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A Regression Discontinuity Study**

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## ABSTRACT

### **Divorcing Upon Retirement: A Regression Discontinuity Study\***

The many facets of retirement have been studied widely by economists. However, the effect of retirement on marriage stability has been ignored in the literature. Retirement represents a dramatic change in individual time allocation that may affect marriage stability. In particular, individuals that grew up in traditional households in which the father did little domestic work and both spouses worked very long hours such as farmer household may find their marriage especially proven by the transition into retirement. We study the effect of retirement on marriage outburst rates using observations on over 200 000 French men and over 166 000 French women aged 50 to 70, drawn from the French Labor Force Surveys over the period 1990 to 2002. Due to reverse causality concerns, we instrument retirement in our divorce model by exploiting legal retirement age in France and applying a regression discontinuity approach. We find a significant increase in divorce rates which soar and almost double upon retirement for individuals of either gender that grew up in a traditional family environment such as a farmer household.

JEL Classification: J14, C1, C36

Keywords: ageing, retirement, regression discontinuity

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## 1. Introduction

Since the pioneering work of Gary Becker, the instability of marriage has been the subject of numerous studies by economists. The well-being and health effects of retirement have also been widely researched. However, to date the relation between the individual retirement decision and marriage stability has been neglected in the economic literature. Here we argue that retirement represents a dramatic change in individual life that may also affect marriage stability. Since the quality of marriage may in turn affect individual productivity and the timing of retirement, to disentangle the direction of causality we exploit legal retirement age in France and use a regression discontinuity approach to study the effect of individual retirement on the probability to divorce.

The economic literature on divorce dates back to the pioneering work of Gary Becker. According to Gary Becker, Elisabeth Landes and Robert Michael (1977), marriage instability may result from a change in the expected returns from marriage or in their variance, the latter capturing the possible uncertainty surrounding the returns from marriage. In line with this prediction, for example, Bruce Meyer and Wallace (2013) find descriptive evidence of a negative effect of disability on marriage stability in the United States (2013). Retirement being entirely anticipated, one would not expect any effect of retirement on marriage outburst rates. Upon retirement though, traditional gender roles and gender stereotypes are likely to be challenged.<sup>1</sup> In particular, it is found that the amount of house work performed by men increases significantly at retirement (Aguiar and Hurst, 2005 and 2007, and Stancanelli and Van Soest, 2012) and this may lead spouses to renegotiate the household allocation of time. Gopi Shah Goda, John B. Shoven, Sita Nataraj Slavov, 2007, investigated the effect of social security on divorce in the USA to conclude that spousal pension benefits do not affect the individual decision to divorce. There are no spousal pension benefits in France. Child custody laws are also likely to be of little relevance to the older population under study in this paper since children are likely to be grown up by the time individuals retire. Because earlier literature suggests that the wife is often the one that initiates the divorce even when she loses financially from the divorce (see Margaret Brining and Douglas Allen, 2000), she may be even more likely to do so if losing survivor pension benefits is not at stake and children are already grown up and have left home. By the time individuals retire, children that often hold couples together (see, for example, Bellido et al. 2014) are likely to have left home and this may contribute to make marriages more vulnerable. In particular, since individuals plan for

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<sup>1</sup> See also Akerlof and Krant (2000) on male gender identity.

their retirement well in advance, to comply with standard advance notice requirements to employers and social security offices, the prospects of retirement may upset marriage stability well before the actual retirement takes place. The actual time of retirement may simply be the last drop that spills over the (marriage) cup. This is the first economic study that attempts to pin down the effect of retirement on marriage stability.<sup>2</sup>

Increases in divorces and remarriages at older ages had been documented in earlier studies (see, for example, Betsey Stevenson and Justin Wolfers, 2007). In line with this, Chart 1 based on administrative data on divorcees (collected by the French Ministry of Justice) illustrates large increases in the proportion of divorces since the nineties, for older generations in France, before and past legal retirement age<sup>3</sup> -which was sixty years for most workers at the time of our data. There are notable spikes in divorce rates both after the introduction of consensual divorce (1975) and the recent reform (2004) that eased further divorce procedures in France. Administrative data on marriage break up rates by the duration of the marriage (see Chart 2, data collected by the French Ministry of Justice) show a steady and steep increase in the proportion of marriages that end up in divorce after having lasted for 30-34 years. By the end of the nineties, as many marriages broke up after 30-34 years of duration as after the first five years of marriage (see Chart 2). Because individuals marry on average in their late twenties/early thirties and retire in their sixties, this suggests that retirement years are likely to be increasingly critical for marriage stability. In particular, because married women's employment rates have steadily increased over the last decades, and the timing of retirement is strictly regulated in France, the husband may retire while the wife is still at work and this may lead to tensions within the household, especially in more traditional couples in which the wife still does most of the housework even when she is employed. Incidentally, anecdotal evidence for Japan indicates that over 60 per cent of older women aged 60 and above are affected by a so-called 'retired husband syndrome', with soaring divorce rates of older couples in Japan (Kenyon Paul, 2006). Recent evidence for Italy, also points to soaring divorce rates of older individuals around retirement age (Corriere della Sera, 2011, La Repubblica, 2014). Interestingly, Italy and Japan stand out as the OECD countries in which married men contribute the least to housework (see OECD, 2001, and Burda, Hamermesh and Weil, 2013).

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<sup>2</sup> Other social scientists provide descriptive evidence of a negative association between retirement, gender roles and the quality of marriage (Moen, Phyllis, Jungmeen E. Kim, and Heather Hofmeister, 2001) using a two years panel on American couples, ignoring though the possibility of reverse causation and the potential endogeneity of the timing of retirement in their model of marriage quality changes at retirement.

<sup>3</sup> The patterns are similar for the younger generation and show pronounced increases in divorce rates since the nineties. For each older age group, there are many more divorces for men than for women, which is explained by the fact that men marry (and divorce) on average younger women.

The costs of divorcing at older age are likely to be large for the economy and society at large, as older people are less likely to remarry and may depend more heavily on the welfare state - while family providers of unpaid care will have to split their time between two parents.

Here, we exploit information on the socio-economic status of the father of the respondent, focusing on individuals that were raised in farmer households, to capture how growing in an environment in which gender roles are likely to be very traditional, with fathers contributing little to domestic work and both spouses working very long hours,<sup>4</sup> may affect individual marital stability at the time of transiting into retirement. Over twenty per cent of the individuals in our sample come from a household in which the father was a farmer. Divorce rates increased dramatically for all socio-economic groups over the period of time covered by our data. By 2002, about five per cent of older men whose father was a farmer were divorced against almost fourteen per cent of men whose father was a University professor or a secondary school teacher. In particular, individuals whose father was a farmer have slightly more children than others, and their marriage is characterized by larger age and education differences between spouses (according to evidence we draw from data on French married couples), which may also characterize more traditional marriages (see Bloemen and Stancanelli, 2014).<sup>5</sup> Interestingly, data on time allocation in France indicate that male farmers spent on average, three hours a week on housework at the end of the nineties, against an average of eleven hours for the average married man, and both spouses in a farmer household enjoyed only twelve hours of pure leisure per week at most, against more than eighteen hours for the average French married spouses. Data drawn from the French Consumption Survey of 2000, suggest that consumption does not drop substantially in farmers' household when the head turns 60 (see also Moreau and Stancanelli, 2014). Although farms have been steadily disappearing over time, France still counted 515 000 farms in 2010 (with an average surface of over 100 hectares per farm), which represent 4.3% of the 12 million European Union farms (INSEE, 2014) while in the USA there were over 2 million farms at about the same time. This implies that the implications of our analysis may concern a non-negligible fraction of households. Traditional gender roles are not the resort of men only but they can also be internalized by women and more generally, by both spouses. Remarkably, Fernandez, Fogli and Olivetti (2004), analyzing the determinants of the secular right of female labor force in

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<sup>4</sup> This argument is supported by evidence drawn from the 1998-99 French time use survey (see Table ). See also, for example, Meiners Jane E and Geraldine I. Olson (1987) on time allocation of American female farmers and Annie Rieu (2004) on the economic situation of French women in agriculture.

<sup>5</sup> According to Chiappori, Pierre-André, Oreffice, Sonia and Climent Quintana-Domeque (2012), the less attractive partner may compensate the other financially.

the USA, find that women married to a man whose mother worked are themselves more likely to participate in the labor force. Here, we find that both men and women who grew up in a farmer household are more likely to experience marriage instability at the time of transiting into retirement and this finding is robust to various sensitivity checks.

Marital instability may not be independent from the timing of divorce –as marriage stability may, for example, also affect productivity and employment- and individuals may have incentives to time their divorce a retirement as they will have more time available to file for divorce then. To identify the effect of retirement on marital stability, we exploit legal retirement age in France to instrument the timing of individual retirement, applying a fuzzy regression discontinuity design. Using data drawn from the French Labor Force Surveys on sample of over 200 000 men and over 166 000 women aged 50 to 70 years, we conclude that the probability to retire increases significantly when individuals turn 60 and the size of the increase is equal, respectively, to about 0.19-0.23 for men and 0.25-0.29 for women, which supports our identification strategy. The probability to divorce upon retirement increases significantly and almost doubles for individuals of either gender that grew up in traditional households in which the father was a farmer, raising respectively, by 0.04 to 0.010 for men and by 0.6 to 0.08 for women. These findings are robust to various specification checks.

This paper is structured as follows. The empirical approach is described next. The data used for the analysis and the sample selection criteria are presented in Section 3. Descriptive analysis follows. The results of estimation are presented in Section 5. Conclusions are drawn in Section 6.

## **2. The empirical model**

Because retirement is likely to be anticipated (see the pioneering work of Gary Becker, Elisabeth Landes and Robert Michael (1977)), we would not expect a priori a significant effect of retirement on divorce. Upon retirement though, partners may want to renegotiate the household allocation of time which may possibly lead to marital conflict. Moreover, retirement may challenge traditional gender roles and this may also upset marital stability. Women perform traditionally more house work than men do and thus female retirement may represent less of a challenge for the household time allocation than male retirement does. Moreover, the wife is often younger than the husband and thus, the last to retire. Therefore, we do not expect to find symmetric effects of male and female retirement on divorce rates. Because earlier literature suggests that the woman is often the one that initiates the divorce

even when the woman loses financially from the divorce (see Margaret Brining and Douglas Allen, 2000), she may be even more likely to do so if losing spousal pension benefits is not at stake (there are no spousal benefits in France) and children are already grown up and have left home (which is typically the case by the time parents retire). This implies that retirement may well cause divorce which is something that has not been considered before in the economic literature. Since individuals are going to plan their retirement well in advance—in France, for example, they have to notify social security officers at least four months earlier that they plan to retire at a certain date—the prospects of retirement may affect marriage stability well before actual retirement takes place. The actual retirement may just be the last drop that spills the (marriage) cup over or say, the last straw that breaks the (marriage) camel’s back. Therefore, we may find an immediate positive effect of retirement on individual divorce rates. In particular, we expect that individuals that grew up in more traditional family environment may see their marital life particularly proven at the time of retirement, since they have been exposed during youth to stronger gender roles and gender specialization in household tasks (see Table 5 below; and for example, Jane Meiners and Geraldine Olson (1987) for an account of time allocation of USA female farmers or Annie Rieu (2004) on the situation of women farmers in France), which implies that they may have more difficulties to adjust to the dramatic change in time allocation at retirement, when work at the office is over and individuals are “forced” to reallocate their time between leisure and house work. This is especially true in the French context of highly regulated retirement age.

Because the individual decision to retire from work may not be independently determined from marriage (in)stability—for example, individuals in (un)stable marriages may be more (less) productive at work and this may affect the timing of their retirement—we exploit the legislation in France that sets 60 as the earliest retirement age for most workers to instrument the effect of retirement in our divorce model. The existence of a legal retirement age creates a discontinuity in the probability of retirement (as a function of age) that enables us to apply a regression discontinuity approach. Excellent literature reviews of regression discontinuity methods are provided, for example, by David Lee and Thomas Lemieux (2010), Wilbert van der Klaauw (2008), or Guido Imbens and Thomas Lemieux (2007). The main advantage of regression discontinuity over other competing approaches is that it is closer to a natural experimental design as individuals close to the discontinuity are likely to be very similar and the only thing that makes them differ is the option to retire once they reach legal retirement age. Thus, we can neatly identify the effect of retirement (instrumented with the legal

retirement age) on marriage outburst. Under this set up, the identification of the effect of retirement on the individual probability to divorce (the outcome variable) is achieved thanks to the sudden and large increase in retirement (the treatment) at the point of discontinuity (age 60) in the running variable (age). Individuals cannot manipulate their age –and this is one of the requirements for using a regression discontinuity approach (see, for example, Lee and Lemieux, 2010). In our data, year and month of birth were collected, and we also know the day, month and year of the survey interview. Therefore, we assume that age is measured continuously. There are no other policy measures that affect individuals reaching age 60 in France.<sup>6</sup> Retirement is also measured at the time of the interview. However, we need to account for the fact that some people may retire earlier than sixty<sup>7</sup> –due to special early retirement schemes or specific employment sector rules - and others later, though in France, unemployment, maternity and sick leave periods are fully covered by pension rights, so that interrupted labour market experience will not translate into smaller pension benefits or into a longer working life.<sup>8</sup> We use a so-called Fuzzy Regression Discontinuity design - the jump in the probability of retirement at age 60 (or 720 months) is greater than zero but less than one.<sup>9</sup>

Let  $R_{ij}$  be a dummy for retirement equal to one if individual  $i$  has retired from market work and zero otherwise. Let  $D_i$  be a dummy that takes value one when individuals have reached age 60 (720 months of age) and zero otherwise, and let  $S_i$  be the divorce outcome. The fuzzy regression discontinuity design can be estimated by specifying a two stages least square model of the effect of retirement -instrumented with a dummy for being aged at least 60 (720 months or more) and full interactions of this dummy with an individual age polynomial- on divorce (see Hahn, Jinyong; Petra Todd; Wilbert Van der Klaauw (2001).

$$1) S_i = \alpha^c + R_i \beta^c + (Age_i - 720) \gamma^c + (Age_i - 720)^2 \gamma^{c2} + (Age_i - 720)^3 \gamma^{c3} + (Age_i - 720)^4 \gamma^{c4} + D_i (Age_i - 720) \delta^c + D_i (Age_i - 720)^2 \delta^{c2} + D_i (Age_i - 720)^3 \delta^{c3} + D_i (Age_i - 720)^4 \delta^{c4} + Z_i \beta^c + v_i^c$$

<sup>6</sup> Other policies are targeted at older unemployed workers, aged 55 and above, that are allowed not to search for jobs (“dispenses the recherches d’emploi”) or at employers, that have to pay some large penalty to be able to fire older workers, aged above 55 (“Contribution Delalande”).

<sup>7</sup> The pension benefits payable reach a maximum when individuals have cumulated a given contribution record (for example, 40 years of contributions in 1994 for people born in 1944 and working in the private sector). Once individuals have contributed enough to retire with maximum (full) pension benefits, their pension benefits will not increase if they retire later. Furthermore, periods of unemployment or sick leave, including maternity and parental leave, all lead to full (100 per cent coverage of) pension contribution records.

<sup>8</sup> See, for example, Blanchet and Pele (1997) for more details of the French pension system. In 2010, the legal early retirement age was set at 62 years, but this will become effective only in 2018.

<sup>9</sup> An application of regression discontinuity to the retirement decision is given in Stancanelli and van Soest (2012) who investigate the effect of partners’ retirement on time allocation and notably, house work.

$$2) R_i = \alpha^r + D_i \mu^r + D_i (\text{Age}_i - 720) \delta^r + D_i (\text{Age}_i - 720)^2 \delta^{r2} + D_i (\text{Age}_i - 720)^3 \delta^{r3} + D_i (\text{Age}_i - 720)^4 \delta^{r4} + (\text{Age}_i - 720) \gamma^r + (\text{Age}_i - 720)^2 \gamma^{r2} + (\text{Age}_i - 720)^3 \gamma^{r3} + (\text{Age}_i - 720)^4 \gamma^{r4} + Z_i \beta^r + v_i^r$$

Equation 1 is the outcome equation for divorcing (S) and equation 2 is the first stage equation for retirement in our Fuzzy Regression Discontinuity model. We specify a quartic flexible polynomial in age and test for the robustness of our estimates to using a different degree of the age polynomial. The threshold *720 months* corresponds to the minimum legal retirement age for most workers in France. We assume that the covariates other than age (denoted by *Z* here) are not discontinuous at age 60 (and we also test for this). The vector *Z* includes individual education dummies, the number of children still living at home, year (we cover a thirteen years period) and district (95 departments) fixed effects, the level of the district unemployment rate a year before the survey, the individual “sex-ratio”, which serves as a measure of tensions in the marriage market (see Section 3 for definitions). The errors *v* is assumed to be normally distributed. The two equations are estimated by two stages least squares. We also adjust the standard errors of the model as recommended in the related literature. Finally, we also run similar models for the outcomes of widowhood (placebo), marriage, or singlehood.

### 3. The data

The data for the analysis are drawn from the French Labour Force Surveys (LFS) 1990-2002. We use this sample cut for a number of reasons. First of all, these yearly surveys are highly comparable over time as they use the same questionnaire, the same data collection method (personal interviews at the respondent’s home) and the same sample design approach. The LFS series was broken in 2003 to comply with Eurostat requirements. The recent LFS surveys (as from 2003) are carried out quarterly and most of the interviews are done by telephone; and the questionnaire and the sample design have changed dramatically relative to the earlier 1990-2002 surveys. In addition, a reform of the length of the pension contribution period took place in 2003,<sup>10</sup> exactly at the time of the break in the LFS series, and divorce law was also reformed in 2004. Therefore, we select a sample of individuals from the 1990-2002 yearly LFS as follows:

1. Individuals reported as the main economic situation either employment or retirement at the interview date.

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<sup>10</sup> Also a substantial reform of survivor pensions took time in 2003, which is when the LFS surveys were also broken up.

2. Individuals were aged between 50 (or 600 months) and 70 (or 840 months) at the interview date to set ten year bounds on the two sides of the discontinuity at age 60 (or 720 months), which is the legal minimal retirement age for most workers in France.

This led to selecting, respectively, a main sample of 202 606 men and 166 162 women, that were either retirees or employees, and aged 50 to 70 years at the time of the survey. The LFS collects month and year of birth together with records of the day, month and year of the interview. Therefore, we construct an approximately continuous measure of age in days, on the day of the interview, assuming that individuals were born on the 15<sup>th</sup> day of the month. We also checked the robustness of the results to measuring age in months and results were not affected. The retirement status is subjectively assessed by the individual and measured on the interview date. In particular, the individual could choose among reporting that his/her main economic status was employment, or unemployment, in full-time education, a military, retirement or early retirement, being a housewife or other inactive. Marital status was also self-assessed and individuals were classified as married, cohabiting, single, divorced or widowed at the date of the interview. It follows that individuals that separated and were not (yet) formally divorced might classify themselves as any of these four possibilities, though it seems likely that they would report to be “divorced” rather than reporting to be still formally married or single and thus, we can think of our dependent (outcome) variable as encompassing either divorce or separation.

As far as the explanatory variables go, we also construct categorical dummies for the occupation of the father of the respondent (see Appendix for more details of the various occupations coded), which we expect to capture the effect of the individual socio-economic background and in particular, the type of household individual grew up in. We do not control for own occupation for a number of reasons. First of all, occupation may be endogenous as individual choose their occupation. Next, current occupation is obviously only recorded for individuals still at work while occupation in the last job is available for retirees but the code is slightly different than that for current occupation and moreover, individuals may have changed occupation over the life-cycle.

We also control for completed education dummies - the excluded group being individuals with college education. The most disaggregated area of residence or say district, available in the survey is the “department”. France is divided into 22 regions that are further subdivided into 95 districts (‘departments’) - without considering the overseas territories (French Guyana,

Guadeloupe, Martinique, Mayotte, Ile de la Reunion) that were not covered by these surveys. The level of the unemployment rate may affect the individual retirement probability as, for example, employers may encourage older workers to retire in recessionary times. Therefore, we construct a measure of the local unemployment rate, using the level of the departmental unemployment rate in the year before each survey was carried out. We also include district (“department”) fixed effects and year dummies. The latter which are meant to capture macroeconomic changes and notably the secular increase in female labour supply. Finally, we constructed a measure of tensions in the marriage market, the “sex-ratio”, defined as the ratio of the number of men born in the same year as the individual under consideration to the number of women born two years later, since the average age difference between older spouses in France at the time covered by this study was two years (see for example, Hans Bloemen and Elena Stancanelli, 2014, on younger French spouses, for whom the average age difference is also two years). We also test for the robustness of the estimates to including birth cohort dummies, defining 5 years birth intervals.

#### 4. Descriptive analysis

Sample descriptive statistics are shown in Table 1. About 5.5% of the men in the sample were divorced against almost 9 % of the women, on average. Marriage was much more common among older men (remember our sample includes individuals aged 50 to 70 years) than among older women: 85 per cent of the men were married against 68% of the women. In contrast, widowhood concerned more often women than men: 16.5% of the women in the sample against only 3% of the men. This is due to longer life expectancy for women and also possibly to the fact that older (widowhood) men are perhaps more likely to remarry than older (widowhood) women. The proportion of singles was only slightly larger in the older women’s sample (almost 6%) than in the older men’s sample (almost 5%). The average sex ratio for the individuals in the sample was almost 0.47, indicating that there were 0.47 men on average for each two-years-younger woman. The local unemployment rate at the time was high, equal on average to 9%. As far as retirement goes, 55% of the men and almost 57% of the women in the sample were retirees.

Divorces are more frequent among college graduates and increase proportionally with the individual education level: almost 7% of male college graduates in our sample were divorced against 4.5% of individuals with less than middle school (see Table 2). Women are generally more likely to remain divorced than men are, as they are less likely to remarry, and especially

so at older age. The differences are even more striking when divorcees are counted by the father's employment type (see Table 3), with older men whose father was a farmer being the least represented among divorcees (less than 2 per cent of them were divorced in 1990) and older men whose father was a secondary school or University teacher registering the highest number of divorces (9.3% of them were divorced in 1990). The trend is towards increasing divorce rates (as also shown in Figures 1 and 2) with soaring divorce rates of men whose father was a teacher, almost 14% of whom were divorced by 2002 against 5.6% of men whose father was a farmer (see Table 3).

Remarkably, over 30 per cent of the individuals in our older population sample had the same type of employment than their father, though the proportion of individuals holding the same employment type as their father is falling over time for both men and women (see Table 4). The correlation between the own and the father's employment fell over time but it was still very sizable throughout our sample period, averaging about 27 per cent for men and 31 per cent for women (see Table 4).

To gain more insights into the implications of stratifying the sample by father's employment state, we gather some descriptive information on marriage-match characteristics, consumption and time allocation of married individuals classified according to the father's employment sector (see Table 5). In particular, couples in which the father of the husband was a farmer appear to be slightly more fertile than others and the age difference between the husband and the wife is slightly larger than for other socio-economic backgrounds. The proportion of housewives in these couples is slightly lower than for other socio-economic background. In line with this, we also find that in current farmer couples, partners tend to enjoy fewer "pure" leisure hours than others -defining "pure" leisure as performing sports, socializing, reading, or watching television- and the husband contributes considerably less than the average to unpaid domestic work. This evidence tends to confirm that men in farmer household perform little domestic work and both spouses work harder on average than the average. Although, we only have a limited number of observations in each cell, which makes generalizations difficult to carry out, we compare total household consumption and wealth returns before and after retirement age for couples of farmers and couples with other employment types, to conclude that the drop in the returns from wealth upon retirement is not especially large for farmer households while the drop in consumption is smaller for farmer than for individuals in top occupations. This is in line with Nicolas Moreau and Elena Stancanelli (2014) who find no significant changes in total consumption upon spouses' retirement in France.

Finally, to verify that we can apply a regression discontinuity approach to our sample of older individuals, we applied a Mc Crary test (see Justin McCrary, 2008) to check the continuity of the running variable (age) on the two sides of the age cut-off at 720 months of age (age 60) and plot the Mc Crary DC density function to shows no discontinuity in age, as required for the approach in this study (see Figures 3A for the sample, and 3B for the subsample of individuals whose father was a farmer). Next, we investigated that the “Z” covariates are smooth on the two sides of the age cut-off (60 years or 720 months, since we measure age in months) and by compliance status (retirement here). We find that individuals with college education are somewhat less likely to retire at age 60 than individuals with lesser education - since the more educated are likely to have entered the labor market later and thus, have cumulated fewer pension contribution than the lesser educated (see Table 6, for men). We also repeat this exercise for men whose father was a farmer (see Table 7, again for men). We also test graphically that the covariates are smooth at age 60 by plotting predicted divorce rates by gender (predicted as a function of the Zs) against age (see Figure 6).

Then, as customary when applying a Regression Discontinuity approach, we present some exploratory graphical analysis of the retirement probability and the outcome variables as a function of the running variable (age) by bins of ten months of age for men and women (see Figures 4A, 4B, 4C and 4D, respectively) and also for the subsample of individuals whose father was a farmer (see Figures 5A, 5B, 5C and 5D). We detect large jumps in the retirement probability upon reaching age 60 (720 months) for both men and women in the main sample and in the subsample of individuals whose father was a farmer (see Figures 4A and 5B, respectively). Figure 5B also suggests an increase in divorce rates upon turning 60 (720 months here) for men and women whose father was a farmer. The evidence for the full sample of men and women is much less clear-cut (see Figure 4B). We find no detectable increase in the chances of widowhood upon turning 60 (see Figure 4D or 5D) while the patterns are complex for marriage (Figure 4C and Figure 5C, respectively), with a turning point slightly before age 60 for men and a steady decline for older women.

## 5. Results of estimation

We expect that retirement may have a possibly deterrent effect on marriage stability and especially so for individuals with more traditional allocation of time and gender roles. We have estimated two-stages-least-squares models of the effect of individual retirement (instrumented with a dummy for reaching legal retirement age, 720 months of age, and full

interactions of this dummy with a quartic age polynomial) on the individual chances to divorce. These models were estimated separately for men and women and for subsamples of individuals by own education level and by father's socio-economic state. We tested for the robustness of the estimates to using different degree of the age polynomials as well as including and excluding covariates and narrowing the sample age boundaries on the two sides of the age cutoff. Finally, we also estimated similar models for different marriage status outcomes including marriage, singlehood and widowhood (placebo).

First of all, we find that retirement increases sharply and strongly (significant at the 1% level) upon reaching age 60 (720 months) for both men and women (see Tables 8 and 9). The estimates of the increase in retirement upon reaching legal retirement age are robust to all specification checks and, equal to 0.19-0.23 for men and 0.22-0.29 for women. The effect of turning 60 years on the retirement probability remains strongly significant (at the one per cent statistical significance level) and is only slightly smaller in size when narrowing the sample bounds on the two sides of the age cut-off, restricting the sample to individuals aged, respectively, 52 to 68 years or 54 to 66 years (see Tables 8 and 9, Specifications 9 to 12). Thus, we are comforted that our identification strategy is valid.

We find no significant change in the probability to divorce for men, except when using a quadratic age polynomial (see Table 8, Specification 5, without covariates, and 6, including covariates). Under this specification, the chances to divorce increase significantly by 0.03 upon male retirement, which represents a large increase in divorce rates –the share of divorces in the sample is equal to 0.05 for men aged 59 to less than 60 years, close to the legal retirement age discontinuity. We find no effect of retirement on female divorce rates (see Table 9). However, when restricting attention to individuals whose father was a farmer, retirement is found to increase significantly divorce rates upon both male and female retirement (see Tables 10 and 11). In particular, the probability to break up increases by 0.045 to 0.11 upon male retirement and by 0.06 to 0.08 upon female retirement for individuals whose father was a farmer. These findings are robust to numerous specification checks such as using degree of the age polynomial or narrowing the sample bounds on the two sides of the age discontinuity or dropping individuals that are age 60 from the sample (see the bottom blocks of results in Tables 10 and 11, respectively). They are also robust to including birth cohort dummies grouped into five years intervals or to observations dropping the early nineties Labor Force Surveys or from the 2000s (see Table 12).

In contrast, retirement does not affect divorce rates of individuals with other social-economic background (see Table 13), except for women issued the families in which the father was a blue collar (manual worker in factories or rural worker) for whom divorce rates drop significantly at retirement. Splitting the sample by education level, we do not find any significant effect of male retirement on divorce rates (see Table 14), except for female retirement that reduces significantly the chances to divorce for women that have completed middle education. These women may overlap with those issued from a family with a blue collar father. This finding could perhaps be explained by the type of men these women marry that might on average more educated and wealthier and perhaps more involved in domestic work, something we cannot test with the data to hand.

Finally, we find no significant effect of retirement on either marriage or widowhood or singlehood, as expected (see Table 15). Table 16A and Table 16B present the full-sets of results for the sample and the subsample of individuals whose father was a farmer. Interestingly, the presence of children reduces significantly the chances of marriage break up for all sample cuts.

## Conclusions

This paper studies the effect of individual retirement on divorce, an issue which has received no attention in the economic literature to date. Retirement may upset marital stability as it represents a dramatic change in individual time allocation that may undermine gender identity and traditional gender roles in the household. Moreover, by the time of retirement, children that often hold the couple together are likely to have left home. Since individuals start planning their divorce well in advance -also to comply with advance notice requirements to employers and social security offices- the actual time of divorce may be the last drop that spills over the (marriage) cup.

Because the individual decision to retire from work may not be independently determined from marriage (in)stability –for example, individuals that expect to divorce may retire earlier or later than others- we exploit legal retirement age in France to identify the effect of male and female retirement on the individual probability to divorce. Using data drawn from the French Labor Force Surveys on sample of over 200 000 men and over 166 000 women aged 50 to 70 years, we conclude that the probability to retire increases significantly when individuals turn into legal retirement age, which support our identification approach. We find that the probability to divorce upon retirement increases significantly for individuals that grew

up in a farmer household. Indeed, individuals that grew up in more traditional family environment may see their marital life particularly proven at the time of retirement, since they have been exposed during youth to stronger gender roles and gender specialization in household tasks, which implies that they may have more difficulties to adjust to the dramatic change in time allocation at retirement, when work at the office is over and individuals are “forced” to reallocate their time between leisure and house work. This is especially true in the French context of highly regulated retirement age.

Our findings are robust to various specification checks. In particular, the probability of marriage breaks up increases by 0.045 to 0.11 upon male retirement and by 0.06 to 0.08 upon female retirement for individuals whose father was a farmer. These represent an almost doubling of the probability to divorce for these individuals upon retirement. Finally, there is no effect of retirement on (re)marriage. (Re)-marriage prospects start falling for men before the actual time of retirement and are thinner all the way through for older women. We also conclude that retirement has no effect on singlehood or widowhood, which serves as a placebo test.

Although farms have been steadily disappearing over time, France still counted 515 000 farms in 2010, which represent 4.3% of the 12 million European Union farms while in the USA there were over 2 million farms at about the same time. It follows that the implications of our analysis may concern a non-negligible fraction of households. Traditional gender roles are not the resort of men only but they can also be internalized by women and more generally, by both spouses. Earlier literature, analyzing the determinants of the secular right of female labor force in the USA, find that women married to a man whose mother worked are more likely to participate in the labor force. Here, we find that both men and women who grew up in a farmer household are more likely to experience marriage instability at the time of transiting into retirement and this finding is robust to various sensitivity checks.

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Figure 1. Divorced persons by year of the divorce and age of the divorcee.  
 (As a proportion of the married population by gender in the same year).  
 Source. French Ministry of Justice.

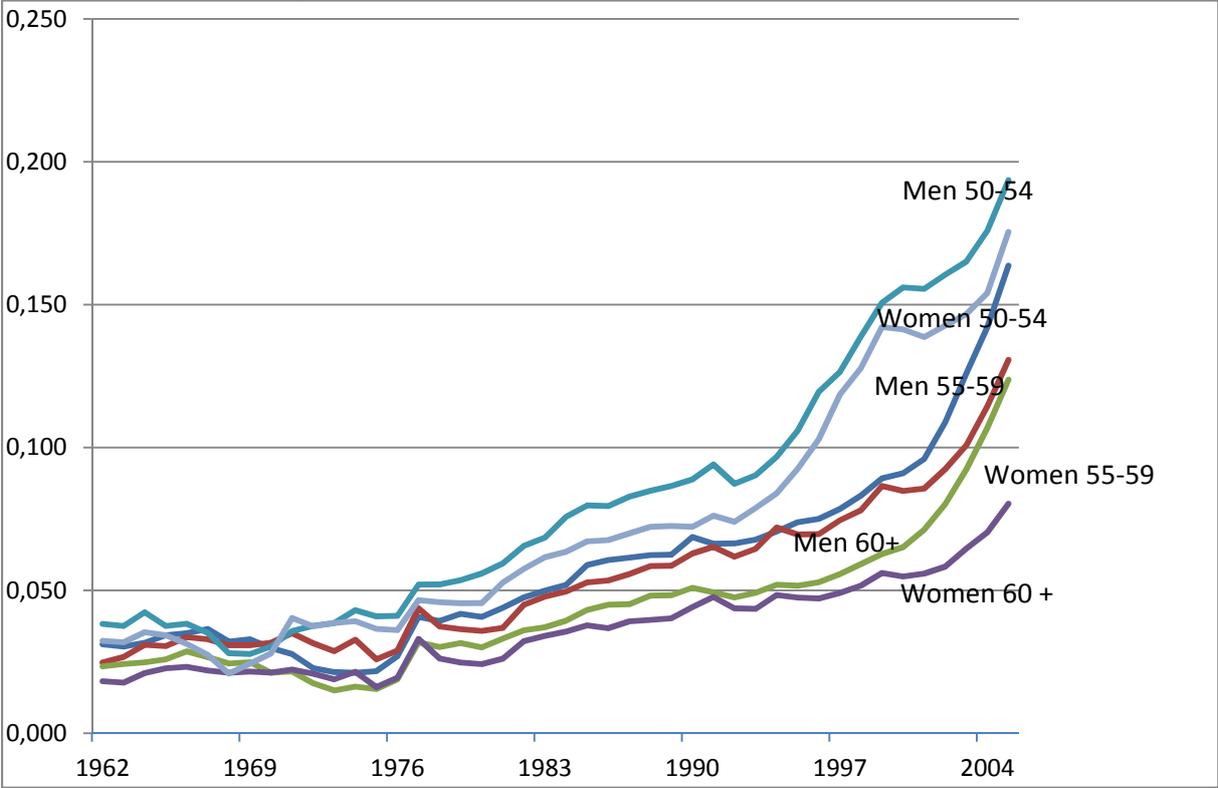
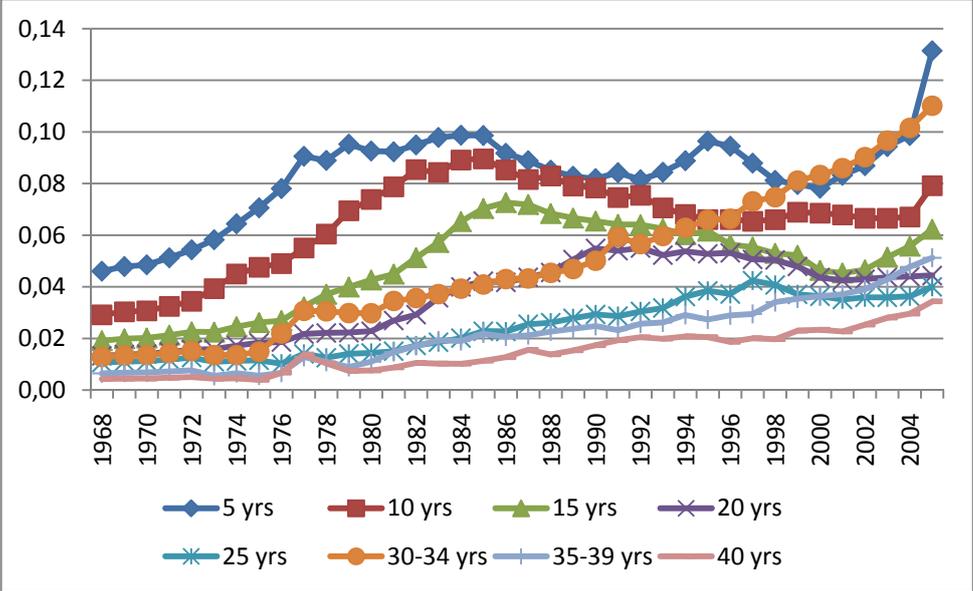


Figure 2. Divorced persons by year of the divorce and duration of the marriage (as a percentage of the married population in the same year)  
 Source. French Ministry of Justice.



**Table 1. Sample descriptives.**

	<i>Sample of Men</i>		<i>Sample of Women</i>	
	Mean	Std. Dev.	Mean	Std. Dev.
Divorced	0.055	0.227	0.089	0.284
Married	0.852	0.354	0.681	0.466
Cohabitant	0.034	0.182	0.031	0.173
Single	0.047	0.213	0.057	0.232
Widow	0.034	0.181	0.165	0.371
Retired	0.552	0.497	0.568	0.495
aged >=720 months	0.505	0.497	0.553	0.497
junior college	0.037	0.19	0.061	0.239
high school	0.078	0.269	0.073	0.260
middle school technical	0.225	0.418	0.155	0.362
middle school	0.051	0.221	0.083	0.276
less than middle school	0.520	0.499	0.582	0.493
local U rate	9.361	2.429	9.307	2.381
sex-ratio in birth year	0.469	0.016	0.469	0.017
<i>Observations</i>	<i>202 606</i>		<i>166 162</i>	

Note: The reference category for the completed education dummies is having a college degree. The sex ratio is the proportion of men born in the individual year of birth over the proportion of women born two years later (as the average age difference between partners is two years in France at the time covered by the survey).

Table 2.		Divorcees by education level and gender.				
	<b>Men</b>			<b>Women</b>		
	Mean	St. Deviation	Obs. no.	Mean	St. Deviation	Obs. no.
College (University)	<i>0.068</i>	0.252	17520	<i>0.145</i>	0.352	7686
junior college	<i>0.080</i>	0.271	7680	<i>0.134</i>	0.341	10144
high school	<i>0.074</i>	0.262	15884	<i>0.125</i>	0.331	12134
middle school technical	<i>0.059</i>	0.236	45679	<i>0.101</i>	0.302	25682
middle school	<i>0.065</i>	0.247	10464	<i>0.105</i>	0.307	13763
less than middle school	<i>0.045</i>	0.207	105379	<i>0.070</i>	0.254	96498

Table 3 . Divorcees by respondent 's father occupation

	1990				2002			
	Mean	St. Dev.	Obs.	Percentage	Mean	St. Dev.	Obs.	Percentage
Farmers	<b>0.018</b>	0.134	3642	24.63	<b>0.056</b>	0.229	3369	20.84
Craftmen	<b>0.034</b>	0.180	1246	8.43	<b>0.060</b>	0.238	1141	7.06
shop keepers	<b>0.043</b>	0.204	778	5.26	<b>0.090</b>	0.287	708	4.38
Business owners of >=10 persons	<b>0.104</b>	0.307	134	0.90	<b>0.088</b>	0.284	171	1.06
Lawyers, consultants	<b>0.034</b>	0.182	118	0.80	<b>0.074</b>	0.263	175	1.08
Public sector managers	<b>0.050</b>	0.219	219	1.48	<b>0.083</b>	0.276	277	1.71
Teachers above primary school	<b>0.093</b>	0.294	43	0.29	<b>0.138</b>	0.348	58	0.36
IT, Web, artists	<b>0.067</b>	0.254	30	0.20	<b>0.086</b>	0.284	35	0.22
firm managers	<b>0.041</b>	0.199	170	1.15	<b>0.096</b>	0.296	228	1.41
firm ingeneers and tech	<b>0.065</b>	0.248	138	0.93	<b>0.067</b>	0.250	195	1.21
primary school teachers	<b>0.023</b>	0.152	86	0.58	<b>0.077</b>	0.267	208	1.29
health and welfare workers	<b>0.049</b>	0.218	41	0.28	<b>0.088</b>	0.285	57	0.35
Public sector supervisors	<b>0.030</b>	0.173	131	0.88	<b>0.086</b>	0.281	163	1.01
private sector supervisors	<b>0.047</b>	0.211	257	1.74	<b>0.091</b>	0.287	298	1.84
technical workers	<b>0.038</b>	0.194	52	0.35	<b>0.095</b>	0.295	105	0.65
supervisors manufacture	<b>0.046</b>	0.211	304	2.05	<b>0.063</b>	0.244	347	2.15
public sector workers	<b>0.032</b>	0.175	411	2.78	<b>0.076</b>	0.266	509	3.15
military forces	<b>0.024</b>	0.153	335	2.26	<b>0.097</b>	0.296	576	3.56
firm administrative workers	<b>0.039</b>	0.193	618	4.18	<b>0.080</b>	0.272	833	5.15
sale assistants	<b>0.026</b>	0.161	76	0.51	<b>0.059</b>	0.238	84	0.52
help sector workers	<b>0.053</b>	0.224	171	1.15	<b>0.081</b>	0.273	173	1.07
skilled workers manufacture	<b>0.029</b>	0.167	1075	7.27	<b>0.082</b>	0.275	1177	7.28
skilled workers craftmen	<b>0.034</b>	0.182	991	6.70	<b>0.078</b>	0.269	1200	7.42
drivers	<b>0.050</b>	0.220	237	1.60	<b>0.087</b>	0.282	357	2.21
transport and storage workers	<b>0.030</b>	0.172	264	1.78	<b>0.084</b>	0.277	251	1.55
unskilled firm workers	<b>0.031</b>	0.174	1415	9.57	<b>0.076</b>	0.265	2006	12.41
unskilled craf worker	<b>0.20</b>	0.140	202	1.36	<b>0.143</b>	0.352	84	0.52
rural workers	<b>0.026</b>	0.161	942	6.37	<b>0.059</b>	0.236	925	5.72
Missing	<b>0.032</b>	0.175	662	4.48	<b>0.096</b>	0.294	459	2.84
			14788	100			16169	100

Table 4 . Raw correlation between individual occupation and their father's occupation.

	Men's main sample			Women's main sample		
	Father's job					
	1990	1996	2002	1990	1996	2002
Last job occupied	0.3685	0.3321	0.2678	0.3948	0.3765	0.3193

**Table 5. Descriptive information on spouses, consumption and time allocation from other data sources.****Labor force surveys 1990-2002: sample of married couples in which the husband was aged 45 to 55 years.**

	<b>Father farmer</b>	<b>Father top occupation</b>	<b>Father white collar</b>	<b>Father blue collar</b>	<b>Sample</b>
Wife is a housewife	0.238 (0.426)	0.255 (0.436)	0.22 (0.41)	0.258 (0.437)	0.245 (0.432)
Children at home number	1.57 (1.41)	1.44 (1.22)	1.30 (1.12)	1.35 (1.22)	1.41 (1.26)
Contractual hours husband	44.12 (12.02)	44.91 (11.68)	41.22 (9.65)	40.35 (8.09)	41.93 (10.09)
Contractual hours wife	34.67 (13.38)	34.46 (12.14)	34.60 (10.90)	33.84 (11.45)	34.30 (11.86)
Husband' age minus wife's	3.12 (4.12)	2.65 (4.37)	2.51 (4.25)	2.60 (4.23)	2.71 (4.28)
He less educated than she	0.13 (0.34)	0.11 (0.31)	0.12 (0.33)	0.125 (0.330)	0.120 (0.325)
She less educated than him	0.21 (0.41)	0.18 (0.39)	0.22 (0.41)	0.24 (0.43)	0.219 (0.414)
Wife same father's background	8.66%	1.98%	0.45%	1.26	12.35%
Observations	20077	21020	23054	41542	110096
%	18.25%	19.09%	20.94%	37.73%	100

**French consumption survey 2000-2001 : sample of married couples in which the husband was aged 45 to 55 years.**

	<b>Husband farmer</b>	<b>Husband top occupations</b>	<b>Husband White collar</b>	<b>Husband blue collar</b>	<b>Sample</b>
Expenditure, Euro year	3220	4812	3909	2869	1516
Wealth revenue, Euro year	3824	2304	1442	518	3807
Observations	61	420	467	456	1418
%	4.3%	29.7%	32.9%	32.2%	100%

**French consumption survey 2000-2001 : sample of married couples in which the husband was aged 60 to 70 years**

	<b>Husband farmer</b>	<b>Husband top occupations</b>	<b>Husband White collar</b>	<b>Husband blue collar</b>	<b>Sample</b>
Expenditure, Euro year	2177	2989	-	2709	2541
Wealth revenue, Euro year	3122	6862	-	670	2634
Observations	79	118	6	361	882
%	8.9%	13.38%	-	40.93%	100%

**French Time Use Survey 1998-99: sample of working age couples with both partners aged between 20 and 59 years.**

	<b>Husband farmer</b>	<b>Husband top occupations</b>	<b>Husband White collar</b>	<b>Husband blue collar</b>	<b>Sample</b>	<b>Wife Farmer</b>
His house work hours	3.52 (5.89)	9.06 (11.28)	12.07 (12.30)	12.16 (12.23)	10.99 (12.00)	6.45 (11.60)
Her house work hours	26.32 (12.94)	13.63 (14.85)	23.96 (14.57)	26.57 (13.93)	24.88 (14.42)	28.48 (12.16)
His Leisure hours	12.24 (12.64)	15.32 (11.94)	19.02 (13.06)	19.67 (13.39)	18.00 (13.02)	10.18 (11.67)
Her leisure hours	11.65 (9.77)	14.67 (10.17)	15.97 (10.60)	16.44 (10.87)	15.64 (10.60)	8.74 (8.62)
Observations	98	812	955	1052	2919	51
%	3.36%	27.82%	32.72%	36.04%	100%	1.75%

Source : author's calculations from the raw survey data as specified above. Unweighted statistics.

<b>Table 6</b>	<b>Sample descriptives by retirement status on the two sides of the age discontinuity. Men.</b>							
	<b>Not Retired &amp; Aged&lt;60</b>		<b>Not Retired &amp; Aged&gt;=60</b>		<b>Retired &amp; Aged&lt;60</b>		<b>Retired &amp; Aged&gt;=60</b>	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
<b>Divorce</b>	0.068	0.252	0.052	0.223	0.061	0.239	0.042	0.200
<b>married</b>	0.857	0.350	0.814	0.389	0.860	0.347	0.850	0.357
<b>Single</b>	0.044	0.205	0.093	0.290	0.047	0.213	0.048	0.215
<b>Widow</b>	0.015	0.123	0.029	0.169	0.040	0.197	0.051	0.221
<b>junior college</b>	0.052	0.223	0.048	0.213	0.041	0.199	0.023	0.152
<b>high school</b>	0.091	0.287	0.095	0.294	0.084	0.277	0.065	0.247
<b>middle tech</b>	0.282	0.450	0.119	0.324	0.274	0.446	0.175	0.379
<b>middle school</b>	0.054	0.227	0.043	0.203	0.063	0.243	0.047	0.213
<b>&lt; middle school</b>	0.399	0.489	0.432	0.495	0.503	0.500	0.635	0.481
<b>Children home</b>	0.851	1.121	0.462	0.907	0.469	0.932	0.221	0.625
<b>local U Rate</b>	9.240	2.427	9.239	2.369	9.519	2.429	9.445	2.429
<b>sex-ratio</b>	0.482	0.011	0.462	0.013	0.475	0.011	0.458	0.013
<b>Obs.</b>	<b>84 351</b>		<b>6520</b>		<b>16140</b>		<b>95 920</b>	

Note: The reference category for the completed education dummies is a college degree. The sex ratio is the proportion of men in the year of birth over the proportion of women born two years later (as the average age difference between partners is two years in France).

**Table 7. Sample descriptives by retirement status on the two sides of the age discontinuity.**

**Male sample. Men whose father was a farmer.**

	Not Retired & Aged<60		Not Retired & Aged>=60		Retired & Aged<60		Retired & Aged>=60	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
<b>divorce</b>	0.040	0.196	0.029	0.168	0.035	0.185	0.028	0.165
<b>married</b>	0.867	0.339	0.758	0.428	0.868	0.338	0.843	0.364
<b>single</b>	0.065	0.246	0.168	0.374	0.059	0.236	0.076	0.266
<b>widow</b>	0.015	0.122	0.033	0.179	0.025	0.157	0.046	0.210
<b>children at home</b>	0.960	1.253	0.559	1.038	0.580	1.164	0.269	0.702
<b>junior college</b>	0.024	0.155	0.018	0.133	0.024	0.154	0.009	0.096
<b>high school</b>	0.052	0.221	0.040	0.196	0.042	0.201	0.024	0.152
<b>middle tech</b>	0.261	0.439	0.092	0.289	0.176	0.381	0.095	0.294
<b>middle school</b>	0.036	0.186	0.030	0.170	0.042	0.200	0.022	0.147
<b>&lt; middle school</b>	0.588	0.492	0.741	0.438	0.704	0.456	0.834	0.372
<b>local U Rate</b>	8.951	2.195	9.034	2.248	9.068	2.082	9.055	2.132
<b>sex-ratio</b>	0.481	0.011	0.461	0.012	0.474	0.011	0.458	0.013
<b>Obs.</b>	17 958		1547		3019		23 689	

Note: The reference category for the completed education dummies is a college degree. The sex ratio is the proportion of men in the year of birth over the proportion of women born two years later (as the average age difference between partners is two years in France).

Figure 3 A. McCrary density distribution of the running variable (age)

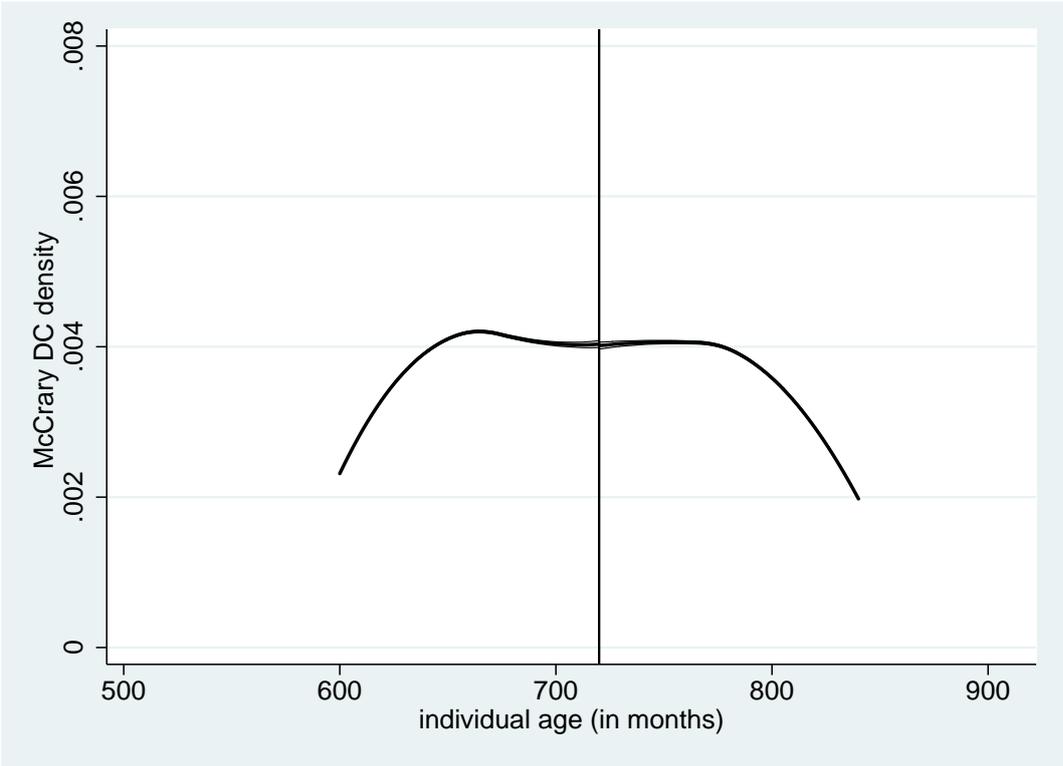


Figure 3 B. McCrary density distribution of the running variable (age).  
Subsample of individuals whose father was a farmer.

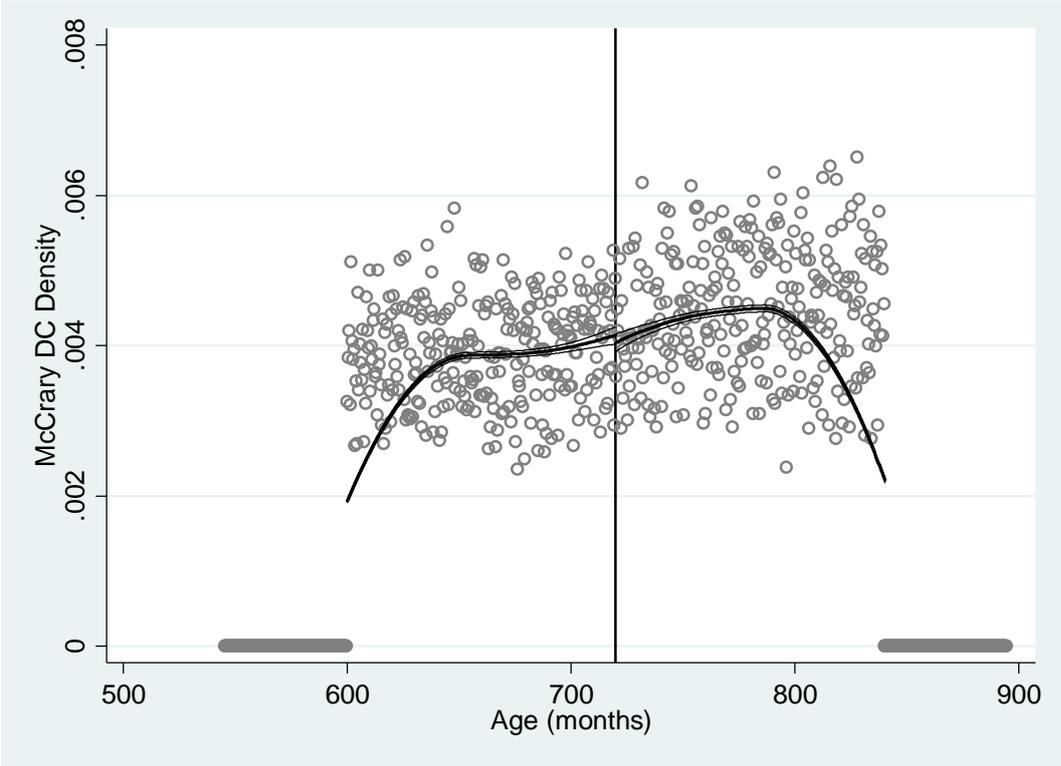


Figure 4A. Individual retirement probability: means by bins of ten months of age.

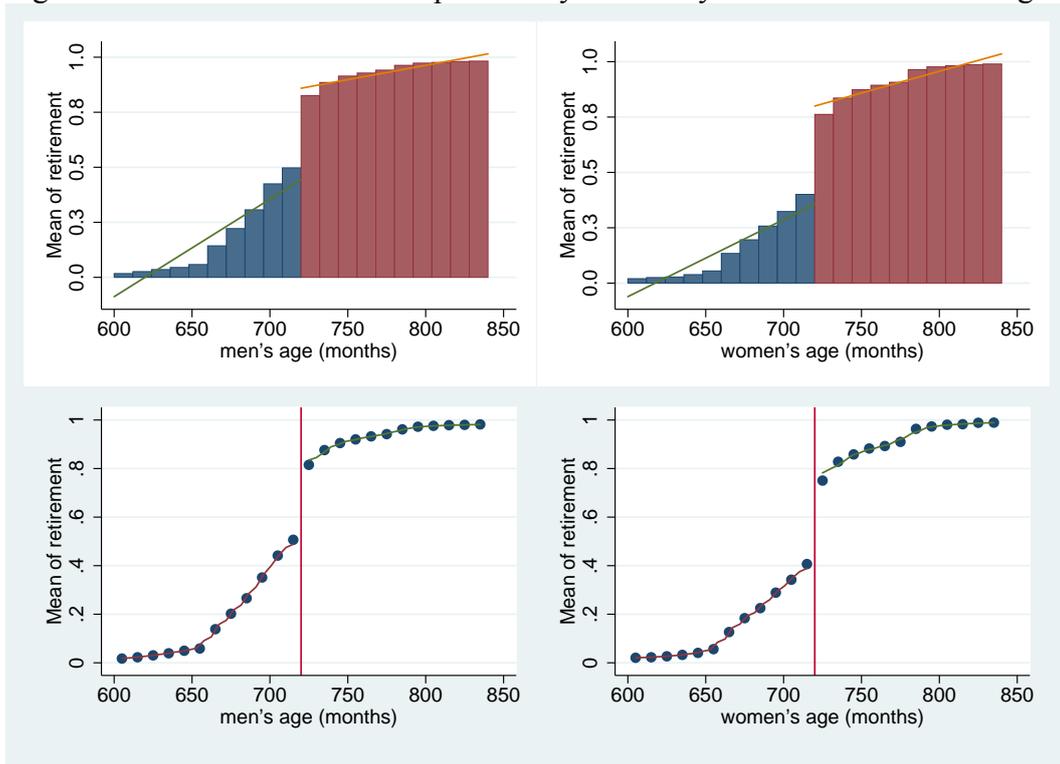


Figure 4B. Divorce rates (outcome variable): means by bins of ten months of age.

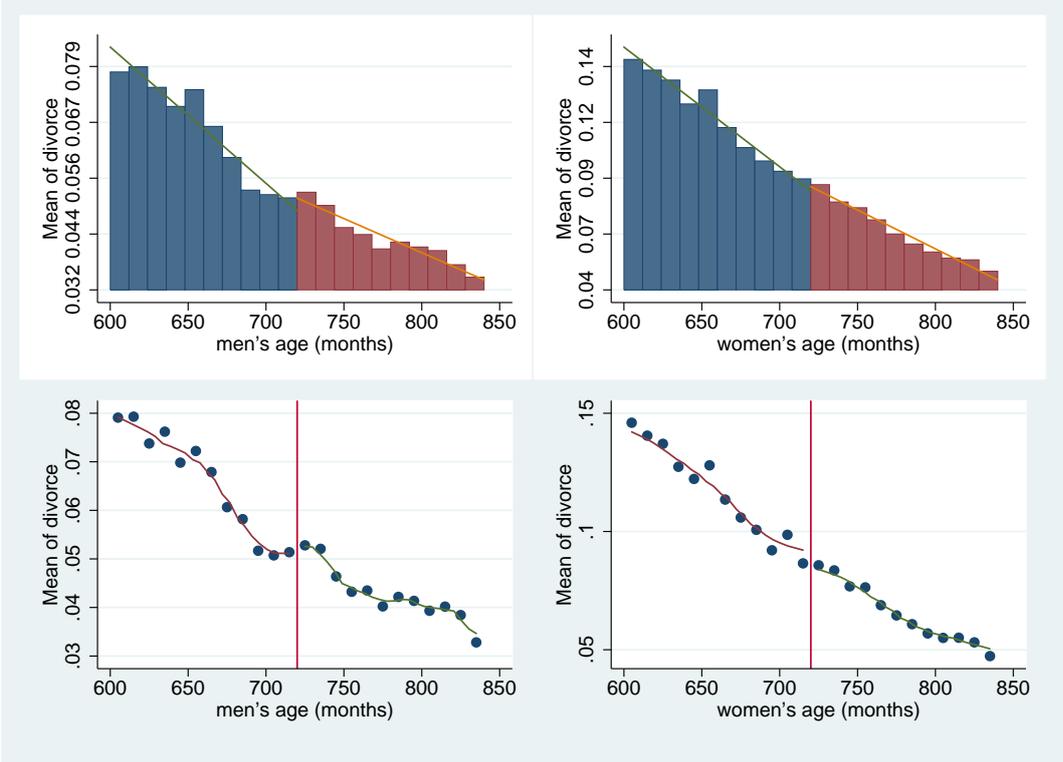


Figure 4C. Marriage rates (outcome variable): means by bins of ten months of age.

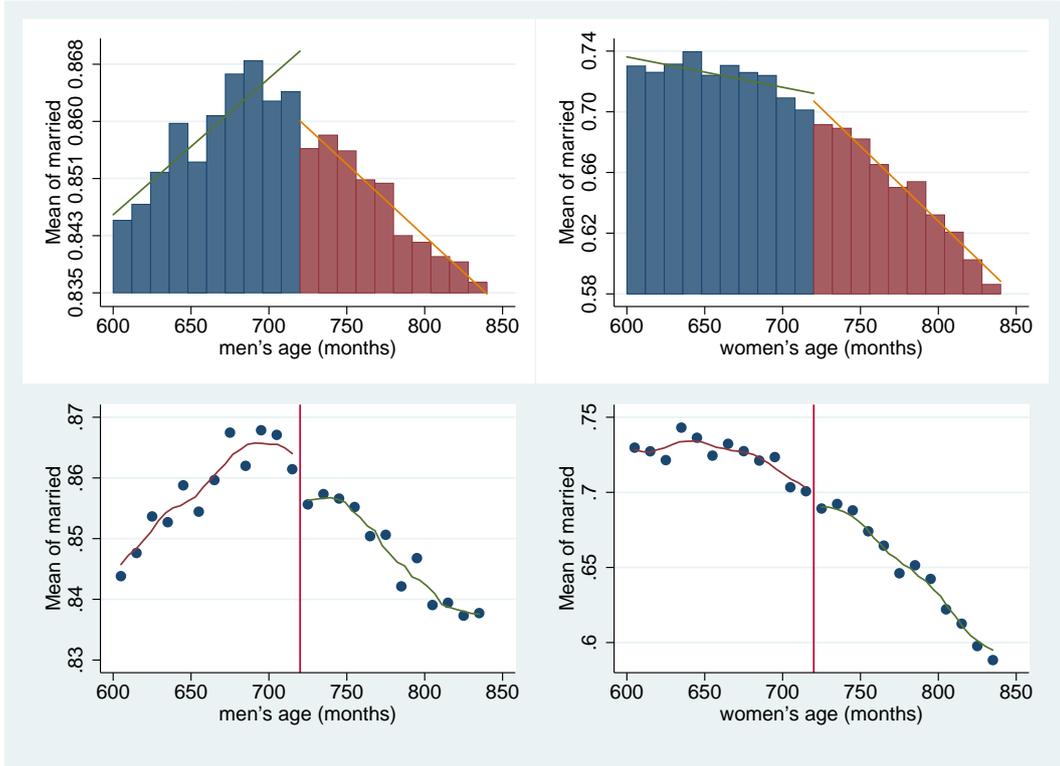


Figure 4D. Widowhood rates: means by bins of ten months of age.

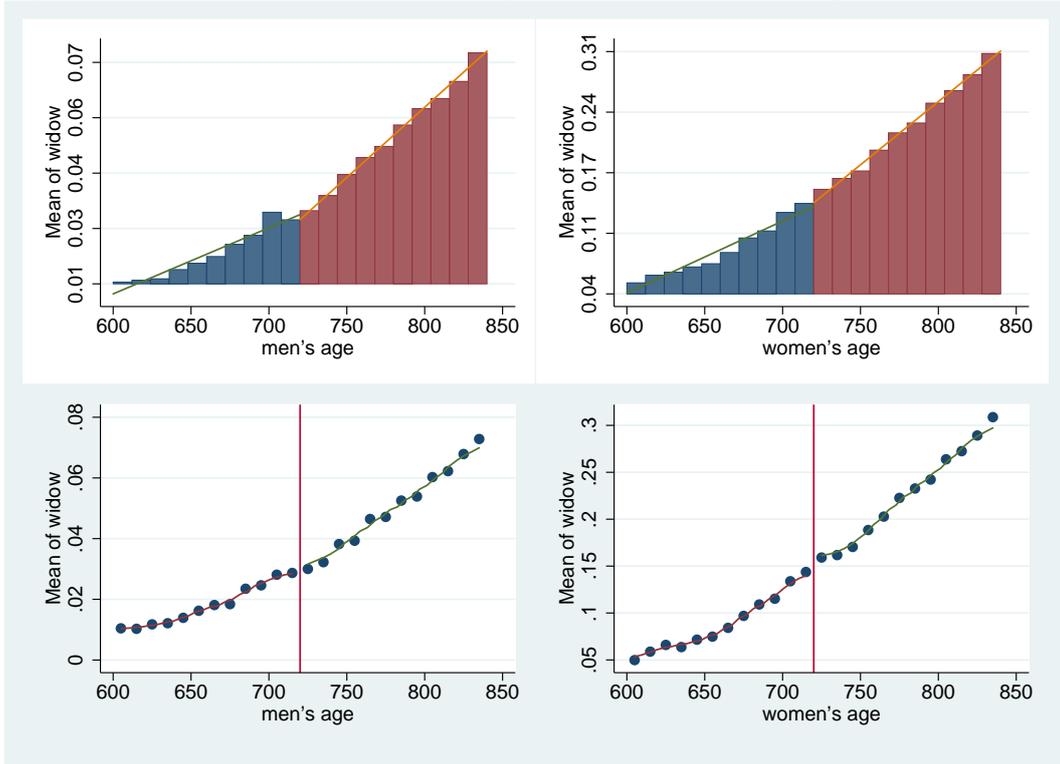


Figure 5 A. Means of retirement by age (bins of ten months).  
Subsamples of men and women whose father was a farmer.

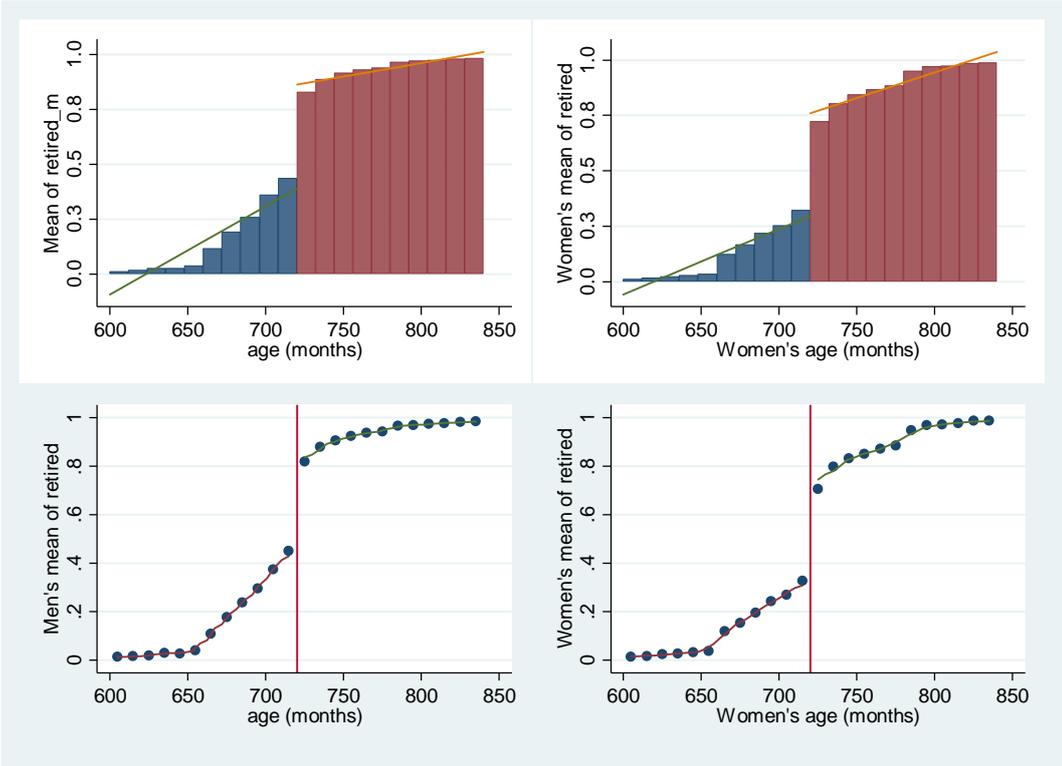


Figure 5 B. Means of divorce by age (bins of ten months).  
Subsamples of men and women whose father was a farmer.

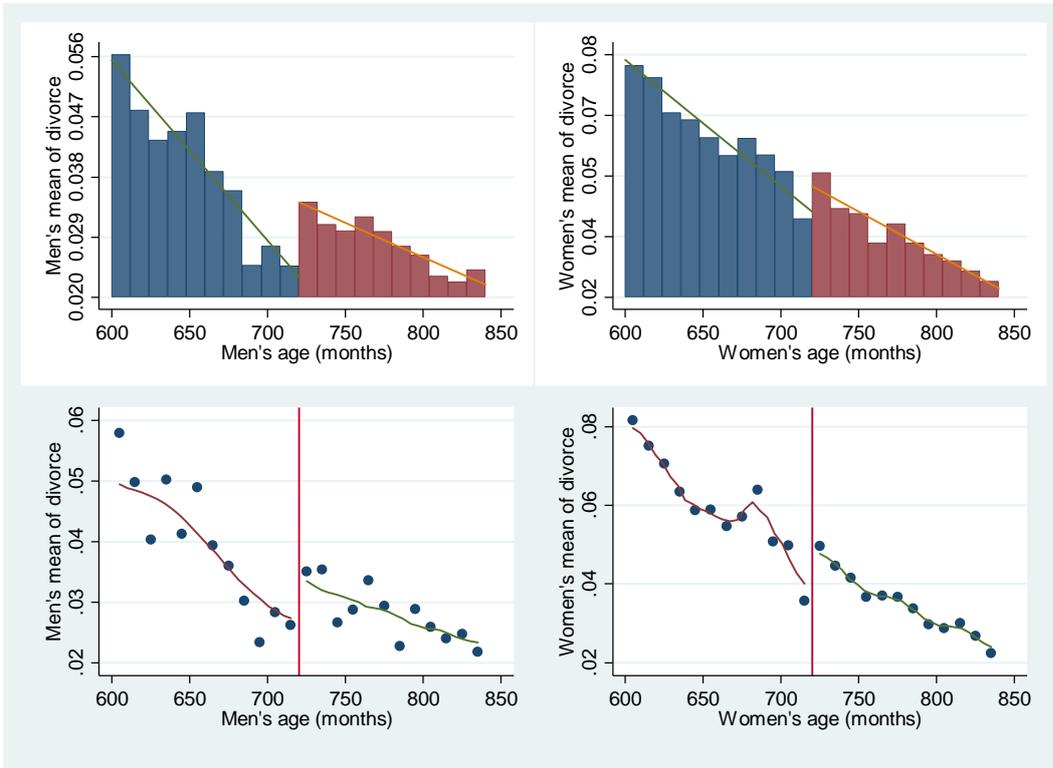


Figure 5 C. Means of marriage by age (bins of ten months).  
 Subsamples of men and women whose father was a farmer.

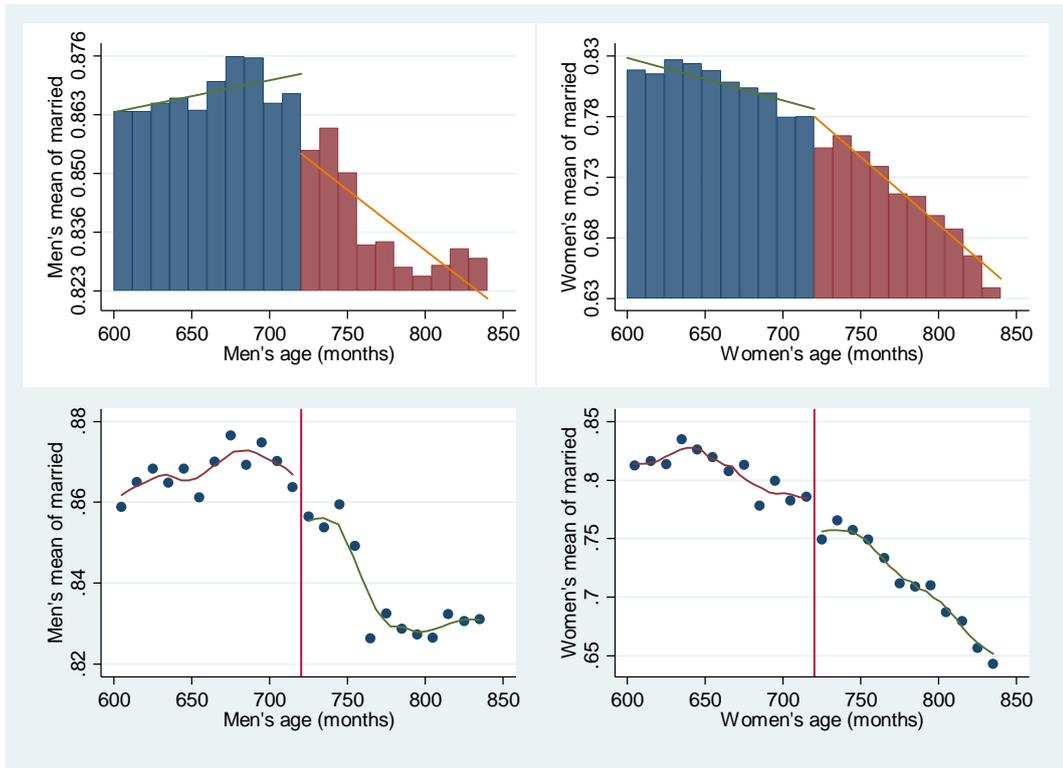


Figure 5 D. Means of widowhood by age (bins of ten months).  
Subsamples of men and women whose father was a farmer.

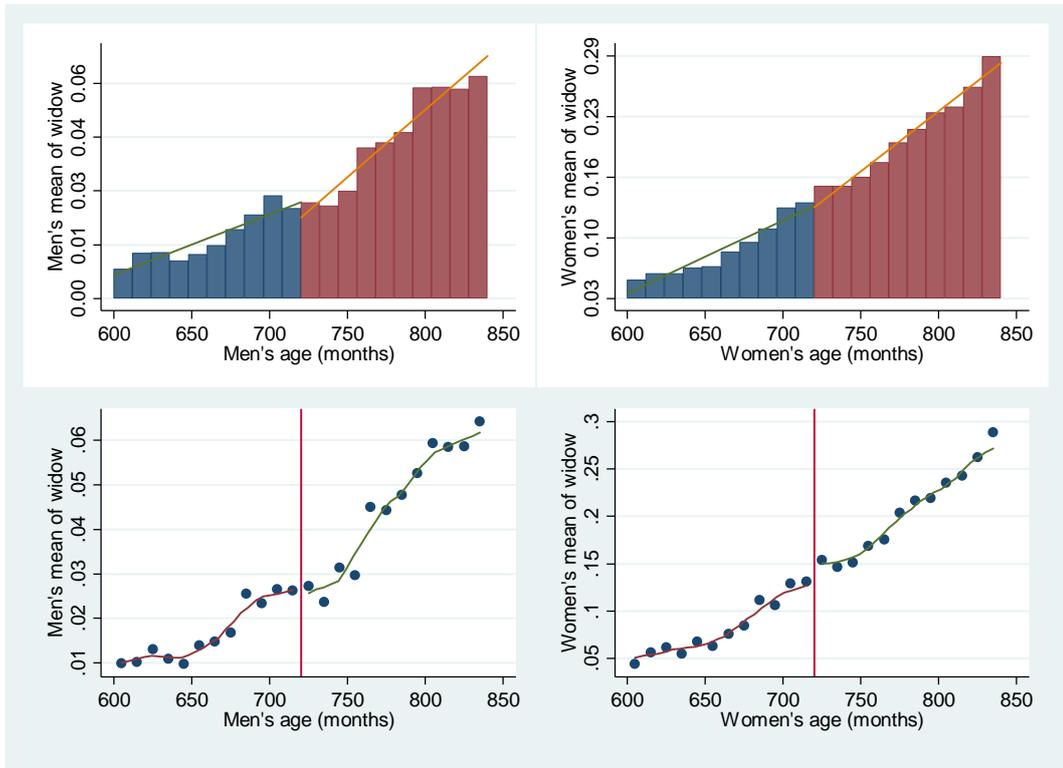


Figure 6. Predicted divorce rates as a function of the Z's: means by bins of ten months of age.

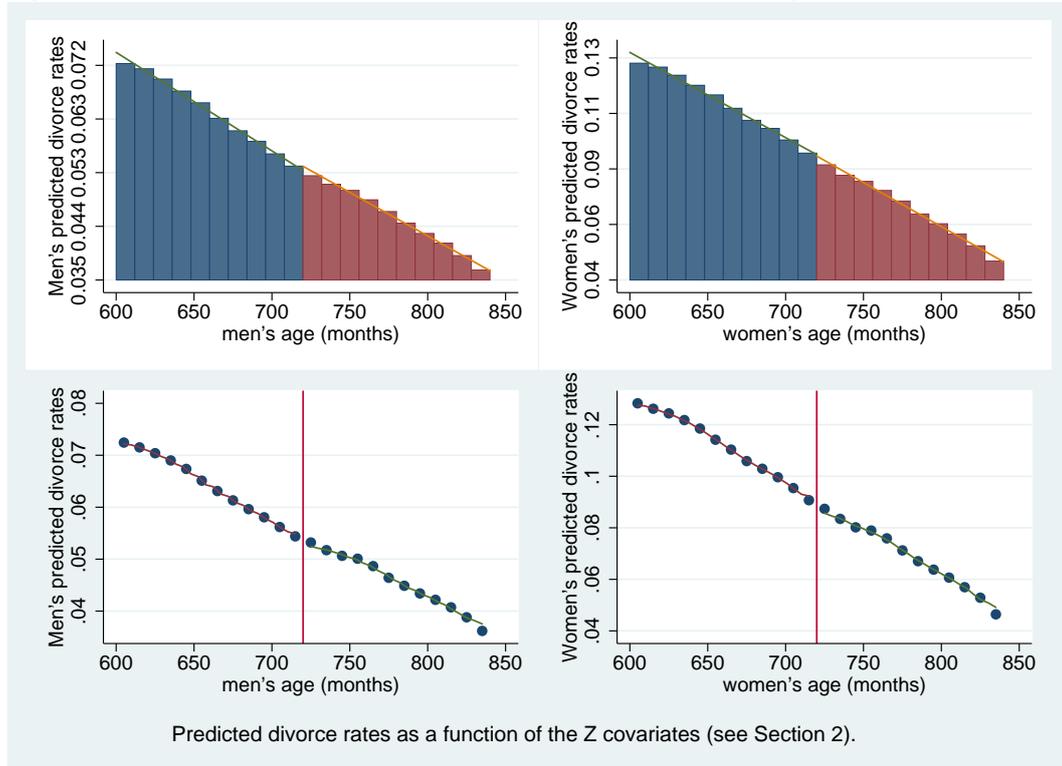


Table 8. Results of estimation for men.  
(Selected coefficient estimates, standard errors in brackets).

Men	(1)	(2)	(3)	(4)	(5)	(6)
	<b>IV, First stage equation for retirement</b>					
<i>Mean retirement, age 59 to &lt; 60</i>	0.496	0.496	0.496	0.496	0.496	0.496
<b>Age 60 and above coefficient</b>	0.236*** (0.010)	0.234*** (0.010)	0.223*** (0.008)	0.221*** (0.008)	0.236*** (0.006)	0.234*** (0.005)
	<b>IV, Outcome variable: divorce rate</b>					
<i>Mean divorce, age 59 to &lt; 60</i>	0.051	0.051	0.051	0.051	0.051	0.051
<b>Retirement coefficient</b>	0.008 (0.021)	0.014 (0.021)	0.028 (0.018)	0.034* (0.018)	0.033** (0.013)	0.035** (0.013)
<b>Including Zs</b>	NO	YES	NO	YES	NO	YES
<b>Quartic Age polynomial</b>	YES	YES	NO	NO	NO	NO
<b>Cubic age polynomial</b>	NO	NO	YES	YES	NO	NO
<b>Quadratic Age polynomial</b>	NO	NO	NO	NO	YES	YES
Observations number	202931	202606	202931	202606	202931	202606
Men	(7)	(8)	(9)	(10)	(11)	(12)
	<b>IV, First stage equation for retirement</b>					
<i>Mean retirement, age 59 to &lt; 60</i>	0.496	0.496	0.496	0.496	0.496	0.496
<b>Age 60 and above coefficient</b>	0.215*** (0.011)	0.214*** (0.011)	0.193*** (0.013)	0.193*** (0.013)	0.238*** (0.010)	0.236*** (0.010)
	<b>IV, Outcome variable: divorce rate</b>					
<i>Mean divorce, age 59 to &lt; 60</i>	0.051	0.051	0.051	0.051	0.051	0.051
<b>Retirement coefficient</b>	-0.0010 (0.026)	0.006 (0.026)	-0.002 (0.033)	0.005 (0.033)	0.010 (0.021)	0.015 (0.021)
<b>Including Zs</b>	NO	YES	NO	YES	NO	YES
Dropping those aged 720 months	NO	NO	NO	NO	YES	YES
Sample age 52 to 68 years	YES	YES	NO	NO	NO	NO
Sample age 54 to 66 years	NO	NO	YES	YES	NO	NO
Observations number	159676	159411	117776	117566	202886	202561
<p>The IV model is estimated by two stages least squares with robust standard errors. The first stage regressors include a dummy for being aged 720 months and above, a polynomial in age, and full interactions of the two. The outcome equation includes a polynomial in age, and full interactions with the dummy for being aged 720 months and above. The Z variables include year and district (department) fixed effects, the individual sex ratio, the local unemployment rate a year before the survey, education dummies, and number of children still living at home. Note: *** denotes statistical significance at the 1% level; ** at the 5 % level and * at the 10 % level.</p>						

Table 9. Results of estimation for women.  
(Selected coefficient estimates, standard errors in brackets).

Women.	(1)	(2)	(3)	(4)	(5)	(6)
	<b>IV, First stage equation for retirement</b>					
<i>Mean retirement, age 59 to &lt; 60</i>	0.401	0.401	0.401	0.401	0.401	0.401
<b>Age 60 and above coefficient</b>	0.293*** (0.012)	0.293*** (0.012)	0.294*** (0.009)	0.294*** (0.009)	0.284*** (0.007)	0.284*** (0.007)
	<b>IV, Outcome variable: divorce rate</b>					
<i>Mean divorce, age 59 to &lt; 60</i>	0.090	0.090	0.090	0.090	0.090	0.090
<b>Retirement coefficient</b>	-0.020 (0.026)	-0.018 (0.025)	0.003 (0.020)	0.009 (0.020)	0.018 (0.016)	0.023 (0.016)
<b>Including Zs</b>	NO	YES	NO	YES	NO	YES
<b>Quartic Age polynomial</b>	YES	YES	NO	NO	NO	NO
<b>Cubic age polynomial</b>	NO	NO	YES	YES	NO	NO
<b>Quadratic Age polynomial</b>	NO	NO	NO	NO	YES	YES
Observations number	166162	165907	166162	165907	166162	165907
Women	(7)	(8)	(9)	(10)	(11)	(12)
	<b>IV, First stage equation for retirement</b>					
<i>Mean retirement, age 59 to &lt; 60</i>	0.401	0.401	0.401	0.401	0.401	0.401
<b>Age 60 and above coefficient</b>	0.254*** (0.014)	0.255*** (0.013)	0.229*** (0.016)	0.231*** (0.016)	0.298*** (0.012)	0.298*** (0.012)
	<b>IV, Outcome variable: divorce rate</b>					
<i>Mean divorce, age 59 to &lt; 60</i>	0.090	0.090	0.090	0.090	0.090	0.090
<b>Retirement coefficient</b>	-0.030 (0.033)	-0.031 (0.033)	-0.012 (0.043)	-0.019 (0.042)	-0.018 (0.026)	-0.016 (0.025)
<b>Including Zs</b>	NO	YES	NO	YES	NO	YES
Dropping those aged 720 months	NO	NO	NO	NO	YES	YES
Sample age 52 to 68 years	YES	YES	NO	NO	NO	NO
Sample age 54 to 66 years	NO	NO	YES	YES	NO	NO
Observations	128174	127976	91828	91690	166129	165874
The IV model is estimated by two stages least squares with robust standard errors. The first stage regressors include a dummy for being aged 720 months and above, a polynomial in age, and full interactions of the two. The outcome equation includes a polynomial in age, and full interactions with the dummy for being aged 720 months and above. The Z variables include year and local area fixed effects, the individual sex ratio, the local unemployment rate a year before the survey, education dummies, and number of children still living at home. Note: *** denotes statistical significance at the 1% level; ** at the 5 % level and * at the 10 % level.						

Table 10. Results of estimation for the subsample of men whose father was a farmer.

	(1)	(2)	(3)	(4)	(5)	(6)
<b>IV, First stage equation for retirement</b>						
<i>Mean retirement, age 59 to &lt; 60</i>	0.437	0.437	0.437	0.437	0.437	0.437
<b>Age 60 and above coefficient</b>	0.30***	0.297***	0.296***	0.295***	0.310***	0.310***
	(0.021)	(0.021)	(0.016)	(0.016)	(0.011)	(0.012)
<b>IV, Outcome variable: Divorce rate</b>						
<i>Mean divorce, age 59 to &lt; 60</i>	0.025	0.025	0.025	0.025	0.025	0.025
<b>Retirement coefficient</b>	0.045*	0.049*	0.042**	0.047**	0.043**	0.042**
	(0.027)	(0.027)	(0.022)	(0.022)	(0.016)	(0.016)
<b>Including Zs</b>	NO	YES	NO	YES	NO	YES
<b>Quartic Age polynomial</b>	YES	YES	NO	NO	NO	NO
<b>Cubic age polynomial</b>	NO	NO	YES	YES	NO	NO
<b>Quadratic Age polynomial</b>	NO	NO	NO	NO	YES	YES
Observations	46213	46121	46213	46121	46213	46121
<b>Men's main sample</b>						
	(7)	(8)	(9)	(10)	(11)	(12)
<b>IV, First stage equation for retirement</b>						
<i>Mean retirement, age 59 to &lt; 60</i>	0.437	0.437	0.437	0.437	0.437	0.437
<b>Age 60 and above coefficient</b>	0.273***	0.270***	0.247***	0.246***	0.305***	0.300***
	(0.024)	(0.023)	(0.028)	(0.027)	(0.021)	(0.021)
<b>IV, Outcome variable: Divorce rate</b>						
<i>Mean divorce, age 59 to &lt; 60</i>	0.025	0.025	0.025	0.025	0.025	0.025
<b>Retirement coefficient</b>	0.063**	0.069**	0.105**	0.111***	0.045*	0.050*
	(0.032)	(0.033)	(0.042)	(0.042)	(0.026)	(0.027)
<b>Including Zs</b>	NO	YES	NO	YES	NO	YES
<b>Quartic Age polynomial</b>	YES	YES	YES	YES	YES	YES
Dropping those aged 720 months	NO	NO	NO	NO	YES	YES
Sample age 52 to 68 years	YES	YES	NO	NO	NO	NO
Sample age 54 to 66 years	NO	NO	YES	YES	NO	NO
Observations	36847	36763	27425	27356	46203	46111
<p>The IV model is estimated by two stages least squares with robust standard errors. The first stage regressors include a dummy for being aged 720 months and above, a polynomial in age, and full interactions of the two. The outcome equation includes a polynomial in age, and full interactions with the dummy for being aged 720 months and above. The Z variables include year and local area fixed effects, the individual sex ratio, the local unemployment rate a year before the survey, education dummies, and number of children still living at home.</p> <p>Note: *** denotes statistical significance at the 1% level; ** at the 5 % level and * at the 10 % level.</p>						

Table 11. Results of estimation for women whose father was a farmer.

	(1)	(2)	(3)	(4)	(5)	(6)
<b>IV, First stage equation for retirement</b>						
<i>Mean retirement, age 59 to &lt; 60</i>	0.324	0.324	0.324	0.324	0.324	0.324
<b>Age 60 and above</b>	0.329***	0.323***	0.340***	0.340***	0.329***	0.328***
	(0.025)	(0.024)	(0.019)	(0.019)	(0.014)	(0.014)
<b>IV, Outcome variable: divorce rate</b>						
<i>Mean divorce, age 59 to &lt; 60</i>	0.039	0.039	0.039	0.039	0.039	0.039
<b>Retirement</b>	0.068*	0.068*	0.057**	0.058**	0.014	0.017
	(0.036)	(0.036)	(0.027)	(0.027)	(0.020)	(0.020)
<b>Including Zs</b>	NO	YES	NO	YES	NO	YES
<b>Quartic Age polynomial</b>	YES	YES	NO	NO	NO	NO
<b>Cubic age polynomial</b>	NO	NO	YES	YES	NO	NO
<b>Quadratic Age polynomial</b>	NO	NO	NO	NO	YES	YES
Observations	38477	38385	38477	38385	38477	38385
	(7)	(8)	(9)	(10)	(11)	(12)
<b>IV, First stage equation for retirement</b>						
<i>Mean retirement, age 59 to &lt; 60</i>	0.324	0.324	0.324	0.324	0.324	0.324
<b>Age 60 and above</b>	0.268***	0.269***	0.230***	0.232***	0.0329***	0.328***
	(0.028)	(0.028)	(0.033)	(0.032)	(0.025)	(0.024)
<b>IV, Outcome variable: divorce rate</b>						
<i>Mean divorce, age 59 to &lt; 60</i>	0.039	0.039	0.039	0.039	0.039	0.039
<b>Retirement</b>	0.082*	0.082*	0.098	0.102	0.068*	0.068*
	(0.049)	(0.048)	(0.066)	(0.066)	(0.035)	(0.035)
<b>Including Zs</b>	NO	YES	NO	YES	NO	YES
Dropping those aged 720 months	NO	NO	NO	NO	YES	YES
Sample age 52 to 68 years	YES	YES	NO	NO	NO	NO
Sample age 54 to 66 years	NO	NO	YES	YES	NO	NO
Observations	29987	29920	21716	21667	38468	38376
<p>The IV model is estimated by two stages least squares with robust standard errors. The first stage regressors include a dummy for being aged 720 months and above, a polynomial in age, and full interactions of the two. The outcome equation includes a polynomial in age, and full interactions with the dummy for being aged 720 months and above. The Z variables include year and local area fixed effects, the individual sex ratio, the local unemployment rate a year before the survey, education dummies, and number of children still living at home.</p> <p>Note: *** denotes statistical significance at the 1% level; ** at the 5 % level and * at the 10 % level.</p>						

Table 12. Results of estimation. More robustness checks.  
Including birth cohort dummies/ dropping observations from 2000s or early 1990 waves

<b>Father Farmer sample</b>	Men	Women	Men	Women	Men	Women
	(1)	(2)	(3)	(4)	(5)	(6)
<b>IV, First stage equation for retirement</b>						
<i>Mean retirement, age 59 to &lt; 60</i>	0.437	0.324	0.437	0.321	0.461	0.351
<b>Age 60 and above</b>	0.299***	0.324***	0.306***	0.333***	0.303***	0.329
	(0.021)	(0.024)	(0.023)	(0.027)	(0.023)	(0.028)
<b>IV, Outcome variable: divorce rate</b>						
<i>Mean divorce, age 59 to &lt; 60</i>	0.025	0.039	0.023	0.038	0.028	0.046
<b>Retirement</b>	0.049*	0.067*	0.046*	0.049	0.064*	0.068
	(0.027)	(0.035)	(0.027)	(0.035)	(0.033)	(0.042)
<b>Including Zs</b>	YES	YES	YES	YES	YES	YES
<b>Quartic Age polynomial</b>	YES	YES	YES	YES	YES	YES
<b>Including Birth Cohort Dummies</b>	YES	YES	NO	NO	NO	NO
<b>Dropping years 2000, 2001, 2002</b>	NO	NO	YES	YES	NO	NO
<b>Dropping years 1990, 1991, 1992</b>	NO	NO	NO	NO	YES	YES
Observations	46121	38385	35930	29815	35357	29561
<p>The model is estimated by two stages least squares. The first stage regressors include a dummy for being aged 720 months and above, a quadratic polynomial in age, and full interactions of the two. The outcome equation includes a quadratic polynomial in age, and full interactions with the dummy for being aged 720 months and above. The Z variables include year and local area fixed effects, the individual sex ratio, the local unemployment rate a year before, education dummies, number of children still living at home.</p> <p>Note: *** denotes statistical significance at the 1% level; ** at the 5 % level and * at the 10 % level.</p>						

**Table 13. Results of estimation by respondent's father occupation. (Selected coefficient estimates. Standard errors in brackets).**

<b>Men</b>	(1)	(2)	(3)	(4)
	<b>Fathers' farmer</b>	<b>Fathers' top occupations</b>	<b>Father's White collar</b>	<b>Father's Blue collar</b>
	<b>IV</b>	<b>First stage equation for retirement</b>		
<i>Mean retirement, age 59 to &lt; 60</i>	0.437	0.353	0.527	0.596
<b>Age 60 and above coefficient</b>	0.297***	0.215***	0.213***	0.228***
	(0.021)	(0.024)	(0.022)	(0.015)
	<b>IV</b>	<b>Outcome variable: divorce rate</b>		
<sup>2</sup> <i>Mean divorce, age 59 to &lt; 60</i>	0.025	0.069	0.065	0.051
<b>Retirement coefficient</b>	0.049*	-0.018	-0.037	0.034
	(0.027)	(0.06)	(0.060)	(0.037)
<b>Including Zs</b>	YES	YES	YES	YES
<i>Observations</i>	46121	38820	38190	71555
<b>Women</b>	(5)	(6)	(7)	(8)
	<b>Fathers' farmer</b>	<b>Fathers' top occupations</b>	<b>Father's White collar</b>	<b>Father's Blue collar</b>
	<b>IV</b>	<b>First stage equation for retirement</b>		
<i>Mean retirement, age 59 to &lt; 60</i>	0.324	0.394	0.494	0.438
<b>Age 60 and above coefficient</b>	0.323***	0.210***	0.304***	0.305***
	(0.024)	(0.028)	(0.026)	(0.020)
	<b>IV</b>	<b>Outcome variable: divorce rate</b>		
<i>Mean divorce, age 59 to &lt; 60</i>	0.039	0.117	0.114	0.095
<b>Retirement coefficient</b>	0.068*	-0.080	-0.020	-0.086**
	(0.036)	(0.091)	(0.063)	(0.042)
<b>Including Zs</b>	YES	YES	YES	YES
<i>Observations</i>	38385	30736	32988	58384
<p>The model is estimated by two stages least squares. The first stage regressors include a dummy for being aged 720 months and above, a quartic polynomial in age, and full interactions of the two. The outcome equation includes a quartic polynomial in age, and full interactions with the dummy for being aged 720 months and above. The Z variables include year and district fixed effects, the individual sex ratio, the local unemployment rate a year before, education dummies, number of children still living at home.</p> <p>Note: *** denotes statistical significance at the 1% level; ** at the 5 % level and * at the 10 % level.</p>				

**Table 14. Results of estimation by respondent's education level.**

<b>Men</b>	(1)	(2)	(3)
	<b>College</b>	<b>High School</b>	<b>Less than high school</b>
<i>Mean retirement, age 59 to &lt; 60</i>	0.310	0.516	0.525
<b>Age 60 and above coefficient</b>	0.088** (0.030)	0.248*** (0.017)	0.255*** (0.013)
	<b>IV</b>	<b>Outcome variable: divorce rate</b>	
<i>Mean divorce, age 59 to &lt; 60</i>	0.070	0.051	0.048
<b>Retirement coefficient</b>	-0.114 (0.196)	0.039 (0.037)	0.012 (0.025)
<b>Including Zs</b>	YES	YES	YES
<i>Observations</i>	25200	61563	115843
<b>Women</b>	(4)	(5)	(6)
	<b>College</b>	<b>High School</b>	<b>Less than high school</b>
	<b>IV</b>	<b>First stage equation for retirement</b>	
<i>Mean retirement, age 59 to &lt; 60</i>	0.421	0.468	0.372
<b>Age 60 and above coefficient</b>	0.130*** (0.037)	0.268*** (0.024)	0.329*** (0.015)
	<b>IV</b>	<b>Outcome variable: divorce rate</b>	
<i>Mean divorce, age 59 to &lt; 60</i>	0.107	0.105	0.080
<b>Retirement coefficient</b>	0.200 (0.212)	-0.136** (0.061)	-0.001 (0.027)
<b>Including Zs</b>	YES	YES	YES
<i>Observations</i>	17830	37816	110261

The model is estimated by two stages least squares. The first stage regressors include a dummy for being aged 720 months and above, a quadratic polynomial in age, and full interactions of the two. The outcome equation includes a quadratic polynomial in age, and full interactions with the dummy for being aged 720 months and above. The Z variables include year and local area fixed effects, the individual sex ratio, the local unemployment rate a year before, education dummies, number of children still living at home.

Note: \*\*\* denotes statistical significance at the 1% level; \*\* at the 5% level and \* at the 10% level.

Table 15. Results of estimation: other marital-status outcomes by father's occupation.

	<b>Fathers' farmer</b>	<b>Fathers' top occupations</b>	<b>Father's White collar</b>	<b>Father's Blue collar</b>	<b>Sample</b>
		<b>Outcome variable: Marriage rate</b>			
<b>MEN</b>	<b>IV</b>				
<b>Retirement</b>	-0.066 (0.054)	0.011 (0.086)	-0.004 (0.085)	-0.021 (0.057)	-0.025 (0.033)
<i>Observations</i>	46121	38820	38190	71555	202606
		<b>Outcome variable: widow rate</b>			
<b>MEN</b>	<b>IV</b>				
<b>Retirement</b>	0.030 (0.025)	-0.020 (0.041)	0.011 (0.040)	-0.038 (0.031)	-0.003 (0.011)
<i>Observations</i>	46121	38820	38190	71555	202606
		<b>Outcome variable: single rate</b>			
<b>MEN</b>	<b>IV</b>				
<b>Retirement</b>	-0.023 (0.040)	0.004 (0.047)	0.070 (0.050)	0.026 (0.032)	0.018 (0.020)
<i>Observations</i>	46121	38820	38190	71555	202606
		<b>Outcome variable: Marriage rate</b>			
<b>WOMEN</b>	<b>IV</b>				
<b>Retirement</b>	-0.109 (0.071)	0.085 (0.134)	-0.015 (0.091)	0.070 (0.069)	-0.011 (0.041)
<i>Observations</i>	38385	30736	32988	58384	165907
		<b>Outcome variable: widow rate</b>			
<b>WOMEN</b>	<b>IV</b>				
<b>Retirement</b>	0.067 (0.058)	-0.078 (0.092)	0.054 (0.066)	0.028 (0.057)	0.032 (0.032)
<i>Observations</i>	38385	30736	32988	58384	165907
		<b>Outcome variable: single rate</b>			
<b>WOMEN</b>	<b>IV</b>				
<b>Retirement</b>	-0.018 (0.034)	0.080 (0.085)	-0.008 (0.048)	-0.0008 (0.030)	0.007 (0.021)
<i>Observations</i>	38385	30736	32988	58384	165907

The first stage regressions for the male and female sample are provided in Table 13.

Table 16 A. Full Results of Estimation (See Tables 10 and 11, Specification 2).

	Men, Father Farmer			Women, Father Farmer		
	IV first stage Retirement	IV outcome Divorce	OLS Divorce	IV First Stage Retirement	IV Outcome Divorce	OLS Divorce
D Age >= 60	<b>0.297***</b> (0.0206)			<b>0.323***</b> (0.0245)		
Retired		<b>0.0494*</b> (0.0270)	<b>0.00645**</b> (0.00299)		<b>0.0676*</b> (0.0356)	<b>-0.00218</b> (0.00365)
local U Rate	-0.00522** (0.00237)	0.00557*** (0.00146)	0.00534*** (0.00146)	0.00220 (0.00273)	0.00213 (0.00208)	0.00228 (0.00207)
sex-ratio	-0.0651 (0.190)	-0.0485 (0.121)	-0.0470 (0.120)	0.0515 (0.216)	-0.0332 (0.156)	-0.0320 (0.155)
children at home	-0.0129*** (0.00147)	-0.0145*** (0.000770)	-0.0151*** (0.000687)	-0.0216*** (0.00226)	-0.00690*** (0.00194)	-0.00842*** (0.00180)
junior college	0.101*** (0.0144)	-0.0136 (0.0109)	-0.00940 (0.0106)	0.124*** (0.0154)	0.00340 (0.0151)	0.0119 (0.0144)
high school	0.0898*** (0.0115)	-0.00708 (0.00912)	-0.00339 (0.00877)	0.0879*** (0.0145)	0.00768 (0.0145)	0.0136 (0.0142)
middle tech	0.0911*** (0.00958)	-0.0172** (0.00764)	-0.0134* (0.00723)	0.0153 (0.0123)	-0.00723 (0.0128)	-0.00642 (0.0128)
middle school	0.111*** (0.0123)	-0.0205** (0.00932)	-0.0159* (0.00880)	0.0476*** (0.0132)	0.00832 (0.0135)	0.0115 (0.0135)
< middle school	0.114*** (0.00933)	-0.0257*** (0.00754)	-0.0209*** (0.00688)	0.0209* (0.0117)	-0.0118 (0.0123)	-0.0106 (0.0123)
(1-D)*Age	0.0583*** (0.0205)	-0.00235 (0.00872)		0.0269 (0.0228)	-0.0169 (0.0131)	
(1-D)*Age2	-0.0172** (0.00751)	0.00293 (0.00314)		-0.0141* (0.00834)	-0.00278 (0.00498)	
(1-D)*Age3	-0.00355*** (0.00104)	0.000499 (0.000486)		-0.00232** (0.00115)	-0.000213 (0.000768)	
(1-D)*Age4	-0.000169*** (4.79e-05)	2.44e-05 (2.49e-05)		-9.55e-05* (5.30e-05)	-2.93e-06 (3.92e-05)	
D*Age	0.112*** (0.0149)	-0.0159 (0.0100)		0.130*** (0.0188)	-0.0194 (0.0132)	
D*Age2	-0.0293*** (0.00541)	0.00462 (0.00356)		-0.0315*** (0.00678)	0.00412 (0.00448)	
D*Age3	0.00353*** (0.000748)	-0.000622 (0.000503)		0.00411*** (0.000927)	-0.000445 (0.000627)	
D*Age4	-0.000153*** (3.47e-05)	2.89e-05 (2.41e-05)		-0.000196*** (4.26e-05)	1.72e-05 (2.98e-05)	
Age			-0.00225*** (0.000577)			-0.00164** (0.000713)
Age2			0.000165* (9.84e-05)			-8.32e-05 (0.000127)
Age3			-4.44e-06 (6.07e-06)			-1.26e-05 (7.93e-06)
Age4			-6.42e-07 (1.11e-06)			1.62e-06 (1.43e-06)
Observations	46,121	46,121	46,121	38,385	38,385	38,385
Rquared	0.696	0.019	0.023	0.667	0.016	0.025

Table 16B. Full Results of Estimation (See Tables 8 and 9, Specification 2).

	Men Sample			Women Sample		
	IV first stage	IV Outcome	OLS	IV First Stage	IV Outcome	OLS
	Retirement	Divorce	Divorce	Retirement	Divorce	Divorce
D Age >= 60	0.235*** (0.00981)			0.293*** (0.0119)		
Retired		0.0140 (0.0215)	0.00267 (0.00181)		-0.0178 (0.0257)	-0.0297*** (0.00247)
local U Rate	-0.00301*** (0.00114)	0.00249*** (0.000877)	0.00246*** (0.000875)	0.000760 (0.00125)	0.00469*** (0.00126)	0.00468*** (0.00126)
sex-ratio	0.0708 (0.0953)	-0.219*** (0.0742)	-0.216*** (0.0740)	-0.0175 (0.105)	0.0208 (0.102)	0.0286 (0.101)
children at home	-0.0167*** (0.000753)	-0.0228*** (0.000596)	-0.0229*** (0.000480)	-0.0154*** (0.00118)	-0.0113*** (0.00132)	-0.0115*** (0.00126)
junior college	0.0943*** (0.00420)	0.00723* (0.00412)	0.00832** (0.00361)	0.0983*** (0.00474)	0.00267 (0.00582)	0.00383 (0.00525)
high school	0.103*** (0.00340)	0.00725** (0.00355)	0.00841*** (0.00282)	0.0705*** (0.00447)	-0.00290 (0.00535)	-0.00192 (0.00502)
middle tech	0.125*** (0.00279)	0.00958*** (0.00346)	-0.00814*** (0.00223)	0.0569*** (0.00390)	-0.0225*** (0.00471)	-0.0216*** (0.00446)
middle school	0.134*** (0.00379)	-0.00279 (0.00420)	-0.00124 (0.00309)	0.0585*** (0.00432)	-0.0135*** (0.00506)	-0.0126*** (0.00482)
< middle school	0.131*** (0.00268)	-0.0106*** (0.00346)	-0.00913*** (0.00206)	0.0419*** (0.00370)	-0.0317*** (0.00435)	-0.0309*** (0.00420)
(1-D)*Age	0.0513*** (0.00973)	0.00167 (0.00595)		0.0354*** (0.0113)	0.00924 (0.00869)	
(1-D)*Age2	-0.0253*** (0.00357)	0.00337* (0.00189)		-0.0186*** (0.00411)	0.00499 (0.00304)	
(1-D)*Age3	-0.00488*** (0.000492)	0.000461 (0.000287)		-0.00327*** (0.000563)	0.000651 (0.000458)	
(1-D)*Age4	-0.00023*** (2.27e-05)	1.92e-05 (1.45e-05)		-0.000145*** (2.58e-05)	2.92e-05 (2.30e-05)	
D*Age	0.108*** (0.00712)	-0.00568 (0.00622)		0.109*** (0.00879)	0.00193 (0.00822)	
D*Age2	-0.0280*** (0.00261)	-0.000271 (0.00219)		-0.0250*** (0.00316)	-0.00281 (0.00281)	
D*Age3	0.00344*** (0.000363)	0.000158 (0.000310)		0.00315*** (0.000433)	0.000438 (0.000397)	
D*Age4	-0.00015*** (1.69e-05)	-1.13e-05 (1.49e-05)		-0.000148*** (1.99e-05)	-2.11e-05 (1.90e-05)	
Age			-0.00418*** (0.000326)			-0.0015*** (0.000455)
Age2			0.000264*** (5.96e-05)			-1.30e-05 (8.26e-05)
Age3			2.99e-06 (3.45e-06)			-2.07e-05*** (4.86e-06)
Age4			-1.83e-06*** (6.55e-07)			1.07e-06 (9.06e-07)
Observations	202,606	202,606	202,606	165,907	165,907	165,907
Rquared	0.680	0.020	0.020	0.679	0.030	0.030

## Appendix Table A.

Respondent's Father Job by District: year average over the years 1990-2002. All Ages Sample.

	Father Farmer %	Father Unskilled worker %	Father Rural worker %	Observations per district
Ain	23.18	1.56	12.35	10414
Aisne	12.76	16.0	11.46	14409
Allier	25.70	13.47	6.70	14563
Alpes-de-Haute-Provence	21.30	<b>8.37</b>	3.86	2976
Hautes-Alpes	24.06	8.48	1.99	2664
Alpes-Maritimes	8.35	7.05	3.44	23028
Ardèche	29.14	10.29	2.09	5463
Ardennes	13.52	20.62	4.12	10284
Ariège	26.87	15.45	5.50	3398
Aube	17.58	15.51	5.60	10731
Aude	16.62	8.62	18.64	7346
Aveyron	41.79	10.59	2.58	6363
Bouches-du-Rhône	7.39	9.88	3.82	40183
Calvados	15.58	14.23	7.81	20918
Cantal	35.99	10.70	9.10	6933
Charente	26.33	12.40	11.37	11609
Charente-Maritime	25.90	8.71	6.38	16603
Cher	16.33	18.59	6.59	9135
Corrèze	30.56	10.49	3.37	15138
Corse	25.29	5.46	6.76	1639
Côte-d'Or	15.98	11.83	4.95	14458
Côtes-d'Armor	37.44	7.71	4.21	13715
Creuse	40.33	6.54	5.84	8147
Dordogne	35.43	10.09	8.03	8807
Doubs	19.43	16.19	1.77	20808
Drôme	26.96	11.25	3.51	9299
Eure	13.89	15.29	8.68	16533
Eure-et-Loir	19.89	14.84	8.36	7857
Finistère	28.46	6.81	6.78	25967
Gard	13.99	12.67	8.90	13848
Haute-Garonne	15.80	8.55	3.88	22842
Gers	37.72	6.76	11.25	4409
Gironde	11.41	9.58	8.77	30758
Hérault	12.83	7.69	10.48	24697
Ille-et-Vilaine	30.34	8.29	3.90	21035
Indre	24.53	12.12	9.54	6813
Indre-et-Loire	20.16	11.89	6.26	14595
Isère	14.64	15.93	2.16	22513
Jura	26.41	13.40	1.99	13094
Landes	27.16	10.00	4.91	6803
Loir-et-Cher	28.43	13.15	8.96	5903
Loire	20.09	18.13	1.70	18209
Haute-Loire	39.66	10.51	0.85	5661
Loire-Atlantique	21.10	9.00	2.83	25588
Loiret	18.72	11.39	5.54	13986
Lot	42.30	9.07	3.90	2922
Lot-et-Garonne	37.00	9.15	7.16	6351
Lozère	37.01	7.26	2.24	2988
Maine-et-Loire	27.98	11.56	6.58	17253
Manche	34.96	8.24	6.47	18181
Marne	14.15	11.25	7.41	17345
Haute-Marne	22.34	15.45	4.29	7484
Mayenne	37.54	11.41	6.35	6742
Meurthe-et-Moselle	8.89	18.42	2.08	16697
Meuse	22.44	16.55	3.54	5705
Morbihan	34.22	7.71	4.57	15239

Respondent's Father Job by District: year average over the years 1990-2002. All Ages Sample. Continued.				
	Father Farmer %	Father Unskilled worker %	Father Rural worker %	Observations per district
Moselle	9.08	19.44	1.93	22850
Nièvre	16.00	16.85	8.42	8496
Nord	6.67	19.26	2.78	56698
Oise	9.72	16.84	6.87	18468
Orne	32.06	11.80	6.03	8023
Pas-de-Calais	9.52	20.93	4.92	31938
Puy-de-Dôme	21.91	16.32	2.33	20704
Pyrénées-Atlantiques	21.93	10.34	4.78	14011
Hautes-Pyrénées	21.67	11.72	3.49	4121
Pyrénées-Orientales	18.51	7.01	12.36	9231
Bas-Rhin	14.04	13.05	1.98	28544
Haut-Rhin	11.27	15.68	2.64	20550
Rhône	12.23	12.75	2.29	33214
Haute-Saône	23.54	19.21	2.07	9738
Saône-et-Loire	23.91	16.99	3.42	19339
Sarthe	27.20	14.89	5.11	12689
Savoie	20.26	17.08	1.80	7908
Haute-Savoie	20.54	13.10	2.63	14735
Paris	7.56	5.48	1.85	50278
Seine-Maritime	10.46	14.55	5.86	36314
Seine-et-Marne	7.75	11.22	5.73	24367
Yvelines	8.27	8.25	2.76	24934
Deux-Sèvres	37.45	11.32	5.25	11915
Somme	16.18	16.35	8.50	16060
Tarn	23.88	17.63	5.24	9949
Tarn-et-Garonne	28.54	10.17	10.56	3647
Var	9.68	7.94	5.66	18860
Vaucluse	15.96	11.38	8.18	9518
Vendée	37.53	8.09	5.98	11664
Vienne	23.91	10.20	8.10	12869
Haute-Vienne	24.96	10.71	7.69	20491
Vosges	17.79	20.02	2.62	9382
Yonne	19.01	12.58	5.33	10.147
Territoire de Belfort	12.04	20.87	1.28	8117
Essonne	8.08	8.55	4.10	23227
Hauts-de-Seine	8.04	8.05	2.26	30822
Seine-Saint-Denis	11.53	11.25	3.90	28194
Val-de-Marne	7.86	8.96	3.23	25402
Val-d'Oise	7.66	11.13	3.49	23147

Source : Author's calculations from raw data. Unweighted statistics. French Labour Force Surveys 1990-2002.

## Appendix. Original father's job classification in French.

Catégorie socio-professionnelle du père

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- : sans objet ou non déclaré
- 10 : agriculteurs exploitants 23.71 % of the sample
- 21 : artisans
- 22 : commerçants et assimilés
- 23 : chefs d'entreprise de 10 salariés ou plus
- 31 : professions libérales
- 33 : cadres de la fonction publique
- 34 : professeurs, professions scientifiques
- 35 : professions de l'information, des arts et des spectacles
- 37 : cadres administratifs et commerciaux d'entreprises
- 38 : ingénieurs et cadres techniques d'entreprises
- 42 : instituteurs et assimilés
- 43 : professions intermédiaires de la santé et du travail social
- 44 : clergé, religieux
- 45 : professions intermédiaires administratives de la fonction publique
- 46 : professions intermédiaires administratives et commerciales des entreprises
- 47 : techniciens
- 48 : contremaîtres, agents de maîtrise
- 52 : employés civils et agents de service de la fonction publique
- 53 : policiers et militaires
- 54 : employés administratifs d'entreprises
- 55 : employés de commerce
- 56 : personnels des services directs aux particuliers
- 62 : ouvriers qualifiés de type industriel
- 63 : ouvriers qualifiés de type artisanal
- 64 : chauffeurs
- 65 : ouvriers qualifiés de la manutention, du magasinage et du transport
- 67 : ouvriers non qualifiés de type industriel 11.66% of the sample
- 68 : ouvriers non qualifiés de type artisanal
- 69 : ouvriers agricoles 6.39 % of the sample