Kramer vs. Kramer: On the Importance of Children and Divorce Filings for Understanding Divorce Rates in the U.S.

Christian Alemán*
New York University Abu Dhabi

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Abstract

I document that approximately 70% of divorce filings in the 1970's were done by wives in the United States. Since then, this figure has experienced a large decline, reaching 56% in 2015. At the same time, divorce rates sharply increased from 1960 until the mid 1980s and have declined since then. I construct a life cycle model of endogenous marriage and unilateral divorce with endogenous labor supply and savings that jointly explains these facts. I use my model to measure the contribution of changes in the gender-wage gap, property division laws and child custody arrangements in explaining the divorce patterns over time. First, the reduction in the gender-wage gap generates two opposing effects. On the one hand, the reduction of the gender-wage gap increases the value of divorce for married women and, on the other hand, unmarried women become more selective in the marriage market thus raising the quality of newly formed matches. Second, children increase the value of divorce for the custodial parent; so a higher probability of getting child custody raises the chances of filing for divorce. Third, a higher share of assets assigned to wives upon divorce can either increase or decrease divorce rates by altering the savings decision of the household. My model accounts for approximately 50 per cent of the decline in divorce filings and 70 per cent of the variation in divorce rates between 1970 and 2015. I find that the decrease in the gender-wage gap and the increase in the probability of getting child custody for men are major drivers behind the changes in divorce rates and in divorce filings, respectively. Importantly, I find that failure to match who files for divorce can lead to opposite counterfactual results that are at odds with the data.

Keywords: Divorce, Divorce Filings, Gender-wage gap, Child Custody
JEL Classification: D1, D14, D13, J12 ,J13, J21

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Contact: Facultat d'Economia i Empresa Universitat Autònoma de Barcelona (UAB) Edifici B Campus de Bellaterra. *Email:* christian.c.aleman@gmail.com *Personal WEB:* alemanchris.github.io

1 Introduction

Divorce rates and the composition of divorce filings[1] in the United States (U.S.) have changed substantially since the 1970s. While the family economics literature has studied divorce rates and their relation with the major labor market changes happening in the U.S. since the 70s, it has done so without using information on divorce filings. Using actual divorce filing data for the U.S., I quantitatively assess the role of divorce filings in explaining divorce rates over a period of 46 years. In particular, I use the information of divorce filings to identify gender specific match quality within a couple. Moreover, I find that matching divorce filing data moments is relevant for accurately quantifying the effects of labor market changes on the structure of the family.

I document that around 70%[2] of the divorces were initiated by wives in the early 70s, since then this number experienced a large decline, reaching 56% in 2015. Moreover, divorce filing data exhibits important heterogeneity across education groups and between couples who had or not children. In 1970, 75% of all divorces were initiated by wives when the couple had children, 83% when a college educated woman was married to a non-college man and 56% when non-college women were married to college men.[3] At the same time, divorce rates sharply increased since 1960 until they reached a peak in 1981 and thereafter continuously declined, thus exhibiting a hump shape pattern, see Figure 1.

The purpose of this paper is to understand the above described patterns of divorce rates and divorce filings, in a world with higher assortative mating, lower fertility, rising female wages, more custodial fathers and changing property division laws. The analysis aims to study the complete evolution of divorce rates and divorce filings starting in 1970 until 2015, thus encompassing 46 years of divorce data. I emphasize the importance of explaining divorce rates together with divorce filings, since abstracting from the latter may lead to different conclusions about the response of divorce rates to changes in labor market outcomes. I construct and estimate a life cycle model of endogenous marriage and unilateral divorce, where agents differ in age, gender, marital status, and education attainment. Married agents make joint decisions on consumption, savings and labor supply. If agents are single they randomly meet unmarried people of the opposite gender and decide whether to marry or not. In order for the marriage to happen, both people need to agree to marry, in this sense this will be an equilibrium match. Once married, spouses can choose to divorce unilaterally. Utility is non transferable, this implies that if one spouse would rather

[1] Alleging to whether it was the wife or the husband the one who initiated the legal divorce proceedings in court. Evidence shows that there is a high correlation between the record of who files for divorce and the person who actually "wanted more" the divorce, Allen and Brinig (2000), Sayer et al. (2011), Rosenfeld (2018).

[2] This number is based on divorce filing records for a sample of 31 states, refer to Section 2 for a more detailed discussion.

[3] I classify an individual as "college" if he/she reported to have 16 years of education or more. Refer to the data Section 2 for a more detailed description of the data used in this paper.

divorce but the other prefers marriage, then he or she cannot convince the divorcing spouse to stay married. Fertility is exogenous and children bring additional utility to their parents, however upon divorce only one of the parents gets full custody of the children with a given exogenous probability, under this setting, the odds of child custody will alter the expected value of divorce for the custodial parent (more often the mother)[4] In my model men and women enjoy married life differently (i.e marital quality/love is gender specific). This a specific feature that I use to match divorce filing moments. This is not a new feature to the literature, a similar way to model love/match quality can be seen in Rios-Rull et al. (2010), however they do not explicitly target divorce filing moments in their estimation, which in contrast is the purpose of my study.

There are three main mechanism in my model occurring through: (1) the gender-wage gap in the labor market, (2) child custody arrangements upon divorce and (3) property (assets) division upon divorce: First, in terms of the labor market, rising female wages affect martial outcomes in two opposite directions in the model. On the one hand, a reduction of the gender-wage gap increases the value of divorce for married women, this makes it easier for women to divorce and leave inconvenient marriage arrangements, thus increasing divorce rates and the number of divorces filed by women. On the other hand, a reduction of the gender-wage gap increases the value of singlehood for unmarried single women making them more selective in the marriage market, this means that potential candidates that she would have married with the previous income arrangement might get rejected under the current arrangement. In other words, women can now afford to wait longer in the marriage market with the intention of securing a better match for themselves. This stronger selection mechanism translates into a delay in marriage and a lower number of marriages being formed. However, these new marriages exhibit higher average match quality for women, thus reducing their willingness to divorce and lowering the share of divorces initiated by wives.

Second, in terms of children and their custodial arrangements upon divorce, I model children as a public good that brings additional utility to the couple; thus making marriage more attractive for both parties. Upon divorce, one of the couple members is randomly chosen to become the custodial parent, moreover, only the custodial parent enjoys the additional utility coming from the child. Then, children increase the value of divorce for the custodial parent, thus raising his/her chances of filing for divorce. In my model, I inform the odds of custody by gender as I find in the data. In particular, in the latest decades the probability of fathers in getting full custody of their children has increased, therefore increasing the number of divorces initiated by husbands, which is in line with the observed reduction of the share of divorce filings done by wives.

[4] In recent years, joint custody became more common, in my model I do not allow for joint custody arrangements, however joint custody would entail that both parents share the children, as opposed to only having one custodial parent. See González-Val and Marcén (2012) for a discussion on the implications of joint custody for divorce.

Third, in terms of property (asset) division upon divorce, in my model assets are divided according to an exogenous splitting rule. The implications of changes in the splitting rule on divorce rates are ambiguous. On the one hand, higher share of assets for wives increases the value of divorce for women thus increasing the number of divorces by wives, on the other hand, lower share of assets for men reduce the value of divorce for men, which decreases the number of divorces by men. The way assets are split upon divorce also alters the savings decision of married households, which in turn also affects the value of divorce for both partners. From 1970 to 1985 reforms were aimed to give a larger share of assets to wives, this created a more convenient situation for divorcing wives, which is in line with the increase in divorce rates between that period.

In order to assess the role of each of these mechanisms in explaining divorce filings and divorce rates, the model is set to match a set of relevant data moments of 1970.[5] I take the 1970's economy as the status quo, I then use the model to get a counterfactual prediction for 1985. To do this I update the education composition of the population, fertility, the gender-wage gap, child custody arrangements and property division rules to their 1985 values. The model predicted values are then compared with their data counterparts, I repeat the same exercise for the period 1985 to 2015. The estimation of the model for 1970 reveals that women enjoy married life less than men and that children bring additional utility to the household they live in. This explains why, conditional on the presence of children, women file more for divorce than men. Furthermore, we can see that the model predictions for 1985 are in line with the changes observed in the data. The model accounts for 41% of the rise in divorce rates and 53% of the decline in divorce filings from 1970 to 1985, and 50% of the decline in divorce rates and 52% of the decline in divorce filings between 1985 and 2015.

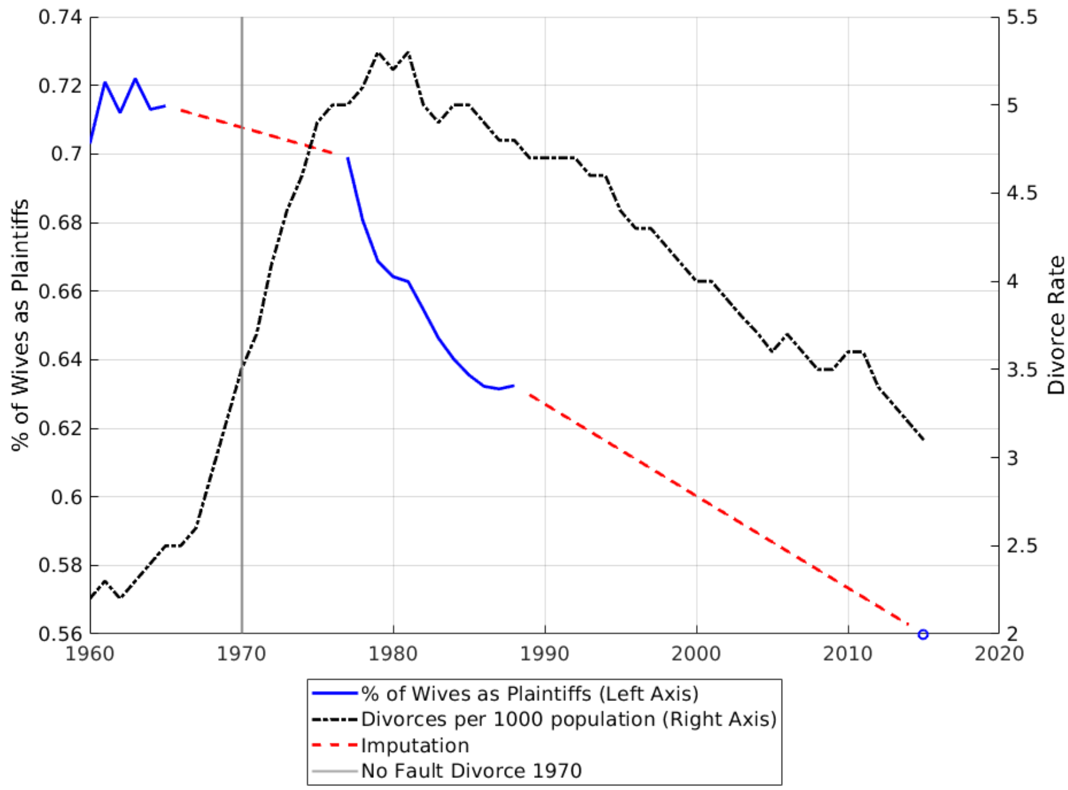
Next, I decompose the above predictions by measuring the individual contribution of each of the three drivers: the gender-wage gap, property division laws and child custody arrangements. To this end, I keep the 1985 parametrization fixed but set the gender-wage gap to its 1970 value. I do the same for the odds of child custody and the property division splitting rule. I repeat the same set of exercises for the period 1985 to 2015. These counterfactual experiments show that the reduction of the gender-wage gap can explain large percentages of the changes seen in both time intervals. Rising relative wages account for 91% of the increase in divorce rates and 29% of the decline in divorce filings between 1970 to 1985. And 62% of the decrease in divorce rates and 17% of the overall decline in divorce filings by women between 1985 to 2015. Results show that the change in child custody arrangements is the most important driver behind the reduction in the share of divorce initiated by wives, it accounts for 77% of the decline between 1970 and 1985 and 83% variation between 1985 and 2015. Changes in property division explain 50% of the rise in divorce rates from 1970 to 1985.

[5] Importantly, I target divorce rates and divorce filings by education of the couple.

I then turn to analyse the relevance of using divorce filing information in getting the above results and show that failing to match divorce filing moments leads to opposite counterfactual results. To do this, I propose an alternative model that abstracts from the features that would allow it to match divorce filing moments; namely gender specific match quality and higher probability for the wife to get custody of the children. In the alternative model both men and women enjoy marriage equally and both have the same chance of becoming the custodial parent in case of divorce. When estimating the alternative model for 1970 I target divorce rates, but no longer target the share of divorces initiated by wives. The estimation of the alternative model for 1970 has no problem in replicating the divorce rate of 1970 however, the model fails to get the share of divorces initiated by wives, predicting this to be 48% as opposed to 71%, as observed in the data for 1970. I then use the alternative model to obtain a counterfactual prediction for 1985. In this case the model predicts a decline in divorce rates and an increase of the divorce filings by wives; results that are contrary to what is observed in the data. This occurs because in the alternative model most of the divorces come from husbands (as opposed to wives as it is the data); therefore an increase in female wages will make women more economically attractive to men, since men can now work less and their wives more, thus reducing the number of divorces initiated by husbands.

Relation to the literature This paper speaks to the family economics literature that studies the links between marital structures and people's economic choices i.e labor market participation, wealth accumulation, investment in education and fertility among others (Greenwood et al. (2017), Yamaguchi et al. (2014)). See a comprehensive summary of the state of the art concerning the economics of the family in Doepke and Tertilt (2016). However, to the best of my knowledge this paper is the first to quantitatively asses the role of divorce filings in explaining divorce rates using actual divorce filing data. I build on the work done by Rios-Rull et al. (2010), where the authors measure the contribution of changing wages on the share of single female households and other demographic facts. My framework is similar to theirs in that I also allow the utility of married individuals to differ by gender; which has the potential to generate gender asymmetries in divorce filings, however the authors do not explicitly target divorce filing moments, as I do. In addition, their model presents a similar selection mechanism where rising female wages induces single women to wait for a better match and makes men more willing to marry since the earning power of their potential partners increased. My work can be seen as an extension to their framework by adding wealth accumulation and child custody arrangements, and a simplification by removing endogenous education attainment/sorting and fertility. The framework I present here is also closely related to Santos and Weiss (2014), where they focus on the effect of the rise in income volatility on the delay and decline of first-marriages. In their model, marriage

Figure 1: Divorce filings and divorce rates



Notes: Divorce filing data comes from the NBER collection of Marriage and Divorce, refer to NBER (1995). Divorce rates are taken from the CDC/NCHS National Vital Statistics System reports, refer to Section 2 for more details.

entails consumption commitments that affect the gains from marriage. Increased volatility leads to agents waiting longer to get a high income draw before getting married, this in order to be able to meet the consumption commitments that come with marriage. In their analysis they abstract from modeling divorce decisions, therefore abstracting from modeling divorce filings. For further work focusing on changes in the wage structure and marriage and intrahousehold decisions refer too Goussé et al. (2017) and Ciscato (2018). Santos and Weiss (2015) links the decline of divorce to the rise of income volatility. Higher volatility leads to less divorce because married couples value spousal insurance more. This channel reduces divorce risk associated to negative income shocks. Their model extends the framework in Santos and Weiss (2014) by including unilateral divorce and bargaining over consumption, labor supply and savings decisions within the household. Their model explains both the decline in divorce rates and the rise in elderly divorce, however information on divorce filings is not reported. Greenwood et al. (2016) present an economy with declining marriage, increasing divorce and rising assortative mating. Within that context they explain how the changing wage structure and the reduction in the price of durables affect marital composition, education attainment and female labor force participation and how all of these factors jointly determine income inequality. The authors explain how, in the presence of better technology at home, the economies of scale from marriage are lower, thus reducing the incentives to marry and promoting divorce. In contrast to Greenwood et al. (2016), I focus on explaining both the rise and fall of divorce rates overtime, together with the decline in the share of divorces initiated by wives. I do not model home production, but at first glance a reduction in the price of durables would reduce the value of marriage for married men more than for women, therefore contributing to the decline in filings done by wives this would be a useful extension to my model.

My paper is also related to Guvenen and Rendall (2015), who explore the role of education as insurance against bad marriages. They build on the fact that future returns on human capital are not divided upon divorce, this makes education a good insurance against divorce risk. In their model women endogenously respond to the change from mutual consent divorce to unilateral divorce by increasing their college enrollment. In my model I take the education composition of the population as given, but this does not hinder college educated wives from being more prone to end bad marriages than their non-college counterparts. Knowles (2005) uses a model of marital bargaining to explain the trends in U.S. labour supply since 1970. The author shows that the standard model without bargaining predicts a large decline in married-male labor supply in response to the reduction of the female to male gender-wage gap since 1970. The author emphasizes that although bargaining has a small impact on aggregate labor supply it is critical in explaining the trends in female labor supply observed in the data. In contrast to my framework, the author explicitly models intra-household bargaining, divides time use within the household in three categories, leisure, work in the office and work at home, finally he includes income taxes into the analysis. However, the author abstracts from modeling wealth accumulation, fertility and child custody arrangements plus does not explicitly target divorce filing moments. Regarding bargaining, I too propose a version of my model where the intra-household allocation weights are set through Nash Bargaining. After estimating my model for 1970, the obtained endogenous the pareto weights were similar to the ones found by Knowles (2005), importantly I found that there was little change in the endogenous pareto weights when generating model predictions for 1985. Following this insight, I keep the pareto weights constant throughout my analysis.

My work is also related to the literature addressing changes in divorce laws and child custody settlements. Fernández and Wong (2017) study the welfare effects of switching from mutual consent divorce to unilateral divorce. They use a model with endogenous family formation, where children stay with the mother upon divorce. They calibrate their model to match moments of the 1940 cohort, and conclude that women were better off under the mutual consent regime vs. unilateral divorce. They model love as a public good but explore the possibility of allowing love draws to differ across partners, however they assume a common distribution of love across partners. I relax this assumption by allowing the mean of the love distribution to differ by gender, furthermore I discipline these means to match divorce filing data by education and conditional on the presence of children. In Fernández and Wong (2017) the welfare losses from divorce are larger for women than for men, this happens because women earn less than men and bear a larger share of child rearing costs, thus more likely to benefit from a mutual consent regime. Voena (2015), studies the effects of switching from mutual consent divorce to unilateral divorce in states with a title based regime vs. states with community property or an equitable distribution regime.[6] She finds that the introduction of unilateral divorce in states with equal division of property, resulted in higher savings and lower female labor force participation. She estimates a model featuring limited commitment to marriage, imperfectly transferable utility between spouses, and remarriage. In my model, utility is non-transferable and I abstract from the possibility of remarriage. Shephard (2019) presents a limited commitment overlapping generations framework with both within and across cohort marital matching. The model is able to explain why men marry women younger than themselves and why labor supply of married women is lower the older is her husband. Furthermore the author quantifies the effect of decline in the gender-wage gap on the marriage age gap; he finds that one third of the reduction of marital age gap is associated to the reduction of relative wages. Marcassa (2013) measures the effects of changes in financial settlements, namely changes in property division, alimony transfers and child custody arrangements and time assignments on the rise of divorce rates in the U.S. since late 1960's. To do so she calibrates a model of wealth accumulation, labor supply and limited commitment to marriage. She finds that financial settlement can account for 30% of the rise in divorce rates. Moreover, she finds that after accounting for all financial settlements, the role of switching from mutual consent to unilateral divorce is significantly smaller. In later counterfactual experiments she finds that changes in the wage structure explain 15% of the increase in divorce rates. In her model agents solely divorce due to marital quality shocks, save for retirement and to mitigate divorce risk. Arpad and Sarolta (2015) study how divorce and asset division rules affect intra-household risk sharing. In a model with lack of commitment and efficient separations calibrated for the UK, they compute optimal property division upon divorce. They find that optimal property division rules balance the trade-off between risk sharing within the couple, and consumption smoothing across marital states (married vs. divorced). In a static setup Weiss and Willis (1985) study endogenous child custody settlements. In their model expenditure on children is a public good enjoyed by both

[6] For the definition of title based regime, community property and equitable distribution refer to Footnote **??**.

the father and the mother; upon divorce the non-custodial parent looses control over the child expenditure allocations. Under this set up optimal marriage contracts are constructed where couples decide the allocations within marriage and child custody settlements upon divorce. If one party is committed to provide the other with a high level of utility, then he may be better off assigning custody as well, thus benefiting from the high level of child expenditures the other party will choose. I would like to stress that none of the above mentioned research papers focus on matching who files for divorce and its role in explaining divorce behaviour, aspect that is the backbone of my analysis.

Regarding the literature studying divorce filings and its determinants, most work is empirical and comes from sociology and law. Empirically, I contribute to this literature by documenting the steady decline in the share of divorce filings initiated by wives since 1970. I show that this decline is not purely a composition effect by showing that divorce filings by wives decline both by education group of the couple and by the presence of children in the household, see Figure 2. Quantitatively, I estimate a structural model to measure and decompose the effects of the main driving forces behind changes in divorce rates and divorce filings by women. Friedman and Percival (1976) make a complete historical analysis on the evolution of divorce and divorce filings in the U.S. since 1870 until the late 1970's. Allen and Brinig (2000) show empirically that filing behaviour depends on the spouse's relative power within the marriage, financial independence and anticipation of child custody, the latter being the most important determinant. Allen and Brinig (2000) were concerned by the fact that most (if not all) couples experience a separation time until the final divorce decision takes place, therefore the divorce filing record might not necessarily reflect the intention of the filing member to divorce when the separation period is long (larger than two years). They find evidence that within a period of two years between separation and divorce, the divorce filing does not appear to be simply a matter of convenience. Following this insight I control for the time form separation to divorce and only use divorce records where the time from separation to divorce did not exceed six years. Then the median time from separation to divorce used to produce the statistics in this paper is two years. Dixon and Weitzman (1982) show that husbands who filed for divorce also revealed a strong preference for becoming the custodial parent. Kalmijn and Poortman (2006) emphasize that child custody affects the husband's decision to divorce more than for it does for wives. Fox and Kelly (1995) study the determinants of child custody arrangements upon divorce. They find that the odds of father custody were enhanced when the children where older but reduced by parental unemployment and prior child support arrangements. Sayer et al. (2011) show that female employment made women more likely to leave the marriage. Additionally they found that men's unemployment affects equally the probability of either partner to file for divorce. Gunter and Johnson (1978) finds evidence that the passage of no-fault divorce was partially responsible for an increase in male divorce filings, suggesting that cultural and societal changes had a secondary role. Finally, Rosenfeld (2018) document that women tend to report lower marital quality than husbands, which is in line with the estimation results coming from my model.

The remainder of the paper is organized as follows. Section 2 presents the data used in this paper. Section 3 describes a simple model of divorce filings, and explains its mechanism. Section 4 describes the fully fledged model to be estimated. Section 5 explains the calibration and estimation procedure. Section 6 and 7 describe the main results and counterfactual experiments. Finally, Section 8 concludes.

2 Data

This paper collects information from various data sets, these data sets are: The Panel Study of Income Dynamics (PSID), Current Population Survey (CPS), divorce filing data from the National Vital Statistics System complemented with survey data coming from the HCMST project, see Rosenfeld (2018). Otherwise stated the numbers reported/used in this paper come from data extracts from the Current Population Survey that were accessed through IPUMS. Moreover, the relevant statistics were computed for couples where the husband was between 21 and 60 years old. In addition, I classify an individual as "college" if he/she reported to have 16 years of education or more. I now describe in detail the relevant variables and their sources.

Divorce filing data This paper uses data on divorce filing records that were directly collected from divorce certificates available for 31 states across the U.S. from 1968 to 1995, see the complete list of sample states in Appendix B. This data set was compiled by the National Vital Statistics System of the National Center for Health Statistics, the data set can be downloaded from the NBER collection of Marriage and Divorce Data, refer to NBER (1995). The collection of this data stopped in 1995 due to lack of funds. Unfortunately data for all states was not available, however the information available for the 31 sample states can be very well used to conduct inference at the national level. In Table1, I show that the divorce rates at the national level and those computed using the sample of 31 states are not so different from one another.

The data set consists of more than 3 million observations and includes the relevant variables necessary for my analysis: level of education of the husband and wife, number or children under 18, marriage duration, time from separation to divorce, age, race, and state of residency. Detailed information on the plaintiff (the person who filed for divorce) is only available from 1977 to 1988, therefore the average share of divorces initiated by wives for 1970 was imputed by interpolating between the value for 1960 (reported by Friedman and Percival (1976)), which was 72% and the value for 1977. The respective numbers by education of the couple and filings in the presence of children were imputed accordingly. In addition, following Allen and Brinig (2000) I control for the time form separation to divorce and only use records where the time from separation to divorce did not exceed six years, this makes the median time form separation to divorce to be two years in the sample I use.

The value for the share of divorce initiated by wives in 2015 comes from survey data collected for the project How Couples Meet and Stay Together, see Rosenfeld (2018). This data set consists of 3,009 records of married individuals and their partners. Follow-up surveys were conducted one and two years after the original wave. After classifying divorces by the education of the couple, the surviving number of observations was to low to produce reliable statistics. Because of this reason I do not analyze divorce filings by education of the couple for the period 1981 to 2015.

Divorce rates Divorce rates were computed using PSID data. First, married heads in the PSID were paired with their respective spouses, thus creating a data set at the couple level. I then follow these couples across years, recording if the couple changed its marital status from married to divorced from one year to the next. I then compute the divorce rate as the relative number of couples who switched marital status from married to divorced between survey dates.[7] Separated couples are not included in the analysis. Between 1968 and 1997, PSID interviews were conducted annually. Since then, interviews have been biennial, thus the calculation for the divorce rate for 2015 has been adapted accordingly.

For the quantitative exercise I use divorce rates at the national level, instead of divorce rates computed for the sample of 31 states for which divorce filing data is available. Table 1 shows that the divorce rates at the national level and those computed using the sample of 31 states are not so different from one another, thus justifying the use of divorce rates at the national level.

Table 1: Divorce rates (in %) for all states vs. sample states

	Year					
	1970	1975	1980	1985	1990	2015
All States	1.30	1.42	1.85	1.87	1.60	1.30
Sample States*	1.29	1.38	1.75	1.93	1.68	1.22

*For the complete list of sample states refer to List B. Source: PSID

Furthermore, Figure 6 in Appendix B shows the divorce rate trends computed from the CDC National Vital Statistics Reports. The figure conveys the same message as Table 1; it shows

[7] Alternatively, the crude divorce rate can be computed as the number of divorces per 1000 population.

that the divorce rates trends from the sample states are close to the ones at the national level. Additionally it shows the divorce rate trends for selected states. Oklahoma and Arizona which are the two states with the two highest divorce rates 1970. Mississippi and Ohio with divorce rates closest to the median for the U.S. Finally, New Jersey and New York with the lowest divorce rates in 1970.

Fertility Data on fertility was collected from the OECD reports on fertility by mother's age at childbirth. The OECD collected data for the U.S. from 1960 until the present. Table 5 shows the evolution of fertility rates by age group of the mother for 1970, 1985 and 2015 .

Table 2: Fertility: Births per 1000 women, U.S.

	Age Group						
Year	15-19	20-24	25-29	30-34	35-39	40-44	45-49
1970	68.3	167.8	145.1	73.3	31.7	8.1	0.5
1985	51.0	108.3	111.0	69.1	24.0	4.0	0.2
2015	22.3	76.8	104.3	101.5	51.8	11.0	0.8

Notes: Source, OECD Stats, Fertility rates by mother's age at childbirth, five-year age groups, 1960-2019

Labor market variables The gender-wage gap, female labor force participation and the average weekly number of hours worked by women were calculated from the Current Population Survey using CPS-IPUMS extracts. I use the sample for all married couples where the husband is between 21 ant 60 years of age. As with the PSID, I first pair up husbands with their respective wives thus creating a sample at the couple level, the CPS provides an easy way of linking spouse records. The CPS provides information on labor earnings per year, thus hourly salaries were computed by dividing the yearly labor earnings by the number of hours worked reported that year. I then proceed to calculate life cycle trends; different trends were computed by education (college, non-college) and gender, these trends were later smoothed using a quadratic fit on age: $\mho_{g,e}(age) = \alpha_0 + \alpha_1\, age + \alpha_2\, age^2$.

The CPS reports the employment status of the household members. It also reports the average number of hours worked per week if the respondent was active in the labor force. Using this information it is straight forward to calculate the female labor force participation and the female to male hours worked ratio h_f/h_m.

Assortative mating The education composition of the population was calculated from the Current Population Survey. This involves computing the relative weight of the respective education groups: (1) College educated women married to college educated men, (2) college educated women married to non-college men, (3) non-college women married to college men, finally (4) non-college women married to non-college men. Table 3 shows the respective shares for 1970 and 1980. The degree of assortiative mating between those years increased, the Pearson's correlation coefficient between the education of the wife and the husband in 1970 was 0.47 and 0.52 in 1985. For a more detailed analysis on the rise of assortative mating see Greenwood et al. (2016), Greenwood et al. (2017) and Liu (2020).

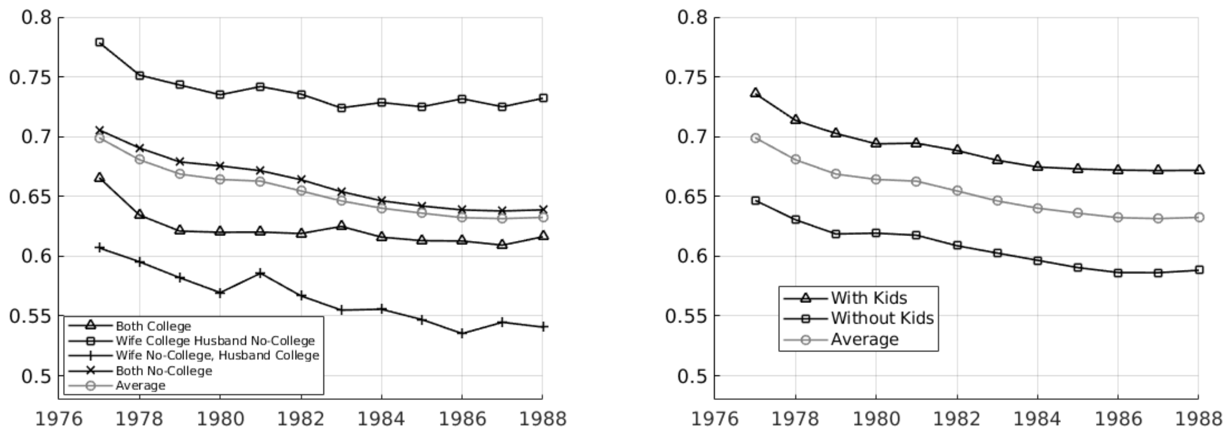
Trends in divorce and divorce filings Between 1970 and 1985 the percentage of divorces initiated by wives in the U.S. declined from 70% to 63% (a 9.7% reduction) and from 63% to 56% (a 11.1% decline) from 1985 to 2015. The crude divorce rate increased, from 3.5% to 5.3% (increase of 51%) between 1970 and 1980, reached a peak in 1981 and declined ever since. By 2015 they had reached levels close to the ones seen in the early 70's. Figure 1 summarizes these trends.

The declining trend in divorce filings by wives is also present when looking at cuts by education of the couple members and in the presence of children, see Figure 2. We observe that the decline is larger for non-college women married to college men (a 10.9% decline), whereas smaller for college women married to non-college men (a 5.9% decline). Note that at every point in time college educated women married to non-college educated men filed more, having a cross-year average of 73% and non-college women married to college men filed the least, 56%. The other two groups were in between, with 62% of women filing when both had a college education and 66% when none of the partners where college educated.

When looking at divorce filings in the presence of children we can see that kids are an important factor behind women's divorce filing behavior. In 1977, 74% of all divorces where initiated by women when the couple had children and 64% in the absence of children. Moreover, the declining trend is present for both groups, the reduction has been larger in magnitude for those couples who didn't have children a 9.7% reduction (from 64% to 58%) and a slightly smaller decline for couples with children, a 8.6% reduction (from 74% to 67%).

Figure 2: Percentage of divorces initiated by wives by education of the couple and presence of children

(a) By education (b) By presence of Children



Source: NBER collection of Marriage and Divorce, refer to NBER (1995).

Table 3 summarizes information about divorce filings, divorce rates, gender-wage gap, assortative mating and female labor supply by education groups for 1970 and 1985. We can see that average relative wages $\bar{w}_f/\bar{w}_m$ are positively correlated with the percentage of divorces initiated by wives; the Pearson's correlation coefficient is 0.7 between the two variables. This suggest a strong connection between wives filing behaviour and their income. We see that for 1970, the wage gap of college women married to non-college men is the lowest, with such women earning 69% their husbands wage; for non-college women married to college men the gap is the largest, with 37%. The gender-wage gap of college women married to college men was 55% and for non-college women married to non-college men was 47%. On the contrary the divorce rate for college women married to college men is the lowest, and the divorce rate of college women married to non-college men is the largest.

Table 3: Divorce rates, divorce filings and labor market variables by education, U.S. 1970, 1985

	Education of the couple							
	Both College		Wife College Husband Not		Husband College Wife Not		None College	
	1970	1985	1970	1985	1970	1985	1970	1985
Divorce rate (%)	0.85	0.92	1.87	2.06	1.37	1.60	1.27	1.99
% of divorces initiated by wives	66.56	61.29	77.87	72.51	60.70	54.74	70.56	64.18
gender-wage gap $\bar{w}_f/\bar{w}_m$	0.55	0.60	0.69	0.74	0.37	0.44	0.47	.54
Working hours ratio h_f/h_m	0.72	0.8	0.85	0.83	0.69	0.74	0.78	.82
Married female labor force participation (%)	47.44	67.42	61.26	71.73	31.85	54.12	40.72	54.04
Sample shares (%)	8.10	14.87	4.73	7.34	8.69	9.68	78.48	67.97

Sources: Divorce filing data is from the NBER collection of Marriage and Divorce, refer to NBER (1995). Divorce rates from PSID. gender-wage gap was computed form CPS-IPUMS extract.

3 A Simple Model of Divorce Filings

Consider a simple economy where agents live only for two periods and are indexed by their gender $g \in \{m, f\}$ and marital status $\omega \in \{\mathcal{M}, \mathcal{D}\}$, married and divorced respectively. Individuals are born married and with children. Agents can only be married to an individual of the opposite sex, therefore a family is conformed by a husband, a wife and children. All families are born with zero assets $a_{t=1} = 0$. As a simplification, children are modeled as a public good that bring additional utility $\eta > 0$ to each parent in the household; children do not make any decisions. Each couple member is born with a given gender specific match quality q_g that is randomly drawn from the gender specific distribution $\mathcal{N}(\alpha_g, \sigma_{\epsilon_\alpha})$. At every point in time agents make decisions over consumption c and the number of hours to work h at a given stochastic gender specific wage rate w_g. log wages follow a Markov process with persistence ρ. Compute the average female to male gender-wage gap as $\bar{w}_f/\bar{w}_m$. Additionally, every period married agents decide unilaterally whether or not to get divorced. This means that although all agents are born married they can choose to divorce in the first period, furthermore a couple that decided to stay together in the first period can choose to split in the second period. In period two, individual match quality is redrawn from the same distribution, but only for married couples; there is no remarriage. Match quality takes the value of zero $q_g = 0$ if divorced. Upon divorce one of the parents keeps the children with probability ν_g, such that $\nu_m + \nu_f = 1$, this means that the non custodial parent looses any utility gains η he/she used to get from the children, whilst the custodial parent keeps them. Importantly, in period one, all agents (married or not) must also choose how much to save for the second period a'. Upon divorce, assets are split according to the asset splitting rule $0 \leq \kappa_g \leq 1$, such that $\kappa_m + \kappa_f = 1$, there are no additional costs to divorce. Following the above description the period utility for an individual is $u(c_g, h_g) + q_g(\omega) + \mathbf{1}_{k=1}\eta$, where $\mathbf{1}_{k=1}$ is an indicator variable that takes the value of 1 in case the individual lives with the child, zero otherwise. I assume that agents are risk averse and dislike working.

The problem of married couples Married couples maximize the weighted sum of each member's individual utility according to the pareto weights μ_g, [8], subject to the budget constraint, $c_m + c_f + a' = w_m h_m + w_g h_f$ in period one and $c_m + c_f = w_m h_m + w_g h_f + a'(1+r)$ in period two, where r is the risk free interest rate. We can see from the borrowing constraint that agents pool income and make joint consumption and savings decisions. Denote the value of marriage for an agent of gender g at period t as $V_g^{\mathcal{M}}(t)$, where $V_g^{\mathcal{M}}(t)$ is an equilibrium object coming from the maximization problem of the married household.

The problem of the divorced A divorced individual maximizes his/her own utility, subject to $c_g + a' = w_g h_g$ in period one, $c_g = w_g h_g + a'(1+r)$ in period two if divorced in period one and $c_g = w_g h_g + a'(1+r)\kappa_g$ in period two if divorced in period two. Denote the value of divorce for an agent with gender g at period t as $V_g^{\mathcal{D}}(t,k)$, where k takes the value 1 if parent g is the custodial parent. Denote $\mathbb{E}$ as the expectation operator over the probability of getting custody of the child upon divorce.

The divorce decision Divorce occurs at any period t if either $\mathbb{E}(V_m^{\mathcal{D}}(t)) > V_m^{\mathcal{M}}(t)$ or $\mathbb{E}(V_f^{\mathcal{D}}(t)) > V_f^{\mathcal{M}}(t)$, or both, thus divorce is unilateral when either the husband or wife is better off in the divorce state and divorce is mutual when both partners are at the same time better off divorced. Under this set up it is straight forward to compute the number of divorces that were initiated by wives, husbands or both.

In the next subsection I parametrize, solve and simulate the above described two period model. Subsequently, I provide an explanation of the relevant mechanisms of interest.

3.1 Mechanisms

In this section I propose four alternative parametrizations of the model, see below. I then solve the model and conduct a comparative statics exercise to better understand the relevant mech-

[8] Such that the value for a couple is: $V_t^{\mathcal{C}}(w, w^*, a, q_m, q_f, k) = \max_{c_m, c_f, h_m, h_f, a'} \mu^f u(c_f, h_f, q_f) + \mu^m u(c_m, h_m, q_m) + \eta$ subject to the period specific budget constraint.

anisms. Figure 3 and 4 present the results from the comparative statics exercise. For a given parametrization, panels (a) to (e) in Figure 3 show the response of divorce rates and the share of divorces initiated by women when changing respectively, the gender-wage gap $\bar{w}_f/\bar{w}_m$, the asset sharing rule upon divorce κ_g and child custody arrangements ν_g:

1. **Reference model:** Represents a gender equality scenario in which there are no gender differences in the model. This scenario sets $\bar{w}_f/\bar{w}_m = 1, \kappa_m = 0.5, \nu_m = 0.5, \psi_m = \psi_f, \mu_g = 0.5, Ł_m = Ł_f = 4$. For the rest of the parameters see Appendix A.

2. **Alternative model 1:** Sets somewhat more realistic gender differences, as found in the literature, $\bar{w}_f/\bar{w}_m = 0.55, \kappa_m = 0.6, \psi_m < \psi_f, \mu_m = 0.6$ but keeps the mean of the individual match quality $Ł_g$ and the probability of child custody ν_g, symmetric between men and women $Ł_m = Ł_f$ and $\nu_m = \nu_f$.

3. **Alternative model 2:** Keeps the parameter values of Alternative model 1, but sets $Ł_m > Ł_f$, explicitly $Ł_m = 4$ and $Ł_f = 3$, that is men an women enjoy married life differently. With women having lower match quality than men.

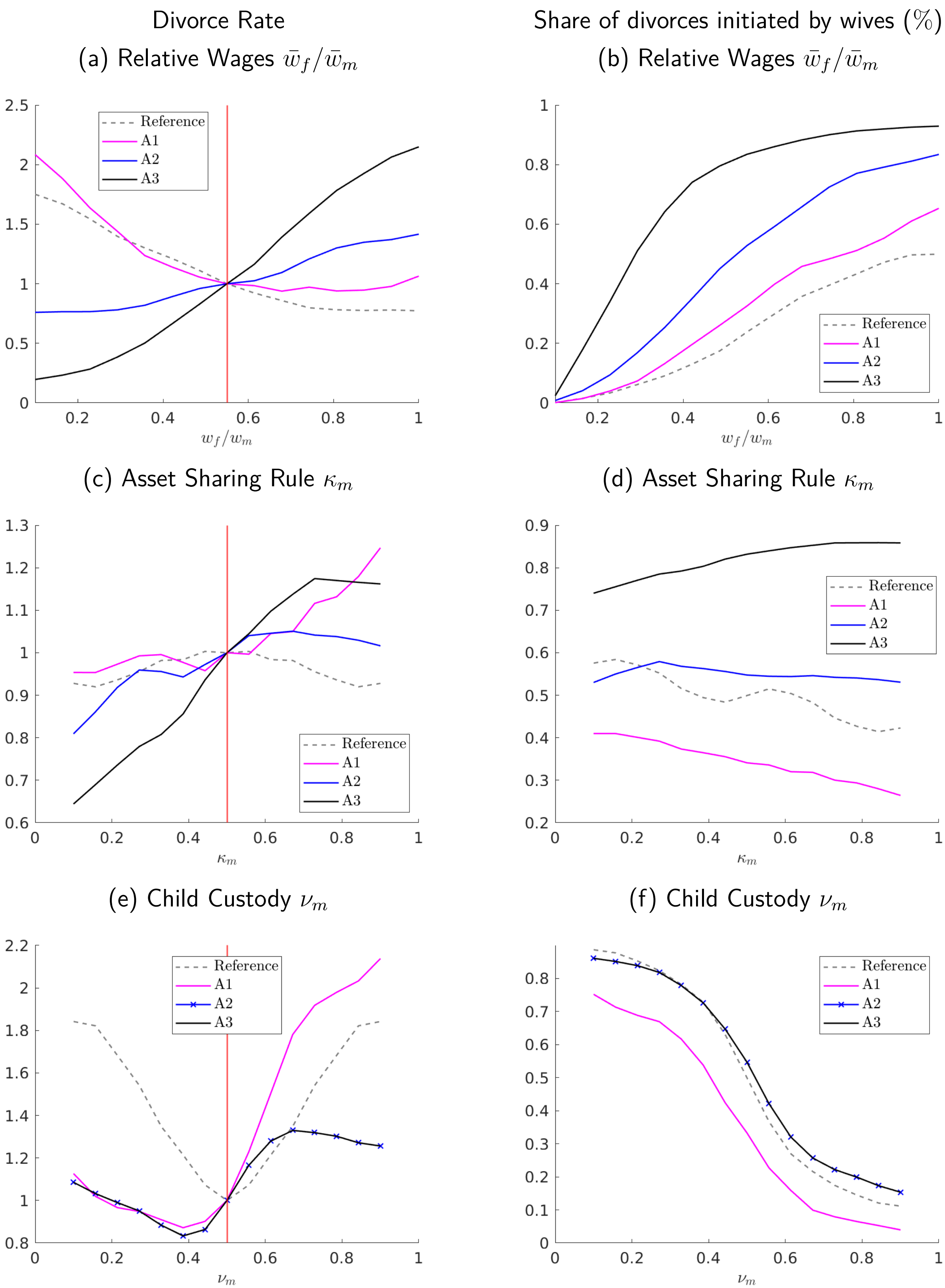
4. **Alternative model 3:** Keeps the parameter values of Alternative model 2, but sets $\nu_m = 0.1$, that is women have a higher probability of getting custody of the children upon divorce.

The divorce rates in panels (a), (c) and (e) of Figure 3 and panels (a) and (c) of Figure 4 are normalized to the values of the reference/equality model that is $\kappa_m = 0.5, \nu_m = 0.5, Ł_m = 4$ respectively, except for panel (a) in Figure 3, that is normalized to a gender-wage gap of $\bar{w}_f/\bar{w}_m = 0.5$ for illustration purposes.

Perhaps the most interesting result comes from Figure 3 panel (a) and (b). In these figures we see that on the reference/equality model, the relationship between the gender-wage gap and divorce rates is negative, and its relationship with the share of divorces initiated by wives is positive. However we can see, that the maximum share of divorces by wives that can be reached under this set up is just 50%, by setting $\bar{w}_f/\bar{w}_m = 1$. This begins to change as we move to Model 1. On one hand, by adding gender differences such as: the way consumption is split within the household, asset splitting rules and making women dislike work more than men, we see that the slope of the line in panel (b) becomes steeper. On the other hand we observe that the relationship between the gender-wage gap and divorce rates takes a U shape, reaching a minimum right around a gender-wage gap of $\bar{w}_f/\bar{w}_m = 0.8$, which happens to be the value where the share of divorce initiated by wives surpasses 50%. The slope of the blue line in panel (b) becomes steeper when moving to Model two and the relationship between divorce rates and the gender-wage gap becomes positive. This becomes more evident when looking at Model 3, that makes women more prone to get custody of the children. Moreover, panel (a) and (b) illustrate that only the Models 2 and 3 are capable or reaching a share of divorce filings by wives that we observe in the data (around 70%). Note that Models 2 and 3 imply different responses of aggregate divorce rates to changes in the gender-wage gap, than Models 1 and 2, which do not reach a higher level of divorce filings by women. This aspect is very important at the moment of quantifying the individual effects of changes in the gender-wage gap, more so in the presence of heterogeneity in divorce filings and wages across education groups. For example for college women married to non-college men the share of divorces initiated by wives is higher and the gender-wage gap lower, which would put this group above $\bar{w}_f/\bar{w}_m = 0.5$ in panels (a) and (b), but for non-college women married to college men, the gender-wage gap will be around 0.5 and the share of divorces initiated by wives lower, position this group of people at the middle. We can see that higher relative wages increases divorce rates, this happens because higher wages increases the value of divorce for women relative to marriage, then already married women who were stuck in inconvenient marriage arrangements can now afford to divorce.

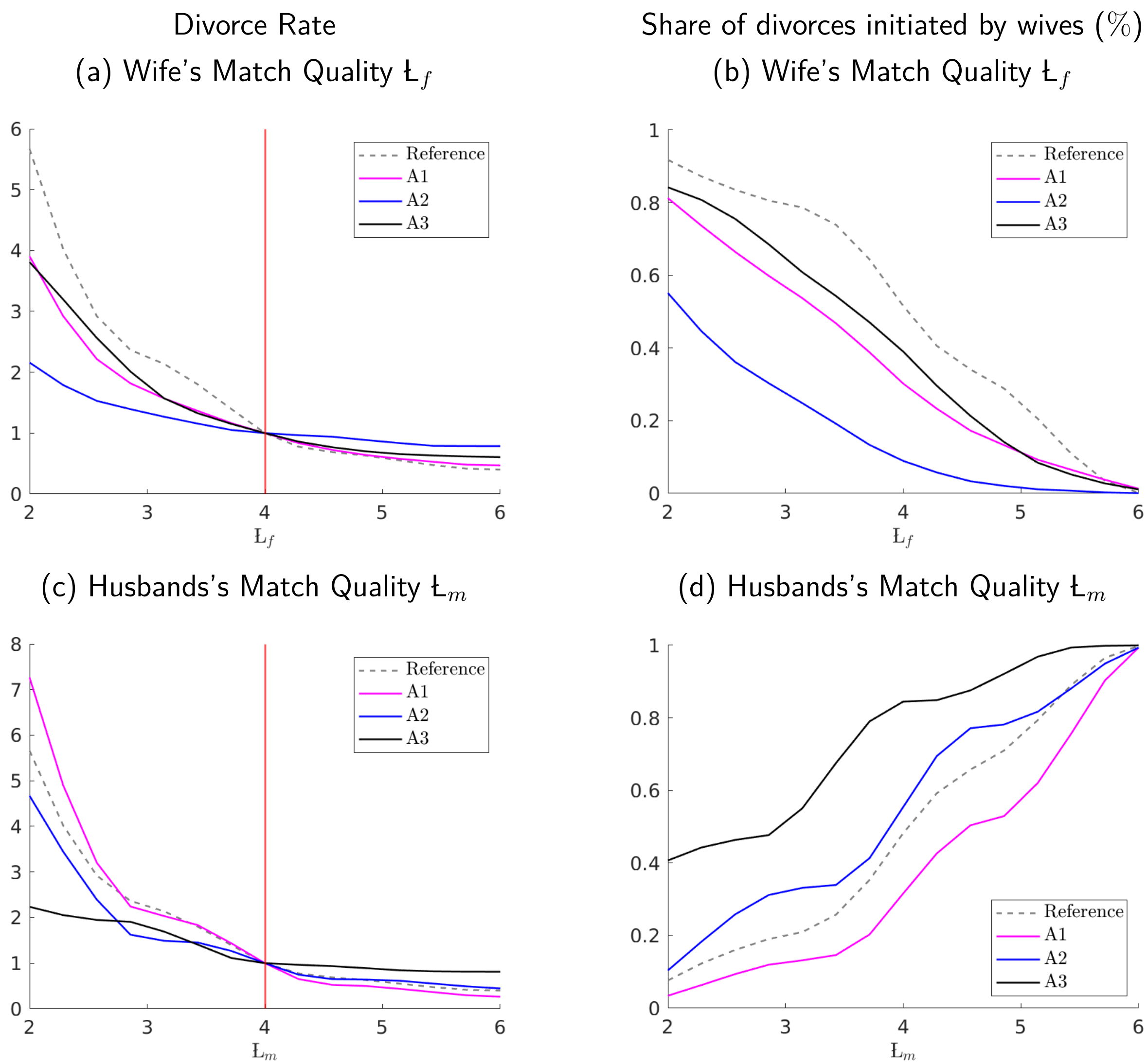
The relationships between unobservable individual match qualities, divorce rates and divorce filings by women, shown in Figure 4 are straight forward. Higher match quality either for men or women, lower divorce rates and lower share of divorces initiated by husbands and wives respectively. However, the interaction between the realized match quality and higher wages for women is more involved. Consider that the higher the value of single-hood for women associated to higher wages, the longer they will wait for a higher match quality. In the long run, this will result in the new matches having a higher average match quality than before, thus exhibiting a lower aggregate level of divorce coming from women. In this way, women become more selective in the marriage market which translates into an increasing average age at first marriage and contributing in building a larger pool of never married individuals. On the contrary, higher wages for women would make men eager to get married even if this means settling for a lower match quality. It is in this two ways that higher relative wages contribute to the decline in divorce rates and the decline in the share of divorces initiated by wives.

Figure 3: Comparative Statics, Observables



Notes: The reference line solves the model with $\bar{w}_f/\bar{w}_m = 1, \kappa_m = 0.5, \nu_m = 0.5, \phi_m = \phi_f, \mu_m = 0.5$, and Ł$_m$ = Ł$_f = 4$ The Model 1 uses $\bar{w}_f/\bar{w}_m = 0.55, \kappa_m = 0.6, \nu_m = 0.5, \phi_m < \phi_f, \mu_m = 0.67$ and Ł$_m$ = Ł$_f = 4$. Model 2 sets Ł$_f = 3$ and Ł$_m = 4$ in addition to Model 1. Model 3 sets $\nu_m = 0.1$ on top of Model 2. See Appendix A for the values of the rest of the parameters used in this example.

Figure 4: Comparative Statics, Unobservables



Notes: The reference line solves the model with $\bar{w}_f/\bar{w}_m = 1, \kappa_m = 0.5, \nu_m = 0.5, \phi_m = \phi_f, \mu_m = 0.5$, and $Ł_m = Ł_f = 4$. Model 1 uses $\bar{w}_f/\bar{w}_m = 0.55, \kappa_m = 0.6, \nu_m = 0.5, \phi_m < \phi_f, \mu_m = 0.67$ and $Ł_m = Ł_f = 4$. Model 2 sets $Ł_f = 3$ and $Ł_m = 4$ in addition to Model 1. Alternative 3 sets $nu_m = 0.1$ on top of Model 2. See Appendix A for the values of the rest of the parameters used in this example.

4 The Model

In this section I present a life cycle model featuring endogenous marriage, unilateral divorce, wealth accumulation and female labor supply, both at the intensive and extensive margins. I start by describing the demographics, namely living arrangements, fertility and the education composition composition of the population. Next I describe child custody arrangements and property division upon divorce. I then describe the income process together with its life cycle component. I next turn to preferences, and the timing that governs decision making and shapes the law of motion of the population. Finally, I provide a definition for the stationary equilibrium and outline the steps of a solution algorithm.

4.1 Demographics

The economy is populated by generations of equal number of men and women, who at every point in their life are indexed by their age/generation t, gender $g \in \{m, f\}$, education attainment $e \in \{c, nc\}$ college, non-college respectively, marital status $\omega \in \{\mathcal{NM}, \mathcal{M}, \mathcal{D}\}$, never married, married and divorced respectively.[9] Additionally, married couples are indexed by the presence of children or not in the household $k \in \{1, 0\}$.

Men and women are born single and enter the model at age $t_m = 21$ and $t_f = 19$ respectively. Agents age deterministically and live a total of 39 periods, that is, men live until age $T_m = 60$ and women up to $T_f = 58$. A difference of 2 years between men and women has been chosen since men tend to marry women who are on average two years younger than them. In the model a generation t consists of all men aged t_m and women aged $t_m - 2$. For the rest of the document, otherwise stated, t will refer to the age of the man and his associated generation. .

Living arrangements Every period, single and married agents decide over their marital status. Single agents decide whether or not to get married to another single individual of the opposite sex but from the same generation and education group. For simplicity I restrict marriage to happen only between individuals from the same generation and education group, that is, there is no intergenerational marriage. Married individuals decide whether to divorce their current partner or remain married for the rest of the period, after divorce there is no possibility of remarriage, therefore divorce is an absorbing state. Notice that since agents are born single, divorce cannot happen at $t = 21$.

Education For simplicity, the education composition and the degree of assortative mating across education groups will be exogenously fed into the model. The education composition

[9]For the rest of the document the term "never married" and "single(s)" will be used interchangeably

of the married population is summarised in contingency Table 4, where the shares ϕ_{e,e^*} will be directly taken from the data.

Table 4: Education composition of the married population

		Husbands's Education	
		College	Non College
Wife's	College	$\phi_{c,c}$	$\phi_{c,nc}$
Education	Non College	$\phi_{nc,c}$	$\phi_{nc,nc}$

Such that: $\phi_{c,c} + \phi_{nc,c} + \phi_{c,nc} + \phi_{nc,nc} = 1$

The population in the model is then divided into four groups: $G1(c, c)$: composed of college men and college women, $G2(nc, c)$: non-college men and college women, $G3(c, nc)$: college men and non-college women, $G4(nc, nc)$: non-college men and women. Under this set up agents are restricted to interact solely with agents of their respective group, for example, a college woman of group $G1(c, c)$ can only meet and marry a college man of the same group and generation, but cannot marry a non-college man of group $G2(nc, c)$, only college women of group $G2(nc, c)$ can marry with non-college men.

Fertility Fertility is exogenous; children can be born within a dyad with probability φ_t, conditional on the couple not having children. There are no children born out of the wedlock and upon divorce the child stays with one of the parents. Children stick around with the couple or the custodial parent forever, see below.

4.2 Child Custody and Divorce Laws

Upon divorce one of the parents gets full custody of the child with exogenous probability ν_g, such that $\nu_m + \nu_f = 1$, where ν_m is the probability that the father gets full custody. The custodial parent inherits all the costs and benefits of raising the child.

Divorce causes the couple's savings (a_t) to be split among couple members according to parameter κ_g. Where κ_m is the share of the assets that the man keeps. Moreover, divorce has no additional cost therefore $\kappa_m + \kappa_f = 1$.

4.3 Income

Agents provide labor supply h and receive wages $w_t^{g,e}$ that depend on gender and education. Wages are stochastic around a deterministic trend $\mho_t$ and assumed to follow an AR(1) process with persistence ρ and transition matrix Π:

$$log(w_t^{g,e}) = \mho_{t,g,e} + F_t \qquad \text{where: } F_t = \rho\, F_{t-1} + \epsilon_w \qquad \text{with: } \epsilon_w \sim \mathcal{N}(0, \sigma^2_{\epsilon_w})$$

Define $\delta = \bar{w}_f / \bar{w}_m$ as the average gender-wage gap and $z = \bar{w}_c / \bar{w}_{nc}$ as the average college wage premium. Note that the income process does not depend on the agents marital status and so the income processes between spouses are independent of each other.

Markets are incomplete and households can save/borrow assets a, at a risk-free interest rate r. There are no borrowing constraints, no intergenerational transmission of assets and agents must pay all their debt before they die, that is $a_{T+1} \geq 0$.

4.4 Preferences

Agents are risk averse, enjoy consumption and dislike working. When married they get additional individual utility q_g associated to the current match. Individual match quality q_g has a permanent component α_g that is drawn from distribution $\mathcal{N}(Ł_g, \sigma^2_{\epsilon_\alpha})$ at the time the couple met, and a stochastic component ϵ_q, marital bliss, that follows an i.i.d process distributed $\mathcal{N}(0, \sigma^2_{\epsilon_q})$. Moreover, if the couple has children $k = 1$, each couple member enjoys extra utility η. In addition, there is a fixed utility cost f to the period utility of married individuals when female hours worked are strictly positive $h_f > 0$. This cost is not present for neither single nor divorced women. Considering the above described features, individual period utility is given by:

$$u_g(c,h,q) + \mathbf{1}_{k=1}\eta + \mathbf{1}_{h_f>0}\, f(\omega) = \frac{c^{1-\sigma}}{1-\sigma} - \psi_g \frac{h^{1+\frac{1}{\xi}}}{1+\frac{1}{\xi}} + q_g(\omega) + \mathbf{1}_{k=1}\eta + \mathbf{1}_{h_f>0}\, f(\omega)$$

$$q_g(\omega) = \begin{cases} \alpha_g + \epsilon_q \quad \epsilon_q \sim \mathcal{N}(0, \sigma^2_{\epsilon_q}) & \text{if } \omega = \{\mathcal{M}\} \\ 0 & \text{if } \omega = \{\mathcal{NM}, \mathcal{D}\} \end{cases}$$

$$f(\omega) = \begin{cases} 0 & \text{if } \omega = \{\mathcal{NM}, \mathcal{D}\} \\ < 0 & \text{if } \omega = \{\mathcal{M}\} \end{cases}$$

- Where α_g is drawn at the time of marriage from distribution $\mathcal{N}(Ł_g, \sigma^2_{\epsilon_\alpha})$.
- ψ_g governs the disutility from labor supply.
- ξ is the Frish elasticity of labor supply.
- Denote A_q the transition matrix associated to q, and B_k the transition matrix governing

fertility.[10]

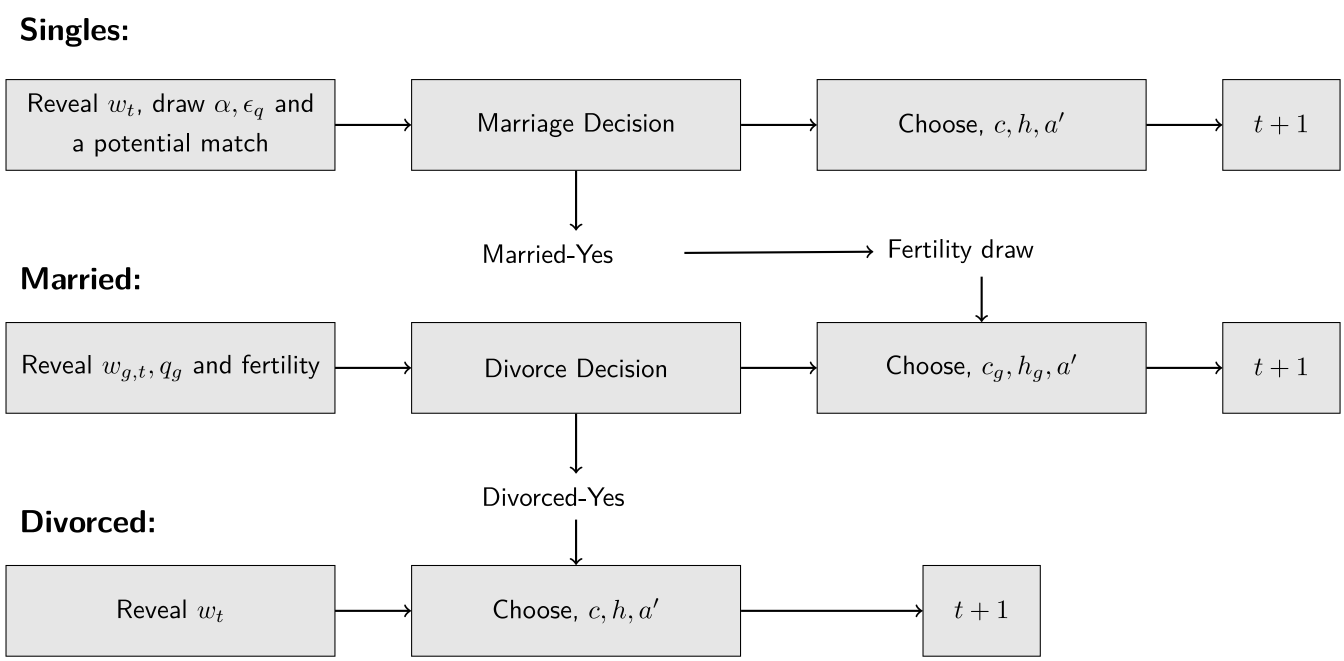
- People discount their future at a rate β.

We are now ready to describe the timing and decision making process.

4.5 Timing

The sequence of events occurring on a given period is summarized in Figure 5. At the beginning of the period income and marital shocks are revealed; single agents draw a random partner from the pool of singles ($\mathcal{NM}$), get a permanent match quality draw from $\mathcal{N}(\text{Ł}_g, \sigma^2_{\epsilon_\alpha})$ and a temporary marital bliss shock ϵ_q. Married couples get a temporary bliss shock and a fertility shock if they didn't have children already.
Next, married couples decide whether to get divorced from their current partner, and the never married/single agents decide to marry or not their match. After the marriage decision has taken place, fertility is revealed for the newly wedded couple. The marriage decision is taken before fertility is revealed in order to avoid selection into marriage associated to the presence of children. Divorce is an absorbing state, there is no possibility of remarriage. Finally, consumption, work and savings decisions are executed.

Figure 5: Timing



[10] A_q is an $N_A \times N_A$ matrix where N_A is the number of discretized states of $q \in Q$, the elements of each row of A_q equal $1/N_A$, such that they sum to one. B_k is a 2×2 matrix with $b_{1,1} = 1 - \varphi(t), b_{1,2} = \varphi(t), b_{2,1} = 0$ and $b_{2,2} = 1$, where φ_t is the fertility of women of generation t.

4.6 Decision Making

Singles Single agents must decide how much to consume c, save a and whether to marry of not the person they randomly meet at the beginning of the period. Single agents solve the following dynamic problem:

$$Vg_t^{\mathcal{NM}}(w,a) = \max_{c,h,a'} \quad u(c,h,0) + \beta \int_{\Omega^{g^*}_{\mathcal{NM}}} \sum_{w'} \sum_{q'} \sum_{k'} \pi_{w'|w} A_{q'|q} B_{k'|k} \tag{1}$$

$$\times \left\{ \mathscr{M}_{t+1} Vg^{\mathcal{M}}_{t+1}(w', w^{*\prime}, a', q', q^{*\prime}, k') + (1-\mathscr{M}_{t+1}) Vg^{\mathcal{NM}}_{t+1}(w', a') \right\} d\Omega^{g^*}_{\mathcal{NM}}(t+1)$$

s.t.

$$c + a' = w_t^{g,e} h + (1+r)a \tag{2}$$

- Where $\mathscr{M}(t)$ is the marriage decision policy at period t, takes value of one if the 'potential' couple decided to marry, zero otherwise, see expression 3.
- $\Omega^{g^*}_{\mathcal{NM}}(t)$ is the normalized distribution of singles of the opposite sex at period t.
- Define the policy functions of the singles problem as follows: consumption policy $\mathcal{P}g_c^{\mathcal{NM}}(w,a,t)$, savings policy $\mathcal{P}g_a^{\mathcal{NM}}(w,a,t)$ and labor supply policy $\mathcal{P}g_h^{\mathcal{NM}}(w,a,t)$.

Marriage, occurs only if both parties agree, that is:

$$\mathscr{M}_t = \begin{cases} 1 & \text{only if } \mathbb{E}_\varphi(Vm_t^{\mathcal{M}}) > Vm_t^{\mathcal{NM}} \text{ and } \mathbb{E}_\varphi(Vf_t^{\mathcal{M}}) > Vf_t^{\mathcal{NM}} \\ 0 & otherwise \end{cases} \tag{3}$$

- Where $\mathbb{E}_\varphi(Vm_t^{\mathcal{M}})$ is the expected value of marriage before the arrival of children, see 6.

Note that in order to solve the above problem single agents must be completely aware of the distribution of singles in $t+1$.

Married Married couples jointly decide how much to consume c_m, c_f, how much the wife works $h_f > 0$ or if she doesn't work at all $h_f = 0$, labor supply of the husband h_m and how much to save a'. The couple maximizes the weighted sum of each members utility according to pareto weights $\mu_m + \mu_f = 1$.[11] Married individuals decide unilateraly whether they separate from their current partners. Because the pareto weights are fixed there is no mechanism by which a partner

[11]Consistent with the unitary framework of the household as described in Chiappori and Donni (2009)

convinces the other to stay in case of divorce. A married household solves the following dynamic problem:

$$V_t^{\mathcal{C}}(w_m, w_f, a, q_m, q_f, k) = \max_{c_m, c_f, h_m, h_f, a'} \eta \mathbf{1}_{k=1} + \mu^f u(c_f, h_f, q_f) + \mu^m u(c_m, h_m, q_m) + f \mathbf{1}_{h_f>0} \tag{4}$$

$$+ \beta \sum_{w'_g} \sum_{q'_g} \sum_{k'} \pi_{w'_m|w_m} \pi_{w'_f|w_f} \; A_{q'_m|q_m} \; A_{q'_f|q_f} \; B_{k'|k}$$

$$\times \Big\{ \mathscr{D}_{t+1} \left[\mu^f \mathbb{E}_\nu \left(V f_{t+1}^{\mathcal{D}}(w'_f, a'\kappa_f, k') \right) + \mu^m \mathbb{E}_\nu \left(V m_{t+1}^{\mathcal{D}}(w'_m, a'\kappa_m, k') \right) \right]$$

$$+ (1 - \mathscr{D}_{t+1}) V_{t+1}^{\mathcal{C}}(w'_g, a', q'_g, k') \Big\}$$

s.t.

$$c_m + c_f + a' = w_t^{m,e} h_m + w_t^{f,e^*} h_f + (1+r)a \tag{5}$$

- Where $\mathscr{D}(t)$ is the divorce policy at t, taking the value one if the couple divorced and zero otherwise.

- The operator $\mathbb{E}_\nu$ is the expectation over custody of the child. The custodial parent gets custody of the child with probability ν_g, such that $\nu_m + \nu_f = 1$.

- κ_m is the share of assets kept by the husband after divorce. The wife keeps $\kappa_f = 1 - \kappa_m$.

- Define the policy functions of the married individuals as follows: consumption policy $\mathcal{P}g_c^{\mathcal{M}}(w, w^*, a, t)$, savings policy $\mathcal{P}g_a^{\mathcal{M}}(w, w^*, a, t)$, labor supply policy $\mathcal{P}g_h^{\mathcal{M}}(w, w^*, a, t)$, and married female labor force participation $\mathcal{P}f_f^{\mathcal{M}}(w, w^*, a, t)$.

- After solving the optimization problem described in 4, we can define the value of a married individual of gender $g \in \{f, m\}$ as:

$$V g_t^{\mathcal{M}}(w_m, w_f, a', q_m, q_f, k) = \eta \mathbf{1}_{k=1} + u(c, h, q) + f \mathbf{1}_{h_f>0} \tag{6}$$

$$+ \beta \sum_{w'_g} \sum_{q'_g} \sum_{k'} \pi_{w'_m|w_m} \pi_{w'_f|w_f} \; A_{q'_m|q_m} \; A_{q'_f|q_f} \; B_{k'|k}$$

$$\times \Big\{ \mathscr{D}_{t+1} \mathbb{E}_\nu \left(V g_{t+1}^{\mathcal{D}}(w'_g, a'\kappa_g, k') \right)$$

$$+ (1 - \mathscr{D}_{t+1}) V g_{t+1}^{\mathcal{M}}(w'_m, w'_f, a', q'_m, q'_f, k') \Big\}$$

- Define $\mathbb{E}_\varphi(V g_t^{\mathcal{M}}) = \varphi_t * V g_t^{\mathcal{M}}(k=1) + (1 - \varphi_t) * V g_t^{\mathcal{M}}(k=0)$, as the expected value of marriage before the arrival of children.

Divorced Divorced agents choose how much to consume c and save a'. They solve the following dynamic problem:

$$Vg^{\mathcal{D}}_{t+1}(w,a,k) = \max_{c,h,a'} \quad \eta \mathbf{1}_{k=1} + u(c,h,0) + \beta \sum_{w'} \pi_{w'|w} Vg^{\mathcal{D}}_{t+1}(w',a',k') \tag{7}$$

$$\text{s.t.}$$

$$c + a' = w^{g,e}_t h + (1+r)a \tag{8}$$

- Define the policy functions of the divorced agents as follows: consumption policy $\mathcal{P}g^{\mathcal{D}}_c(w,a,t)$, savings policy $\mathcal{P}g^{\mathcal{D}}_a(w,a,t)$ and labor supply policy $\mathcal{P}g^{\mathcal{D}}_h(w,a,t)$,

Divorce occurs unilaterally, that is:

$$\mathscr{D}_t = \begin{cases} 1 & \text{if } \; \mathbb{E}_\nu(Vm^{\mathcal{D}}_t) > Vm^{\mathcal{M}}_t \; \text{ and/or } \; \mathbb{E}_\nu(Vf^{\mathcal{D}}_t) > Vf^{\mathcal{M}}_t \\ 0 & \text{otherwise} \end{cases} \tag{9}$$

- Where $\mathbb{E}_\nu(Vg^{\mathcal{D}}_t)$ is the expected value of divorce over the probability of obtaining custody of the child, that is $\mathbb{E}_\nu(Vg^{\mathcal{D}}_t) = \nu_g * Vg^{\mathcal{D}}_t(w,a,k=1) + (1-\nu_g) * Vg^{\mathcal{D}}_t(w,a,k=0)$.

4.7 Endogenous Population Dynamics

Singles The law of motion for single agents of gender g and education group $G(e,e^*)$ is:

$$\Omega^g_{\mathcal{NM}}(w',a',t+1) = \int_{\Omega^{g^*}_{\mathcal{NM}}(w^*,a^*)} \sum_w \sum_q \sum_k \Big\{ \mathbf{1}_{a'(w,a)\in A} \pi_{w'|w} A_{q'|q} B_{k'|k} \times (1 - \mathscr{M}_t(w,w^*,a,q,q^*,k)) \Omega^g_{\mathcal{NM}}(w,a,t) \Big\} d\Omega^{g^*}_{\mathcal{NM}}(w^*,a^*,t) \tag{10}$$

Normalize as needed for Problem 1:

$$\Omega^g_{\mathcal{NM}}(y,a,t) = \Omega^g_{\mathcal{NM}}(y,a,t) \Big/ \int d\Omega^g_{\mathcal{NM}}(y,a,t)$$

Married The law of motion for married agents is:

$$
\begin{aligned}
\Omega^g_{\mathcal{M}}(w', w^{*\prime}, a', q', q^{*\prime}, k', t+1) = \sum_{w,w^*} \sum_{q,q^*} \sum_{k} & \Big\{ \mathbf{1}_{a'(w,w^*,a)\in A} \pi_{w'|w} \pi_{w^{*\prime}|w^*} \; A_{q'|q} \; A_{q'^*|q^*} \; B_{k'|k} \\
& \times (1 - \mathscr{D}_t(w, w^*, a, q, q^*, k)) \; \Omega^g_{\mathcal{M}}(w, w^*, a, q, q^*, k, t) \Big\} \\
& + \int_{\Omega^{g^*}_{\mathcal{NM}}(w^*,a^*)} \sum_{w} \sum_{q} \sum_{k} \Big\{ \mathbf{1}_{a'(w,w^*,a+a^*)\in A} \pi_{w'|w} A_{q'|q} B_{k'|k} \\
& \times \mathscr{M}_t(w, w^*, a, q, q^*, k) \; \Omega^g_{\mathcal{NM}}(w, a, t) \Big\} d\Omega^{g^*}_{\mathcal{NM}}(w^*, a^*, t)
\end{aligned}
\tag{11}
$$

Normalized:

$$
\Omega^g_{\mathcal{M}}(w, w^*, a, q, q^*, t) = \Omega^g_{\mathcal{M}}(w, w^*, a, q, q^*, t) \Big/ \int d\Omega^g_{\mathcal{M}}(w, w^*, a, q, q^*, t)
$$

Divorced The law of motion for divorced agents is:

$$
\begin{aligned}
\Omega^g_{\mathcal{D}}(w', a', k', t+1) = & \sum_{w} \Big\{ \mathbf{1}_{a'(w,a)\in A} \pi_{w'|w} \; \Omega^g_{\mathcal{D}}(w, a, k, t) \Big\} \\
& + \sum_{w,w^*} \sum_{q,q^*} \sum_{k} \Big\{ \mathbf{1}_{a'(w,a,\kappa_g)\in A} \pi_{w'|w} \pi_{w^{*\prime}|w^*} \; A_{q'|q} \; A_{q'^*|q^*} \; B_{k'|k} \\
& \times \mathscr{D}_t(w, w^*, a, q, q^*, k) \; \Omega^g_{\mathcal{M}}(w, w^*, a, q, q^*, k, t) \Big\}
\end{aligned}
\tag{12}
$$

Normalized:

$$
\Omega^g_{\mathcal{D}}(w, a, t) = \Omega^g_{\mathcal{D}}(w, a, t) \Big/ \int d\Omega^g_{\mathcal{D}}(y, a, t)
$$

Define the period t divorce rate for education group $G(e, e^*)$ as:

$$
DIV(e, e^*) = \int \Big(\mathscr{D}(t) \times \Omega^g_{\mathcal{M}}(t) \Big) d\Omega^g_{\mathcal{M}}(w_{g,e}, w_{g,e^*}, a, q, q^*, t) \tag{13}
$$

And the aggregate divorce rate

$$
\widehat{DIV} = \sum_{e} \sum_{e^*} \phi(e, e^*) DIV(e, e^*) \tag{14}
$$

4.8 Definition for the Stationary Equilibrium

A Stationary Equilibrium is a set of value functions by gender g and age t: for never married individuals $Vg_t^{\mathcal{NM}}(w,a)$, divorced $Vg_t^{\mathcal{D}}(w,a)$, married households $V^{\mathcal{C}}(w,w^*,a,q_m,q_f,k)$, consumption policy functions, $\mathcal{P}g_c^{\mathcal{NM},\mathcal{D}}(w,a)$ and $\mathcal{P}_c^{\mathcal{M}}(w,w^*,a)$, policy functions for savings $\mathcal{P}g_a^{g,\mathcal{NM},\mathcal{D}}(w,a)$ and $\mathcal{P}_a^{\mathcal{M}}(w,w^*,a)$, policy functions for labor supply $\mathcal{P}g_h^{\mathcal{NM},\mathcal{D}}(w,a)$ and $\mathcal{P}_h^{\mathcal{M}}(w,w^*,a)$, labor force participation for married women $\mathcal{P}_f^{\mathcal{M}}(w,w^*,a)$, divorce and marriage policy functions $\mathscr{D},\mathscr{M}$ respectively, and stationary distributions of singles $\Omega^g_{\mathcal{NM}}$, married individuals $\Omega^g_{\mathcal{M}}$ and divorced $\Omega^g_{\mathcal{D}}$, such that:

- The policy functions $\mathcal{P}g_c^{\mathcal{NM}}(w,a),\mathcal{P}g_a^{\mathcal{NM}}(w,a),\mathcal{P}g_h^{\mathcal{NM}}(w,a)$, together with the marriage decision rule $\mathscr{M}$ and the distribution of potential partners $\Omega^g_{\mathcal{NM}}$, solves the singles problem described in 1.
- The policy functions $\mathcal{P}g_c^{\mathcal{M}}(w,w^*,a),\mathcal{P}g_a^{\mathcal{M}}(w,w^*,a),\mathcal{P}g_h^{\mathcal{M}}(w,w^*,a),\mathcal{P}g_f^{\mathcal{M}}(w,w^*,a)$, together with the divorce decision rule $\mathscr{D}$ solves the married household problem 4.
- The policy functions $\mathcal{P}g_c^{\mathcal{D}}(w,a),\mathcal{P}g_a^{\mathcal{D}}(w,a),\mathcal{P}g_h^{\mathcal{D}}(w,a)$ solves the problem for the divorced, problem 7.
- The Marriage policy $\mathscr{M}$ is computed according to Equation 3, given $Vg_t^{\mathcal{NM}}(w,a)$ and $Vg_t^{\mathcal{M}}(w,w^*,a,q_m,q_f,k)$.
- The Divorce policy $\mathscr{D}$ is computed according to Equation 9, given $Vg_t^{\mathcal{D}}(w,a)$ and $Vg_t^{\mathcal{M}}(w,w^*,a,q_m,q_f,k)$.
- The stationary distributions for singles $\Omega^g_{\mathcal{NM}}$, married individuals $\Omega^g_{\mathcal{M}}$ and divorced $\Omega^g_{\mathcal{D}}$ are induced by the equilibrium policy functions.

4.9 Solution Algorithm

We are interested in finding the Stationary Equilibrium described above for a given set of parameters $\Theta = \{\sigma,\xi,\mu_m,\rho,\sigma^2_{\epsilon_w},\mho_t,\varphi_t,\beta,r,\kappa_m,\nu_m,Ł_m,Ł_f,\sigma_{\epsilon_\alpha},\sigma_{\epsilon_q},\phi_m,\phi_f,\eta\}$. Since agents are fully rational, this requires single agents to know the exact distribution of potential partners $\{\Omega^g_{\mathcal{NM}}(w,a,t)\}_{t=21}^{T=60}$ at every point in their lives, this will involve making a guess of the underlying marital distribution of the population over the life cycle. The reasoning goes as follows the decision to marry today depends on the value of waiting to marry tomorrow, which in turn depends on the distribution of potential partners tomorrow, this extends until the last period of life. The problem requires solving the optimal allocations backwards starting from the last period $T = 60$ until $t = 21$. Below I describe in detail the computational steps to solve for the equilibrium:

***Algorithm No.1*: Computation of the stationary equilibrium:**

Step 0: Provide a guess for the distribution of potential partners $\{\Omega^g_{\mathcal{NM}}(w,a,t)\}_{t=21}^{T=60}$ for every t.

Step 1: Compute the equilibrium policy functions and the value functions iterating backwards from the last period $T = 60$ until $t = 21$.

Step 2: With the help of the optimal policy functions, simulate forward the evolution of the population distribution from $t = 21$ to $T = 60$. Store the simulated distribution of never married individuals at every t, $\{\widehat{\Omega}^g_{\mathcal{NM}}(w,a,t)\}_{t=21}^{T=60}$.

Step 3: Compare the simulated distribution of potential partners $\{\widehat{\Omega}^g_{\mathcal{NM}}(w,a,t)\}_{t=21}^{T=60}$ with the initial guess of the same object. If they are not the same update the guess and go back to Step 1.

5 Calibration Strategy

In this Section I describe the calibration strategy. The model is calibrated to the U.S. in 1970. Parameters which have direct observable data analogs were assigned its respective values, some other parameters take values that are commonly used in the literature $(\sigma, \xi, \mu_m, \rho, \sigma^2_{\epsilon_w}, \mho_t, \varphi_t, \beta, r, \kappa_m, \nu_m)$. The rest of the parameters $(Ł_m, Ł_f, \sigma_{\epsilon_\alpha}, \sigma_{\epsilon_q}, \phi_m, \phi_f, \eta)$ were picked to match several moments in the data. I select the same number of data moments (7) than the number of free parameters in the model (7), thus achieving exact identification.

This procedure involves finding a set of parameters Θ that minimizes the distance between the model generated moments and the moments observed in the data. Specifically, let the targeted moments be $\mathcal{M}(\Theta) = [\mathbf{m} - \widehat{\mathbf{m}}(\Theta)]$ where $\mathbf{m}$ is a vector of observed moments and $\widehat{\mathbf{m}}(\Theta)$ is the vector of model generated moments given parametrization Θ. Then, we can construct the objective function $\min_\Theta\ \mathcal{M}(\Theta)^T W \mathcal{M}(\Theta)$, where the weighting matrix W is the diagonal matrix.

A summary of the parameter values resulting from the calibration exercise for 1970 is presented in Table 6. Below I describe in detail the calibration choices for 1970.

5.1 Calibration to 1970

5.1.1 Externally calibrated parameters

We have to choose values for $\sigma, \xi, \mu_m, \rho, \sigma^2_{\epsilon_w}, \mho_t, \varphi_t, \beta, r, \kappa_m, \nu_m$.

Coefficient of relative risk aversion σ Agents are risk averse with coefficient of relative risk aversion σ. Estimates for the coefficient of relative risk aversion range from 1 to 4. I select a coefficient of risk aversion of $\sigma = 2$, which is standard in the literature, Ortigueira and Siassi (2013), Ríos-Rull (1996), Santos and Weiss (2014).

Frish elasticity of labor supply ξ Estimates for the Frish elasticity for labor supply vary, see Bredemeier et al. (2021) and Domeij and Floden (2006). Blundell et al. (2016) estimate the Frish elasticity for men to be 0.52 and 0.85 for women. Ortigueira and Siassi (2013) target a value of 0.5 for men and 0.85 for females. Following these references I choose $\xi = 0.5$.

Husbands pareto weight μ_m There is very little guidance on how to select this parameter and choices in the literature are diverse. Cubeddu and Rios-Rull (1997) choose a value of 0.5, and in later robustness select 0.4. They select a lower pareto weight because it is usually the case that the wife keeps custody of the children after divorce, as they don't model child custody explicitly. Voena (2015) estimates a value of 0.75, following this insight Fernández and Wong (2017) use a value of 0.7. Knowles (2005) estimates a value of 0.67 for 1970 and a value of 0.57 for 1990. I set, $\mu_m = 0.67$ and keep it constant thoughout, I later conduct robustness on this value. Other papers determine the weights through Nash bargaining Knowles (2005), Greenwood et al. (2002), I too propose a version of the model where the weights are set though Nash Bargaining, it turns out the estimates for 1970 were around 0.6 and there was little change for 1985.

Income process I borrow the estimates for ρ and σ^2_ϵ from Santos and Weiss (2014). They estimate the income process using PSID data from 1964 and 2009, for individuals aged 18 to 64 years old. Their estimates yield a highly persistent process with $\rho = 0.98$ and variance $\sigma^2_\epsilon = 0.011$. The life cycle trend component $\mho_{age,g,e}$ was computed using CPS data extracts for 1970, 1985 and 2015 for couples where the husband was between 21 and 60 years of age. Different trends were computed by education (college, non-college) and gender. The trends were later smoothed using a quadratic fit on age.[12] The average gender-wage gap and college premium were calculated from $\mho_{age,g,e}$. For the purpose of the model I take non-college males aged 21 as the reference group, that is $w(t = 21, g = m, e = nc) = 1$. Note that the life cycle trend component does not

[12] That is $\mho_{age,g,e} = \alpha_0 + \alpha_1\, age + \alpha_2\, age^2$

depend on marital status, in the model more productive individuals are endogenously sorted into marriage.

Fertility φ_t The OECD reports fertility rates by mother's age at childbirth for the U.S. from 1960 until the present. Table 5 shows the values for 1970, 1985 and 2015 used in the calibration.

Table 5: Fertility: Births per 1000 women, U.S.

	Age Group						
Year	15-19	20-24	25-29	30-34	35-39	40-44	45-49
1970	68.3	167.8	145.1	73.3	31.7	8.1	0.5
1985	51.0	108.3	111.0	69.1	24.0	4.0	0.2
2015	22.3	76.8	104.3	101.5	51.8	11.0	0.8

Notes: Source, OECD Stats, Fertility rates by mother's age at childbirth, five-year age groups, 1960-2019

Property division rules κ_m Around the 1970's, title based regimes were predominant across the majority of stated in the U.S., Voena (2015) estimates that in title based states [13], around 60% of the assets went to the husband. I follow that estimate and set $\kappa_m = 60\%$ for the 1970 calibration. By 1985, most states transited to either equitable distribution or community property regimes, therefore I set $\kappa_m = 50\%$ for the 1985 and 2015 model simulations.

Child custody arrangements ν_m The Census Bureau[14], reports that the percentage of children living only with their father was 10% in 1970, 15% in 1985 and 20% in 2015, I take this as a proxy for the evolution of the probability of the husband in getting full custody of the child ν_m. For a more exhaustive analysis on the characteristics of single-father headed families with children see Meyer and Garasky (1993). In recent years, joint custody became more common, in my model I do not allow for joint custody arrangements.

Other parameters I choose a discount factor of $\beta = 0.98$ and a yearly real risk-free interest rate of $r = 2\%$ following Fernández and Wong (2017) and Blundell et al. (2016) respectively.

[13] The title based regime assigns assets to the respective title owner, community property makes a 50/50 split, and equitable distribution involves the courts discretion so that assets are "fairly" divided, but this is not necessarily 50/50. For a detailed timeline showing the years in which states switched from title based regimes to equitable distribution or community property see Voena (2015).

[14] In a report authored by Hemez and Washington (2021)

5.1.2 Estimated Parameters and Targeted Moments

The following parameters, $Ł_m, Ł_f, \sigma_{\epsilon_\alpha}, \sigma_{\epsilon_q}, \phi_m, \phi_f, \eta$ were picked to match several data moments. The average marital quality by gender $Ł_m, Ł_f$ were chosen to match divorce rates and the average share of divorces initiated by wives. The value of the public good η, is aimed to match the share of divorces initiated by wives with children. The standard deviation of the initial match quality σ_{ϵ_α} and the standard deviation of the marital quality shock σ_{ϵ_q} govern the percentage of never married agents in the economy and the median age at first marriage. Finally, the female and male dis-utilities from work ϕ_m and ϕ_f are directly set to match the amount of work hours supplied by each couple member, see values in Table 3. I normalize the amount of hours worked supplied by men to unity. Divorce filing data is taken from the NBER collection of Marriage and Divorce Data NBER (1995), divorce rates were computed from the PSID, the rest of the data moments were computed from CPS-IPUMS data extracts. I compute these moments for couples where the husband had between 21 and 60 years old, see Section 2 for a more detaield description of the data treatment.

5.2 Estimation Results

Table 6 shows the estimation results for 1970. We can see that $Ł_m < Ł_f$, this means that on average women enjoy marriage less than men, this result is not new in the literature, Rios-Rull et al. (2010) find results in the same direction, moreover, this result is consistent with marital satisfaction surveys where wives report on average lower marital quality than their husbands Rosenfeld (2018). We can also see that $\eta > 0$ meaning that children bring additional utility to the marriage, thus making marriage more attractive for both men and women, however, since wives have a higher probability of keeping the children upon divorce, children raise the value of divorce for wives more than for husbands which justifies why the percentage of wives filing for divorce is larger in the presence of children. Finally, the estimation makes $\phi_m < \phi_f$, meaning that men have a comparative advantage in the labor market, relative to women.

Table 6: Calibration for 1970

Description	Symbol	Value
Preferences		
Risk aversion	σ	2
Frish elasticity	ξ	0.5
Disutility from work Men	ϕ_m	0.98
Disutility from work Women	ϕ_f	2.7
Value of the public good/children	η	1.35
Husbands utility share	μ_m	0.67
Income Process		
Persistence	ρ	0.98
Variance wage shock	σ_ϵ^2	0.011
Gender wage gap	w_f/w_m	0.55
Life cycle trend	$\mho_t$	CPS
Marital Shocks		
Average marital quality Man	Ł$_m$	2.9
Average marital quality Woman	Ł$_f$	2.2
St. deviation of initial marital quality draw	σ_{ϵ_α}	1.01
St. deviation of marital quality shock	σ_ϵ	11.0
Fertility		
Fertility	φ_t	OECD Charts
Other		
Discount factor	β	0.98
Risk free rate	r	0.02
Husbands share of assets	κ_m	0.6
Wife share of assets	κ_f	0.4
Probability the husbands gets child custody	ν_m	0.1

Notes: Parameters in red are those which were estimated rather than set apriori.

Model fit 1970 Table 7 shows the performance of the model in matching the targeted moments. We see that the model performs fairly well in matching most of the targeted moments.

Table 7: Model Fit 1970

Moment	1970	
	Model	Data
Divorce Rate	1.34	1.30
% of wives as plaintiffs	71.59	71.60
% of wives w/kids as plaintiffs	76.94	75.80
% of Never married	11.48	12.40
Male hours	1.05	1.00
Female hours	0.75	0.77
Male median age at first marriage	25.45	22.00

6 Counterfactual experiments

In this section I conduct a set of counterfactual experiments. First, I generate counterfactual predictions for 1985 and 2015 where I measure the combined contribution of changes in the population composition, fertility, gender-wage gap, child custody arrangements and property division laws. Next I propose a decomposition exercise where I individually quantify the effects of the main drivers of interest.

6.1 Counterfactual Prediction for 1985

The purpose of this exercise is to generate model predictions for 1985. To do so, I exogenously change the value of fertility, the gender-wage gap, child custody arrangements, and asset splitting rules and set them to their 1985 values. With these values, the model is simulated and the moment predictions compared with their data counterparts for 1985.

From 1970 to 1985 the average relative wages increased from $\bar{w}_f/\bar{w}_m(1970) = 0.55$ to $\bar{w}_f/\bar{w}_m(1985) = 0.65$, the probability of the husband in getting custody of the children increased from 10% to 15%, the share of assets that went to the husband after divorce decreased from 60% to 50%. Finally, fertility decreased, see Table 5. For 1985 I re-estimate the values of ϕ_m and ϕ_f such that they match the new ratio between male hours and female hours $h_f/h_f(1985) = 0.8$, otherwise the rise in relative wages causes male hours to reduce and female hours to increase.

Model predictions for 1985 Table 8 shows that the model can account for 40% of the total change in divorce rates between 1970 and 1985, 53% of the change in the share of divorces initiated by wives, 33% in the rise of the share of never married individuals and 30% in the delay in marriage, reflected by an increase in the median age at first marriage.

Table 8: Model Fit 1985

Moment	1970		1985		%Δ	
	Model	Data	Model	Data	Model	Data
Divorce Rate	1.34	1.30	1.58	1.87	17.79	43.85
% of wives as plaintiffs	71.59	71.60	66.13	61.30	-7.63	-14.39
% of wives w/kids as plaintiffs	76.94	75.80	62.28	64.70	-19.05	-14.64
% of Never married	11.48	12.40	13.98	20.50	21.82	65.32
Male hours	1.05	1.00	1.08	1.00	-	-
Female hours	0.75	0.77	0.83	0.80	-	-
Male median age at first Marriage	25.45	22.00	26.54	25.00	4.25	13.64

6.2 Counterfactual Prediction for 2015

The objective is to generate model predictions for 2015 and compare them with their respective data counterparts. I follow the same logic that is described above. Between 1985 and 2015 relative wages increased from $\bar{w}_f/\bar{w}_m(1985) = 0.65$ to $\bar{w}_f/\bar{w}_m(2015) = 0.80$, the probability of the husband in getting custody of the children increased from 15% to 20%, the share of assets that went to the husband after divorce remained constant, fertility decreased, see Table 5. This time the values of ϕ_m and ϕ_f were kept as in 1985 since the new ratio between male hours and female hours remained roughly constant $h_f/h_f(2015) = 0.83$.

Model predictions for 2015 We can see from Table 9 that the change in divorce rates generated by the model between 1985 and 2015, represents 95% of the total change in the data, 52% of the change in the share of wives as plaintiffs, 4% in the share of never married and 26% of the change in the median age at first marriage of males. Moreover simple calculations, show that the model accounts for 54% of the overall decline in divorces initiated by wives between 1970 and 2015, 17% in the rise of the share of never married and 26% of the rise in the median age at first marriage for men.

Table 9: Model Fit 2015

Moment	1985		2015		%Δ	
	Model	Data	Model	Data	Model	Data
Divorce Rate	1.58	1.87	1.12	1.30	-28.96	-30.48
% of wives as plaintiffs	66.13	61.30	63.47	56.60	-4.02	-7.67
% of wives w/kids as plaintiffs	62.28	64.70	54.40	59.00	-12.65	-8.81
% of Never married	13.98	20.50	14.21	29.20	1.66	42.44
Male hours	1.08	1.00	1.08	1.00	-	-
Female hours	0.83	0.80	0.90	0.84	-	-
Male median age at first Marriage	26.54	25.00	27.62	29.00	4.10	16.00

6.3 Decomposition of Effects

I'm interested in measuring the contribution of each driver: the rise of mean relative wages $\bar{w}_f/\bar{w}_m$, the change in the probabilities of becoming custodial parent ν_m and the change in property division laws κ_m, in explaining the observed rise and later decline of divorce rates and the reduction of the share of dorced initiated by wives. To this end I propose the following counterfactual experiments:

1. Take the parametrization used for the 1985 simulation but set $\bar{w}_f/\bar{w}_m$ to its value in 1970 ($\bar{w}_f/\bar{w}_m(1970) = 0.55$).
2. Take the parametrization used for the 1985 simulation but set κ_m to its value in 1970 ($\kappa_m(1970) = 0.6$).
3. Take the parametrization used for the 1985 simulation but set ν_m to its value in 1970 ($\eta_m(1970) = 0.1$).

I repeat the above experiments for the period 1985 to 2015, this involves fixing the parameters used for the 2015 simulation and setting one by one the values of $\bar{w}_f/\bar{w}_m, \kappa_m$ and ν_m to their respective 1985 levels, that is: $\bar{w}_f/\bar{w}_m(1985) = 0.65, \kappa_m(1985) = 0.5$ and $\eta_m(1985) = 0.15$. The Results for these experiments are shown in Tables 11 to 13.

Tables 11 to 13 show the percentage of the data variation than can be explained by each of the drivers. I then proceed to measure the contribution of each driver on the total effect shown in Tables 8 and 9. This is done by computing a residual by subtracting the individual effects (taken from tables 11 to 13) from the total effect. I then divide the residual by the number of drivers (three in this case) and add this value to each of the individual effects. The sum of the residual and the individual effect by driver gives a new set of individual effects such that the sum of all individual effects adds up to the total effect. Results of this exercise are shown in 10.

From table 10 we see that the change in relative wages is the main driver of the rise in divorce rates from the period 1970 to 1985. Changes in the splitting rule contribute positively to the rise in divorce rates in the same time frame. On the contrary changes in child custody arrangements act in the opposite direction reducing divorce rates. We see that Changes in child custody arrangements are the main driver of the reduction in the share of wives as plaintiffs, accounting for 77% of the decline, the rest is mostly explained by changes in the gender-wage gap.

For the period 1985 to 2015 the selection effect arising from the rise in female wages accounts for 62% of the decline in divorce rates, the rest is driven by changes in child custody arrangements. During this period it is still the case that most of the reduction in the share of divorces initiated by wives, around 82%, is explained by the increase in the probability of the husband becoming the custodial parent.

Table 10: Decomposition of Effects

	Shutting Down:			Total	Contribution of: (%)		
	$\Delta w_f/w_m$	$\Delta \kappa_m$	$\Delta \nu_m$	$\frac{\Delta Model}{\Delta Data}$	w_f/w_m	κ_m	ν_m
				1970 to 1985			
Divorce Rate	37.02	20.09	-16.53	40.57	91.24	49.51	-40.75
% of wives as plaintiffs	15.31	-3.28	40.99	53.02	28.88	-6.18	77.31
% of wives w/kids as plaintiffs	31.66	41.97	56.49	130.12	24.33	32.25	43.41
				1985 to 2015			
Divorce Rate	59.20	0.00	35.81	95.01	62.31	0.00	37.69
% of wives as plaintiffs	9.04	0.00	43.38	52.41	17.24	0.00	82.76
% of wives w/kids as plaintiffs	0.82	0.00	142.77	143.59	0.57	0.00	99.43

Shutting down relative wages ($\bar{\mathbf{w}}_\mathbf{f}/\bar{\mathbf{w}}_\mathbf{m}$)

When relative wages don't increase we see that the share of divorces initiated by wives slightly increases and the aggregate divorce rate slightly decreases. This suggests that relative wages are a major driver of both divorce rates and divorce filings by wives. Raising relative wages to their 1985 levels would increase divorce rates by 20% and reduce divorce filings by women by 8.39%, which account for 47% and 53% of the variation that we see in the data.

Table 11: Shutting Down Relative Wages $\bar{w}_f/\bar{w}_m$

Moment	1970 Model	1985 Model	1985 Data	Experiment: 1985 with $\bar{w}_f/\bar{w}_m$ of 1970 Result	% of data variation explained by $\Delta\bar{w}_f/\bar{w}_m$
Divorce Rate	1.34	1.58	1.87	1.31	47.54
% of wives as plaintiffs	71.59	66.13	61.30	71.68	53.87
% of wives w/kids as plaintiffs	76.94	62.28	64.70	62.80	4.68
% of Never married	11.48	13.98	20.50	12.30	20.74
Male hours	1.05	1.08	1.00	1.02	-
Female hours	0.75	0.83	0.80	0.77	-
Male median age at first Marriage	25.45	26.54	25.00	25.85	22.83
Moment	**1985 Model**	**2015 Model**	**2015 Data**	**Experiment: 2015 with $\bar{w}_f/\bar{w}_m$ of 1985 Result**	**% of data variation explained by $\Delta\bar{w}_f/\bar{w}_m$**
Divorce Rate	1.58	1.12	1.30	1.21	14.65
% of wives as plaintiffs	66.13	63.47	56.60	67.02	75.49
% of wives w/kids as plaintiffs	62.28	54.40	59.00	51.75	-46.52
% of Never married	13.98	14.21	29.20	12.37	21.12
Male hours	1.08	1.08	1.00	1.02	-
Female hours	0.83	0.90	0.84	0.80	-
Male median age at first Marriage	26.54	27.62	29.00	25.92	42.60

Shutting down changes in property division ($\kappa_{\mathbf{m}}$)

If in 1985 women would be getting the same share of marital wealth as in the 1970's, divorce rates wouldn't have risen as much as in the data, likewise the share of divorces initiated by wives wouldn't have reduced as much. In addition the share of never married increases as well as the median age at first marriage.

Table 12: Shutting down changes in property division κ_m

Moment	1970	1985		Experiment: 1985 with κ_m of 1970	
	Model	Model	Data	Result	% of variation explained by $\Delta\kappa_m$
Divorce Rate	1.34	1.58	1.87	1.41	30.61
% of wives as plaintiffs	71.59	66.13	61.30	69.76	35.28
% of wives w/kids as plaintiffs	76.94	62.28	64.70	63.95	14.99
% of Never married	11.48	13.98	20.50	14.84	-10.62
Male hours	1.05	1.08	1.00	1.12	-
Female hours	0.75	0.83	0.80	0.85	-
Male median age at first Marriage	25.45	26.54	25.00	26.77	-7.88
Moment	1985	2015		Experiment: 2015 with κ_m of 1985	
	Model	Model	Data	Result	% of variation explained by $\Delta\kappa_m$
Divorce Rate	1.58	1.12	1.30	1.12	0.00
% of wives as plaintiffs	66.13	63.47	56.60	63.47	0.00
% of wives w/kids as plaintiffs	62.28	54.40	59.00	54.40	0.00
% of Never married	13.98	14.21	29.20	14.21	0.00
Male hours	1.08	1.08	1.00	1.08	-
Female hours	0.83	0.90	0.84	0.90	-
Male median age at first Marriage	26.54	27.62	29.00	27.62	0.00

Shutting down changes in the probability of becoming the custodial parent ($\nu_\mathbf{m}$)

In the absence of changes in the probability of the husband in becoming the custodial parent, the share of divorces initiated by women decrease very little, from 71.50% to 68%. This suggests that the change in child custody arrangements is the main driver of the reduction in the share of divorce filings by wives, as it accounts for almost all the variation observed in the data. Furthermore, if wives would have the same chance of getting custody of the children the divorce rates would reach higher (lower) levels for the period 1970 to 1985 (1985 to 2015) thus suggesting that changes in child custody arrangements have an impact on the composition of divorces but seem to keep the divorce rates at the same level.

Table 13: Shutting down changes in the probability of the father in getting full custody of the child ν_m

Moment	1970	1985		Experiment: 1985 with ν_m of 1970	
	Model	Model	Data	Result	% of variation explained by $\Delta\nu_m$
Divorce Rate	1.34	1.58	1.87	1.61	-6.01
% of wives as plaintiffs	71.59	66.13	61.30	74.32	79.55
% of wives w/kids as plaintiffs	76.94	62.28	64.70	65.56	29.51
% of Never married	11.48	13.98	20.50	14.11	-1.56
Male hours	1.05	1.08	1.00	1.08	-
Female hours	0.75	0.83	0.80	0.82	-
Male median age at first Marriage	25.45	26.54	25.00	26.58	-1.54
Moment	**1985**	**2015**		**Experiment: 2015 with ν_m of 1985**	
	Model	Model	Data	Result	% of variation explained by $\Delta\nu_m$
Divorce Rate	1.58	1.12	1.30	1.07	-8.74
% of wives as plaintiffs	66.13	63.47	56.60	68.64	109.83
% of wives w/kids as plaintiffs	62.28	54.40	59.00	59.84	95.43
% of Never married	13.98	14.21	29.20	14.21	0.03
Male hours	1.08	1.08	1.00	1.08	-
Female hours	0.83	0.90	0.84	0.90	-
Male median age at first marriage	26.54	27.62	29.00	26.61	25.42

7 Importance of Matching Divorce Filings

In this section I emphasize the importance of using the information on divorce filings to explain the observed trends in divorce rates since 1970. I show that failure to match "who" files for divorce delivers different (potentially misleading) counterfactual results.

Divorce rates in the U.S. have been predominantly driven by wives, but would aggregate divorce rates respond differently to the observed labor market changes if divorces were not mainly triggered by wives? The answer to this question is not obvious, more so since the proposed model exploits fundamental differences in the utility that men and women get from marriage and child custody arrangements to match the share of divorces initiated by wives. To address this question, one would need to abstract from these mechanisms and reassess the model's performance in reproducing the divorce rate trends observed in the data. To this end, I propose a restricted version of the model where I abstract from the model features that allow it to match divorce filings. I set the restriction that $\text{Ł}_m = \text{Ł}_f$, that is, now men and women on average enjoy married life equally, and I set $\nu_m = 0.5$, that is, both the husband and wife have the same probability of getting the custody of the child after divorce. With this restrictions I re-estimate the model to match the data moments of 1970 described in Section 5.1.2, except for divorce filing moments. I repeat the exercise described in Section 6.1 to get the prediction for 1985, then I conduct the corresponding decomposition exercise to disentangle the effects of relative wages, child custody arrangements and property division laws. Results are shown in Tables 15 to 16.

Alternative model fit to 1970 The newly estimated parameter values are shown in Table 14. We can see that the average match quality for men and women in the alternative model is lower than in the benchmark estimation. In addition, the variance of the initial marital quality draw and the standard deviation of the marital quality shock are smaller, making marriages in this world less susceptible to divorce risk coming from marital quality. Table 15 shows that the alternative model matches the targeted moments very closely, however delivers a large share of divorce filings coming from men 52% compared to 29% in the data.

Table 14: Estimated Parameters, alternative model

Description	Symbol	Value
Average marital quality	$Ł_m = Ł_f$	1.49
St. deviation of the initial marital quality draw	σ_{ϵ_α}	0.7
St. deviation of the marital quality shock	σ_{ϵ_q}	8.5
Disutility from work Men	ϕ_m	0.93
Disutility from work Women	ϕ_m	2.1

Alternative model predictions for 1985 The alternative model predicts a decline in divorce rates and a slight increase of the divorce filings by wives, these results are opposite to what is observed in the data. The intuition behind the results is the following: because in the alternative model most of the divorces come from husbands (as opposed from wives like in the data),an increase in female wages will make women more attractive to men, since if married, men can work less and wives more, thus reducing the number of divorces initiated by husbands. Moreover, the median age at first marriage and the percentage of never married individuals barely increased compared to the benchmark scenario, this suggests that women's incentives to wait to obtain better matches are not as strong as in the benchmark scenario.

Table 15: Model Fit 1985

Moment	1970		1985		$\%\Delta$	
	Model	Data	Model	Data	Model	Data
Divorce Rate	1.34	1.30	1.02	1.87	-23.94	43.85
% of wives as plaintiffs	48.09	71.60	48.95	61.30	1.79	-14.39
% of wives w/kids as plaintiffs	50.54	75.80	41.79	64.70	-17.30	-14.64
% of Never married	13.38	12.40	13.47	20.50	0.64	65.32
Male hours	1.03	1.00	1.00	1.00	-3.05	-
Female hours	0.72	0.77 0	0.79	0.80	8.99	-
Male median age at first Marriage	25.65	22.00	26.20	25.00	2.15	13.64

Table 16: Counterfactual experiments

Moment	1970	1985		Experiment: 1985 with $\bar{w}_f/\bar{w}_m$ of 1970	
	Model	Model	Data	Result	% of data variation explained by $\Delta\bar{w}_f/\bar{w}_m$
Divorce Rate	1.34	1.02	1.87	1.21	-34.14
% of wives as plaintiffs	48.09	48.95	61.30	59.03	97.80
% of wives w/kids as plaintiffs	50.54	41.79	64.70	66.36	221.30
% of Never married	13.38	13.47	20.50	12.62	10.47
Male hours	1.03	1.00	1.00	1.02	-
Female hours	0.72	0.79	0.80	0.82	-
Male median age at first Marriage	25.65	26.20	25.00	25.87	11.11
Moment	1970	1985		Experiment: 1985 with κ_m of 1970	
	Model	Model	Data	Result	% of variation explained by $\Delta\kappa_m$
Divorce Rate	1.34	1.02	1.87	1.16	-24.64
% of wives as plaintiffs	48.09	48.95	61.30	41.38	-73.57
% of wives w/kids as plaintiffs	50.54	41.79	64.70	34.70	-63.89
% of Never married	13.38	13.47	20.50	12.97	6.15
Male hours	1.03	1.00	1.00	1.00	-
Female hours	0.72	0.79	0.80	0.76	-
Male median age at first Marriage	25.65	26.20	25.00	25.61	19.66

8 Conclusions

In this paper I quantitatively assess the role of divorce filings in explaining divorce rate trends in the U.S. from 1970 until 2015. To do so I construct and estimate a model with endogenous marriage and unilateral divorce that matches divorce filing data for the U.S. in 1970. The model includes two features that allow it to match divorce filing data: first, gender specific marital quality/love, meaning that men and women enjoy married life differently. Second, child custody arrangements that favoring wives in getting the custody of the children after divorce. Equipped with this model I generate counterfactual predictions for 1985 and 2015 and quantify the effects of changes in the gender-wage gap, property division laws and child custody arrangements. I show that the proposed model does a good job in describing the joint dynamics of divorce rates and divorce filings. The model accounts for roughly 50% of the variation in divorce rates and divorce filings by wives between 1970 and 2015.

In further counterfactual experiments I decompose the effects of the three drives (the gender-wage gap, property division laws and child custody arrangements), in accounting for the observed trends in divorce rates and divorce filings by wives. Results show that changes in relative wages and changes in child custody arrangements are largely responsible for the rise and later decline in divorce rates, plus the overall decline in divorce filings by women. Rising relative wages account for approximately 91% of the increase of divorce rates between 1970 to 1985 and 62% of their decrease between 1985 and 2015. They also account for 23% of the overall decline in divorce filings by women between 1970 to 2015. Child custody arrangements are the most important driver behind the reduction in the share of divorce initiated by wives. The change in the probability of the husband in getting custody of the children accounts for almost 77% of the decline in divorce filings by wives between 1970 and 1985, and 83% of the variation between 1985 and 2015.

Importantly, I show that failing to match divorce filing data delivers opposite counterfactual results, thus stressing the importance of matching who files for divorce when explaining divorce rates. An alternative version of the model that does not match divorce filing moments predicts a decline in divorce rates and an increase of the share of divorce filings done by wives for the period 1970 to 1985, result that is opposite to what is observed in the data. Behind this result lies the fact that it is relevant to distinguish whether divorce rates are driven by husbands or by wives. If divorces are driven by husbands (opposite to what we see in the data) higher relative wages for women will make women more financially attractive to men, thus reducing the number of divorces triggered by men and as a consequence reducing aggregate divorce rates.

The model presented in this paper can be extended to study other related questions, like the rise in married female labor force participation or welfare implications of changes in child custody laws or property division rules upon divorce. Furthermore, I currently make steady state comparisons between 1970 and 2015; ideally one would want to endogenize the full path for divorce rates and divorce filings by computing transitional dynamics between these years.

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Appendix

A Parametrization of the two period model

We need to assign values to for $\sigma, \xi, \rho, \sigma^2_{\epsilon_w}, \varphi, \eta, r$ and β. Since this is a qualitative example most of the parameters set apriori. I choose a coefficient of relative risk aversion $\sigma = 2$ following

Ortigueira and Siassi (2013). The Frish Elasticity of labor supply ξ is set to 0.5 following Blundell et al. (2016). The parameters for the income process are borrowed from Greenwood et al. (2016), with $\rho = 0.98$ and $\sigma^2_{\epsilon_w} = 0.011$. I select a risk free interest rate of $r = 2\%$ and a discount factor of $\beta = 0.98$ that are standard in the literature. The value of the public good η is adhoc set to one. Finally fertility is set to $\varphi = 0.57$ which is the share of married households with children in 1970.

The rest of the parameters $\mu_g, \kappa_g, \nu_g, \phi_g, Ł_g, \sigma_{\epsilon_q}$ are calibrated depending on the following scenarios:

1. **Reference Model**: This is a gender equality scenario, that is, there are no differences between men and women. I set $\bar{w}_f/\bar{w}_m = 1, \kappa_m = 0.5, \nu_g = 0.5, \mu_g = 0.5$ and $\phi_m = \phi_f, Ł_m = Ł_f$. I calibrate the values for ϕ_g such that the average number of hours worked is equal to 1. I set σ_{ϵ_q} such that everyone gets married in period 1, finally, $Ł_g$ is set to have a divorce rate larger than 1% in the second period.

2. **Alternative Model 1**: Sets some more realistic gender differences, as found in the literature and in the data, I set $\bar{w}_f/\bar{w}_m = 0.55, \kappa_m = 0.6, \mu_m = 0.6$. I calibrate $\phi_m < \phi_f$ such that the ratio of hours worked by women with respect to men is equal to 0.7. This scenario keeps the mean of individual the match quality $Ł_g$ symmetric between men and women $Ł_m = Ł_f = 4$ and keeps the same probability of getting custody of the children across gender $\nu_g = 0.5$.

3. **Alternative Model 2**: Keeps the parameter values of Alternative Model 1, but sets $Ł_m > Ł_f$, explicitly $L_m = 4$and $L_f = 3$, that is men an women enjoy married life differently. With women having lower match quality than men.

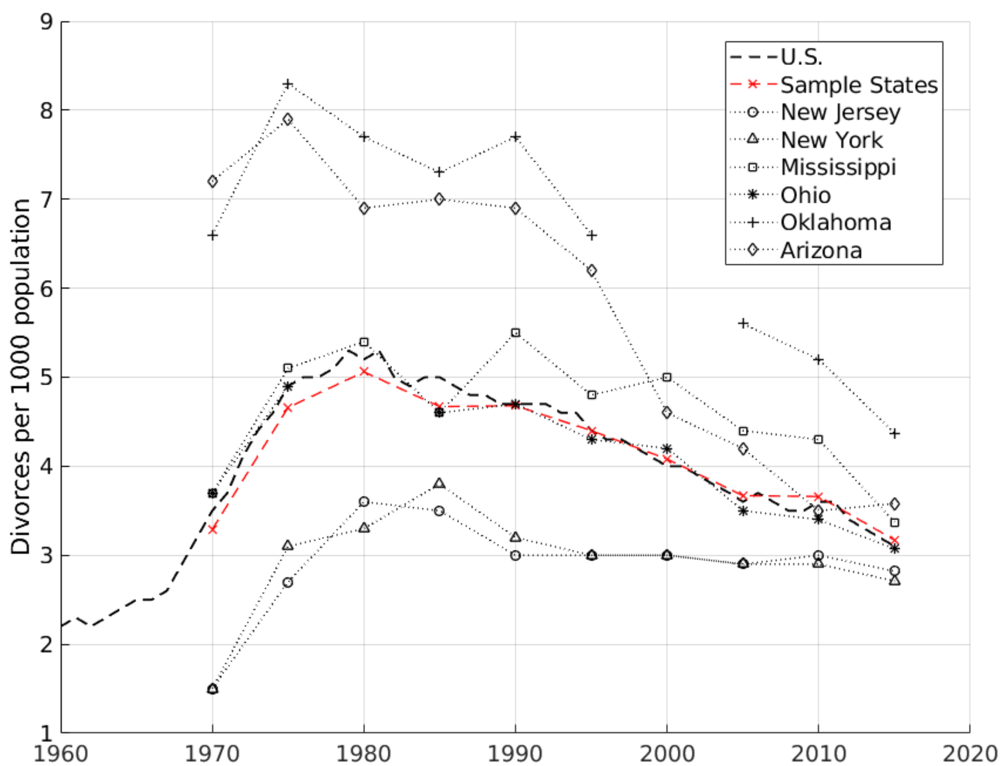
4. **Alternative Model 3**: Keeps the parameter values of Alternative Model 2, but sets $\nu_m = 0.1$, that is women have a higher probability of getting custody of the children upon divorce.

B List of States with reported divorce filing records

The list of sample countries is the following: Alabama, Alaska, Arkansas, Connecticut, Delaware, Georgia, Hawaii, Idaho, Illinois, Iowa, Kansas, Kentucky, Maryland, Massachusetts, Michigan, Missouri, Montana, Nebraska, New Hampshire, New York, Ohio, Oregon, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Utah, Vermont, Virginia, Wisconsin, Wyoming. A total of 31 states.

Figure 6 compares the divorce rates for the sample states vs. aggregate divorce rates. Additionally, It shows divorce rates for selected states: Oklahoma and Arizona which are the two states with the two highest divorce rates 1970. Mississippi and Ohio, with divorce rates at the median. Finally, New Jersey and New York with the lowest divorce rates in 1970. We see that the divorce rates for the sample states and the aggregate divorce rates move closely following the same trends and reaching the peat at the same year. In addition we see that all states exhibit a declining trend since the mid 80's.

Figure 6: Divorces per 1000 population



Notes: Divorce rates are taken from the CDC/NCHS National Vital Statistics System reports.