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Employment, Partnership and Childbearing Decisions of German Women and Men: A Simultaneous Hazards Approach

by

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Employment, partnership and childbearing decisions of German women and men: A Simultaneous hazards approach [1]

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Abstract. This paper investigates the interrelated dynamics of employment, cohabitation and fertility for German women and men. Using a simultaneous hazards approach due to Lillard (1993), I estimate a five-equation model with unobserved heterogeneity. One of the contributions of this paper is to include the current employment and nonemployment hazard rates and the union formation and union dissolution hazard rates as regressors. My results suggest that being employed or nonemployed only has small effects on other transitions, but that employed women with a high hazard of becoming nonemployed are less likely to have children, while nonemployed men having a low hazard of finding a job are more likely to have children. Children reduce the hazard of taking up a job for women and reduce the hazard of becoming nonemployed for women and men. Children also increase the stability of unions. Having a partner strongly increases the likelihood for having children. Interestingly, unions with a high risk of splitting up are more likely to have children. Economically, this can be interpreted as an attempt to invest in partner-specific capital in order to reduce the likelihood of splitting up.

JEL-Classification: C33, C41, J64, J130, J230

Keywords: Employment, Fertility, Marriage, Family planning, Labor demand, Simultaneous hazards

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1 Introduction

During the last decades Germany has seen tremendous changes in employment and family outcomes. Fertility rates have dropped from 2.031 in 1970 to 1.381 per women in 2008[2]. Women have become older at first and all subsequent births and more often do not have children at all. Socioeconomic reasons often named for this are the increased female participation in higher education and the increase in female labor force participation which has risen from 46% in 1970 to 69% in 2008[3]. Nonetheless, the overall labor market situation has changed for women and men. Germany has undergone strong fluctuations in unemployment, and jobs have become more flexible but also less stable. This holds true especially for young workers for whom an unclear employment situation often has strong effects on family planning. However, it is not only employment that has changed. There also new forms of cohabitation. Marriage has become less important, while more and more couples cohabit without being married. Finally, marriages have become less stable which is reflected by an increasing number of divorces and which has resulted in a strong increase in the number of single-parents and patchwork-families.

The developments described above depend on processes which are generally assumed to be interrelated. For example, fertility decisions are influenced by a women's employment status, which in turn depends on whether or not there are children. The economic literature deals with many aspects of the different interrelations between employment, partnership and fertility outcomes. Authors like Lillard and Waite (1991, 1993) and Steele et al. (2005) take account of the interrelations between cohabitation and fertility. A very general finding of these papers is that children increase the stability of marriages, although stability depends on children's age. Also the interrelations between labor force participation and fertility are of interest, in particular, between fertility and female labor force participation. Typical examples are Angrist and Evans (1998), Hyslop (1999), and Michaud and Tatsiramos (2011). These studies mostly indicate that children, in particular pre-school children, reduce participation rates of women. However, labor market outcomes do also affect family outcomes. Del Bono et al. (2012), for example, show that a job loss yields a postponement of childbirth for Austrian women, while Eliason (2012) indicates that a job loss results in an increase of divorce rates for Swedish men. Nonetheless, only Aassve et

[2]See Human Fertility Database. Max Planck Institute for Demographic Research (Germany) and Vienna Institute of Demography (Austria). Available at www.humanfertility.org (data downloaded on 23rd November, 2012)

[3]See Statistisches Bundesamt. Available at www.destatis.de (data downloaded on 23rd November, 2012)

al. (2006) consider the three processes of employment, cohabitation or marriage, and childbirth jointly. Joint estimation however is important to identify also indirect effects and to take account of unobserved heterogeneity. For instance, a job loss may influence fertility decisions directly but also via its effects on union stability.

A further aspect, which so far has only attracted little attention is how transition risks, i.e. the risk of becoming unemployed or of exiting a union, influence other outcomes. From an economic perspective, using simultaneous hazards also as regressors provides important insights, because they take account of how expectations on one outcome may affect other outcomes. Individuals may, for example, delay or cancel cohabitation and childbirth decisions, if they work in an unstable employment and are uncertain about their future employment state. Furthermore, couples with a high risk of splitting up may postpone childbirth decisions until they have found better-suiting partners. However, children may also be used as a way to rescue their relationship. So far as I am aware, only Lillard (1993) and Lillard and Waite (1993) consider how the transition risk of one process affects the outcome of an other process. More precisely, they both use the dissolution hazard as a regressor for the fertility process indicate that unions with a high risk to split up less likely have children.

This paper adds to the literature by using hazard regression techniques in order to estimate a five-equation model which includes employment, non-employment, union formation, union dissolution, and conception. Using a hazard approach comes with the advantage that effects can often be identified more precisely. For example, children obviously reduce female labor force participation. However, for employed women children may also increase the attachment with the current job due to increased expenses. Such effects, however, cannot be identified, if the state of being employed is modeled by a simple logit or probit model. In addition to Aassve et al. (2006) I also include the current hazards of losing and finding a job as regressors for the union formation and union dissolution hazards and the conception hazard. Furthermore, also the union formation and union dissolution hazards are used as regressors for the conception hazard. In general, risks are seldom used as regressors, and if so mostly a two-step procedure not taking into account a possible dependence of unobserved heterogeneity (see for example Del Bono, 2001 who uses employment and income risks as regressors for the fertility hazard). From an econometric perspective, Lillard (1993) and Lillard and Waite (1993) provide the only exemptions who use a simultaneous hazards approach in which also the hazard of one process directly affects the hazard of a second process. In this study the framework is of a higher complexity, since five processes are used and several hazards may have an influence on one process. Using a triangular form and a small set of exogenous

regressors which also include the process-specific variables accounting for state dependence, is sufficient to identify the effects.

This study investigates effects for the 1960-69-cohort of German women and men using data from the study "Working and Learning in a changing world" (ALWA). The data set provides retrospective information on all five processes and information is of a very high precision as it is given on a monthly basis and there is no attrition in the sample. Furthermore, the observational period is very long, because individuals are observed from primary school onwards. The data-set is therefore well-suited for this type of analysis. My results suggest that employed women with a high hazard of becoming nonemployed are less likely to have children, while nonemployed men with a low hazard of finding a job are more likely to have children. The state of employment, however, has no effect on other hazards, although employed men are less likely to split up their relationships. Furthermore, results point out that being in a union strongly increases the likelihood of having children. In contrast to economic theory and empirical findings for the United States (see Lillard, 1993 and Lillard and Waite, 1993), unions with a high risk of splitting up are more likely to have children. A possible explanation for the result found, is that unions with a high risk of splitting up tend to use children as an investment in partnership-specific capital which in turn is used to increase the stability of the current union. Such investments may have become more widespread, because separation costs have fallen and investments in partnership-specific capital have shifted from marriage to children.

By adding a binary indicator for current pregnancy, my paper also provides new insights on interrelations between fertility and female labor force participation. In contrast to Aassve et al. (2006) and large parts of the literature, my results suggest that children reduce the likelihood of becoming nonemployed, and that only a current pregnancy strongly increases the likelihood of a transition to nonemployment. My results therefore imply that also for women children increase the attachment with their current employment. With regard to the transition of becoming employed, the results show that children and current pregnancy reduce the likelihood of becoming employed. For men, children have no effect on the transition of becoming employed, while they also decrease the hazard of becoming nonemployed.

The reminder of this paper is structured as follows. The next two sections provide an overview of the related literature and the institutional framework during the observational period. The fourth section presents the data set and explains the sample selection. The fifth section then deals with the econometric framework. The sixth section presents and discusses empirical results. Finally,

section seven concludes.

2 Related literature

For a long time, there has been a strong interest in the interrelation of employment and family outcomes. Fundamental theoretical contributions on this topic are Becker (1976, 1981), Cigno (1991), and Apps and Rees (2001). Nonetheless, they all focus on interrelations of fertility and female labor force participation. With regard to the effects children have on (female) labor force participation, Angrist and Evans (1998) and Hyslop (1999) are prominent empirical examples. While the first study uses twins as an instrument in order to estimate the effect family size has on labor force participation, the latter study uses a Maximum Simulated Likelihood approach taking into account state dependence and serial correlation of unobserved heterogeneity terms. More recent studies often use simultaneous estimation approaches (see Francesconi, 2002, or Michaud and Tatsiramos, 2011) or quasi-experimental designs (see Fröhlich and Melly, 2012). All studies named here suggest that children decrease female labor force participation, but usually no effects can be found for men.

The effects of employment on fertility and cohabitation are also of great interest. Ahn and Mira (2001) show that Spanish men delay childbearing and also marriage decisions, if they are nonemployed or only have a fixed-term work contract. Gutiérrez-Domènech (2008) shows that Spanish women delay childbearing decisions, if they are employed. However, effects are mixed with regard to marriage. While older cohorts delay marriage, if they are employed, younger cohorts tend marry ar an earlier stage. The author also points out that male unemployment results in a postponement of marriage and thereby has negative effects on fertility outcomes. Del Bono (2001) finds that British women delay childbearing decisions as a consequence of unemployment experiences. She also shows that the effect is stronger for women expecting high future wages and that women who expect more favorable job opportunities in the future bring childbearing decisions forward. More recently, Del Bono et al. (2012), using firm closures as quasi-experiments, show that unemployment experiences of Austrian women result in a delay of childbearing decisions. Eliason (2012) finds that unemployment experiences also increase the risk of separation. Using data for Sweden, he shows that for men the excess divorce rate is by 13% higher if there was a unemployment experience, while effects are similar but not significant for women. For the case of Germany, Kreyenfeld (2000) provides some insight. She shows that unemployment experiences

of East German women increase the hazard for a first birth.

With regard to the interrelation of cohabitation or marriage and childbearing there is a large number of studies using simultaneous estimation approaches and thereby take account of these interrelations. Lillard and Waite (1991), using data on American women and men, show that pre-school children born inside a union increase the stability of a marriage, whereas older children and children born prior to a marriage increase the probability of disruption. Steele et al. (2005) show that for British women pre-school children stabilize unions, whether born within a marriage or not. Again, effects are weaker for older children. Brien et al. (1999), using data from the National Longitudinal Study of the High School Class of 1972, point out a strong positive dependence between cohabitation, marriage and pre-marital birth for women. Lillard (1993) and Lillard and Waite (1993) show that for married couples an increase in the hazard of dissolution has strong negative on marital childbearing. These studies are of particular interest, because the authors point out that expectations about the future union status play a role for childbearing decisions.

Finally, Aassve et al. (2006) are the only ones who model employment, cohabitation and childbearing decisions jointly. They find that being employed has a negative effect on childbearing for women but a positive for men. Being employed also has a positive effect on union formation for women and men and on union dissolution for women. Finally, with regard to the effects of family outcomes on transitions from and to employment, results are all as one would expect.

3 Institutional Framework

The period of interest for the cohort under consideration is from 1975 until 2008. For this period, several policy instruments are used to support the birth and upbringing of children. During the whole period child allowances (*Kindergeld*) were provided for dependent children. The receipt of child allowances for the first child was introduced in 1975. Since then the amount has varied steadily. From 1975 onwards, the amount for the first child increased from 26€ in 1975 to 154€ in 2008. In addition to child allowances for each dependent child, a tax allowance independent of the number of children was introduced in 1989. From 1996 until today, parents have been receiving either a tax allowance or a child allowance depending on which is more advantageous.

Maternity leave (*Mutterschaftsurlaub*) has been used as an instrument to secure the job and income during which an expecting mother cannot work due to her pregnancy. An expecting

mother is obliged to take maternity leave from six weeks prior to a birth until eight weeks after a birth. During this period 100% of the actual wage is paid and women are not allowed to be dismissed.

With regard to other forms of support, parents receive during the first years after a birth, the sample period can be divided into three subperiods. From 1979 to 1986, employed mothers were able to receive *Mutterschaftsurlaubsgeld*, for a period away from work of up to six months during which they received 383€ (750 DM) per month. This amount was reduced to 261€ (510 DM) in 1984. The *Mutterschaftsurlaubsgeld* was introduced in order to better combine motherhood and job, but it was abolished in 1986. From 1986 to 2007, either parent could take parental leave and receive a parental allowance (*Erziehungsgeld*). The parental allowance varied from 307€ for a period of ten months in 1986 to 450€ for a period of twelve months or 300€ for a period of 24 months in 2004. While receiving parental allowances a parent was allowed to work for only up to 30 hours per week. The parental allowance was heavily criticized, as it was considered to keep young mothers away from the labor market (see for example Schönberg and Ludsteck, 2007). In 2007 the *Elterngeld* was introduced. It can be splitted between partners, is paid for up to fourteen months and depends on the prior net income. Parents receive at least a minimum amount of 300€ up to a maximum amount of 1800€. The *Elterngeld* was introduced with the goal to keep young mothers, in particular highly qualified ones, in touch with the labor market.

Despite of the increase in child and parental allowances, there was a decline in fertility rates from 1.527 births per women in 1975 to 1.381 in 2008[4], while the mean age at birth rose from 26.25 in 1975 to 30.01 in 2008[5]. This indicates that, at least at an overall level, the policies were not effective in increasing fertility rates. One reason often named, is the missing compatibility of job and family for women. This issue has become more relevant because of an increasing female labor market participation[6]. In 2008, the participation of mothers was still lower than that of fathers and the proportion of part-time employment was around 70% for all women (see Statistisches

[4]See Human Fertility Database. Max Planck Institute for Demographic Research (Germany) and Vienna Institute of Demography (Austria). Available at www.humanfertility.org (data downloaded on 23rd November, 2012)

[5]See Human Fertility Database. Max Planck Institute for Demographic Research (Germany) and Vienna Institute of Demography (Austria). Available at www.humanfertility.org (data downloaded on 23rd November, 2012)

[6]In 1975 48.17% of all women aged 15-65 were part of the labor force, while it were 68.96% in 2008. See Statistisches Bundesamt. Available at www.destatis.de (data downloaded on 23rd November, 2012)

Bundesamt, 2011).

In 1977, Germany underwent a major reform of the Marriage and Family Law (*Erstes Gesetz zur Reform des Ehe- und Familienrechts*) which introduced the equal status of wife and husband in marriage and divorce. After this reform, it was no longer relevant for maintenance payments who caused a divorce. Since then the number of marriages has decreased[7], while the number of divorces has increased[8]. On the other side, other forms of cohabitation have become more popular (see for example Statistisches Bundesamt, 2011). In particular, younger couples form unions without ever getting married. This increase comes along with a rise of the number of children born out of wedlock. Moreover, the number of single mothers has increased steadily from 13.8% in 1996 to 18.8% in 2008. From a tax perspective, forms of cohabitation other than marriage have become popular despite the fact that married couples benefit from more generous tax exemptions[9]. The tax advantage of married couple is the larger the more unequal earnings are between wife and husband.

Until 2004, the German unemployment insurance system consisted of two components, unemployment benefits (*Arbeitslosengeld*) and unemployment assistance (Arbeitslosenhilfe). In addition to the financial support for the unemployed, several Active Labor Market Policies existed with the goal of bringing back unemployed into permanent employment. Beginning in 2003 the "Laws of a modern provision of services on the labor market" (*Gesetz für moderne Dienstleistungen am Arbeitsmarkt*) became effective. The reforms were conducted as a response to the enormous rise in the unemployment rate from 4.7% in 1975 to 13.0% in 2005[10]. These so-called Hartz-reforms are a heavily discussed topic in the literature (an excellent survey is Jacobi and Kluve, 2006). They included changes in occupational training programs, new forms of temporary employment, new forms of marginal employment, improvements of the matching of unemployed and firms with vacancies, and, in particular, the abolishment of unemployment assistance. There are now two new components of the unemployment compensation system, unemployment benefit

[7]In 1975 6.7 of 1000 inhabitants have married, while it were only 4.6 in 2008. See Statistisches Bundesamt. Available at www.destatis.de (data downloaded on 23rd November, 2012)

[8]In 1975 there were 1.9 of 1000 inhabitants that divorced, while it were 2.3 in 2008. See Statistisches Bundesamt. Available at www.destatis.de (data downloaded on 23rd November, 2012)

[9]The so-called *Ehegattensplitting* privileges those unions with only the men or women working. See for example Folkers, 2003.

[10]See Bundesagentur für Arbeit. Available at www.arbeitsagentur.de (data downloaded on 23rd November, 2012)

I (*ALG I*) and unemployment benefit II (*ALG II*). ALG I is similar to the unemployment benefit paid before the Hartz-reform, although replacement ratios and entitlement periods have changed. ALG II combines unemployment assistance and social assistance (*Sozialhilfe*). Although the Hartz-reforms were heavily discussed, results show that, at least in some aspects, the reforms were successful (see for example Jacobi and Kluve, 2006 or Fahr and Sunde, 2006). The Hartz-reforms are also named as one reason for the drop in the unemployment rate to 8.7% in 2008[11]. However, a side-effect of the reforms was an increase in types of employment which are generally linked with a high unemployment risk, like fixed-term employment, temporary employment or part-time employment.

4 Data

4.1 Data set

For this study I use the "Working and Learning in a changing world" ("Arbeit und Leben im Wandel", ALWA) data set that was collected within the project "Qualifications, Competencies and Working Life" at the department "Education and Employment over the Life Course" of the Institute of Employment Research (IAB). The data set was originally designed to analyze the dependencies between the employment history, educational degrees and basic skills. It is, however, a very precise and informative data set well suited for the analysis conducted here. The data set considers as its population all individuals born between 1956 and 1988 and living in Germany in July 2007. Of this population, a random sample was drawn and voluntary interviews were conducted in order to construct a retroperspective life course for each individual.

In total, 10,404 individuals were interviewed. Of those individuals, 227 were interviewed in Turkish or Russian. I drop those 227 individuals, because they were interviewed about only a small part of their life course. As it is typical with voluntary interviews, the resulting sample is not representative for the population. Although incentives were given to promote participation in the interviews[12], the final sample overrepresents older and higher educated individuals.

The information about the life courses is given on a monthly basis and starts with the beginning of

[11] see Bundesagentur für Arbeit, 2011

[12] All participants received 15 € for taking part in the interview and could take part in a lottery.

primary school. Because the information was collected retrospectively, attrition does not present a problem. The data set therefore provides highly precise information and very long life courses in comparison to survey data such as the German Socioeconomic Panel (GSOEP) or the British Household Panel (BHPS). However, a general problem with retrospective data is misreporting, in particular, of information on events that happened early in the life course. In order to reduce such measurement errors, the interviewers were instructed to inquire again, if inconsistencies in the life courses occurred (see for example Antoni et al., 2010 and Gilberg et al., 2011). In general, the resulting data set provides a comprehensive and precise information source on the individual life courses.

The data set consists of different subfiles. In order to create one common event-history file, all subfiles are merged with each other and additional external covariates. The final event-history file then represents the complete life course of the individual from age 15 up to the censoring point. Information on life courses is given, as said, on a monthly basis, which allows a precise examination of interrelations between employment and family outcomes. The data set provides information on birth records of every child born to a certain individual and every child once living together with this individual. Furthermore, information on all cohabiting unions of an individual are given, i.e. start and end dates as well as information on the respective union like marriage status or the age or the educational level of partner. In addition to family outcomes, the life courses also present detailed information on the current occupational status, where the occupational status comprises schooling, further education, employment, unemployment, military or civil service, periods as housewife, and further periods. The data set also provides a large set of covariates covering employment-specific, partner-specific and child-specific information. In addition, external information, such as regional unemployment rates are merged with the life courses.

In Germany as well as in other European countries, cohabitation is an increasing form of union (see for example Köppen, 2011). In particular, cohabitation as a first form of union is common. Cohabitations may therefore precede a marriage, but may also act as a substitute. A further point which has to be taken into consideration is that there is an increasing number of non-marital births. I therefore follow Aassve et al. (2006) and use cohabitation as dependent variable. This means, all heterosexual couples living together in one household or married to each other[13] are

[13]In general, most married couples also live within the same household. However, there is a small number of individuals that begin to cohabitate after they have married. These individuals are also considered as cohabiting from the start of their marriage.

considered as cohabiting union. The cohabitation starts when the individuals move in together and ends when they split up. This also applies to married couples for whom divorce is considered as one possible end. One generally could also assume couples as unions that do not live in the same household. However, such forms of unions are prone to misreporting and represent a weaker form of misreporting so that I do not follow this approach here.

With regard to employment and nonemployment, I consider all individuals as employed, if they are in paid employment, no matter if it is full or part-time employment. This means that also self-employed individuals are considered as employed. Women that are on maternity leave ("Mutterschaftsurlaub") are also considered as employed, while women and men that are on parental leave ("Elternzeit") are considered as nonemployed. Nonemployment further captures periods in unemployment, education, as a housewife or househusband, and periods of military or civil service. The employment status of an individual changes if she or he moves in and out of paid employment. This means that periods of subsequent movements from one employer to an other are considered as one employment period, while for example moving from unemployment to schooling is considered as one nonemployment period.

Of the 10,177 individuals who were interviewed in German, I focus on the cohort of individuals born between 1960 and 1969. Cohort effects are likely to exist for female labor market participation, the duration of unions or the number of children born to an individual. In addition to all same-sex couples, I drop all nuns, monks and priests, because they neither participate in the labor market nor in the marriage market. Finally, due to the socialist regime in East Germany until 1990, labor market conditions were not comparable to West Germany at the time when most individuals enter the labor market. I therefore focus on individuals that were raised up and start their career in Western Germany. This does not exclude individuals who move to East Germany after 1990.

4.2 Sampling design

An individuals' first employment or nonemployment process generally starts when she enters the labor market. For most individuals this point equals the date when the individual gets in touch with the labor market for the first time. However, some individuals work for a short period prior to entering university, while others register as unemployed after leaving secondary school and return to the education system only after a short time. Although these periods constitute a first contact to the labor market, they are hardly comparable to employment and nonemployment

periods after the individual has left the education system for good. Such periods rather display short interruptions of education periods and mostly take place in occupations different to the ones the individuals choose later on. The goal of this study, however, is to disentangle the effects employment and nonemployment have on family outcomes. In particular, it shall be highlighted how the hazards of becoming nonemployed or finding a job influence the probabilities of having a partner or having children. The labor market entry is therefore assumed to be the start date of the first spell after the individual has left the educational institution, where she achieves or could have possibly achieved her highest degree. This also includes individuals who, for example, choose to become housewife or househusband. Nonetheless, the approach discussed so far includes few exemptions for whom the definition of the labor market entry does not fit very well. An example is an individual, who after obtaining an high school and vocational training degree, works for ten years and then chooses to go to university. In order to account for such exemptions, I set age limits until which a certain type of education form has to be started[14].

Although decisions on partnership and having children are seldom made while being in school or in education[15], individuals may form a first union or even may have children before entering the labor market. In order to account for this, the processes of union formation and conception start when the individual becomes fifteen.

— Figure 1 about here —

Figure 1 presents two typical persons that both enter the labor market at age twenty. While Person A has not yet formed a union when entering the labor market, Person B has already formed a union and has conceived a child when she or he enters the labor market. Due to the fact that notably the effects employment and nonemployment have on family outcomes shall be identified, only those union formation and dissolution and conception spells are used for estimation which are in progress when the individual enters the labor market or which begin afterwards. All prior outcomes are used for construction of stocks. Finally, estimation requires a common starting point. I therefore assume the union formation, dissolution and conception spells to be quasi-left-truncated at the time of the labor market entry, i.e. I follow Lancaster (1979) and condition the likelihood contribution of the spell in progress on the probability of surviving in that state until

[14] A precise description of the different age levels is given in the Appendix

[15] With regard to partnership, university students provide an exemption. However, only few students decide to have a child during their academic studies.

the labor market entry. For person A in figure 1 this means that likelihood contributions of the union formation and the conception spell are conditioned on the probability surviving in these states since age fifteen. For person B, the likelihood contributions of the union formation process and the conception process are conditioned on the probability of surviving in the current union and not conceiving until entering labor market.

The way a common starting date for all processes is chosen, is quite different to, for example, Aassve et al. (2006) who let all processes begin at age thirteen. However, a particularly relevant point of this study is to estimate how the hazard of moving from employment and nonemployment or vice versa affect the processes of union formation, dissolution and conception. Letting all processes start at age thirteen, would mean that these risk measures were influenced by whether there is a transition from unemployment to employment or from education to employment. Also the effect nonemployment itself has on conception depends on whether an individual is in education or is a housewife or househusband. The strategy of how the common starting date is chosen therefore provides a way to account for the effects of what one may call the "real" labor market risks. Nonetheless, the strategy comes with the disadvantage that the labor market entry is an endogenous starting point depending on observable and unobservable characteristics.

Furthermore, a strong desire for having children may result in having children prior to entering the labor market, which may influence the point of entering the labor market. However, such a strong desire for having children may also affect employment decisions afterwards. In order to account for such initial condition problems, I condition the process-specific unobserved heterogeneity on a set of variables consisting of the age at entry, whether the individual is employed after entering the labor market, whether she was in a union and had children, and of an interaction term accounting for whether she went to university and had children prior to entering the labor market. A more technical description of how I deal with the initial conditions is given in subsection 5.2.

4.3 Descriptive statistics

Table 1 presents some descriptive statistics for women and men born between 1960 and 1969. Results show that more women (1428) than men (1312) are part of the sample. Comparing women and men, the numbers show that the average birth year is the same for women (1964.21) and for men (1964.23) but that men are better educated than women. In particular, the proportion of men having an university degree or a degree from a technical college is higher for men (28.13%) than for

women (17.57%). On average, women are more than one year younger than men when entering the labor market (20.92 vs. 22.15 years). This may be due to spending less time in education, but also due to the fact that almost all men belonging to this cohort had to do military service or civil service. Subsequently, men spent on average almost three years longer in employment than women (191.87 vs. 226.79 months) and around 50 months less in nonemployment (71.15 vs. 21.42 months). This finding indicates that, although part-time employment is included, the employment ratio of women is significantly lower than for men in this cohort.

— Table 1 about here —

Looking at relationships, it is easy to see that women are on average younger than men when forming their first union (24.21 vs 26.95). This means that women also more quickly form a union after entering the labor market (3.29 vs 4.80 years). Furthermore, one has to note that more men never enter a union until being censored (6.58% vs. 10.67%) and that the proportion of men forming two or more unions is also slightly higher (18.84% vs. 19.59%).

With regard to children the numbers show that on average men have significantly fewer children than women (1.56 vs. 1.26). This is a typical finding in the literature (see Aassve et al., 2006 for the case of the British Household Panel, BHPS) and two possible reasons can be named. First, men are, on average, older than women when having a first birth (29.65 vs. 27.00). This also holds true for further births. Therefore, the number of children not part of the data set due to right-censoring tends to be higher for men than for women. A second point may be misreporting among men. In spite of the high quality of the data set, it is a general finding that misreporting with regard to family outcomes is much higher for men than for women (for fertility histories in the BHPS see Rendall et al., 1999). This in turn may explain in parts the lower fertility rate for men.

In general, a comparison of the results for the cohort used here with official data shows that with respect to the number of children, the data set fits well. For example, women born in 1962 have on average 1.56 children. Since one of the aims of this study is to investigate the effects employment and nonemployment have on fertility, it is interesting to see what happens to fertility rates when individuals are nonemployed or employed in an unstable environment. Having been nonemployed for at least one month increases the duration in the labor market until the conception of a first child significantly for women (6.05 vs. 6.64 years) and even more for men (6.38 vs. 8.67 years). But it is not only nonemployment, also the expectation about the stability of a job seems to play

a strong role in determining fertility. Also, having been temporarily employed for at least one month increases the duration in the labor market until the conception of a first child for women (6.14 vs. 6.78 years) and even more for men (7.49 vs. 8.49 years). Despite of this being no causal analysis, these results indicate that job stability and the expectation about it play a role for the timing of a first birth.

A further point worth mentioning is that for women, almost 20% of all births occur outside a union, while it is only around 8% of all births for men. This supports a possible misreporting among men, as it is likely that men will not report children when they are born outside a union and no union is formed afterwards.

5 Econometric Framework

Based on the work of Lillard (1993) two models of interrelated dynamic discrete choices are specified. In both models the discrete choices are defined over employment, nonemployment, union formation, union dissolution and conception and the dynamics are considered jointly. The five processes are specified as transition intensities, which are conditional on the time spent in the respective state, exogenous and endogenous covariates, as well as unobserved heterogeneity components that may be correlated with each other.

Model A: Inspired by Aassve et al. (2006), the set of processes is given as

$$\begin{aligned}\ln\left(h_A^E(t)\right) =& e_1 T^E(t) + e_2 A^E(t) + e_3 X^E(t) + e_4 P^E(t) + e_5 P^C(t) \\ &+ e_6 \mathbf{1}\{M(t)\} + e_7 \mathbf{1}\{C(t)\} + v^E,\end{aligned} \tag{1}$$

$$\begin{aligned}\ln\left(h_A^U(t)\right) =& u_1 T^U(t) + u_2 A^U(t) + u_3 X^U(t) + u_4 P^U(t) + u_5 P^C(t) \\ &+ u_6 \mathbf{1}\{M(t)\} + u_7 \mathbf{1}\{C(t)\} + v^U,\end{aligned} \tag{2}$$

$$\begin{aligned}\ln\left(h_A^M(t)\right) =& m_1 T^M(t) + m_2 A^M(t) + m_3 X^M(t) + m_4 P^M(t) + m_5 P^C(t) \\ &+ m_6 \mathbf{1}\{E(t)\} + m_7 \mathbf{1}\{C(t)\} + v^N,\end{aligned} \tag{3}$$

$$\begin{aligned}\ln\left(h_A^D(t)\right) =& d_1 T^D(t) + d_2 A^D(t) + d_3 X^D(t) + d_4 P^D(t) + d_5 P^C(t) \\ &+ d_6 \mathbf{1}\{E(t)\} + d_7 \mathbf{1}\{C(t)\} + v^D,\end{aligned} \tag{4}$$

$$\ln\left(h_A^C(t)\right) = c_1 T^C(t) + c_2 A^C(t) + c_3 X^C(t) + c_4 P^C(t) + c_5 \mathbf{1}\{E(t)\} + c_6 \mathbf{1}\{M(t)\} + v^C \tag{5}$$

where $\ln(h_A^s), s = E, U, M, D, C$, are the logarithms of the hazards of employment, nonemployment, union formation, union dissolution and conception. Individuals start the processes of finding employment (i.e. $\ln\left(h_A^U(t)\right)$) or entering the state of nonemployment (i.e. $\ln\left(h_A^E(t)\right)$) when entering the labor market for the first time. This means they are at risk of finding employment, if they are currently nonemployed. After finding employment, they are at risk at of entering the state of nonemployment. These events may be repeated several times and an individual can only be in one of the two states at a time $T = t$, i.e. the processes are mutually exclusive. The same holds true for the processes of union formation (i.e. $\ln\left(h_A^M(t)\right)$) and union dissolution (i.e. $\ln\left(h_A^D(t)\right)$). The process of union formation is assumed to start at age 15 years, i.e. the individual is single at this age. After the individual starts her first union, she is at the risk of dissoluting the union. Again these events may be repeated several times. Further, individuals are assumed to be at risk of having the first conception from age 15 years, i.e the process of conception (i.e. $\ln\left(h_A^C(t)\right)$) starts at this age. After the first conception, individuals become at risk of having a second conception and so on. Thus conceptions are specified within one hazard function.

For estimation, a common starting point is needed, which is assumed to be the date of labor

market entry $T = t_0$. As the processes of union formation, union dissolution and conception start prior to t_0, only those spells are used that are in progress or start after t_0 and the likelihood contribution of the spell in progress is conditioned on the probability of survival until t_0.

For all the processes the baseline transition intensity is modeled as a piecewise constant function. More precisely, $T^s(t)$ is a $(K^s \times 1)$-vector of binary indicator variables whose coefficients are allowed to differ between the K^s time intervals. Denoting the interval bounds for process $S = s$ as τ_k^s, the binary indicator variable for the kth interval is defined as

$$T^s(t) = \mathbf{1}\left\{\tau_{k-1}^s < t - \tilde{t}^s \leq \tau_k^s\right\}, \quad k = 2, \ldots, K_s \quad \text{and} \quad s = (E, U, M, D, C),$$

where $\tilde{t}^s$ is the start date of the current spell of the respective process. Modeling the elapsed duration as a piecewise constant function is a flexible way to account for duration dependence. Doing so also allows to account for possible nonlinearities. Age effects $A^s(t)$ are specified similarly in order to capture possible nonlinearties.

In addition to age effects, I include controls for the stock of each event $P^s(t)$ accounting for occurrence and lagged duration dependence effects. While the stock of children is implemented as dummy variables, the stock of partners and the stocks for employment and nonemployment is specified as the cumulative occurrence. For the processes of employment and nonemployment, I also include the cumulative durations in employment and nonemployment. Furthermore, the stock of children enters all five processes, while the other stocks only enter the respective pair of mutually exclusive processes. Furthermore, I include endogenous binary variables $\mathbf{1}\{E(t)\}$ accounting for the employment status and $\mathbf{1}\{M(t)\}$ for the cohabitation status. $\mathbf{1}\{E(t)\}$ enters the processes of union formation and dissolution and the process of conception, while $\mathbf{1}\{M(t)\}$ enter the process of conception and the processes of employment and nonemployment. Finally, $\mathbf{1}\{C(t)\}$ is a binary indicator that displays whether the individual or his respective partner is currently pregnant. This indicator enters the processes of employment, nonemployment, union formation and union dissolution.

I also condition the processes on a set of exogenous covariates $X^j(t)$. This set of covariates differs between the five processes. The ALWA data set includes a rich set of exogenous covariates. Furthermore environmental covariates like the unemployment rate or the growth rate are included.

In this study, I do not account for the order of conception or for the order of the union. However, it is clear that results may depend on the order of birth. The transition to the first union and first birth probably differs from later transitions. Likewise there is a large strand of the literature

focusing on first unions and births (see for example Le Goff, 2002 or Billari and Philipov, 2004). Also transitions from school to employment may be different to transitions from unemployment to employment. Like Aassve et al. (2006) I do not take account of the order because of the already high complexity of the model. Furthermore, several authors have argued that cohabitation and marriage differ in their effects on childbirth (see for example Steele et al. 2005). Also nonemployment tends to be a rather heterogenous state that may include unemployed individuals as well as housewives or -husbands. A similar issue concerns employment. Francesconi (2002) for example points out that women working part-time are more likely to have children than women working full-time. Nonetheless, the already complex structure of both models requires to collapse part-time work and full-time work into one employment state. The same holds true for nonemployment and cohabitation.

Model B: In addition to Model A, the processes for union formation, union dissolution and conception include the logarithm of the employment and nonemployment hazard. The process of conception additionally includes the logarithm of the union formation and dissolution hazards. These are interrelated with the state dummies because, e.g., the hazard of becoming nonemployed only matters if the person is employed. The five processes evolve as follows:

$$\ln\left(h_B^E(t)\right) = \ln\left(h_A^E(t)\right), \tag{6}$$

$$\ln\left(h_B^U(t)\right) = \ln\left(h_A^U(t)\right), \tag{7}$$

$$\ln\left(h_B^M(t)\right) = \ln\left(h_A^M(t)\right) + m_8\mathbf{1}\{E(t)\}\ln\left(h_B^E(t)\right) + m_9\mathbf{1}\left(1-\{E(t)\}\right)\ln\left(h_B^U(t)\right), \tag{8}$$

$$\ln\left(h_B^D(t)\right) = \ln\left(h_A^D(t)\right) + d_8\mathbf{1}\{E(t)\}\ln\left(h_B^E(t)\right) + d_9\mathbf{1}\left(1-\{E(t)\}\right)\ln\left(h_B^U(t)\right), \tag{9}$$

$$\begin{aligned}\ln\left(h_B^C(t)\right) = {} & \ln\left(h_A^C(t)\right) + c_8\mathbf{1}\{E(t)\}\ln\left(h_B^E(t)\right) + c_9\mathbf{1}\left(1-\mathbf{1}\{E(t)\}\right)\ln\left(h_B^U(t)\right) \\ & + c_{10}\mathbf{1}\{M(t)\}\ln\left(h_B^M(t)\right) + c_{11}\left(1-\mathbf{1}\{M(t)\}\right)\ln\left(h_B^D(t)\right)\end{aligned} \tag{10}$$

where $\ln(h_A^s), s = E, U, M, D, C$ are the log hazards from Model A. For example, m_8 captures the influence of the hazard of becoming nonemployed on the hazard of entering a union. More precisely, an increase by 1% of the hazard becoming nonemployed, results in an increase of the hazard of entering a union by $m_8\%$. The coefficient reflects whether and to what extent

individuals with stable jobs are more attractive for possible partners on the marriage market. Obviously, one could also assume that the risk of becoming pregnant has an effect on employment or union dissolution. However, this study particularly focuses on the effects employment risks have on union formation, union dissolution and conception. For pregnancy, I only include a pregnancy indicator. The hazard of becoming employed or nonemployed are likely to be well represented by the other observed covariates (age, education, etc.) and the correlated structure of unobserved heterogeneity. Other effects, like the effect the union dissolution hazard would have on employment outcomes are of minor interest and can be neglected. These choices result in a triangular form of the system of hazards which makes identification more easy and estimation more tractable.

5.1 Likelihood Function

Let $\psi(t)$ denote the history of outcomes, $\phi^s(t) = \{T^s(t), A^s(t), \ldots\}$ the path of observed components relevant for each state $s = E, U, M, D, C$ and v^s be the value of the unobserved heterogeneity component. Further, let $T = \bar{t}_i$ be the censoring point for individual i. Then conditional on $\Phi^s(t) = \phi^s(t)$, and $V^s = v^s$, the contribution to the likelihood function of person i's history can be expressed as the product of the contribution of each spell in each state,

$$L\left(\psi(t_{i,n_i}), \bar{t}_i | v_i\right) = \prod_s \left\{ L^s\left(\bar{t}_i | \phi^s(t_{i,n_i}), v_i^s\right) \times \left(\prod_{j=1}^{n_i} L^s\left(t_{i,j} | \phi^s(t_{i,j-1}), v_i^s\right) \right) \right\}^{\mathbf{1}\{S(t)=s\}}, \quad (11)$$

where $\mathbf{1}\{S(t) = s\}$ is a binary indicator for the current state.

The second term in equation (11) refers to all completed spells. Conditional on $\Phi^s(t) = \phi^s(t)$, and $V^s = v^s$, the contribution to the likelihood of the event of individual i moving from one state to another for $s = E, U, M, D$ or restarting the process $s = C$ (i.e. restarting the conception process) at time $t_{i,j}$ is

$$L^s\left(t_{i,j} | \phi^s(t_{i,j-1}), v_i^s\right) = h^s\left(t_{i,j} | \phi^s(t_{i,j-1}), v_i^s\right) \times \exp\left(- \int_{t_{i,j-1}}^{t_{i,j}} h^s\left(u | \phi^s(u), v_i^s\right) \, \mathrm{d}u \right), \quad (12)$$

where for $j = 1$, $t_{i,0}$ is the individual date of labor market entry. In equation (12) the right-hand side has the familiar "hazard function times survivor function"-expression, where the first term provides the hazard, i.e. the intensity of moving from one state to another and the second term is the probability of no events taking place between time $t_{i,j-1}$ and $t_{i,j}$. Because $t_{i,0} \geq \tilde{t}_{i,0}$, where $\tilde{t}_{i,0}$ is the start date of the current (union formation, union dissolution, or conception) spell before

entering the labor market, equation (12) automatically corrects for left-truncation by conditioning on the probability of no events taking place between time $\tilde{t}_{i,0}$ and $t_{i,0}$ (see for example D'Addio and Rosholm, 2002). Under the assumption that $\bar{t}_i$ is independent of the transition processes and observed and unobserved heterogeneity, $\bar{t}_i$ is uninformative about the parameters of interest and the distribution of $\bar{t}_i$ can be ignored in the likelihood function. Therefore, the contribution to the likelihood of the last right-censored spell, i.e. the first term in equation (11), is

$$L^s\left(\bar{t}_i|\phi^s(t_{i,n_i}), v_i^s\right) = \exp\left(-\int_{\bar{t}_i}^{t_{i,n_i}} h^s\left(u|\phi^s(u), v_i^s\right)\,\mathrm{d}u\right). \tag{13}$$

Equation (13) is simply the probability of no events taking place between t_{i,n_i} and $\bar{t}_i$.

5.2 Initial conditions and unobserved heterogeneity

As already mentioned, individuals may form unions or have children before entering the labor market. These outcomes may be influenced by unobserved characteristics, such as a strong preference for having children. In addition, the first employment state may be influenced by unobserved characteristics, such as a strong motivation to work. In general, such unobserved characteristics may bias results of other covariates. For example, a strong desire for children may result in having children while being in education and thereby affect the educational level, which in turn has an effect on the entry date and later on on other employment outcomes. It is therefore necessary to take account of these so-called initial conditions. Following Wooldridge (2005), I condition each of the processes of an individual i on a set of covariates $\mathbf{Z}^s(t_{i,0})$, where $\mathbf{Z}^s(t_{i,0})$ accounts for the age at entry, whether the individual is employed after entering the labor market, whether she was in a union, had children, and of an interaction term accounting for whether she went to university and had children prior to entering the labor market. Conditioning on $\mathbf{Z}^s(t_{i,0})$ requires to specify the probability function of V_i conditional on $\mathbf{Z}^s(t_{i,0})$ in order to integrate out the unobserved effect V_i. Wooldridge (2005) suggests the use of a parsimonious function for specifying the probability function of V_i^s conditional on $\mathbf{Z}^s(t_{i,0})$. I assume V_i^s to be a linear function of $\mathbf{Z}^s(t_{i,0})$ and a residual random effect W_i^s, whose distribution is independent of everything else, i.e. $V_i^s = \gamma^s \mathbf{Z}^s(t_{i,0}) + w_i$. By doing so, integrating out V_i^s conditional on $\mathbf{Z}^s(t_{i,0})$ results in integrating over the unconditional distribution of the random effect W_i^s and estimating some additional coefficients that refer to $\mathbf{Z}^s(t_{i,0})$, i.e. to the "initial conditions". The resulting likelihood contribution of individual i is then given by

$$L_i = \int_{-\infty}^{\infty} L\left(\psi(t_{i,n_i}), \bar{t}_i|\mathbf{z}(t_{i,0}), w_i\right)\,\mathrm{d}A^*\left(w\right), \tag{14}$$

where A^* is the time-invariant marginal distribution of w_i and integration is done using a Stieltjes integral.

In contrast to what is common in the literature, I do not assume W_i to be multivariate normal distributed. I follow Heckman and Singer (1984) and assume W_i to take on only a small number of different values. Steele et al. (2005) show how a discrete frailty may also be used for simultaneous hazard models. Let the discrete support of W_i^s be $w_1^s, \ldots, w_M^s$ and let $\pi_m = \mathrm{P}(W_i = w_m)$ be the joint probability for the m^{th} point of support for $s = E, U, M, D, C$. Equation (14) then becomes

$$L_i = \sum_{m=1}^{M} L\left(\psi(t_{i,n_i}), \bar{t}_i | \mathbf{z}(t_{i,0})\right) \pi_m. \tag{15}$$

It is common practice to think of the points of support as different types of persons. Using a larger number of types results in a more flexible distribution of unobserved heterogeneity. In practice however, most studies only use a small number of types. Following Gaure et al. (2005) I use the Akaike Information Criterion in order to select an appropriate number of $M = 3$ points of support for Models A and $M = 4$ for Model B.

5.3 Identification

The identification scheme for Model A is similar to the ones proposed by Aassve et al. (2006), Steele et al. (2005), or Upchurch et al. (2002). Model A uses the information on repeated events for each individual, i.e. multiple transitions from employment to nonemployment and vice versa, multiple union formation and dissolution, and multiple conceptions. There are also overlaps of all varieties in the events across the five processes. Identification is then ensured, as unobserved heterogeneity is assumed to be time-constant for each individual. The potentially endogenous variables enter the other processes as lagged transitions or the stocks of outcomes. This ensures identification of the parameters without further exclusion restrictions (see Maddala, 1983).

Such exclusion restrictions, however, are required for identification of the preferred Model B. In this model, the (contemporaneous) hazards of employment and nonemployment enter the processes of union formation and dissolution, while the (contemporaneous) hazards of employment, nonemployment, union formation, and dissolution enter the process of conception. As Lillard (1993) points out, dependence on the contemporaneous hazards requires exclusion restrictions, i.e. variables are required to have an effect on, for example, the process of employment but must not enter the processes of union formation and dissolution, and the process of conception. As

one can only be employed or nonemployed at a time, the same set of variables could enter the processes of employment and nonemployment. The same holds true for union formation and dissolution. Identification of Model B is more involved, because the employment and nonemployment hazards enter the conception hazard a second time via the union formation and dissolution hazards. This requires that the union formation and dissolution hazards include variables that neither enter the conception hazard nor the employment and nonemployment hazards. As mentioned, the process starts at different times and there are all forms of overlaps. Further, time enters the processes in a nonlinear way. Therefore, the variables accounting for duration dependence should suffice as exclusion restrictions. Nonetheless, it is always better to have more exclusion restrictions. Therefore, for each process an additional set of exclusion restrictions is used. By taking advantage of the variation over time in the maternity leave durations, I can construct a binary indicator for whether an individual is currently taking or could potentially take maternity leave. This indicator is the used as an exclusion restriction for the hazards of becoming employed and nonemployed. However, this exclusion restriction is only meaningful for women. Further exclusion restrictions are, for example, macroeconomic variables like the regional unemployment rate, the regional growth rate or the regional birth rate. A full list of all exclusion restrictions for each process is given in Table 13 in the Appendix.

The effects the endogenous variables have on the respective simultaneous hazards, can also be considered as treatment effects. For example, the treatment of moving from employment to nonemployment may change the probability of conceiving, while the treatment of conception may change the search behavior of nonemployed individuals. Identification of such treatment effects, however, requires that the treatment date can not be anticipated (see Abbring and van den Berg, 2003a, 2004). If the exact date of treatment were known, individuals would act on this information and parameter estimates could not be identified. This does not mean that individuals do not know about the process itself and do not act on this information. However, it is necessary that transition dates are defined as dates when information about an event emerges. In sum this means that identification is still given, although individuals may act on the conception process, for example by stopping the usage of contraceptives, because the point of conception is still random. Nonetheless, one has to be cautious about women's transitions from employment to nonemployment, as these may to some extent be planned events in order to become pregnant.

6 Results

Following Gauré et al. (2006) the Akaike selection criterion is used to choose the appropriate number of points of support for the unobserved heterogeneity. For both genders the AIC selects three mass points for Model A and four mass points for Model B[16]. The results for both genders are presented in the Tables 3-7. Coefficients are given as average partial effects and standard errors are calculated using the Delta method. If there are no major differences between Model A and B, only results for the preferred Model B are discussed.

— Table 3 about here —

— Table 4 about here —

— Table 5 about here —

— Table 6 about here —

— Table 7 about here —

6.1 The effects of employment on union formation, dissolution and conception

In contrast to Aassve et al. (2006) my results for Model A suggest that the employment state has no effect on finding a partner for women and but a slightly positive effect for men, as can be seen in the first and third column of Table 5. However, this positive effect vanishes for Model B, a point that can be seen in the second and fourth column of Table 5, and results suggest that men with a high hazard of losing a job are less likely to start a union. This means that for men the stability of a job is important and less the job itself. My results are therefore in line with Ahn and Mira (2001) who show that Spanish men delay marriage decisions due to bad employment prospects. Results for Model B further indicate that women with a high hazard of finding a job are more likely to find a partner. One reason may be that women with better labor

[16]See the Appendix for a comparison of the values of the AIC.

market perspectives are more confident and therefore considered as more attractive or partners want to benefit from better labor market perspectives.

With regard to union dissolution, as shown in columns one and three of Table 6, results for Model A indicate that unions of employed men tend to be more stable, while no such effect can be found for women. However, the effect for men is no longer significant, if the hazards of finding and losing employment are included as regressors (see column four of Table 6). Nonetheless, results still indicate that male employment plays a positive role for union stability. These results are supported by Eliason (2012) who shows that for Swedish men a job loss increases the excess divorce rate by 13%. Since men still contribute a larger part to the household income, a job loss often results in a severe loss of household income. This in turn may yield a loss of self-confidence as unemployed men can not manage their role as breadwinners what may destabilize a union. For women the effects are ambiguous. While for couples in which women contribute a large part to the household income a wife's job loss may destabilize a union, the effect might be reverse for women becoming housewives. Therefore, it is not surprising that no effect can be found for women.

With regard to conception, results for Model A indicate that being employed has no effect on childbearing for men and a negative effect for women (see columns one and three of Table 7). For men the absence of a positive employment effect is surprising, because most nonemployed men are unemployed and it is plausible that unemployed men are less likely to have children than employed men due to income restrictions. The results are also in contrast to what Aassve et al. (2006) have found. For women the negative employment effect vanishes for Model B (see column two of Table 7) and is now captured by the hazard of losing a job which indicates that for women a high hazard of losing a job decreases the hazard of having children. This is similar to what Del Bono (2001) finds for British women. Women working in an unstable employment in general depend heavily on the income from these employments. This is particularly true for single-mothers and women living in households depending strongly on wife's income. It is therefore not surprising that women with a high risk of becoming nonemployed are less likely to have children. For men, results from Model B suggest that a low hazard of finding a job increases the hazard of having children (see column four of Table 7). Men with low job market perspectives might spend more time in other activities than searching for a job, which may include having children and they might also care less about contraceptives. Nonetheless, the absence of any positive effect of being employed for men is surprising.

6.2 The effects of partnership on employment, nonemployment and conception

For women having a partner increases the likelihood of becoming nonemployed and decreases the likelihood of finding a job (see columns one and two of Tables 3 and 4). Although the effects are small, they are significant and point in the same direction as supposed by Aassve et al. (2006). For men the effects point in the opposite direction (see columns three and four of Tables 3 and 4). My results therefore suggest a classical division of labor between women and men, with men as breadwinners and women as housewives. Surprisingly, the educational level of the partner does not seem to play a role, as the coefficients are very small and mostly insignificant.

Obviously, having a partner strongly increases the conception hazard (see columns one to four of Table 7). One can see that the effects are stronger for Model A than for Model B, since the hazards of starting and ending a union capture these effects in parts. Surprisingly, a high hazard of losing a partner results in an increase of the hazard of having children (see column two of Table 7) for women. An 1% increase in the union dissolution hazard increases the hazard of having a child by 1.15% for women. The effect is also large for men but not significant. These findings are in contrast to large parts of the economic theory (see for example Becker et al., 1976) which predicts that couples with a high risk of splitting up are less likely to invest in partnership-specific capital and therefore tend to have fewer children. The result is also in contrast to Lillard (1993) who finds that an 1% increase in the hazard of union dissolution results in a decrease of the conception hazard by -1.62%. Note that the presented results here are based on cohabiting couples who are not necessarily married. It is important to note that Becker et al. (1976) and Lillard (1993) base their results on data of cohorts which had explicitly higher separation costs[17]. Over the years however, separation costs have considerably fallen. Today, many women work and therefore do not depend exclusively on husbands alimonies. Furthermore, normative issues seem to be less important, which is reflected in an increasing number of single-mothers and step families. A further aspect that has to be taken into consideration is that most forms of investment into partner-specific capital, e.g. marriage, have become less valuable with lower separation costs. The only investment that may be considered as an exception is having children. Therefore, for couples with a high risk of dissolving, having children may present the best form of investment, if they want to maintain their relationship, i.e. children are used in

[17]Lillard (1993) uses data of US-American marriages for the period from 1955 until 1985 and accounts only for married couples and children born within a marriage.

order to rescue the relationship. This may to some extent explain why couples with a high risk of dissolving are more likely to have children.

The results found here also shed some light on the increase in single-mothers and the high proportion of mothers among separated and divorced women. If couples that are likely to split up had fewer children, the proportion of mothers should be lower among separated and divorced women. However, results for Germany show that for the cohort 1959-1968 the proportion of mothers is the same for married and divorced women[18]. As some of the couples with a high risk of dissolving maintain their relationship due to the investment in children and therefore increase the proportion of mothers among married women, these results support the findings here. Also Kohler et al. (2006) show that from a European perspective the result seems to hold. They find that the cross-sectional correlation coefficient between the total fertility rate and the divorce rate of several European countries has switched from negative to positive between 1975 and 2002.

6.3 The effects of children and childbearing

In contrast to Aassve et al. (2006), I also include a dummy variable that displays current pregnancy. This variable leads to some changes with respect to variables that account for the number of children, in particular, for women. While the number of children accounts mostly for long-run decisions, current pregnancy accounts mostly for short-run decisions. With regard to the transition from employment to nonemployment, the results show that fathers are less likely to become nonemployed (see columns three and four of Table 3). Because children cause costs, there is an incentive to work for fathers who usually contribute a larger part to the household income. Fathers may therefore choose jobs that are more stable and put more emphasis on fulfilling their duties. Furthermore, for men virtually no effect can be found for the transition from nonemployment to employment (see columns three and four of Table 4). So far the literature has neglected that children may also have positive effects on job stability of women. By including a binary indicator for current pregnancy, I am able to show that it is only pregnancy that drives women out of employment, while children strongly increase the attachment with the current job (see columns one and two of Table 3). A possible reason for this is an increase in household expenses due to children and therefore a higher motivation to work and to remain employed. The finding is also of particular interest, because it applies most notably to women that are strongly affected

[18]For both groups the rate of mothers is around 90% (See Statistisches Bundesamt, 2012)

by increases in household expenses, like single-mothers or women from low-income households. For the hazard of becoming employed, my results show that for nonemployed women, children and a current pregnancy strongly hamper the return to employment (see columns one and two of Table 4). This is in line with the existing literature which deals with the interrelation of fertility and female labor force participation (see for example Hyslop, 1999, or Michaud and Tatsiramos, 2011). However, most studies neglect that effects are different for women that are dependent on their job because of income reasons, e.g. single-mothers. The results in this paper show that for these women children strongly increase the attachment to their jobs.

With regard to the hazard of starting a union, the results in column one to four of Table 5 show that a current pregnancy more than quadruplicates this hazard for women and more than septuples it for men[19]. This is consistent with economic theory, which predicts that cohabitations are more beneficial once partner-specific capital has been acquired. Moreover, normative aspects may force individuals to enter a union. Interestingly, the effect seems to be stronger for men. One reason for this may be that men tend to underreport children born outside a union more often than women. The number of children has no effect on forming a union for both women and men. This is surprising because children are generally considered to impede entering a (second) union. However, as already mentioned, the costs of entering a subsequent union have fallen.

Turning to the union dissolution hazard, one can see that the number and age of children play a strong role for the stability of a union (see columns one to four of Table 6). Economic theory often names children as a typical form of partner-specific capital increasing the cost of a dissolution. However, the effect seems to reduce somewhat with the age of children. This is in line with other empirical findings (see for example Steele et al., 2005, or Lillard and Waite, 1991). Normative forces may explain to a large extent the strong effect a current pregnancy has on the union dissolution hazard (reduces the hazard by 90% for women and 98% for men).

The results in columns two and four of Table 7 show that the first child reduces the hazard of conception by around 44% for women and 48% men compared to having no children. However, the effects are offset, if the child is younger than three years, whereas three years is the typical time span within a second child is born. A second child then reduces the hazard by around 88% for women and men, while the effect for three or more children is even stronger. These findings support the classical role model of families having two children born within a short time interval.

[19]Percentage values for the respective effects of a binary indicator can be calculated by $\exp(\beta_i) - 1$, where $\beta_i = e_i, u_i, m_i, d_i, c_i$

6.4 The effects of education

Note that education is measured by the highest degree obtained. For men, a higher educational level goes along with a higher job stability (see columns three and four of Table 3). This is not the case for women, for whom the hazard for a transition to nonemployment seems to be unaffected by the educational level (see columns one and two of Table 3). Furthermore, better educated women and men are more likely to find employment when nonemployed (see columns one to four of Table 4). Interestingly, the results for women are stronger than for men. This might indicate that highly educated women also return to employment more quickly after a voluntary nonemployment period (e.g. a parental leave).

The results in columns one to four of Table 5 suggest that for women education does not seem to have an effect on the hazard of union formation, while men with a university degree are more likely to find a cohabiting partner. Because higher education is also linked to more prestigious jobs and higher wages, this result supports the idea of a Jane Austen's world, where women prefer successful partners (Coles and Francesconi, 2011). Furthermore, the results in columns one and two of Table 6 show that a women's education plays no role for the decision to end a union, while results in columns three and four indicate that unions of better educated men are more stable. However, these effects are smaller for Model B, i.e. the variables accounting for education in Model A seem to capture in parts the effects of the hazards of finding and losing employment.

With regard to conception, results from Model B indicate that women and men having obtained a university degree are more likely to have children (see columns two and four of Table 7). On first sight, this result is surprising as academics are usually considered to have a low birth rate. However, two aspects may play a role here. First, university graduates are on average older when entering the labor market. This means that they are faced with a higher biological pressure to have children and therefore have children more rapidly. Furthermore, education accounts in parts for the current income level and also expectations about future income. Therefore, results for education suggest that the income level and income stability play a role for the decision on having children.

6.5 The effects of age

Concerning age effects, the results for men are as expected. Older men are less likely to become nonemployed, but also less likely to find a job (see columns three and four of Table 3). For women these results do not hold (see columns one and two of Table 3). Interestingly, both transitions from and to employment do not seem to depend on the current age of a woman. By contrast, Steele (2005) finds that for Australian women job stability increases with age.

The results for the union formation process (see columns one to four of Table 5) exhibit an inverse U-shape with respect to age for women and men with a peak for the group aged 25 to 30, indicating that within this age interval most unions are formed. Although many individuals find their partner at an earlier stage, cohabitations typically start when individuals have entered the labor market. Nonetheless, finding a cohabiting partner becomes less and less likely the older an individual gets. In particular, women aged 40 or older have poor chances of finding a cohabiting partner. These women are even less likely to start a union than women aged 20 or younger, i.e. women who are mostly still in school and live with their parents. The results with regard to age are in line with the literature, although Brien et al. (1999) find that American women and men enter unions at an earlier stage. However, the authors use data from the National Longitudinal Study of the High School Class of 1972, i.e. of a much older cohort. The union dissolution hazard seems to be independent of age (see columns one to four of Table 6). Even though one could assume that older partners have more stable unions, results show that this is not the case. The results for duration dependence show that the duration of a union and not the individuals age increases the stability of a union.

The results from Model B indicate that the hazard of conception also exhibits a typical inverse U-shape for both women and men (see columns two and four of Table 7). Women most likely become pregnant between 25 and 30, while men most likely become fathers between 30 and 35. Not surprisingly, men aged 40 or older are still more likely to become father than men aged 20 or younger, while the hazard of becoming pregnant drops sharply for women aged 40 or older due to biological reasons.

6.6 State dependence effects

The results for duration dependence are fully captured by the baseline hazards which are displayed in Figures 2 and 3. The transitions from employment to nonemployment exhibit strong negative duration dependence, i.e. transitions become less likely over time for both men and women. At least for men, this is a typical finding, often linked with higher opportunity costs for a dismissal and institutional issues, like Germany's strict Dismissal Protection Law. In addition, the likelihood of a transition for both women and men increases with the number of prior employment spells but not with their duration (see columns one to four of Table 3). The results therefore indicate stigmatization effects and no positive effect on human capital due to longer lasting employment spells.[20]

With regard to the transition from nonemployment to employment, the results show a decaying baseline hazard for women and men. For men, however, the baseline hazard first increases strongly and then decreases to its base level, while for women, the baseline hazard decreases directly. In general, decaying baseline hazards are often found in the literature (see for example Cockx and Dejemeppe, 2005) and typically linked with decreases in human capital or stigmatization effects. Results for men also suggest that again no lagged duration dependence can be found and that the more often someone has been employed, the more likely he is to find employment (see columns three and four of Table 4). However, the jobs found seem to be of a poor quality, as results for occurrence dependence for the hazard of becoming nonemployed reveal. This means that for men, there might be a vicious circle of unstable employment and nonemployment and exiting this circle becomes less likely the more often someone has transited between employment and nonemployment.

The success of search for a partner seems to depend only on age, but not on the duration of the search process (see columns one to four of Table 5). By contrast, a reverse effect is found for the process of splitting up a partnership, when age does not play a role, but an inverse U-shaped pattern is found for the baseline hazard for women and men (see columns one to four of Table 6). Such an inverse U-shape is plausible, because the longer a relationship lasts, the higher are the costs of splitting up. Furthermore, the start of a cohabiting union is related to an investment, e.g. the partners have to move together, and therefore typically do not split up directly. For women, the number of prior partnerships does not play a role for both transitions, meaning that

[20]Note that the number of nonemployment spells is directly linked to the number of employment spells.

they neither learn from prior partnerships nor are stigmatized by having had many relationships before (see columns one and two of Table 6). However, for men, the union formation hazard increases with the number of prior partnerships.

Note that the process of conception is a recursive one. While effects for the first birth are mostly captured by age variables, variables concerning duration dependence mostly capture effects from subsequent births. Therefore, the strong peak for the period from two to five years after a birth, probably indicates that a subsequent birth typically occurs within a time span of two to five years. Separate estimation of hazard rates subject to the order of birth would certainly help to elaborate such effects in more detail.

6.7 The effects of environmental and other background variables

My results for the transitions from and to employment suggest that the region in Germany has no effect on becoming nonemployed (see columns one to four of Table 3) but that men living in East Germany are less likely to find employment (see columns three and four of Table 4). Similar to this finding, the results also show that an increase in the current unemployment rate does not play a role for the hazard of becoming nonemployed but decreases the hazard of finding a job for men. Furthermore, for men, a decay in the regional growth rate reduces the hazard of finding a job, while it has almost no effect on the transition from employment to nonemployment. For men, the findings with respect to regional unemployment and growth rate are therefore consistent with Hall (2005) who argues that during slack periods, unemployment rises mainly due to low hiring rates rather than increased separations. Nonetheless, the situation is reverse for women, for whom an increase in the regional unemployment rate increases the hazard of becoming nonemployed (see columns one and two of Table 3), while the regional growth rate has a positive effect on becoming employed (see columns one and two of Table 4). Furthermore, my results suggest for both genders that public employees, civil servants and self-employed individuals are less likely to become nonemployed, while employees with a temporary contract are more likely to become nonemployed. The results also point out that during maternity leave, women are less likely to become employed but also less likely to become nonemployed. For men, no such effect can be found[21]. The transition from nonemployment to employment also includes two binary indicators

[21]Maternity leave periods are modeled via a binary indicator that points out whether an individual is currently entitled to take maternity leave. As it is the wife who normally is entitled to take maternity leave, for men, the binary indicator is likely to act as a proxy for whether the wife is working or not.

for whether an individual is unemployed or in education. They indicate that unemployed individuals return to employment more quickly than housewives or individuals in education. This is mostly due to the longer durations of the latter two occupations.

The only background variable having an effect on the union formation hazard is a dummy variable characterizing the months from March to September (see columns one to four of Table 5). Results show that during spring and summer months women and men more are more likely to start a cohabiting union. With regard to the union dissolution hazard, results show that women living in the East Germany are more likely to end their relationship, while no effect can be found for men (see columns one to four of Table 6). Note that individuals in the sample were not raised in East Germany but moved to this region later. As unemployment risk is considerably larger in East Germany, the dummy variable might act as a proxy for spouse's employment state. The results may therefore indicate that women tend to quit a relationship if the spouse is unemployed. Unions are also more stable, if one of the partners belongs to a religious denomination, probably, because conservative values and norms may be more important to them. With regard to information on the partner, the results depend strongly on the model choice (see columns one to four of Table 6). While most coefficients are significant for Model A, this is no longer the case for Model B. Finally, the results show that women are more likely to end their relationships during the second half of year.

Turning to the conception hazard, my results suggest that the place of residence has no effect on the hazard of conception (see columns one, two and four of Table 7), although Model A indicates that for men, living in East Germany has a small and significant, positive effect on having children. Furthermore, belonging to a religious denomination increases the hazard of having children. Also a higher regional rate of births increases the likelihood for children. While this rate may proxy for the number of nurseries or kindergartens, it also displays regional preferences and attitudes towards children that may affect personal preferences. Finally, my results indicate that an increase in the potential amount of child allowance[22] tends to increase the hazard of having children for women.

[22]Here the potential amount of child allowance is calculated as the amount an individual would potentially receive for his or her next child. The amount is divided by the current average gross income in order to make the amount of child allowance comparable across time.

6.8 The effects of initial conditions

With respect to the hazard of becoming nonemployed, one can see that none of the coefficients are significant except for the coefficient for women's age at entry of Model B, which has a small negative impact (columns one to four in Table 3). The results for the hazard of becoming employed show that for women being in a union and having children before entering the labor market have a positive effect on becoming employed (columns one and two in Table 4). This is not very surprising, because women who have already formed their family before entering the labor market may spend less time on raising children afterwards and are therefore more likely to find a job, if nonemployed.

The estimates for the union formation hazard suggest that men who have formed a union before entering the labor market are more likely to form subsequent unions afterwards (columns three and four in Table 5). The effect is in addition to the positive effect the cumulative number of unions has on the hazard of finding a partner. For the union dissolution hazard, results indicate that women who have formed a union prior to entering the labor market are more likely to quit this or any subsequent union (columns one and two in Table 6). For men, a dissolution becomes more likely, the older an individual is when entering the labor market. Note that the age at entry is on average higher, the higher the educational degree. My results further show that having obtained a university degree stabilizes unions of men. The result therefore holds particularly for men who are old when entering the labor market and have not obtained a university degree.

The results for the conception hazard show that women who formed a union before entering the labor market are less likely to have children (columns one and two in Table 7). Furthermore, results for Model B predict that women who are older at entry are less likely to have children. Again, note that the age at entry is, on average, higher, the higher the educational degree and that having obtained a university increases the hazard of having children for women. Therefore, the result holds particularly for women who are old when entering the labor market and have not obtained a university degree.

6.9 The effects of unobserved heterogeneity

The effects of unobserved heterogeneity are only considered for Model B, i.e. four points of supports are used for women and men. It is common to assume the points of support as different

types of individuals. The results then show that for women the second type is the most likely, while the other three types are almost equiprobable (e.g. column two in Table 3). With respect to the different transitions, the types of support differ only very slightly (column two in Tables 3 to 7). In particular, the variation is small for the hazard of childbearing. However, the volatility is relatively large with respect to the hazard of becoming employed. Of particular interest are the second and the fourth type. The second type is characterized by stable employments, short nonemployment periods, short periods of partner search and stable unions . The fourth type may be attributed to housewives, since this type is characterized by stable jobs, long nonemployment periods, short periods of search for a partner, stable unions and short periods until childbirth.

For men the situation differs strongly. Here the first type is by far the most likely one. Together with the third type, they account for more than 86% of all men (e.g. column four in Table 3). One therefore should be cautious with the interpretation of types two and four. The first type is characterized by stable jobs, short job-search periods and short periods of search for a partner, stable unions and short periods until childbirth (column four in Tables 3 to 7). The third type is also characterized by stable jobs and short job-search periods, but longer periods of search for a partner and periods until childbirth, and also less stable unions.

I also calculated the correlations between the mass points for unobserved heterogeneity in Model A and B (Tables 8 to 11). Although one has to be cautious with the interpretation, since for calculation of the correlations only three different values are used for Model A and four for Model B, comparing correlations for Model A and B provides some interesting insights. For both genders, Model A provides evidence for a strong positive correlation between union dissolution and conception and strong negative correlation between union formation and conception. These findings are similar to Aassve et al. (2006) who uses data on British women and men. However, the situation is different for Model B. By including the union formation and dissolution hazards as regressors for the conception hazard, the coefficients switch signs. This means that to some extent the strong positive correlations in Model A are due to the strong positive effect the union dissolution hazards have on the conception hazards.

7 Conclusion

This study investigates the interrelated effects of employment, cohabitation and fertility. Using a simultaneous hazards approach due to Lillard (1993), I estimate a five-equation model. An

important contribution of this paper is to provide evidence how labor market risks influence union formation, dissolution as well as childbearing decisions. I do so by including the employment and nonemployment hazard rates as simultaneous regressors for the processes of union formation, union dissolution and conception. Furthermore, also the union dissolution and union formation hazard rates are used as regressors for the process of conception. The effects are analyzed using a sample of German women and men born between 1960 and 1969, which is drawn from the ALWA data set.

Results show that whether someone is employed generally has no effect on union formation, union dissolution and childbearing. This holds for both women and men, although for employed men, I find a significant low hazard of splitting up. Employed women with stable jobs and nonemployed men with poor chances to find a job are more likely to have children. The hazards of becoming employed and nonemployed are mostly influenced by the educational level and the duration of the current employment or nonemployment period. Another finding is that family events have significant effects on the transitions from and to employment. The results are of the expected direction. By adding a variable that indicates current pregnancy, I can show that for women children reduce the likelihood of becoming nonemployed. This is interesting also from a policy perspective, because many women who work and have (pre-school) children belong to disadvantaged groups (single-mothers or women from low-income households). For these women, children increase the dependence on earned income and therefore make transitions to nonemployment less likely. Results further indicate that children, in particular pre-school children, make unions more stable and do not present a burden for subsequent unions. Obviously, children are more likely to be born inside a union. However, my results show that unions that are likely to split up may use children as an investment in partnership-specific capital in order to stabilize their relationship. This is in line with an increase in single-parents and step-families. Overall, the results support the view that the effects from employment on cohabitation and fertility are not as strong as the other way round. The interrelation between cohabitation and childbirth however exhibits strong influences for both directions.

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9 Tables

Table 1 – Descriptive statistics

	female	*male*
Gender		
Frequency	1428	1312
Proportion	52.12%	47.88%
Year of birth		
Year of birth	1964.21	1964.23
Education (completed)		
Proportion No Degree	5.32%	3.13%
Proportion High School (HS)	2.24%	2.29%
Proportion Vocational Training (VT)	58.05%	52.52%
Proportion HS + VT	16.81%	13.95%
Proportion Technical College	6.51%	11.59%
Proportion University	11.06%	16.54%
Children		
Children per person	1.57	1.26
Children born while in a union	1.41	1.16
Children born while not in a union	0.16	0.10
Children born while employed	1.05	1.18
Children born while nonemployed	0.52	0.08
Proportion having no children	18.98%	35.21%
Proportion having 1 child	22.62%	23.25%
Proportion having 2 children	43.84%	33.54%
Proportion having 3 children	12.61%	6.78%
Proportion having at least 4 children	1.96%	1.22%
Age at 1st child	27.00	29.65
Age at 2nd child	29.62	32.24
Age at 3rd child	31.78	34.50
Age at 4th child	33.18	35.71
Years in E/NE until 1st child	6.29	7.76
Years in E/NE until 1st child if no NE	6.05	6.38
Years in E/NE until 1st child if NE	6.64	8.67
Years in E/NE until 1st child if no TE	6.14	7.49
Years in E/NE until 1st child if TE	6.78	8.49
Relationships		
Relationships per person	1.14	1.11
Proportion forming no union	6.58%	10.67%
Proportion forming 1 union	74.58%	69.74%
Proportion forming 2 unions	17.09%	17.61%
Proportion forming 3 or more unions	1.75%	1.98%
Age at 1st union	24.21	26.95
Age at 2nd union	30.09	33.51
Age at 3rd union	34.48	35.62

—Continued on next page—

Employment		
Age at labor market entry	20.92	22.15
Number of periods employed	1.99	1.95
Number of periods nonemployed	1.46	1.29
Months spent employed	191.87	226.79
Months spent nonemployed	71.15	21.42

If not specified, mean is given

E: Employment, NE: Nonemployment, TE: Temporary Employment

Table 2 – Model Selection

	1 MP	2 MP	3 MP	4 MP
Women				
AIC_A	76681.495	76514.196	76465.107***	
AIC_B	76413.057	76246.225	76210.656	76154.036***
Men				
AIC_A	64014.617	63737.815	63699.166***	
AIC_B	63894.321	63614.514	63582.083	63558.382***

*Chosen Model indicated by ****

Table 3 – Employment to Nonemployment

	Women		Men	
	Model A	*Model B*	*Model A*	*Model B*
Duration dependence				
Elapsed duration (base: <6 months)				
Elapsed 6-12 months	0.1289	0.1255	0.2971	0.3162*
	(0.1379)	(0.1344)	(0.1877)	(0.1867)
Elapsed 12-24 months	-0.1772	-0.2231**	-0.1861	-0.1554
	(0.1119)	(0.1105)	(0.1245)	(0.1245)
Elapsed 24-60 months	-0.2384**	-0.3022***	-0.4650***	-0.4132***
	(0.1080)	(0.1065)	(0.1215)	(0.1225)
Elapsed 60-120 months	-0.5070***	-0.6018***	-1.0057***	-0.9603***
	(0.1266)	(0.1242)	(0.1530)	(0.1556)
Elapsed >120 months	-0.7768***	-0.8593***	-1.1826***	-1.0883***
	(0.1761)	(0.1751)	(0.2260)	(0.2376)
Age				
Age structure (base: <20 years)				
20-24 years	-0.0640	-0.0409	-0.3151**	-0.3279**
	(0.1568)	(0.1560)	(0.1323)	(0.1330)
25-29 years	0.1501	0.1594	-0.6779***	-0.6997***
	(0.1735)	(0.1718)	(0.1706)	(0.1723)
30-34 years	0.1489	0.1650	-0.8061***	-0.8228***
	(0.2105)	(0.2094)	(0.2301)	(0.2335)
35-39 years	0.2183	0.2523	-0.8631***	-0.8858***
	(0.2459)	(0.2443)	(0.2887)	(0.2917)
>40 years	0.2465	0.2920	-0.9033***	-0.9230***
	(0.2896)	(0.2898)	(0.3339)	(0.3356)
Education				
Highest degree achieved (base: no degree)				
Voc. Train.	-0.0833	-0.0663	-0.3004**	-0.3088**
	(0.0903)	(0.0827)	(0.1502)	(0.1296)
HS degree	-0.1028	-0.0827	-0.0977	-0.1114
	(0.2003)	(0.2005)	(0.2295)	(0.2242)
HS + VT	-0.1445	-0.1089	-0.4953***	-0.5286***
	(0.1185)	(0.1208)	(0.1904)	(0.1730)
Tech. College	-0.0819	0.0108	-0.8998***	-0.9135***
	(0.1618)	(0.1607)	(0.2197)	(0.2073)
Uni. degree	-0.2246	-0.1538	-0.8154***	-0.8411***
	(0.1661)	(0.1678)	(0.2197)	(0.2063)
Children				
Number of children (base: no child)				
1 child	-0.3562***	-0.3204***	-0.1352	-0.1534
	(0.1029)	(0.1021)	(0.1407)	(0.1412)
2 children	-0.5653***	-0.5341***	-0.3113*	-0.3549**
	(0.1302)	(0.1309)	(0.1702)	(0.1717)

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Table 3 – (continued)

	Women		Men	
	Model A	*Model B*	*Model A*	*Model B*
3 or more children	-0.7666***	-0.7503***	-0.3669	-0.5016*
	(0.2032)	(0.2134)	(0.2798)	(0.2790)
children <3y	-0.1481	-0.1347	-0.0718	-0.0781
	(0.1490)	(0.1442)	(0.1977)	(0.2045)
children 3y-6y	0.2327	0.2349**	0.0597	0.0573
	(0.0969)	(0.0950)	(0.1183)	(0.1191)
Pregnant	3.0415***	3.0765***	-0.0729	-0.0989
	(0.0604)	(0.0633)	(0.1687)	(0.1740)
Union				
Currently in a union	0.3701***	0.3255***	-0.2998*	-0.2961*
	(0.1082)	(0.1050)	(0.1550)	(0.1753)
Partner has VT (+HS) degree	-0.0204	0.0287	0.0297	0.0137
	(0.0793)	(0.0833)	(0.1539)	(0.1575)
Partner has TC or UD degree	-0.0594*	-0.0353	0.1999	0.1675
	(0.0800)	(0.0806)	(0.1860)	(0.1848)
Other covariates				
East	0.1385	0.0499	0.6086	0.6477
	(0.3829)	(0.3984)	(0.4298)	(0.4328)
Public employee	-0.3537***	-0.3042***	-0.6278***	-0.6482****
	(0.0606)	(0.0617)	(0.0976)	(0.0997)
Civil servant	-0.4554***	-0.4722***	-0.3159*	-0.3602***
	(0.1591)	(0.1507)	(0.1653)	(0.1826)
Fixed-term contract	1.0667***	1.0259***	0.9034***	0.9369***
	(0.0966)	(0.0949)	(0.0953)	(0.0989)
Self-employed	-0.3252**	-0.3077**	-0.9783***	-0.9981***
	(0.1435)	(0.1428)	(0.1793)	(0.1941)
Regional U-rate	0.0169*	0.0178*	-0.0009	-0.0044
	(0.0097)	(0.0094)	(0.0129)	(0.0133)
Regional growth rate	0.0018	0.0033	-0.0371**	-0.0365**
	(0.0126)	(0.0471)	(0.0154)	(0.0156)
Maternity protection	-0.6511***	-0.6526***	0.0954	0.0945
	(0.1629)	(0.1529)	(0.2004)	(0.2060)
State dependence				
Cum. # of employments	0.1335***	0.1392***	0.0823***	0.0843***
	(0.0513)	(0.0471)	(0.0209)	(0.0199)
Cum. dur. in employment	-0.0001	-0.0006	0.0011	0.0011
	(0.0012)	(0.0012)	(0.0015)	(0.0016)
Cum. dur. in nonemployment	0.0006	0.0009	0.0008	0.0006
	(0.0011)	(0.0011)	(0.0015)	(0.0016)
Initial conditions				
Situation at labor market entry				

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Table 3 – (continued)

	Women		Men	
	Model A	*Model B*	*Model A*	*Model B*
Age at entry	-0.0226	-0.0287*	0.0268	0.0305
	(0.0170)	(0.0169)	(0.0205)	(0.0204)
Employed at entry	0.0339	0.0469	0.0948	0.1004
	(0.1120)	(0.1085)	(0.1509)	(0.1520)
In union before entry	-0.0267	-0.0437	-0.0119	-0.0144
	(0.0645)	(0.0640)	(0.1179)	(0.1204)
Children before entry	0.1884	0.1452	-0.4150	-0.3790
	(0.2053)	(0.2072)	(0.4665)	(0.4431)
Children while at college	-0.1173	-0.1839	0.5258	0.5139
	(0.4136)	(0.4418)	(0.5213)	(0.5058)
Unobserved heterogeneity				
Points of support				
$\ln v_1^E$	-5.2899***	-5.1292***	-4.2692***	-4.2846***
	(0.3464)	(0.3528)	(0.4022)	(0.4120)
$\ln v_2^E$	-5.2620***	-5.1559***	-3.7348***	-4.0681***
	(0.3534)	(0.3471)	(0.4283)	(0.4342)
$\ln v_3^E$	-4.6196***	-5.0829***	-4.2678***	-4.4563***
	(0.3780)	(0.3676)	(0.4248)	(0.4439)
$\ln v_4^E$		-4.5965***		-3.4209***
		(0.3799)		(0.4917)
Probabilities				
π_1	0.4606***	0.1745***	0.7145***	0.6423***
	(0.0757)	(0.0320)	(0.0672)	(0.1445)
π_2	0.4044***	0.5761***	0.1172***	0.0925***
	(0.0782)	(0.0795)	(0.0174)	(0.0226)
π_3	0.1351**	0.1069**	0.1682**	0.2191
	(0.0622)	(0.0489)	(0.0659)	(0.1487)
π_4		0.1425**		0.0461*
		(0.0747)		(0.0250)

Heteroskedasticity-robust standard errors in parentheses

Significance on 10%, 5% and 1%-level is indicated by *, ** and ***

Table 4 – Nonemployment to Employment

	Women		Men	
	Model A	*Model B*	*Model A*	*Model B*
Duration dependence				
Elapsed duration (base: <6 months)				
Elapsed 6-12 months	-0.3097***	-0.2667***	-0.4217***	-0.4110***
	(0.1003)	(0.1009)	(0.0927)	(0.0934)
Elapsed 12-24 months	-0.3741***	-0.3014***	0.6213***	0.6263***
	(0.1011)	(0.1063)	(0.0918)	(0.0985)
Elapsed 24-60 months	-0.2505**	-0.1132	0.2470*	0.2786*
	(0.1005)	(0.1148)	(0.1399)	(0.1506)
Elapsed 60-120 months	-0.5123***	-0.3942**	0.1068	0.0984
	(0.1441)	(0.1671)	(0.1697)	(0.1742)
Elapsed >120 months	-0.6979***	-0.5560**	-0.0283	-0.0473
	(0.2060)	(0.2290)	(0.2378)	(0.2384)
Age				
Age structure (base: <20 years)				
20-24 years	-0.0398	0.1062	0.6278***	0.6539***
	(0.1847)	(0.1904)	(0.1531)	(0.2384)
25-29 years	-0.3613	-0.0884	0.4115*	0.5126**
	(0.2335)	(0.2465)	(0.2141)	(0.2329)
30-34 years	-0.2188	0.1846	0.2737	0.4142
	(0.2843)	(0.2932)	(0.2568)	(0.2852)
35-39 years	-0.5845*	-0.0820	0.0611	0.2561
	(0.3417)	(0.3588)	(0.3207)	(0.3539)
>40 years	-0.6612	-0.1735	-0.4205	-0.1835
	(0.3965)	(0.4060)	(0.4247)	(0.4687)
Education				
Highest degree achieved (base: no degree)				
Voc. Train.	0.8794***	0.4586***	0.2751**	0.3904***
	(0.1637)	(0.1561)	(0.1236)	(0.1215)
HS degree	0.2668	0.1551	-0.2433	-0.2279
	(0.2639)	(0.2014)	(0.2030)	(0.2152)
HS + VT	0.9153***	0.4796**	0.2370	0.3837**
	(0.2195)	(0.1917)	(0.1634)	(0.1694)
Tech. College	1.1764***	0.6571**	0.5697**	0.6274***
	(0.4078)	(0.2699)	(0.2252)	(0.2132)
Uni. degree	1.4576***	1.0024***	0.3015	0.3561*
	(0.3241)	(0.2828)	(0.2107)	(0.2158)
Children				
Number of children (base: no child)				
1 child	-0.5045***	-0.6474***	0.0379	-0.1173
	(0.1396)	(0.1938)	(0.1840)	(0.1877)
2 children	-0.7162***	-1.1472***	-0.0377	-0.1431
	(0.1724)	(0.2562)	(0.2098)	(0.2468)

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Table 4 – (continued)

	Women		Men	
	Model A	*Model B*	*Model A*	*Model B*
3 or more children	-0.8842***	-1.4333***	0.1788	0.2054
	(0.2339)	(0.3169)	(0.3527)	(0.4423)
children <3y	-1.0334***	-1.0443***	0.1166	0.3253*
	(0.1180)	(0.1299)	(0.2106)	(0.1949)
children 3y-6y	-0.1505*	-0.0584	0.2257	0.2081
	(0.0847)	(0.0888)	(0.1662)	(0.1935)
Pregnant	-1.6885***	-1.8701***	-0.0201	0.0222
	(0.1905)	(0.2171)	(0.1625)	(0.1617)
Union				
Currently in a union	-0.2758*	-0.4291***	0.3562**	0.3987*
	(0.1481)	(0.1566)	(0.1800)	(0.2125)
Partner has VT (+HS) degree	0.2226	0.1003	-0.2466	-0.2920*
	(0.1555)	(0.1635)	(0.1631)	(0.1771)
Partner has TC or UD degree	0.0554	-0.0334	-0.1482	-0.2435
	(0.1517)	(0.1702)	(0.2301)	(0.2339)
Other covariates				
East	-0.5014	-0.2257	-1.2903***	-1.3291***
	(0.3360)	(0.4410)	(0.3973)	(0.3892)
In education	-0.4173***	-0.4503***	-0.5788***	-0.5620***
	(0.1537)	(0.1678)	(0.1306)	(0.1227)
Unemployed	0.9285***	0.8814***	1.3651***	1.4234***
	(0.0927)	(0.0979)	(0.1173)	(0.1187)
Regional U-rate	-0.0115	-0.0241	-0.0312**	-0.0280**
	(0.0148)	(0.0152)	(0.0144)	(0.0139)
Regional growth rate	0.0393***	0.0437**	0.0259	0.0308
	(0.0149)	(0.0152)	(0.0166)	(0.0178)
Maternity protection	-0.2137	-0.3168**	-0.0238	-0.1534
	(0.1314)	(0.1427)	(0.2175)	(0.2106)
State dependence				
Cum. # of employments	-0.0485	-0.1255	0.1127***	0.0871***
	(0.0666)	(0.0780)	(0.0154)	(0.0268)
Cum. dur. in employment	-0.0000	-0.0006	-0.0011	-0.0012
	(0.0015)	(0.0015)	(0.0016)	(0.0017)
Cum. dur. in nonemployment	0.0015	0.0036*	-0.0009	-0.0018
	(0.0017)	(0.0019)	(0.0014)	(0.0016)
Initial conditions				
Situation at labor market entry				
Age at entry	-0.0157	-0.0298	-0.0157	-0.0215
	(0.0260)	(0.0267)	(0.0227)	(0.0230)
Employed at entry	-0.2254	-0.0016	0.0829	0.0277
	(0.1528)	(0.0174)	(0.1365)	(0.1443)

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Table 4 – (continued)

	Women		Men	
	Model A	*Model B*	*Model A*	*Model B*
In union before entry	0.1927*	0.2022*	0.1358	0.1341
	(0.1070)	(0.1183)	(0.1543)	(0.1815)
Children before entry	0.3450	0.5329**	-0.1846	-0.2346
	(0.2585)	(0.2304)	(0.2432)	(0.2945)
Children while at college	-0.1537	-0.3591	-0.4107	-0.3496
	(0.6075)	(0.4436)	(0.6357)	(0.6460)
Unobserved heterogeneity				
Points of support				
$\ln v_1^U$	-1.7572***	-0.2822	-3.1150***	-3.1833***
	(0.4885)	(0.5313)	(0.4400)	(0.4417)
$\ln v_2^U$	-3.4207***	-1.9667***	-5.0168***	-5.3581***
	(0.4717)	(0.5181)	(0.4580)	(0.4638)
$\ln v_3^U$	-3.0926***	-3.8093***	-2.9143***	-2.7273***
	(0.4880)	(0.5553)	(0.5106)	(0.6832)
$\ln v_4^U$		-2.6801***		-4.2803***
		(0.5936)		(0.4636)
Probabilities				
π_1	0.4606***	0.1745***	0.7145***	0.6423***
	(0.0757)	(0.0320)	(0.0672)	(0.1445)
π_2	0.4044***	0.5761***	0.1172***	0.0925***
	(0.0782)	(0.0795)	(0.0174)	(0.0226)
π_3	0.1351**	0.1069**	0.1682**	0.2191
	(0.0622)	(0.0489)	(0.0659)	(0.1487)
π_4		0.1425**		0.0461*
		(0.0747)		(0.0250)

Heteroskedasticity-robust standard errors in parentheses

Significance on 10%, 5% and 1%-level is indicated by *, ** and ***

Table 5 – Union formation

	Women		Men	
	Model A	*Model B*	*Model A*	*Model B*
Duration dependence				
Elapsed duration (base: <6 months)				
Elapsed 12-24 months	0.2148	0.1998	0.2125	0.2080
	(0.1933)	(0.1968)	(0.1784)	(0.1914)
Elapsed 24-60 months	0.2849*	0.2840*	0.0540	0.0841
	(0.1728)	(0.1721)	(0.1692)	(0.1800)
Elapsed 60-120 months	0.2713	0.2557	0.0511	0.0782
	(0.2021)	(0.1974)	(0.1976)	(0.2260)
Elapsed >120 months	-0.0594	-0.0128	0.1282	0.2011
	(0.2635)	(0.2429)	(0.2231)	(0.2784)
Age				
Age structure (base: <20 years)				
20-24 years	0.5209***	0.5768***	0.5679**	0.5628**
	(0.1990)	(0.2100)	(0.2615)	(0.2668)
25-29 years	0.6589***	0.7295***	0.9414***	0.9344***
	(0.2246)	(0.2370)	(0.2822)	(0.3067)
30-34 years	0.2173	0.3536	0.7617***	0.7862**
	(0.2444)	(0.2827)	(0.2916)	(0.3245)
35-39 years	-0.4992*	-0.3211	0.3423	0.3872
	(0.2777)	(0.3285)	(0.3177)	(0.3632)
>40 years	-1.3850***	-1.199***	0.0212	0.0835
	(0.3307)	(0.3793)	(0.3381)	(0.3917)
Education				
Highest degree achieved (base: no degree)				
Voc. Train.	0.0594	0.0865	0.2062	0.2260
	(0.1538)	(0.1670)	(0.1915)	(0.1951)
HS degree	-0.0198	0.0487	0.3137	0.3152
	(0.2789)	(0.2949)	(0.2459)	(0.2857)
HS + VT	0.1195	0.1491	0.3368	0.3499
	(0.1907)	(0.2111)	(0.2225)	(0.2296)
Tech. College	0.1076	0.0486	0.4782*	0.4464
	(0.2393)	(0.2635)	(0.2624)	(0.2891)
Uni. degree	0.2557	0.2569	0.5228**	0.5403*
	(0.2474)	(0.2725)	(0.2611)	(0.2858)
Children				
Number of children (base: no child)				
1 child	-0.0634	-0.1284	0.1735	0.1018
	(0.1783)	(0.1875)	(0.1786)	(0.1858)
2 children	0.1956	0.1141	0.4620**	0.3856
	(0.2070)	(0.2262)	(0.2301)	(0.3045)
3 or more children	0.4201	0.3424	0.3991	0.3010
	(0.3862)	(0.4498)	(0.5510)	(0.6120)

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Table 5 – (continued)

	Women		Men	
	Model A	*Model B*	*Model A*	*Model B*
children <3y	-0.2818	-0.1855	0.2781	0.3195
	(0.2065)	(0.2241)	(0.2074)	(0.2175)
children 3y-6y	-0.0071	0.0222	-0.1661	-0.1645
	(0.1890)	(0.1877)	(0.1842)	(0.1863)
Pregnant	1.7911***	1.7330***	2.2745***	2.1780***
	(0.1250)	(0.4377)	(0.1596)	(0.1862)
Employment				
Currently employed	0.0467	-0.1077	0.2003*	0.2490
	(0.1467)	(0.7903)	(0.1045)	(0.7402)
Hazard of becoming NE		-0.0670		-0.1276*
		(0.0693)		(0.0727)
Hazard of becoming E		0.2268**		0.0395
		(0.0946)		(0.1208)
Other covariates				
East	-0.0120	0.0668	0.3857	0.4351
	(0.4781)	(0.4310)	(0.3752)	(0.4586)
Religion	-0.0360	-0.0887	0.0311	-0.0049
	(0.1156)	(0.1294)	(0.0838)	(0.0952)
Spring / summer	0.5811***	0.5823***	0.4213***	0.4227***
	(0.0648)	(0.0654)	(0.0627)	(0.0627)
State dependence				
Cum. # of unions	0.0263	-0.1302	0.4104***	0.3185*
	(0.1394)	(0.1557)	(0.1543)	(0.1763)
Initial conditions				
Situation at labor market entry				
Age at entry	0.0109	0.0017	-0.0175	-0.0192
	(0.0213)	(0.0245)	(0.0197)	(0.0233)
Employed at entry	0.0810	0.0897	0.1446*	0.1353
	(0.0881)	(0.1002)	(0.0830)	(0.0853)
In union before entry	0.1685	0.2481	0.2989*	0.3354*
	(0.1536)	(0.1676)	(0.1737)	(0.1972)
Children before entry	-0.2985	-0.2559	0.4939	0.6163
	(0.3284)	(0.3474)	(0.5668)	(0.7101)
Children while at college	-0.5316	-0.5463	-1.0736	-1.1840
	(0.5016)	(0.7014)	(0.8240)	(0.9404)
Unobserved heterogeneity				
Points of support				
$\ln v_1^M$	-5.4430***	-4.7424***	-5.6292***	-5.3585***
	(0.4937)	(0.5857)	(0.4535)	(0.7387)
$\ln v_2^M$	-5.3878***	-4.3774***	-6.5917***	-6.3351***
	(0.5235)	(0.5733)	(0.4407)	(0.6711)
$\ln v_3^M$	-6.4926***	-4.5761***	-6.8274***	-6.6963***

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Table 5 – (continued)

	Women		Men	
	Model A	*Model B*	*Model A*	*Model B*
	(0.5504)	(0.8952)	(0.4618)	(0.6832)
$\ln v_4^M$		-5.8240***		-6.6778***
		(0.7293)		(0.6904)
Probabilities				
π_1	0.4606***	0.1745***	0.7145***	0.6423***
	(0.0757)	(0.0320)	(0.0672)	(0.1445)
π_2	0.4044***	0.5761***	0.1172***	0.0925***
	(0.0782)	(0.0795)	(0.0174)	(0.0226)
π_3	0.1351**	0.1069**	0.1682**	0.2191
	(0.0622)	(0.0489)	(0.0659)	(0.1487)
π_4		0.1425**		0.0461*
		(0.0747)		(0.0250)

Standard errors in parentheses

Significance on 10%, 5% and 1%-level is indicated by *, ** and ***

Table 6 – Union dissolution

	Women		Men	
	Model A	*Model B*	*Model A*	*Model B*
Duration dependence				
Elapsed duration (base: <12 months)				
Elapsed 12-24 months	0.3327	0.2196 **	0.5965***	0.2365
	(0.2607)	(0.1044)	(0.2411)	
Elapsed 24-60 months	0.7388***	0.3378***	0.9949***	0.5558
	(0.2329)	(0.1237)	(0.2413)	(0.4186)
Elapsed 60-120 months	0.6342**	0.2274*	1.0168***	0.4142
	(0.2624)	(0.1244)	(0.2734)	(0.3962)
Elapsed >120 months	0.6961**	-0.1315	0.9321***	0.0283
	(0.3218)	(0.1500)	(0.3522)	(0.3252)
Age				
Age structure (base: <20 years)				
20-24 years	0.1744	-0.1109	0.3570	0.1916
	(0.4711)	(0.3052)	(1.0762)	(0.7639)
25-29 years	-0.2733	-0.3736	0.2103	0.3999
	(0.4890)	(0.3093)	(1.0694)	(0.7423)
30-34 years	-0.3313	-0.3350	0.4246	0.5039
	(0.5137)	(0.3233)	(1.0837)	(0.7842)
35-39 years	-0.3286	-0.2346	0.3225	0.4873
	(0.5373)	(0.3495)	(1.1039)	(0.7870)
>40 years	-0.4644	-0.3886	0.1740	0.3303
	(0.5656)	(0.3813)	(1.1135)	(0.8227)
Education				
Highest degree achieved (base: no degree)				
Voc. Train.	-0.1158	0.1970	-0.4013	-0.1844
	(0.2837)	(0.1656)	(0.3594)	(0.2677)
HS degree	-0.2488	0.2694	-0.6549	-0.2524
	(0.5376)	(0.2743)	(0.5362)	(0.4432)
HS + VT	-0.1402	0.2230	-0.8763**	-0.2934
	(0.3420)	(0.2098)	(0.4327)	(0.3545)
Tech. College	-0.1961	0.1511	-1.0637**	-0.5852
	(0.3905)	(0.2562)	(0.5001)	(0.3680)
Uni. degree	-0.9908	-0.0472	-1.3856***	-0.7822*
	(0.4608)	(0.2845)	(0.5311)	(0.4216)
Children				
Number of children (base: no child)				
1 child	-0.5310**	-0.3208**	-0.7149***	-0.5598***
	(0.2101)	(0.1634)	(0.2269)	(0.2086)
2 children	-1.1930***	-0.8828***	-1.2335***	-1.0335***
	(0.2721)	(0.2145)	(0.2852)	(0.2747)
3 or more children	-1.2238***	-0.8210***	-1.6534***	-1.2756***
	(0.3680)	(0.2823)	(0.4523)	(0.4758)

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Table 6 – (continued)

	Women		Men	
	Model A	*Model B*	*Model A*	*Model B*
children <3y	-0.4967**	-0.4423**	-0.9255***	-1.1025***
	(0.1939)	(0.1780)	(0.2352)	(0.2692)
children 3y-6y	0.1990	0.1299	-0.1753	-0.2784
	(0.1629)	(0.1424)	(0.1988)	(0.2015)
Pregnant	-1.0725***	-2.3032***	-1.7662***	-3.7691***
	(0.2848)	(0.4451)	(0.4196)	(2.0350)
Employment				
Currently employed	-0.0447	0.0394	-0.6080***	-0.5630
	(0.1668)	(0.2574)	(0.2070)	(0.6364)
Hazard of becoming NE		0.0735		-0.0201
		(0.1353)		(0.1239)
Hazard of becoming E		-0.1494		0.2741
		(0.0993)		(0.1866)
Other covariates				
East	1.2406**	0.9101**	0.0982	-0.1743
	(0.5515)	(0.4229)	(0.5035)	(0.4891)
Religion	-0.3809**	-0.3211***	-0.3609**	-0.2951**
	(0.1494)	(0.1216)	(0.1410)	(0.1230)
Age difference	-0.0045	-0.0130*	0.0596***	0.0072
	(0.0170)	(0.0073)	(0.0228)	(0.0235)
Partner has higher edu.	-0.0981	-0.0470	0.5484**	0.0504
	(0.1945)	(0.0693)	(0.2193)	(0.1932)
Partner has lower edu.	-0.4631***	-0.0226	-0.4765***	-0.1899
	(0.1392)	(0.0590)	(0.1783)	(0.2052)
No information on partner	1.8136***	0.1380	2.1354***	0.6348
	(0.2769)	(0.2211)	(0.2194)	(1.0647)
Children from other partner	0.5605***	0.2679**	0.1132	-0.0385
	(0.2041)	(0.1151)	(0.2408)	(0.1543)
2^{nd} half of year	0.2683***	0.1409***	0.2518**	0.1140
	(0.0997)	(0.0513)	(0.1008)	(0.1163)
State dependence				
Cum. # of unions	0.0011	0.0492	-0.1488	0.0242
	(0.1817)	(0.0726)	(0.1803)	(0.1228)
Initial conditions				
Situation at labor market entry				
Age at entry	0.0709	0.0362	0.0763**	0.0702***
	(0.0299)	(0.0228)	(0.0327)	(0.0262)
Employed at entry	-0.0376	-0.0653	-0.0946	-0.0767
	(0.1488)	(0.1009)	(0.1386)	(0.1148)
In union before entry	0.2607*	0.3313***	-0.2513	-0.1790
	(0.1465)	(0.1128)	(0.1984)	(0.1684)
Children before entry	0.3204	-0.0496	-0.0663	0.1363

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Table 6 – (continued)

	Women		Men	
	Model A	*Model B*	*Model A*	*Model B*
	(0.2905)	(0.2914)	(0.6074)	(0.5751)
Children while at college	-0.5065	0.0691	-0.3542	-0.6571
	(0.8697)	(0.6606)	(0.8029)	(0.8925)
Unobserved heterogeneity				
Points of support				
$\ln v_1^D$	-7.0306***	-7.0919***	-7.7167***	-6.2701***
	(0.7428)	(0.6533)	(1.1797)	(1.1055)
$\ln v_2^D$	-8.1419***	-7.1241***	-6.7809***	-5.4058***
	(0.8076)	(0.6159)	(1.1931)	(1.1811)
$\ln v_3^D$	-6.0201***	-8.0288***	-5.5205***	-4.8587***
	(0.8076)	(0.8272)	(1.2139)	(1.1607)
$\ln v_4^D$		-6.6447***		-4.4697***
		(0.7377)		(1.0653)
Probabilities				
π_1	0.4606***	0.1745***	0.7145***	0.6423***
	(0.0757)	(0.0320)	(0.0672)	(0.1445)
π_2	0.4044***	0.5761***	0.1172***	0.0925***
	(0.0782)	(0.0795)	(0.0174)	(0.0226)
π_3	0.1351**	0.1069**	0.1682**	0.2191
	(0.0622)	(0.0489)	(0.0659)	(0.1487)
π_4		0.1425**		0.0461*
		(0.0747)		(0.0250)

Heteroskedasticity-robust standard errors in parentheses

Significance on 10%, 5% and 1%-level is indicated by *, ** and ***

Table 7 – Conception

	Women		Men	
	Model A	*Model B*	*Model A*	*Model B*
Duration dependence				
Elapsed duration (base: <24 months)				
Elapsed 24-60 months	1.4642***	0.9969***	1.3961***	0.9419***
	(0.0752)	(0.0811)	(0.0935)	(0.1149)
Elapsed 60-120 months	1.1669***	0.4172***	0.8781***	0.1502
	(0.1030)	(0.1423)	(0.1348)	(0.1959)
Elapsed 120-180 months	1.2254***	0.1929	0.9687***	-0.1287
	(0.1046)	(0.1718)	(0.1153)	(0.2732)
Elapsed >180 months	1.2286***	0.1227	1.1182***	-0.1460
	(0.1259)	(0.1962)	(0.1329)	(0.3212)
Age				
Age structure (base: <20 years)				
20-24 years	0.6098***	0.6081*	0.5022	1.1257***
	(0.2149)	(0.3149)	(0.3808)	(0.5758)
25-29 years	0.7600***	1.2776***	0.7637**	1.7012***
	(0.2100)	(0.3193)	(0.3721)	(0.6280)
30-34 years	0.5319**	1.1755***	0.7561**	1.7768***
	(0.2178)	(0.3308)	(0.3691)	(0.6912)
35-39 years	-0.2781	0.2633	0.3749	1.4260***
	(0.2418)	(0.3717)	(0.3764)	(0.6968)
>40 years	-1.9670***	-0.5683	-0.4500	0.5554
	(0.3557)	(0.5033)	(0.4061)	(0.6538)
Education				
Highest degree achieved (base: no degree)				
Voc. Train.	-0.0507	-0.0930	0.1106	-0.0094
	(0.1062)	(0.1853)	(0.1669)	(0.2230)
HS degree	-0.0668	-0.2269	-0.0061	-0.1054
	(0.1738)	(0.3236)	(0.2335)	(0.3410)
HS + VT	-0.0504	-0.2290	0.1404	-0.0996
	(0.1287)	(0.2365)	(0.1870)	(0.3052)
Tech. College	0.0315	-0.2159	0.3487*	0.2299
	(0.1706)	(0.2959)	(0.2054)	(0.2948)
Uni. degree	0.2484	0.9970***	0.5199**	0.8013**
	(0.1615)	(0.3135)	(0.2105)	(0.3709)
Children				
Number of children (base: no child)				
1 child	-0.2869**	-0.5768***	-0.3005**	-0.6475***
	(0.1115)	(0.2067)	(0.1344)	(0.2310)
2 children	-2.0050***	-2.1904***	-1.9403***	-2.1548***
	(0.1785)	(0.2704)	(0.1944)	(0.3155)
3 or more children	-2.2807***	-2.5029***	-2.1638***	-2.3957***
	(0.2669)	(0.3875)	(0.2809)	(0.3924)

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Table 7 – (continued)

	Women		Men	
	Model A	*Model B*	*Model A*	*Model B*
children <3y	0.7869***	0.4766**	0.9589***	0.8050***
	(0.0956)	(0.2206)	(0.1133)	(0.1919)
children 3y-6y	0.2699***	0.1429	0.3540***	0.2589
	(0.0252)	(0.1793)	(0.1047)	(0.1710)
Union				
Currently in a union	1.6424***	1.0579***	2.2721***	1.6441***
	(0.0903)	(0.2317)	(0.1211)	(0.4356)
Hazard of finding partner		-0.0048		-0.1156
		(0.2042)		(0.3689)
Hazard of losing partner		1.1493***		0.7066
		(0.2863)		(0.5563)
Employment				
Currently employed	-0.3368***	0.2523	-0.0286	-0.2980
	(0.0572)	(0.5705)	(0.1108)	(0.3946)
Hazard of becoming NE		-0.2765*		0.0362
		(0.1465)		(0.0582)
Hazard of becoming E		0.0166		-0.1780*
		(0.0909)		(0.0983)
Other covariates				
East	0.4238	-0.5185	0.4725**	0.5783
	(0.2744)	(0.5695)	(0.2315)	(0.4558)
Religion	0.4273***	0.8940***	0.2850***	0.5261***
	(0.0796)	(0.1869)	(0.0682)	(0.1486)
Regional birth rate	0.1428***	0.1465***	0.1347***	0.1375***
	(0.0322)	(0.0334)	(0.0374)	(0.0390)
Potential child allowance	0.0413	0.0532**	-0.0160	-0.0064
	(0.0252)	(0.0266)	(0.0286)	(0.0251)
Initial conditions				
Situation at labor market entry				
Age at entry	0.0168	-0.0864***	0.0136	-0.0803
	(0.0133)	(0.0298)	(0.0139)	(0.0839)
Employed at entry	0.0329	0.0814	0.0190	0.0988
	(0.0571)	(0.1151)	(0.0623)	(0.0975)
In union before entry	-0.1003*	-0.3820**	-0.0471	0.1789
	(0.0607)	(0.1616)	(0.0782)	(0.1778)
Children before entry	0.0886	0.4780	-0.0859	-0.0864
	(0.2023)	(0.3982)	(0.3059)	(0.4108)
Children while at college	0.2893	0.0226	-0.2074	0.0169
	(0.4122)	(0.8019)	(0.3645)	(0.6733)
Unobserved heterogeneity				
Points of support				

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Table 7 – (continued)

	Women		Men	
	Model A	*Model B*	*Model A*	*Model B*
$\ln \upsilon_1^C$	-9.7828	-7.6898***	-10.5124***	-10.7079***
	(0.4942)	(1.2271)	(0.6102)	(1.9128)
$\ln \upsilon_2^C$	-9.9413	-8.0124***	-10.6366***	-11.7387***
	(0.4957)	(1.1264)	(0.6108)	(2.3126)
$\ln \upsilon_3^C$	-9.1856	-7.5739***	-9.9820***	-11.1340***
	(0.4942)	(1.2844)	(0.5982)	(2.5602)
$\ln \upsilon_4^C$		-7.7363***		-10.8840***
		(1.4244)		(2.4976)
Probabilities				
π_1	0.4606***	0.1745***	0.7145***	0.6423***
	(0.0757)	(0.0320)	(0.0672)	(0.1445)
π_2	0.4044***	0.5761***	0.1172***	0.0925***
	(0.0782)	(0.0795)	(0.0174)	(0.0226)
π_3	0.1351**	0.1069**	0.1682**	0.2191
	(0.0622)	(0.0489)	(0.0659)	(0.1487)
π_4		0.1425**		0.0461*
		(0.0747)		(0.0250)

Heteroskedasticity-robust standard errors in parentheses

Significance on 10%, 5% and 1%-level is indicated by *, ** and ***

Correlations of unobserved heterogeneity

Women:

Table 8 – Correlations for Model A (women)

	EU	UE	UD	UF	C
EU	1	-0.348	0.897	-0.988	0.966
UE	-0.348	1	0.101	0.200	-0.093
UD	0.897	0.101	1	-0.955	0.981
UF	-0.988	0.200	-0.955	1	-0.994
C	0.966	-0.093	0.981	-0.994	1

Table 9 – Correlations for Model B (women)

	EU	UE	UD	UF	C
EU	1	-0.223	0.765	-0.940	-0.624
UE	-0.223	1	0.457	-0.123	-0.620
UD	0.765	0.457	1	-0.939	-0.980
UF	-0.940	-0.124	-0.939	1	0.853
C	-0.624	-0.620	-0.980	0.853	1

Men:

Table 10 – Correlations for Model A (men)

	EU	UE	UD	UF	C
EU	1	-0.961	0.005	-0.520	-0.295
UE	-0.961	1	0.272	0.263	0.548
UD	0.005	0.272	1	-0.857	0.954
UF	-0.520	0.263	-0.857	1	-0.663
C	-0.295	0.548	0.954	-0.663	1

Table 11 – Correlations for Model B (men)

	EU	UE	UD	UF	C
EU	1	-0.914	0.873	-0.730	-0.369
UE	-0.914	1	-0.600	0.390	-0.040
UD	0.873	-0.600	1	-0.971	-0.775
UF	-0.730	0.390	-0.971	1	0.904
C	-0.369	-0.040	-0.775	0.904	1

10 Figures

Figure 1 – Labor market and family processes

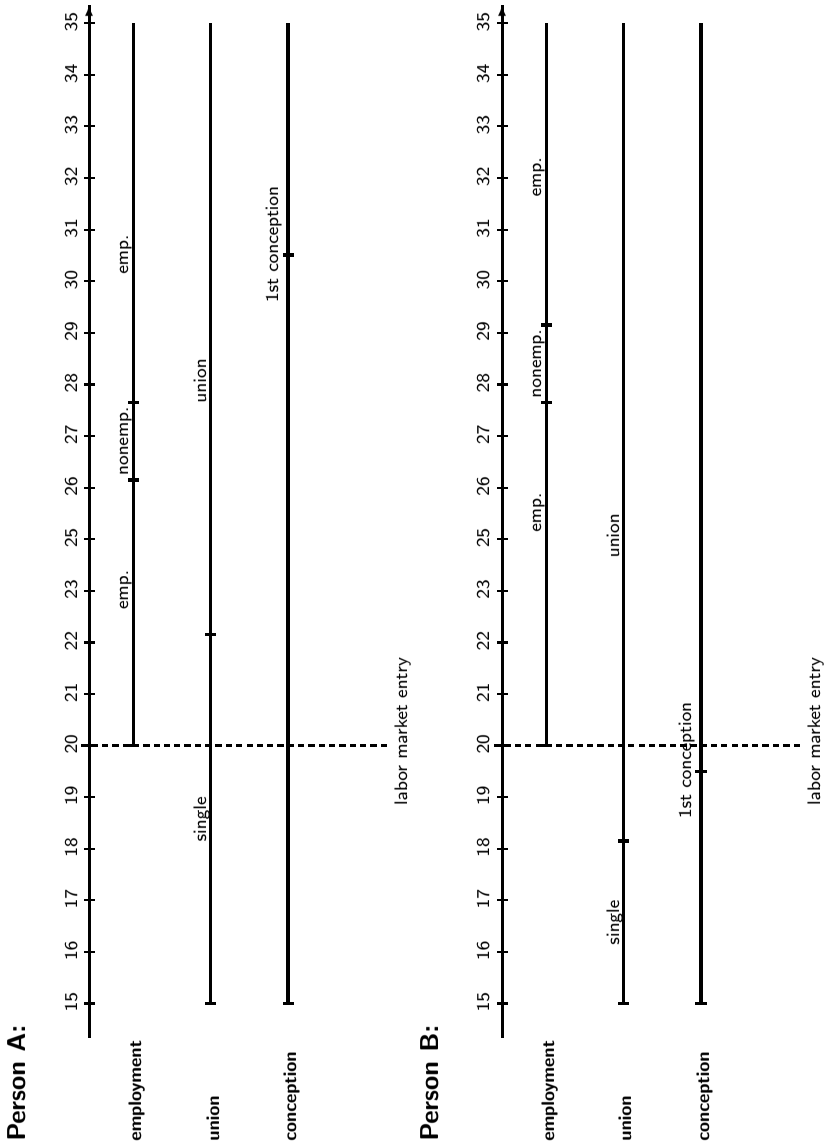


Figure 2 – Baseline Hazards (women)

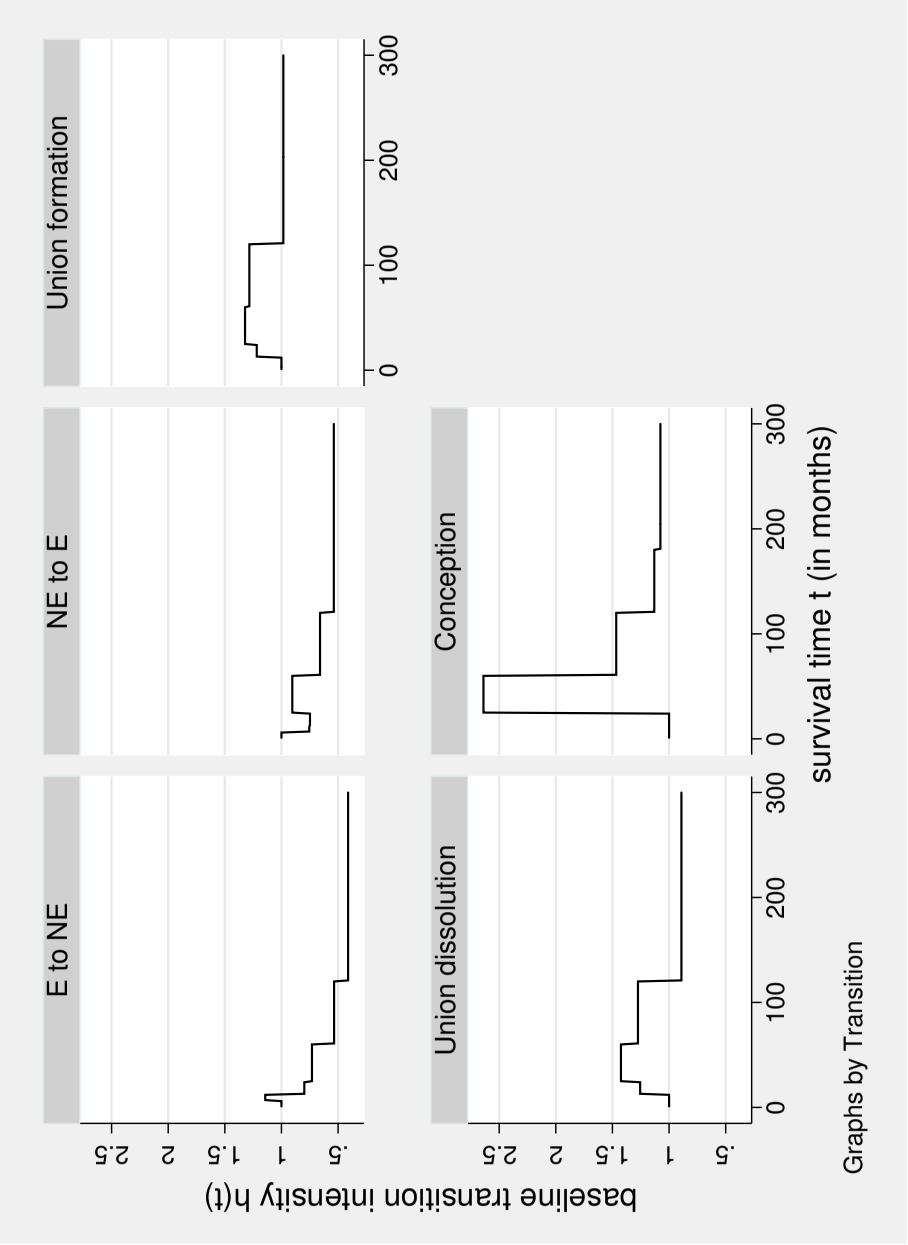
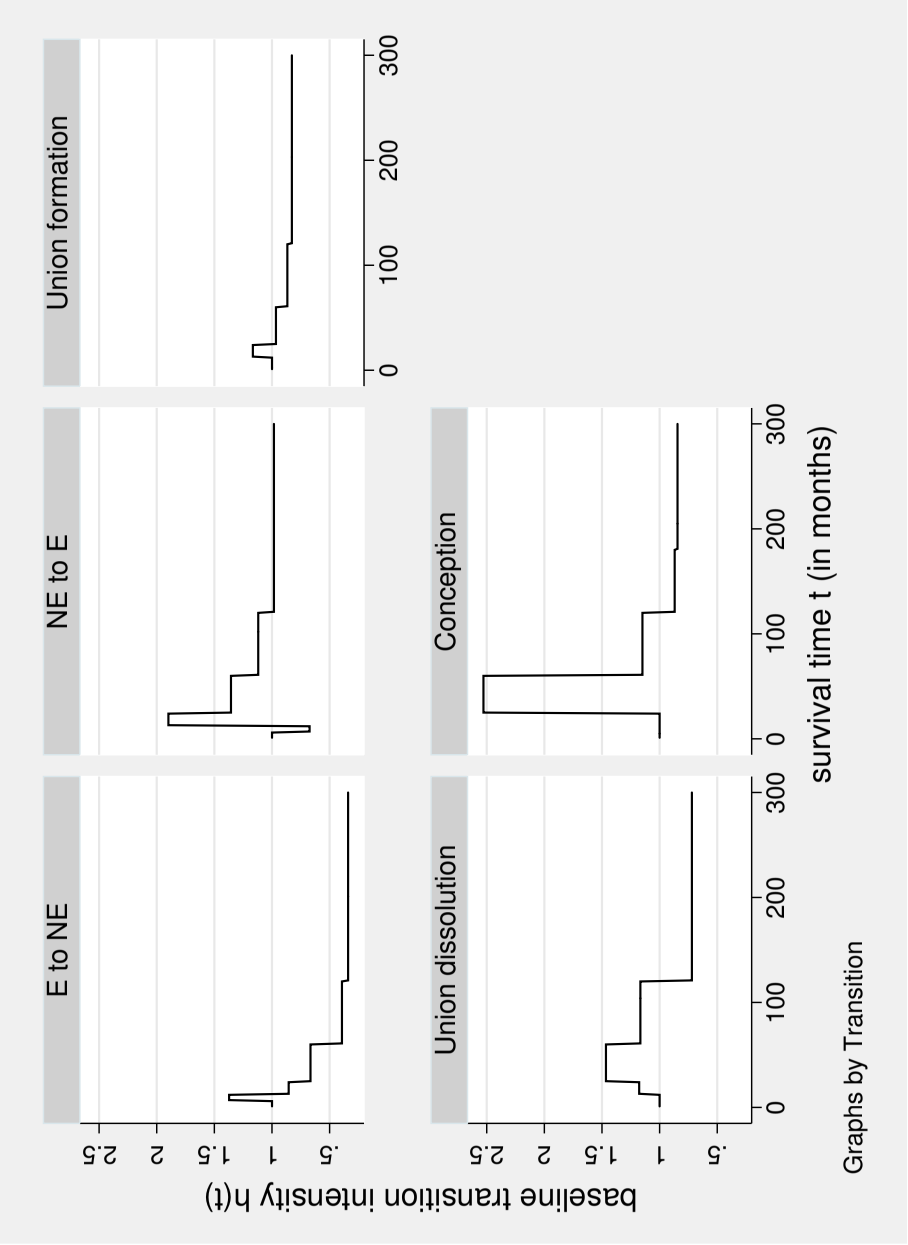


Figure 3 – Baseline Hazards (men)



A Definition of labor market entry

The labor market entry is defined as the start date of the first spell after the individual has left the educational institution, where she obtains or could possibly obtain her highest degree. However, there are some exemptions for whom the definition of the labor market entry does not fit very well. An example may be an individual, who after obtaining an high school and vocational training degree, works for ten years and then chooses to go to university. In order to account for such exemptions, age limits are set, until which a certain type of education at latest has to be started. The age levels are presented in table 12.

Schooling:	
School type	*Age level*
Lower secondary school	20
Intermediate school	21
Upper secondary school	23
Further Education:	
Type of further education	*Age level*
Vocational training	23
Master craftsmen's college	23
Technical college	25
University	26

For schooling, the age levels for starting a certain type of school are arbitrarily set to four years after an individual typically finishes this form of schooling. For example, a typical individual leaves upper secondary school at nineteen. The age level to start this form of schooling is therefore set to 23. For further types of education the age levels are based on the required type of schooling and the age an individual typically has, when finishing this form of schooling. Although, for example, a relatively large fraction of individuals going to a master craftsmen's college do so at higher ages, these individuals typically have worked for a longer period after their last degree and

therefore might have formed decisions with regard to their familiar situation.

B Exclusion restrictions

Table 13 – Process-specific exclusion restrictions

Hazard of becoming nonemployed
State dependence
Duration dependence
Cum. # of employments
Cum. dur. in employment
Cum. dur. in nonemployment
Additional exclusion restrictions
Regional Unemployment rate
Regional growth rate
Maternity protection
Hazard of becoming employed
State dependence
Duration dependence
Cum. # of employments
Cum. dur. in employment
Cum. dur. in nonemployment
Additional exclusion restrictions
Regional U-rate
Regional growth rate
Maternity protection
Union formation hazard
State dependence
Cum. # of unions
Additional exclusion restrictions
Duration dependence
Spring / summer
Union dissolution hazard
State dependence
Duration dependence
Cum. # of unions
Additional exclusion restrictions
Age difference
Partner has higher edu.
Partner has lower edu.
No information on partner
Children from other partner
2^{nd} half of year
Conception hazard
State dependence
Duration dependence
Additional exclusion restrictions
Regional birth rate
Potential child allowance