The hazards of partnership dissolution in Britain: a comparison between second and first marriages

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April 18, 2008

Abstract

Since the divorce rate has risen in the last decades, more people are at risk of remarriage. From the seminal paper of Becker *et al.* (1977) many authors have looked at forces driving divorce risk. However, previous research has not investigated whether second marriages differ from previous ones in the dissolution risk and its determinants. This paper tries to fill this gap by analysing the factors affecting divorce risk, considering both first and second marriages. Using retrospective and longitudinal data from British Household Panel Survey, a simultaneous piecewice linear hazard model for the risk of ending first and second marriage is estimated. The effect of predictors is compared across first and second marriages, separately for men and women. The model takes into account individual-level random effects (unobserved heterogeneity). Moreover first and second marriage dissolution equations are linked by allowing these random effects to be correlated. The estimates show that the correlation is not significant different from zero. Moreover some key factors affect first and second marriages differently. The presence of children within current marriages has a stabilising effect on first marriages but there is no such effect for second marriages. Cohabitation before marriage increases the hazard of first marriage dissolution, but the correlation between the pre-cohabitation dummy and the hazard of divorce becomes negative when second marriages are considered.

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1 Introduction

This paper investigates the reason why marriages dissolve and compares the first and second. The comparison is based on the analysis of the association between marital dissolution and its determinants across marriages: do predictors have the same effect on the risk of first and second marital dissolution?

The interest in doing such analysis is given by three aspects. First, there are two stylized facts that emerge from Census data: (1) the percentage of divorces increased in Britain in the last decades, so more people at risk of remarriage, and (2) re-marriage rate is higher then marriage rate.[1] Second, while there are studies addressing the impact of partners' characteristics on the probability of divorce across cohort and over time, studies that explicitly analyse and compare first and second marriage are rare. Third, the combination of the retrospectives and longitudinal data from the British Household Panel Survey (BHPS) gives the opportunity to look at a large sample of second marriages.

The paper follows the theoretical framework of Becker *et al.* (1977). In their seminal paper the authors suggest some of the key factors affecting the hazard of divorce and provide an economic framework to justify the association between these factors and the marital dissolution. A lot of scholar empirically 'tested' their hypotheses and these studies provide the set of characteristics used as determinants of the hazard of divorce in my analysis.

The paper is structured as follows. In the next section the theoretical framework is presented. I then discuss previous research. The fourth section describes the samples used in the analysis. In the fifth section the method

[1] These statistics can be found on the web site of the UK Office for National Statistics: www.statistics.gov.uk

and the estimates are presented. Last section concludes.

2 Theoretical framework

Becker's ideas have dominated research in the economic of the family. According to him the probability of divorce is a function of two factors: (1) the expected gain from marriage and (2) the distribution of a variable describing unexpected outcomes. In particular the probability of divorce is smaller the greater the expected gain from marriage and the smaller the variance of the distribution of unanticipated gains from marriage.[2]

Regarding the first factor (1), the marriage is a partnership for the purpose of joint production and joint consumption and the following are the most important sources of gain from marriage: [3]

- The division of labour (i.e. specialization) allows the exploitation of comparative advantage: men are more advantaged in the labour market while women more in home production, each partner can use his/hers capital to a large extent; and increasing returns: producing two meals instead of one does not require double input.

- Within a marriage the partner can share collective (non-rival) goods (if they exist): the husband's enjoyment from consuming the non-rival good does not effect the wife's enjoyment.

- Children have been seen as a marital specific capital but, even if it is no longer the case, there are obvious advantages to rise children within the family. Child care and child expenditure are more efficient decision taken by both parents together.

[2]See Becker (1977) p.1143.
[3]Weiss (1997).

- Within a marriage, partners can coordinate investment activities: if there is an imperfect credit market (i.e. the couple can save but not borrow) consumption and production decisions can not be separated. The family will invest in the schooling of the person with the higher rate of return the other person will work in the market and finances the investment.

- Finally, if two partners are risk averse they can be made strictly better off marrying given that their incomes are not perfectly correlated. The gain derive from the risk pooling.

Regarding the second factor (i.e. the probability of divorce is smaller the smaller the variance of the distribution of unanticipated gains from marriage), Becker claims that change in partners' expectations may have an impact on marital dissolution: the higher the deviation between actual and expected value the higher is the probability of divorce. If the gains from marriage are large small shocks will not destabilize a union.

The size of the gain from marriage depends on the characteristics of each partner and the quality of their match. Becker (1991) provides an analysis of optimal marital sorting stating that, for all traits which are not good substitutes in the production of commodity income, predominates a positive assortative mating. Education, for instance, is complementary trait, therefore if spouses differ significantly the gains from marriage are lower and the probability to divorce higher.[4]

Recently scholars have updated Becker's studies by looking at multiple equilibria in the framework of optimal marital sorting[5] or allowing for a 'learning by doing' setting.[6]

[4]Becker *at al.* (1977) also provide empirical evidence for these.
[5]See Burdett and Coles (1997, 1998).
[6]See Bougheas and Georgellis (1998).

3 Previous empirical research

During the 1990s scholars started to 'test' Becker's ideas. These studies can be divided into two strands: the first describes the old and the new forces driving divorce, focussing on some key factors affecting the hazard of marital dissolution. The second deals directly with remarriage process and the comparison between first and higher order marriages.

Factors such as religion (Lehrer and Chiswick, 1993), cohabitation experience before marrying, henceforth premarital cohabitation (Haskey, 1999; Berrington and Diamond, 1999), divorce costs (Bougheas and Georgellis, 1998), unexpected changing in economic circumstances (Weiss and Willis, 1997; Böheim and Ermisch, 2001), age at marriage (Lehrer, 2006), education and assortative mating (Chan and Halpin, 2003), previous partnership experience (Steele et al. 2006) are generally associated with the likelihood of marital dissolution. Moreover some authors have looked at how the impacts of these factors on marital dissolution changed over time (Chan and Halpin 2005). All these studies provide a key of interpretation for the result of the analysis of this paper. There is consensus for the effects of most of the determinants of marital dissolution: age at marriage, having religion beliefs and children within current marriage are negatively related to the hazard of divorce, premarital cohabitation and young cohort are factors positively relate to the hazard of marital dissolution. However, lately some authors have found systematic change over time, above all of the effect of children and premarital cohabitation.[7] In the first case children have always been seen as stabilising marriage lately these authors find that presence of children increases the hazard of divorce. Having cohabited before marrying increased the hazard of partner dissolution but it seems to be no longer the case.

[7] See Chan and Halpin (2002) and Böheim and Ermisch (2001).

Stevenson and Wolfers (2007) look at trends in marriage and divorce behaviour and new driving forces. Over the last 150 years divorce rates have risen, age at marriage as well as cohabitation has emerged as an important precursor or substitute for marriage, and is much more common among divorcees. Some of the factors explaining this phenomenon are the following: the rise of the birth control pill and women's control over their own fertility; sharp changes in wage structure including a rise in inequality and partial closing of the gender gap; dramatic changes in home production technologies; and the emergence of the internet as a new technology that change the marriage market.

Regarding the second strand of the literature, i.e. the analysis of remarriage process and the comparison between first and higher order marriages, we see that studies based on US data find contradicting result. McCarthy (1978), using the National Survey of Families Growth, shows that the characteristics that affect the probability of dissolving a first marriage are less important in a second marriage. Castro Martin and Bumpass (1989) survey papers on marital instability and look at the difference between first and second marriages. To address the net effect of remarriage they pool first and second including remarriage as a variable and they state that net of compositional differences with respect to education and age at first marriage remarriages have no higher risk of disruption than first ones. Differently Cuningham Clarke and Foley Wilson (1994) find that remarriages are more likely to end in divorce than first marriages in the earlier years. Given the inverse relationship between age at marriage and marital dissolution, older age composition of men and women in remarriages offsets the disruptive effect of previous marriages.

Beaujouan (2007) compares second and higher unions in France with

first ones. She finds that, controlling for social background, union status and fertility, second unions are not as likely to dissolve as first unions. She also tests for unobserved heterogeneity and she finds second unions last longer.

Finally, there are no studies that directly address this issue for UK.

4 Data

The selection of the sample is based on family history data from the British Household Panel Study (BHPS), a dataset which combines retrospective histories and information from the panel.[8]

All the analysis is based on partnership defined by a legal marriage.[9] Cohabiting partnership are not considered as marriages here.

There are potential different estimation samples, depending on the definition of (1) first and second marriage, (2) duration, and (3) on which set of covariates is used. In this section I describe the implication of these three sample selections.

4.1 First vs. second marriages

The first selection criterion is based on the distinction between first and second marriage. There are two samples distinguishing between (1) first marriages (all individuals at risk of ending first legal marriage i.e. all individuals get legally married) and (2) second marriages (all individuals at risk of ending second legal marriage i.e. all individuals get legally married then they separate or become widows and then they get legally re-married).

[8] See Pronzato (2006).

[9] From here onwards, when I will refer to marriage I always mean legal marriage as defined above.

People in sample (2) are included in sample (1). I construct the samples also looking at the retrospective history in the BHPS, so for individuals in sample (2) I have information on the characteristics of their first marriage. However when I consider observations derived from the retrospective data I can not use any partner variables that are informations coming from the panel.

4.2 Duration

The second selection criterion is based on the definition of the spell length (i.e. duration).

Let t_0 be the first time I observe the individuals in the sample. At t_0 all the individuals are married. Let t_1 be the separation date. Let t_2 be the starting date of the second marriage and t_3 the separation date of the second marriage. The duration of a marriage, is the separation date minus the starting date: i.e. for first marriage the duration will be given by $t_1 - t_0$ while for the second marriages the duration will be $t_3 - t_2$. The duration is time until separation and it is calculated in months. The diagram below graphs the dependent variable (the duration) for sample (1) and (2).

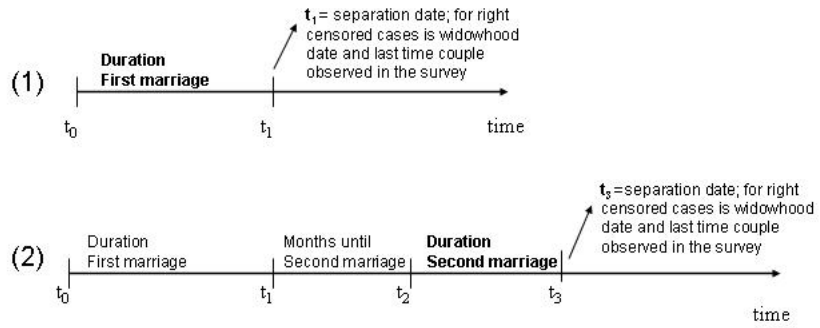
In the data some issues arise: first, for each individual, I know the starting date of the marriage with the correspondent left censoring indicator, the date of end and how the marriage end. For divorced people I use the date of the separation, but for some this is not available. For this group of the people I use as ending data 18 months before divorce date.[10]

Secondly, I follow all the individuals until the end of the survey so I could not see for all of them the transition to the event: it could be that the event has not yet occurred or it will never occur. These observations are

[10]Eighteen months is the average time that takes to get divorce from separation in the data and also quite plausible as legal length from separation to divorce.

right-censored, the spell length will be equal to starting data of the marriage minus the date they are last observed. I also include in the right-censored case the widows and the spell length will be equal to starting data of the marriage minus the widowhood date.

Figure 1: Duration of first and second marriages



Third, it could be possible that before t_0 (as well as between t_1 and t_2) individuals have cohabited and then they have experienced a cohabitation dissolution (so they had partnership experiences but not marriages). These cases are not considered.

Finally, some individuals experience cohabitation before marrying: i.e. they first cohabit and then they marry with the same partner. I define the dependent variable according to the literature i.e. duration of legal marriage, not considering the cohabitation spell length.

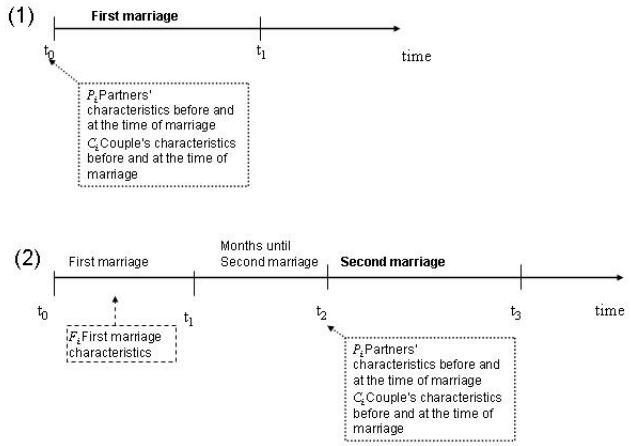
For each individual a failure indicator is calculated. It takes value one if the marriage ended in divorce or separation and zero otherwise.[11]

4.3 Explanatory variables

The third selection criterion depends on the set of covariates used in the analysis. The main implication is that the sample size is different depending on the regressors used: e.g. using partner variables on the right hand side (partner education or partner age) reduces sample size a lot.

I choose the explanatory variables for my analysis looking at the literature on marriage dissolution.

Figure 2: Covariates and duration of first and second marriages



Let P_i be the first set of coovariates describing the respondent characteristics. P_i will include a cohort dummy (whether he/she is born on or before the 31st December 1945), education dummies (whether he/she has lower then O-level, O-level, A-level or First degree and higher education

[11] It is zero for the right-censored observation.

qualification, the reference category will be no education), a religion dummy (whether he/she has religious belief) and whether he/she had children before the current marriage.

Let C_i be the second set of coovariates describing couple's characteristics. C_i will include a premarital cohabitation dummy (whether the couple experiences a cohabitation before marrying), the age at marriage (collected both for respondent and partner), homogamy dummies ('upwards' describing the respondent has higher level of education then the partner and 'downwards' being the opposite, the reference category will be homogamy i.e. same level of education), whether the respondent is older than the partner and whether there are children within the current marriage

Let F_i be first marriage characteristics and respondent characteristics during the time until second marriage, of course, they are included only in the second marriage equation. F_i includes duration of first marriage, whether first marriage ends in divorce or widowhood, months until second marriage and whether respondent had other partnership experiences between first and second marriage.

Finally I also include divorce rate at the year of the marriage to take into account the trend. The divorce rate is constructed use ONS data and it is the ratio between the number of divorce and the number of the marriages in each year.

P_i and F_i are available for each individual in the sample, whereas when including C_i in the estimates the sample reduces as I use both partners information that are available only from the panel.

Descriptive statistics are based on a sample of all individuals[12] for whom I have the duration variable. In the section where I present the estimates I

[12] 17,356 observations for first marriages and 1,830 for second marriages.

will consider a second sample that consists of all individuals[13] for whom I have both the duration and the partner variables.[14]

4.4 Descriptive statistics

The characteristics of the two different samples are summarized in table 1, 2 and 3. The two samples of first and second marriages are different. This is partly due to: (1) age selection: persons in second marriages are older (they already experienced a marriage); (2) gender selection related to differentials in mortality rates (women survive longer); (3) time selection: second marriages are younger (they come after the first); and (4) unobservable selection: second marriages persons are different from first marriages persons (maybe more prone to divorce).

Given these types of selection it is not surprising to see that second marriages person are older (1), but more prone to cohabit before marry (3).

Table 1: First and second marriage by cohort and gender (column percentage)

	Women		**Men**	
	Marriage 1	**Marriage 2**	**Marriage 1**	**Marriage 2**
Born on or before 31dec45	40.15	37.26	41.05	45.80
Born after 31dec45	59.85	62.74	58.95	54.20
No. observations	9,486	1,044	7,870	786

[13] 9,056 observations for first marriage and 1,152 for second marriage.
[14] For the time being there are no time-varying covariates.

Table 2: First and second marriage by failure indicator and gender (column percentage)

	Women		**Men**	
	Marriage 1	**Marriage 2**	**Marriage 1**	**Marriage 2**
Right censored	79.13	83.01	76.20	74.17
Divorce/Separation	20.87	16.99	23.80	25.83
No. observations	9,486	1,044	7,870	786

Table 3: First and second marriage by pre-cohabitation and gender (column percentage)

	Women		**Men**	
	Marriage 1	**Marriage 2**	**Marriage 1**	**Marriage 2**
Directly married	84.86	45.40	83.02	43.77
Pre-cohabit	15.14	54.60	16.98	56.23
No. observations	9,486	1,044	7,870	786

5 Method

The methodology used in this paper aims to capture the simultaneous relationships between first and second marriage dissolution. The model is characterized by two equations for both men and women. Let ${h_i}^1(t)$ be the hazard of first marital separation at duration t for any woman (or man) i $(i = 1, ..., N)$, and ${h_j}^2(t)$ the hazard of second marital dissolution at duration t for any woman (or man) j $(j = 1, ..., S)$, where N includes S. The multiprocess model for the two marital dissolutions can be written:

$$ln{h_i}^1(t) = \alpha^1 {T_i}^1(t) + \beta^1 {P_i}^1 + \gamma^1 {C_i}^1 + {u_i}^1 \tag{1}$$

$$ln{h_j}^2(t) = \alpha^2 {T_j}^2(t) + \beta^2 {P_j}^2 + \gamma^1 {C_j}^2 + \lambda^2 {F_j}^2 + {u_j}^2 \tag{2}$$

where

$$\text{Corr}({u_i}^1 {u_j}^2) = \rho$$

The baseline log-hazard functions are ${T_i}^1(t)$ and ${T_j}^1(t)$ respectively for first and second marriage duration. These are specified as piecewise-linear splines with knots at 2, 5 and 10 years.

The explanatory variables are chosen looking at the literature on marriage dissolution, P_i is a vector summarizing partners characteristics, C_i couple characteristics and F_i first marriage characteristics, as I described above.

The model incudes ${u_i}^1$ and ${u_j}^2$ that are individual components that capture the effects of unmeasured risk factors which are not included in the model. It is assumed they are constant over time. They allow to take into account unobserved heterogeneity between individual. Moreover these factor are a source of correlation across equations. In fact, the two hazard equations

are linked by allowing these random effects to be correlated: ρ. The model assumes that the random effects follow a bivariate normal distribution with zero mean.

I compare this simultaneous model with a piecewise linear hazard model where the two equations are estimated separately and also with a Cox proportional hazard model. A non parametric technique to allow for more flexibility, but where it is not possible to estimate the baseline.

5.1 Estimates

The estimates for separate and simultaneous models are presented respectively in Table 4 and 5. I estimate two different models for men and women.

For the time being I do not include time-varying covariates in the analysis and the explanatory variables included are mainly the P_i defined above.

First of all, looking at the estimates for equation (1) (hazard of ending first marriage) I find all the associations being in line with the previous empirical research on divorce dissolution and consistent both for men and women (Tab.4). Men and women born after 31st December 1945, cohabiting before current marriage, being affiliated to a religion and having children before current marriage experience high risk of divorce. On the other side, confirming findings in the literature[15], individuals who delay entry into marriage are less likely to divorce but beyond later twenties further waiting has the opposite impact on marital dissolution. Moreover having children within current marriage decrease the hazard of marriage dissolution. Divorce rate seems to be positively correlated with the hazard of dissolution: the higher the divorce rate the year of the marriage the higher is the hazard of marital breakdown. Finally, education qualifications seem to have no consistent

[15]See Lehrer (2006).

Table 4: Piecewise linear hazard model. Four models separated for first and second divorces and men and women

	Men		**Women**	
	First	**Second**	**First**	**Second**
Marriage duration 0-2ys	0.0450 ***	0.0386	0.0314 ***	0.0053
	-0.0086	*-0.0384*	*-0.007*	*-0.0318*
Marriage duration 2-5ys	-0.0058 *	-0.0192 *	0.0011	0.007
	-0.003	*-0.011*	*-0.0024*	*-0.0111*
Marriage duration 5-10ys	0.0080 ***	0.0185 **	0.0055 **	0.0083
	-0.0027	*-0.009*	*-0.0022*	*-0.0092*
Marriage duration 10ys+	-0.0041 ***	-0.0022	-0.0033 ***	-0.0054
	-0.0006	*-0.0034*	*-0.0004*	*-0.0033*
Born after 31stDec45	0.5141 ***	0.3049	0.7687 ***	-0.3
	-0.1303	*-0.3614*	*-0.0999*	*-0.3455*
Cohabit before current marriage	0.2913 ***	-0.7895 *	0.1730 **	-0.9539 **
	-0.0853	*-0.4077*	*-0.0678*	*-0.4459*
Age at current marriage	-0.1379 ***	-0.0952	-0.1506 ***	-0.1941 *
	-0.0274	*-0.0803*	*-0.0265*	*-0.101*
Age squared	0.0008 **	0.0005	0.0009 **	0.0015 *
	-0.0004	*-0.0008*	*-0.0004*	*-0.0009*
First degree or higher	-0.2083	-0.025	0.0157	0.27
	-0.1315	*-0.4116*	*-0.1103*	*-0.4611*
A-level or equivalent	0.0477	0.0091	0.0214	0.1243
	-0.0931	*-0.2974*	*-0.0795*	*-0.298*
O level	0.1298	-0.3157	0.0408	-0.1582
	-0.0935	*-0.35*	*-0.0714*	*-0.2686*
Lower than O level	0.0191	-0.5676	-0.0302	0.043
	-0.1027	*-0.4558*	*-0.0813*	*-0.277*
Divorce rate	0.0151 ***	0.0401 *	0.0227 ***	0.0540 **
	-0.0038	*-0.0224*	*-0.0028*	*-0.0259*
Has kids before current marriage	0.5863 ***	0.5969	0.5998 ***	0.7074
	-0.09	*-0.4181*	*-0.068*	*-0.4471*
Has kids within current marriage	-0.6881 ***	-0.3247	-0.4843 ***	-0.3022
	-0.1092	*-0.4522*	*-0.091*	*-0.4662*
No religion belief	0.1797 ***	-0.0399	0.2149 ***	0.1381
	-0.0662	*-0.2091*	*-0.0552*	*-0.1978*
First marriage ended in divorce		0.1251		-0.3286
		-0.2904		*-0.2822*
Constant	-5.1955 ***	-5.9962 ***	-5.3612 ***	-3.9574 ***
	-0.4165	*-1.9575*	*-0.3693*	*-1.25*
Standard deviation of u_i	0.7019 **	1.339	0.5585 ***	1.5352
	-0.3056	*-1.2453*	*-0.2071*	*-1.1989*
Log Likelihood	-9224.35	-1376.73	-13595.88	-1827.47

Note: standard error in italics; $*: p < 0.1$; $**: p < 0.05$; $***: p < 0.01$

effect on the hazard of divorce.

More interesting are the findings for that determinants affecting differently first and second marriages. Cohort and age at marriage have no effect in second marriages and this could be due to the strong effect of the divorce rate that take into account the trend.

Quite strong and consistent across specifications and both for men and women the difference between the effect on first and second marriages of children and pre-marriage cohabitation.

Having children within the current marriage reduce the hazard of divorce while the opposite is true for children before current marriage. This effect no longer hold when looking at second marriages. This result could be driven by two aspect. First there are fewer children within second marriages than within first marriages. Second marriage women are older then first marriage women so they can be at the end of their fertility history. Second, some authors found the association between children and hazard of divorce has changed in the last decade: second marriages are younger then first ones. They can be affected by this change in the impact of children on marital dissolution.[16]

According with the literature[17] cohabiting before marrying increase the hazard of divorce. This surprising finding was seen as the result as of a selection bias as cohabitation can be a period of learning about partner characteristics and expectations. In fact previous studies[18] argue that people who go cohabit before marrying are different from the one get directly married. These individuals may be the ones more prone to divorce as they do not trust the marriage as institution and they are the one not willing to marry

[16] See Chan and Halpin (2002) and Böheim and Ermisch (2001).
[17] See Haskey (1999), Berrington and Diamond (1999) and Ermisch (2004).
[18] See Lillard *et al.* 1995.

Table 5: Piecewise linear simultaneous hazard model for first and secondo divorces. Two models separated for men and women

	Men		**Women**	
	First	**Second**	**First**	**Second**
Marriage duration 0-2ys	0.0452 ***	0.0382	0.0312 ***	0.0077
	-0.0087	*-0.037*	*-0.0071*	*-0.0329*
Marriage duration 2-5ys	-0.0057 *	-0.0192 *	0.001	0.0074
	-0.0031	*-0.011*	*-0.0024*	*-0.0112*
Marriage duration 5-10ys	0.0081 ***	0.0186 **	0.0053 **	0.0087
	-0.0027	*-0.0089*	*-0.0022*	*-0.0091*
Marriage duration 10ys+	-0.0040 ***	-0.0023	-0.0034 ***	-0.0052
	-0.0006	*-0.0033*	*-0.0004*	*-0.0034*
Born after 31stDec45	0.5148 ***	0.2372	0.7618 ***	-0.1814
	-0.1315	*-0.3546*	*-0.0989*	*-0.3479*
Cohabit before marrying	0.2922 ***	-0.7693 *	0.1731 **	-1.0233 **
	-0.0865	*-0.3962*	*-0.0672*	*-0.4661*
Age at marriage	-0.1392 ***	-0.0952	-0.1469 ***	-0.1868 *
	-0.0277	*-0.0814*	*-0.0262*	*-0.1013*
Age squared	0.0856 **	0.0412	0.0869 **	0.1562
	-0.037	*-0.0766*	*-0.0406*	*-0.0952*
First degree or higher	-0.2095	0.015	0.016	0.2128
	-0.133	*-0.419*	*-0.1095*	*-0.4661*
A-level or equivalent	0.0464	0.0245	0.0219	0.0969
	-0.0942	*-0.2977*	*-0.0791*	*-0.3039*
O level	0.1306	-0.3012	0.0433	-0.204
	-0.0945	*-0.3454*	*-0.0709*	*-0.2815*
Low then O level	0.0166	-0.5575	-0.0292	0.0275
	-0.1037	*-0.448*	*-0.0807*	*-0.2823*
Divorce rate	0.0152 ***	0.0429 *	0.0224 ***	0.0522 **
	-0.0038	*-0.023*	*-0.0028*	*-0.0249*
Has kids before current marriage	0.5914 ***	0.5672	0.5904 ***	0.7750 *
	-0.0909	*-0.4086*	*-0.0672*	*-0.4678*
Has kids within current marriage	-0.6928 ***	-0.2936	-0.4759 ***	-0.3547
	-0.1105	*-0.4499*	*-0.0903*	*-0.487*
No religion belief	0.1817 ***	-0.0452	0.2126 ***	0.1613
	-0.0669	*-0.2094*	*-0.0548*	*-0.2053*
First marriage ended in divorce		0.141		-0.3306
		-0.2938		*-0.2908*
Constant	-5.1960 ***	-5.7777 ***	-5.3880 ***	-4.6454 ***
	-0.4206	*-1.8963*	*-0.3683*	*-1.4076*
Standard deviation of $u_i{}^1$	0.7269 **		0.5203 **	
	-0.3014		*-0.2143*	
Standard deviation of $u_i{}^2$	1.3336		1.6187	
	-1.2084		*-1.1901*	
ρ	-0.3232		0.6238	
	-0.3835		*-0.468*	
Log Likelihood	-10600.54		-15421.24	

Note: standard error in italics; $* : p < 0.1$; $** : p < 0.05$; $*** : p < 0.01$

at all. I find that this association between cohabitation before marriage and hazard of divorce is negative for second marriages. Second marriage sample is much more homogenous than first marriage sample, they all experienced a divorce, they are all selected in this respect, so in this sample the "true" association could emerge: having cohabited before getting married decrease the hazard of divorce.

All the results described above and show in tab. 4 are robust also when estimating the model simultaneously allowing for unobserved heterogeneity correlated across processes (tab. 5).

6 Conclusion

The aim of the paper was to fill the gap in the literature of divorce describing second marriage dissolution and comparing second to first marriages in UK.

The research questions were: which are the factors affecting marital dissolution? Do predictors have the same effect on first and second marital instability?

My analysis shows that there are important differences between the risk of ending first and second marriages and the most interesting one is the association between cohabitation before marriage and hazard of divorce that is negative for second marriages whereas positive for first. I argued that second marriage sample is more homogenous than first marriage sample, they all experienced a divorce, they are all selected in this respect. As the sample is more homogenous I argue that here the "true" association could emerge.

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Appendix A

A Cox proportional hazard model when estimating the equations for the hazard of ending (1) first marriages and (2) second marriages is estimated separately for men and women. The choice is given to allow for more flexibility using a non parametric technique. Three specifications are estimated: (1) the explanatory variables included are mainly the P_i defined above; the specification (2) includes also partner variables so on RHS there are P_i and C_i; the last specification (3) is estimated only for equation 2 and it includes first marriages characteristics so on RHS there are P_i, C_i and F_i. This is the reason why specifications (2) and (3) have a smaller sample size than specification (1).

Table 6: Cox model for marriage: men

	(1)		(2)		(3)
	First	**Second**	**First**	**Second**	**Second**
P_i					
Born after 31stDec45	0.43***	0.25	0.75*	0.15	0.13
Cohabit before current marriage	0.28***	-1.39***	0.36***	-1.43**	-1.53**
No religion belief	0.15***	-0.05	0.14	-0.24	-0.18
Has kids before current marriage	0.52***	0.39***	0.92***	-0.22	-0.15
Education†					
First degree or higher	-0.17	-0.04	-0.52*	0.35	0.23
A-level or equivalent	0.06	0.03	-0.04	0.13	0.08
O level	0.12	-0.22	0.14	-0.28	-0.27
Lower than O level	0.05	-0.38	0.01	-0.59	-0.57
C_i					
Age at current marriage	-0.12***	-0.08	0.01	-0.11	-0.03
Age squared	0.00***	0.00	0.00	0.00	0.00
Partner age			-0.04	-0.10**	-0.13**
Partner age squared			0.00	0.00	0.00
Has kids within current marriage	-0.61***	-0.25	-0.76***	-0.24	-0.27
Men older then women			0.04	-0.40	-0.80
Downwards			0.22	0.31	0.36
Upwards			-0.04	0.51	0.48
F_i					
No cohabitation between marriages		-0.94***		-1.44**	-1.64**
Duration First marriage					-0.01*
Months until second					-0.01*
First marriage ended in divorce					-0.61
Divorce rate	0.01***	0.02***	1.05***	1.22***	1.28***
No. of observations	7036	727	4490	540	540
Log likelihood	-9397.78	-1128.8	-1755.06	-288.24	-285.97

Note: (1) No partner variables included, (2) Partner variables included (3) First marriage duration and other first marriage characteristics included

†reference category: no academic qualifications

Table 7: Cox model for marriage: women

	(1)		(2)		(3)
	First	**Second**	**First**	**Second**	**Second**
P_i					
Born after 31stDec45	0.70***	-0.20	1.02**	-0.02	-0.04
Cohabit before current marriage	0.17**	-1.23***	0.31***	-1.32**	-1.55***
No religion beliefs	0.20***	0.10	0.05	0.10	0.05
Has kids before current marriage	0.56***	0.40***	0.69***	-0.19	-0.19
Education					
First degree or higher	-0.02	0.20	-1.04***	0.50	0.55
A-level or equivalent	0.03	0.13	-0.74***	0.48	0.51
O level	0.04	-0.13	-0.17	0.08	0.08
Lower than O level	0.00	-0.08	-0.15	0.05	0.10
C_i					
Age at current marriage	-0.13***	-0.14***	0.00	-0.19*	-0.23**
Age squared	0.00***	0.00***	0.00	0.00	0.00
Partner age			0.00	-0.22***	-0.20***
Partner age squared			0.00	0.00***	0.00***
Has kids within current marriage	-0.44***	-0.13	-0.56***	-0.20	-0.14
Woman older then man			0.38*	-0.92**	-0.78*
Downwards			-0.05	0.06	0.06
Upwards			-0.40***	-0.01	0.00
F_i					
No cohabitation between marriages		-0.70*		-0.99	-1.23**
Duration First marriage					0.01
Months until second					0.00
First marriage ended in divorce					0.77
Divorce rate	0.02***	0.04***	1.11***	1.28***	1.31***
No. of observations	8680	993	4566	612	612
Log likelihood	-14682.06	-1607.21	-2459.94	-362.21	-360.01