Delta P(\text{Divorce} \mid y) = &\int_{\underline{C}}^{C^L(y)} \int_{\theta^{MCD}(y)}^{\theta^{UD}(y)} f(\theta) n(C_j)\, dC_j\, d\theta \\ &+ \int_{C^L(y)}^{C^H(y)} \int_{-\infty}^{\theta^{UD}(y)} f(\theta) n(C_j)\, dC_j\, d\theta.\end{aligned} \tag{A.14}$$

The derivative of (A.14) with respect to y is given by

$$\begin{aligned}&\int_{\underline{C}}^{C^L} f(\theta)\left(\frac{d\theta^{UD}(y)}{dy} - \frac{d\theta^{MCD}(y)}{dy}\right) n(C_j)\, dC_j + \\ &\frac{\partial C^L}{\partial y}\int_{\theta^{MCD}(y)}^{\theta^{UD}(y)} f(\theta) d\theta + \left(\frac{\partial C^H}{\partial y} - \frac{\partial C^L}{\partial y}\right)\int_{-\infty}^{\theta^{UD}(y)} f(\theta)\, d\theta + \frac{\partial \theta^{UD}}{\partial y}\int_{C^L(y)}^{C^H(y)} f(\theta) n(C_j)\, dC_j.\end{aligned} \tag{A.15}$$

We see that the first term in (A.15) is equivalent to the one derived when separation was

not feasible and its sign will be unclear. The second term in (A.15) will be negative as C^L falls in income. The third term in (A.15) will be positive, as shown in (A.11). Finally, the last term in (A.15) 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 households. Even if the effect on C^L and C^H is very small (and thus the effects of 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 stated in Proposition 4. Under mutual consent divorce, divorce 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 with 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* of Proposition 2 (i.e., those with $C^L < C_j < C^H$), 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 among whom 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 their spouse (only the abandoned partner can do that), the length of t^s will have no impact in that decision. For couples in *Case II*—among whom both partners prefer separation to divorce—desertion laws will not change their decisions either.

However, desertion laws may impact couples in *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, the wife can unilaterally file for divorce after the passage of t^s a fraction of time following the husband's decision to separate.

In anticipation this, the husband will only separate if

$$\theta_j < t^s(y - c/2) + (1 - t^s)((1 - \beta^D)(y + z) - (1 - \alpha)C_j) - (1 - \beta^M)h(y, z). \tag{A.16}$$

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 (A.16) to the second term of (1)).

If the husband threatens with separation, the couple will renegotiate the marital allocation in his favor, up to the point where 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

$$\beta_j^M \equiv \frac{h(y, z) + \theta_j - t^s(y - c/2) - (1 - t^s)((1 - \beta^D)(y + z) - (1 - \alpha)C_j)}{h(y, z)}. \tag{A.17}$$

Since the value of divorce is lower than the value of separation for the husband once again, the value of β_j^M defined by (A.17) will be higher than the maximum β_j^M that would have sustained the marriage in a world without desertion. Therefore, the surplus the husband can extract in marriage is lower when desertion laws are in place, and relationships in which women have higher bargaining power can be sustained.

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

$$\theta_j^{SD} < \frac{(y+z) - t^s c - (1-t^s)C_j - h(y,z)}{2}. \tag{A.18}$$

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 *Cases I* and *II*. However, for *Case III*, couples who will break-up, namely those with $\theta < \theta^{SD}$, will divorce after being separated for t^s. This will lead to a higher fraction of couples being divorced instead of separated at the end of the period, compared to a world without desertion laws in place.

(b) For couples in *Cases 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 with $\theta < \theta_j^{SD}$ 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 *Cases I* and *II*. In *Case III*, women's welfare will increase among couples who remain married. This is because the value of θ at which the husband asks to renegotiate the contract is now defined by (A.16), which is lower than in a world without desertion, leading to better outcomes within marriage for the wife. Moreover, couples who used to separate will now divorce, which also increases wives' welfare. Therefore, compared to the transition to *UD*, desertion laws only modify the welfare of women in *Case III*, a case in which we have already shown 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. Wives' welfare will decrease, as the share of the marital value $(1 - \beta_j^M)$ that the husbands' require to stay in the marriage (defined by (A.17)) 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 women's 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 t^s would mitigate the effects of desertion laws on marital stability (the sign of which was ambiguous, based on (b)).

Note that in the extreme case in which $t^s \to 1$, the results are analogous to the mutual consent case. On the other hand, as $t^s \to 0$, the wife can file for divorce right away, 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 effect on 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 (9). 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 who 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, once again, given by (A.18).

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 $C_j < c$, then $\theta^{UD} > \theta^{SD}$. In that case, 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 $C_j > c$, then $\theta^{UD} < \theta^{SD}$. In that case, marriage will end more often than before and this will lower women's welfare since they were better off in marriage than in divorce in that range.

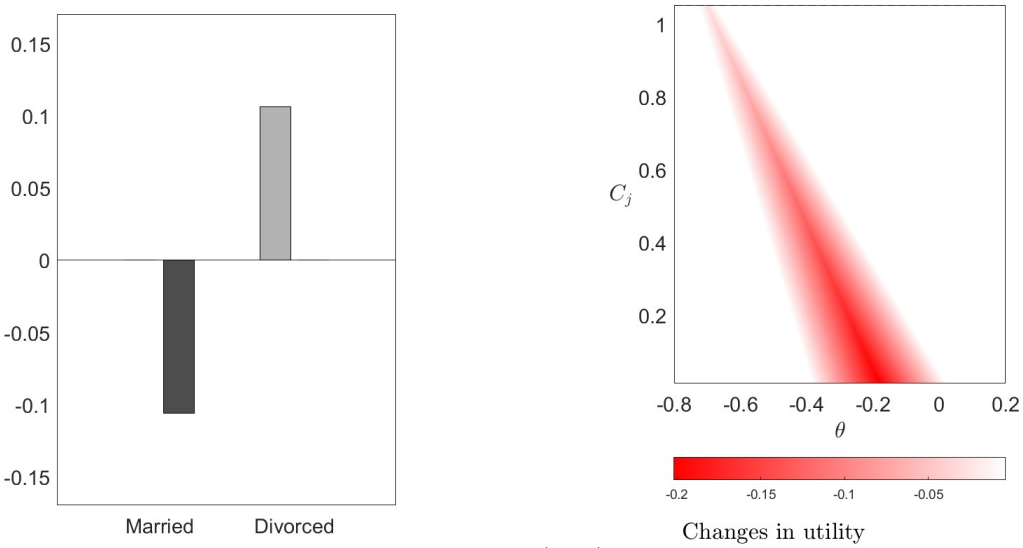
If the wife wants to divorce before the husband ($\beta^M < \overline{\beta_j^M}$), she will now be forced to wait t^s fraction of period 2 before obtaining the divorce. This reduces the value of her outside option, lowering the value of θ_j that will trigger renegotiation. Upon renegotiation, she will 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 husbands' outside option increases and the value of the wives' outside option increases, exacerbating the effects of the cool-off periods. ■

C Additional simulations

Figure A.3: 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 model simulations over (θ, C_j). We set the model's parameters to the same values as in Figure 4. To eliminate separation, we set c significantly high relative to C_j ($c = 5$). The left panel shows the changes in marital status upon transition from *MCD* to *UD*. Without separation, the decline in marriage is exactly offset by the increase in divorce.

D Calibration

D.1 Parameters and Endowments

Table A.2: Parameters Preset in the Calibration, Average Endowments, and Sources

Description	Symbol	Value	Source
Wife's share in marriage	β^M	0.50	Reynoso (2024)
Household payoff function	$h(y,z)$	$(y+z)^m$	Iyigun and Lafortune (2023)
Wife's share in divorce	β^D	0.423	Table 4
Woman's fraction of divorce cost	α	1/3	Assumption
Mean male income ('000)	y	7.9	PSID
Mean female income ('000)	z	4.7	PSID
Mean male income (low educ.) ('000)	y_l	7.4	PSID
Mean female income (low educ.) ('000)	z_l	3.5	PSID
Mean male income (high educ.) ('000)	y_l	8.3	PSID
Mean female income (high educ.) ('000)	z_l	5.8	PSID

Notes: We construct income moments using data from mutual consent divorce regime states, prior to 1980. The sample includes men and women who are single, separated, or divorced, and who are between 22 and 55 years old. All income are in real annual terms, expressed in thousands of 1970 US dollars. Low and High education groups are constructed as discussed in Section 5.

D.2 Calibration Algorithm

We describe here the grid search algorithm we implement to internally calibrate the model parameters discussed in Section 5.1.

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 combinations of c and θ_{max} that can match the fraction of couples from the PSID that separate and divorce in mutual consent regimes, reported in Table 12. We find that the model is well-behaved and that c and θ_{max} play a different role in modifying the fractions 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 matters for the role of each partners' income and we can measure heterogeneity in education in the PSID. We consider two educational groups: those with at most a high-school degree 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 triplet (m, c, and θ_{max}) that better matches the targeted heterogeneity in divorce and separation rates by women's 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 the impact on separation rates of the transition from *MCD* to *UD* estimated in Panel B of Table 9. A higher maximum value of divorce costs allows for higher separation rates in *UD* and thus generates a smaller decrease in separation post *UD* adoption.

D.3 Additional Results

Table A.3: Simulated impact of unilateral divorce laws on women's welfare with $\alpha = 0.4$

	Average	Low Educated		High Educated	
		Low educ. husband	High educ. husband	Low educ. husband	High educ. Husband
	(1)	(2)	(3)	(4)	(5)
Δ Separation	-0.012	-0.021	-0.022	0.001	-0.004
Δ Divorce	0.049	0.080	0.080	0.046	0.029
Δ Avg. Welfare	0.317	0.817	1.354	-0.071	0.020
Δ Avg. Welfare (−)	-0.118	–	–	-0.376	-0.280
Δ Avg. Welfare (+)	0.640	0.915	1.355	0.023	0.343

Notes: Results of simulation of model with $\beta^M = 0.5$, $\beta^D = 0.42$, $\alpha = 0.4$, $c = 1.782$, $m = 1.003$, $\delta = 1.8$. C_j is randomly drawn from [0, 5.6017] and θ from [-0.977, 0.977].

Table A.4: Simulated impact of unilateral divorce laws on women's welfare with $\alpha = 0.2$

	Average	Low Educated		High Educated	
		Low educ. husband	High educ. husband	Low educ. husband	High educ. Husband
	(1)	(2)	(3)	(4)	(5)
Δ Separation	-0.012	-0.025	-0.025	-0.004	-0.004
Δ Divorce	0.029	0.043	0.056	0.027	0.024
Δ Avg. Welfare	0.212	0.455	0.797	-0.002	0.065
Δ Avg. Welfare (−)	-0.322	-0.191	-0.046	-0.399	-0.409
Δ Avg. Welfare (+)	0.810	1.016	1.224	0.395	0.603

Notes: Results of simulation of model with $\beta^M = 0.5$, $\beta^D = 0.42$, $\alpha = 0.2$, $c = 3.163$, $m = 1.013$, $\delta = 3.6$. C_j is randomly drawn from [0, 12.4455] and θ from [-1.868, 1.868].

D.4 Unilateral Divorce with Cool-off Periods

As mentioned in Section 5, several states mandated cool-off periods following the implementation of *UD*, with the objective of giving couples the opportunity to reconsider their choices before finalizing divorce.

D.4.1 Theory

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 cool-off 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 aims to give partners time to re-consider their decisions before officially filing for divorce. Using data from two states that implemented *UD* with cool-off mandates—Virginia and Vermont, we show in Figure A.4 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.[31]

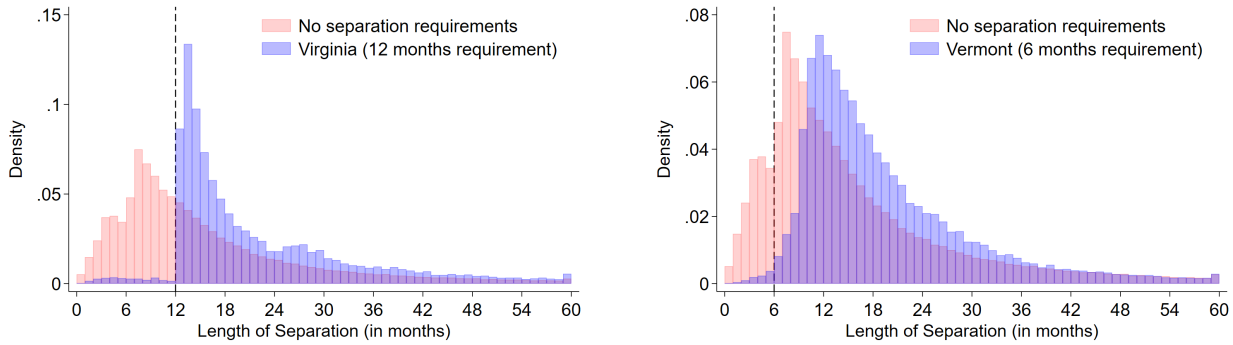
In the model, we introduce cool-off mandates by forcing spouses to wait for a fraction t^s of time in period 2, before being able to file for divorce (either unilaterally or if both agree to it). When $t^s > 0$, the second-period payoffs for spouses who separate and then divorce will be defined by (14) and (15). The following proposition formally establishes the role of cool-off periods on outcomes in 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. ■

[31] 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 variations in the data to assess the impact of these laws on the length of separation or other outcomes.

Figure A.4: 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.

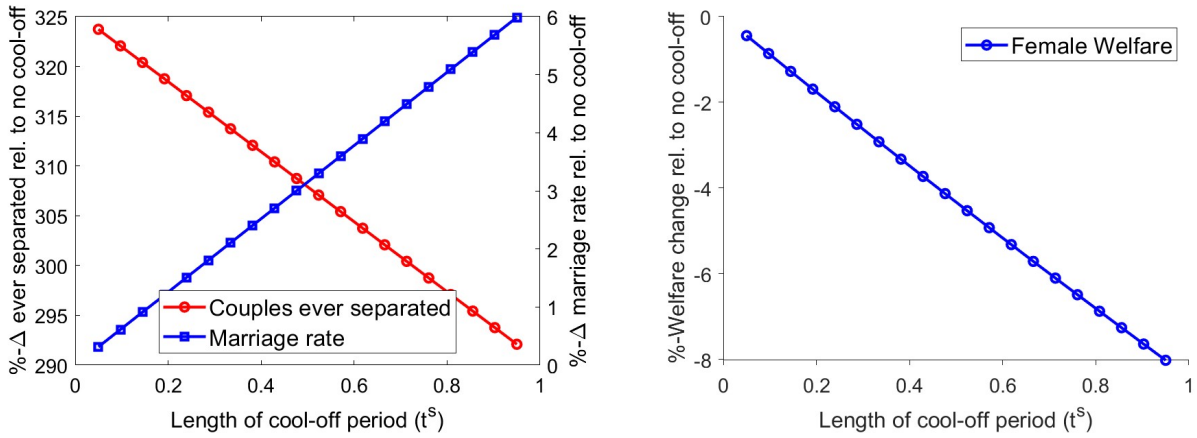
The introduction of cool-off periods—according to which spouses need to wait a certain mandated time before they can legally file for divorce, either by mutual consent or unilaterally—has no impact on couples among whom both partners prefer to separate. However, for couples among whom at least one spouse 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 among whom 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 among whom 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 lengths of the cool-off period. 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 A.5 (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, 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 latter effects dominate. As we show in Figure A.5 (right panel), the women's welfare falls with the implementation of cool-off periods. This decline is more pronounced as the mandated waiting time lengthens.

Figure A.5: 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. The rest of the parameters are set to the same values as in Figure 4. The horizontal axis measures 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 0.10.

D.5 Effects of Cool-off Periods in the Calibrated Model

We finally use our calibrated model to simulate the adoption of *UD* with cool-off periods for different values of t^s. We report in Table A.5 the aggregate changes in female welfare, as well as those disaggregated by couple type. Our results show that *UD* with cool-off periods is still on average better for women than *MCD* (column (1)), but a longer length of the cool-off period significantly reduces the average gains associated with this transition. 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 spread evenly across educational groups. The only group that benefits on average from cool-off periods are high-educated women with low-educated husbands who are penalized by unrestricted *UD* and see their utility fall by less when cool-off periods are implemented (column (4)). As cool-off periods make divorce less attractive for men in couples below C_L (as they now need to spend some time in separation), some of these marriages remain intact now and in others, men cannot renegotiate, which benefits women.

Table A.5: Simulated impact of cool-off periods on women's welfare (compared to *MCD*)

	Average	Low Educated		High Educated	
		Low educ. husband	High educ. husband	Low educ. husband	High educ. Husband
	(1)	(2)	(3)	(4)	(5)
$t^s = 0.1$	0.300	0.723	1.264	-0.044	0.052
$t^s = 0.2$	0.283	0.697	1.226	-0.042	0.045
$t^s = 0.5$	0.215	0.584	1.041	-0.032	0.023

Notes: Results of simulation of model with $\beta^M = 0.5$, $\beta^D = 0.42$ and $\alpha = 1/3$. Other parameters are set to the calibrated values from Table 11. C_j is randomly drawn from $[0, 7.337]$ and θ from $[-1.074, 1.074]$. Changes in welfare measure changes in utility terms.