Economic Uncertainty and Fertility

Evidence from German Panel Data

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Contents

Abstract

Besides changes in the economic role of women, increasing economic uncertainties are regarded as driving forces behind the recent postponement of fertility. In this paper, we analyze how economic uncertainty influences the transition to first and subsequent births in West Germany. We use data from the German Socio-Economic Panel which provides longitudinal information on education, employment, partner characteristics as well as subjective measures of economic uncertainty for the period 1984 to 2003. We do not find evidence for a universal negative impact of economic uncertainty on fertility. Instead, our results indicate that there is heterogeneity in how an insecure economic situation affects the decision to have children. Unemployment delays family formation primarily among the highly educated women. The partner's higher education is one of the most influential determinant for higher order birth risks.

1 Introduction

Over the last decades, most European countries have witnessed a dramatic shift of childbearing to older ages. This development is one of the most significant demographic changes that Western industrialized countries have been experiencing. The increase in the age at childbirth plays a significant role in the decrease of annual fertility rates. It has also become evident that the delay in family formation is the prime cause of the recent fertility decline in Southern and Eastern Europe (Bongaarts 1999: 256; Sobotka 2004). Fertility delay has long-term consequences for completed fertility, given that a late age at first birth reduces the chances of having any further children (Marini and Hodson 1981; Morgan and Rindfuss 1999; Kohler, Skytthe and Christensen 2001).

Women's education, employment and career orientation have been identified as chief parameters for the increase in the age at childbirth (Rindfuss et al. 1996; Martin 2000; Gustafsson 2001). In more recent publications, it has been stipulated that youth unemployment, term-limited working contracts and unstable employment situations are other factors that induce a postponement of childbearing (McDonald 2000: 10f.; Mills and Blossfeld 2003; De la Rica and Iza 2004). Economic uncertainty is also regarded to be among the main driving forces behind the fertility postponement and the unprecedented decline in period fertility rates which occurred all over Eastern Europe after the demise of the communist systems (Eberstadt 1994; Witte and Wagner 1995; Adler 1997; Ranjan 1999; Sobotka 2004; Huinink and Kreyenfeld 2005). The delay in family formation may thus reflect growing uncertainty about the economic future that individuals in contemporary societies face.

However, little empirical evidence exists on the relationship between economic uncertainty and fertility. On the macro level, sudden economic downswings have left its clear imprint on annual fertility rates. The Great Depression is an example, where a sudden increase in unemployment was followed by an erratic drop in birth rates. The fertility development in East Germany after unification is another example. It is unclear, though, if historically exceptional situations of this kind can be generalized. On the

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micro-level, some studies have addressed the role of female unemployment in fertility (Hoem 2000; Santow and Bracher 2001; Kravdal 2002; Vikat 2004). Only few studies have also dealt with the impact of male characteristics or subjective measures of uncertainty for fertility decisions (Huinink 1995; Kohler and Kohler 2002). That there is little micro-level evidence for the uncertainty-fertility nexus can, among other factors, be attributed to the strong demand on data quality. In order to study how an insecure economic situation affects subsequent childbearing, one requires longitudinal data on fertility, attitudes and employment, ideally for the respondents and the partner. Such data are rarely available.

The aim of this paper is to investigate the role of labor market uncertainties in fertility decisions in Germany using event history techniques. We use data from the German Socio-Economic Panel (SOEP). The SOEP provides longitudinal information on fertility, labor market characteristics and attitudes for the period 1984 to 2003. We restrict the analysis to the western states of Germany. We employ 'objective' measures of uncertainty (unemployment) as well as 'subjective' measures (the feeling that the future economic situation is insecure). A major focus of our analysis is on how the effect of economic uncertainty differs by educational groups. Since the SOEP is one of the largest and longest panels in Europe, it provides sufficient sample size for such kind of analysis. The paper is structured as follows: In the following part, we develop our main research hypotheses. Section 3 gives an overview on data and methods. Section 4 presents the empirical results.

2 Economic uncertainty, education and fertility

Women's growing labor market participation is considered to be among the chief factors for low fertility rates in contemporary societies. Economic theory, as stipulated by Becker (1960; 1993), assumes that marriage and the family are institutions that essentially rest on sex-role specialization and a gender-specific division of labor. Motherhood and a successful labor market career are considered as two mutually

exclusive life options. Hence, women are confronted with a choice to *either* follow the traditional track of a housewife and mother who is economically dependent on the male breadwinner *or* to stay economically independent and childless. This perspective implicitly takes for granted that caring obligations are fulfilled within the family and the option to take advantage of children's day care services does not exist. In such a societal context, women's growing labor market options are assumed to be important causes of decreasing marriage and fertility rates.

The Becker framework views family life and an employment career as two strictly exclusive options in a woman's life. It does not consider that women and men might try to bring in synch both life domains. The more feasible it becomes for women to proceed with an employment career after motherhood, the more does the question of the *timing of fertility* move into focus. In other words, it becomes vital to understand how women time fertility in accordance with their employment careers. What Becker's framework also disregards is the pivotal role of male employment in fertility. If the male is the sole breadwinner, insecurities in his employment career must have strong repercussions on fertility. In the following, we summarize stylized facts where we draw upon to develop our argumentation more clearly.

2.1   Women's education and fertility

Little dispute exists over the fact that *educational participation* defers family formation. There is consistent evidence that during school enrolment or a vocational training scheme, individuals refrain from parenthood (Hoem 1986; Rindfuss et al. 1988; Blossfeld and Huinink 1991; Klein and Lauterbach 1994; Kravdal 1994; Liefbroer and Corijn 1999; Santow and Bracher 2001). Parenthood during education is postponed because of a lack of income to support a family during this time, or, most likely, because the future employment career is still uncertain. Having children during education is widely regarded as a risky venture which puts the future employment career on stake.

Theoretically, several arguments have been named why *highly educated women* postpone parenthood beyond completion of education. Since higher educated women are

more career-minded, they are supposed to be more sensitive to the timing of employment interruptions than lower educated women (Huinink 1995; Gustafsson 2001; Taniguchi 1999). After labor market entry, the employment situation is often insecure. Fertility postponement can be a strategy to balance work and family life, if the labor market position becomes more stable after some time on the job (Liefbroer and Corijn 1999: 54; Brewster and Rindfuss 2000: 282). What is important in this argumentation is that it is assumed that highly educated women do not remain childless. Instead they want to establish themselves in the labor market before they decide to have a family.

Empirically, the impact of educational level on fertility is disputed. Event history models mostly show no effects of educational level on first births, once educational enrolment is accounted for (Hoem 1986; Blossfeld and Huinink 1991; (DeWit and Ravanera 1998; Liefbroer and Corijn 1999; Kreyenfeld 2004). These findings can be attributed to the fact that there are two conflicting 'time clocks' for university graduates. On the one hand, they delay family formation because they feel a stronger pressure than less educated women to establish themselves in the labor market before parenthood. On the other hand, the relatively high ages when university graduates enter the labor market, and the approaching biological limits of fertility, make it more likely that they accelerate the transition to the first birth after labor market entry.

Studies for higher order births do not provide a consistent picture, either. Event history studies usually show a positive impact of woman's education on birth risks (Huinink 1989; Kravdal 1992; Hoem and Hoem 1989; B. Hoem 1996; Hoem et al 2001; Oláh 2003). This effect is often explained by a 'time squeeze'. More highly educated women are older at first birth, hence they have less time left than other educational groups to have subsequent children. This results into a closer spacing of the first and the second child, while the ultimate progression rate to a second child is the same for all educational levels. Another explanation for the positive impact of education on higher order fertility is 'selectivity'. Highly educated more often remain childless. Those who have a first child (and become at risk of second birth) are suspected to be more family and less work oriented.

2.2   Uncertainty, gender roles and fertility

Women's education and employment have been regarded as the most important factor for low fertility in contemporary Western societies. What has often been neglected in this discussion is that in a society where women are care givers, men act primarily as household providers. In these societies, the economic well-being of the household depends chiefly on the performance of the male breadwinner. As Oppenheimer (1988; 2003) has suggested, the deterioration of men's position in the labor market and the declining ability of men to serve as the family's single breadwinner, must be a key factor for understanding the recent postponement of fertility and marriage. Low fertility rates may thus reflect growing uncertainties in male employment careers.

Against this background, different hypotheses of the impact of female unemployment and economic uncertainty on fertility decisions have been put forward. A standard hypothesis is that female unemployment reduces the opportunity costs of childrearing and therefore should rather support than hinder fertility. Friedman, Hechter and Kanazawa (1994: 382ff.) posit that specifically women with limited employment options respond to unfavorable employment prospects by choosing the 'alternative career' of a mothers. Those women are likely to perceive motherhood as a strategic choice to structure an otherwise uncertain life course.

The considerations by Friedman, Hechter and Kanazawa are important in that they suggest that the effect of uncertainty differs by educational level. On the one hand, women with restricted options in the labor market might accommodate themselves more readily with the role of mothers (either as single mothers or as dependent housewives). This group of women perceives unemployment as a suitable situation to opt for parenthood. On the other hand, highly educated women will typically consider economic independence as a prerequisite for family formation. Given that they do not want to rely on partner income (or on public transfers), they will delay fertility decisions when subject to an insecure labor market situation.

Although there is a general belief that economic uncertainty is an important factor in the postponement of fertility, there is little empirical evidence of this. Studies on the influence of women's (un)employment on first birth risks provide no clear-cut picture

(Hoem 2000; Santow and Bracher 2001; Kravdal 2002). This might also be attributed to the fact that little attention has been paid to the question of educational differences in the effects of unemployment on fertility decisions. A study based on Finish register data supports this presumption. It shows that unemployment defers family formation among the highly educated, but not among other educational groups (Vikat 2004).

Regarding the impact of partner characteristics, there is fairly little empirical evidence. For West Germany, it has been shown that men with a low educational level experience low transition rates to first birth (Huinink 1995; Schmitt 2005). It has also been shown that women with highly educated partners encounter high transition rates to higher order births (Kreyenfeld 2002). This finding could suggest that labor market prospects of the partner (measured by his educational resources) are crucial factors for the ability to support a larger family in West Germany.

2.3   The societal context and family policies in West Germany

West Germany is a prototype of a conservative and familialistic male bread-winner regime (Gauthier 1996: 155; Gornick et al. 1998; Esping-Andersen 1999: 65; Treas and Widmer 2000: 1431). Based on the 'subsidarity principle', the primary care responsibility in West Germany is assigned to the family, while public and private day care institutions are hardly available.

One of the most significant policy measures in this context is presumably the system of 'income splitting' which allows married couples to file their taxes jointly. Due to the progressive tax scheme, there are substantial tax relieves for married one-earner couples (Dingeldey 2001). Sainsbury (1997: 195) argues in this context that the German tax system imposes "the most severe penalties on a working wife". In addition, the non-employed spouse is covered by the national health insurance and has access to a widow's pension. Parental leave regulations provide a fairly long period of leave after childbirth (since 1992 up to three years) which is combined with a low level of income tested benefits. A lack of day-care institutions makes it rather impossible for mothers to combine employment and childrearing when the child is younger than age 4. Only 2

percent of all children below age 4 attended public day care in the western states of Germany in the year 2002 (Statistisches Bundesamt 2004). For children ages 3-6, there is mainly part-time care available. Important is also the fact that schools are generally part-time and hardly any afternoon care is available.

The institutional constraints in Germany shape mothers' employment behavior. The majority of West German mothers typically reduces working hours or withdraws from the labor market after childbirth. As shown in Table 1, only 14 percent of West German women with children of primary school age (ages 6-10) are employed full-time. Even though female employment rates have somewhat increased over time, the institution of the family still rests on the 'female care-giver and male breadwinner model'.

Table 1: Employment rates of mothers in 1996 and 2002 by age of youngest child (column percent), western states of Germany without Berlin

	1996			*2002*		
Age of youngest child	*0-3*	*3-6*	*6-10*	*0-3*	*3-6*	*6-10*
All mothers						
Not employed	56%	51%	40%	50%	41%	33%
Marginally employed (1-10 h)	15%	28%	32%	21%	37%	41%
Employed part-time (11-34h)	4%	8%	11%	5%	10%	12%
Employed full-time (>25h)	25%	13%	17%	24%	12%	14%
Mothers with one child						
Not employed	47%	42%	31%	42%	33%	28%
Marginally employed (1-10 h)	15%	29%	32%	20%	35%	36%
Employed part-time (11-34h)	4%	11%	15%	5%	15%	17%
Employed full-time (>25h)	35%	18%	22%	32%	17%	19%
Mothers with two children						
Not employed	61%	52%	41%	52%	41%	31%
Marginally employed (1-10 h)	16%	31%	33%	23%	41%	46%
Employed part-time (11-34h)	4%	6%	11%	5%	8%	11%
Employed full-time (>25h)	20%	11%	14%	21%	10%	11%

Notes: The sample comprises women aged 18 to 45 with children aged 0 to 11. We excluded Berlin from the analysis, because it is not possible any longer to distinguish East and West Berlin with scientific use file of the microcensus. The age categories 0-3, 3-6 and 6-10 refer to 0 to just under age 3, 3 to just under age 6 and 6 to just under age 10. Only children who live in the same household/family are considered.
Source: Scientific use file of microcensus 1996 and 2002 (own estimations)

2.4 Hypotheses

The bulk of arguments discussed above propose that, in a societal context, where the man is the main provider of the family, men's economic position and, in particular, insecurities in male employment careers should affect a couple's fertility decisions. In West Germany, the capacity of men to sustain dependent family members (wife and children) is strongly supported by the German tax system and social policy measures. Given that West Germany still is in many respects a 'male breadwinner regime', the general expectation is that couples postpone fertility decisions until the male breadwinner has gained a stable employment situation. Insecurities in male employment should hence decrease fertility rates.

From our theoretical considerations, it follows that women's growing education and labor force participation is another crucial factor for understanding low fertility rates in West Germany. Given an institutional framework that makes motherhood and paid work into two incompatible life domains, career oriented women are faced with a decision between staying childless, or trying to accommodate the role of workers and mothers in their life course. Hence, especially for higher educated women, postponing parenthood until they have established themselves in the labor market might be a way to achieve satisfactory outcomes in the domains of family life and employment. Economic uncertainties in their employment careers are likely will delay fertility transitions for these women.

3 Data, method and covariates

We use data from the German Socio-Economic Panel (SOEP). The SOEP is presumably the longest household panel in Europe (for details see SOEP-Group 2003). It currently provides longitudinal information for the period 1984 until 2003. The first wave of the SOEP has been launched in 1984 when it included 4,500 West German households (sample A) and an oversample of roughly 1,500 West German households with a foreign

household head (sample B). Since 1984, the SOEP has been supplemented by several subsamples. For example in 1990, an 'East German sample' (sample C) has been added. In 1995, an 'immigrant sample' (sample D) was drawn. For the analysis in this study, we use respondents from the original two samples that were drawn in 1984 (sample A and sample B).

The SOEP is a panel study in which individuals are re-interviewed on an annual basis. It includes a battery of questions on employment, income, labor market characteristics, attitudes and household compositions. Most items are surveyed in a similar manner each year. This allows utilizing a large set of longitudinal information on a person's characteristics (see below). For fertility analysis, it is also vital to have information on the parity of a person when he or she enters the study. Also this information is available from the SOEP. For sample A and B, complete fertility histories of women were surveyed. Since men's fertility histories were not recorded for members of sample A and B, we restrict the analysis to female respondents. Hence, we take into account the characteristics of the partner the woman is cohabiting with.

For some selected variables, such as source of income or activity status, the SOEP provides monthly information. For most other variables, information is surveyed for the date of interview only. In other words, the respondent is requested to give his or her current employment status or labor market position. Respondents are also requested to report if they are currently worried about their economic situation. For the time period between panel waves, we do not have any information on the worries of the respondent. For simplicity, we assume that a person's characteristics which have been reported at the time of interview are fixed during the last and the following six months. Figure 1 visualizes this procedure. In this example, the first interview was conducted in April 1984 and the respondent reports that she is not worried when she thinks about her personal economic situation. This respondent experiences several changes in respect to her worries. In February 1988, the woman gives birth to her first child and when she is interviewed in April 1988, she is worried about her economic situation.

In order to guarantee that attitudes proceeds − in *all* cases − the decision to have a child, we backdate the date of birth by twelve months. By this procedure, we make sure

that we avoid reversed causation of economic uncertainty and fertility. The temporal order particularly matters in this context, because economic worries will most likely increase in response to having children. A similar matter applies to the impact of female employment which is also highly responsive to childbirth.

Figure1: Survey design and covariates
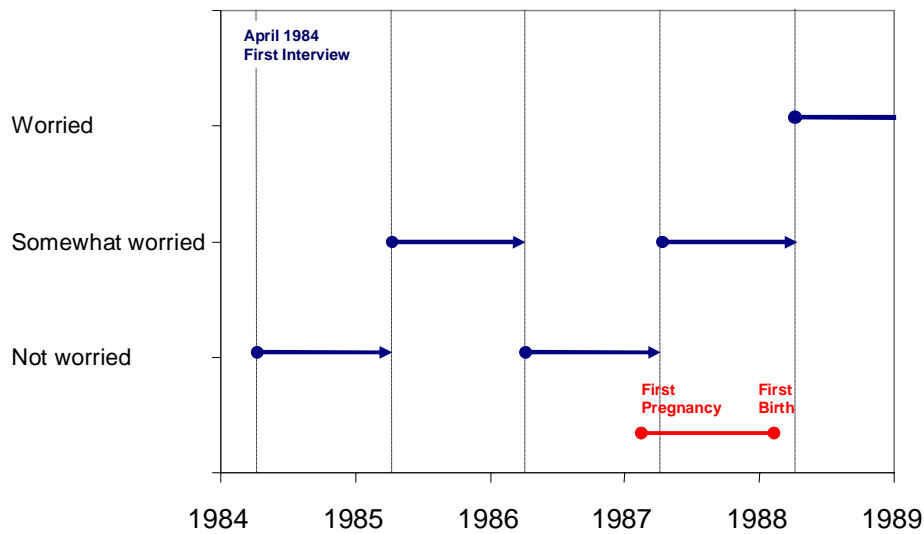
Method

We employ event history techniques to investigate how education, employment, partner characteristics and economic uncertainty impacts fertility. We estimate separate models for foreigners and Germans. We also estimate separate models for first, second and third births. For the analysis of first births, the process starts at age 15 and it ends at first pregnancy. Cases are censored when a person drops out of the sample or at age 45. The second and third birth process starts at birth of the previous child and ends at the next pregnancy. For the specification of the baseline hazard, we use a piecewise constant function. We restrict the multivariate analysis to the time period respondents are part of the panel study. This means that some cases are left-censored. For example, a woman

who is born in 1960 is 24 year of age when she becomes under observation in 1984. The process time to first birth has, nevertheless, started for her at age 15.

Covariates

One of our key interests is in the impact of economic uncertainty on fertility. We measure economic uncertainty by a variable that indicates if a person reports that she is worried, somewhat worried and not worried when she thinks about *her personal economic situation.* There are several items in the SOEP that relate to a person's attitudes and feelings. We have selected this particular item, because it was among the few that has been surveyed each year. Furthermore, the phrasing of the item has been the same over the panel waves. [1]

Educational attainment was measured by a categorical variable that distinguishes the categories (1) no degree, (2) a vocational training degree combined with compulsory schooling ('Hauptschulabschluss'), (3) a vocational training degree combined with a 'Realschulabschluss' or 'Abitur', and (4) a university degree. A distinction of university graduates by their school level is not useful, because the large majority of university graduates have an 'Abitur'. It was neither useful to distinguish the respondents who do not have any vocational (or university) degree by their school degrees, because they mostly had a low school degree ('Hauptschulabschluss').

Respondents are requested to report their *employment status* each year. In the year 1984, for example, respondents could choose between the categories full-time employment, part-time employment, vocational training, irregular employment, registered unemployed, military service and not employed. Based on this variable and additional information on whether the respondent attended school or university, we constructed a variable with five categories. We distinguish (1) in education, including school, university education and vocational training, (2) employed (3) not working. If a

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[1] The exact wording of the question is as follows: "Wie ist es mit folgenden Gebieten? Machen Sie sich da Sorgen? Um ihre eigene wirtschaftliche Situation. Große Sorgen/ einige Sorgen/ keine Sorgen."

respondent reports to be employed and to attend university at the same time, we only consider the respondent's educational participation.

We also take into account calendar period. We distinguish the years 1984 to 1990, 1991 to 1996 and 1997 to 2002. The last date of interview is the beginning of 2003. Since we backdate the date of childbirth (and of censoring) by twelve months, the year 2003 is not covered in our analysis.

We also consider the partner's employment status and educational level. The variables for the partner were constructed similarly to the woman's characteristics. For the male partner educational participation also encompasses military service, though. The partner's characteristics are included only for the time period the woman is cohabiting with the partner. If the partner moves out, his characteristics are no longer considered. If a new partner moves in with the respondent, only his characteristics are taken into account. If a woman does not have a partner, we control for 'not having a partner'.

For the analysis of second and third birth, we also take into account woman's age at first birth which we have grouped into the categories 16-20, 21-24, 25-28, 29-32 and 33-45. With respect to third births, we also take into account the sex composition of the previous children. Other studies have shown some small impact of the gender of the previous children on higher order childbearing (Brockmann 2001; Hank 2003).

4   Results

4.1   General fertility development in West Germany

According to the most recent publications of the Council of Europe (2004), Germany's completed fertility rates are among the lowest in Europe. The total number of children for the birth cohort 1965 is estimated to amount to 1.5 children per woman. Compared to this, a Swedish or a French woman of the same cohort will have given birth to almost 2 children. An important 'ingredient' in low German fertility rates are the high proportions of women who remain childless throughout their lives. Unfortunately, there are no

reliable data on childlessness from German vital statistics. Estimations from survey data suggest that roughly 25 percent of West German women of the recent cohorts will remain childless.

Apart from low fertility rates, another characteristic of the German fertility regime are high ages at first birth. From the cohort perspective, women born after 1950 have subsequently delayed fertility if compared to their predecessors. Estimations based on the German Socio-Economic Panel suggest that the median age at first birth was age 24 for the cohorts 1941-1950. The cohorts 1951-1960 were three years older at first parenthood. For the cohorts 1961-1970, the median age at first birth has risen to 29 years of age (see Figure 1). Regarding second and third births, there are no major changes over the cohorts. Roughly 75 percent of the women with a first birth have a second, mostly three years after first birth. Roughly 25 percent of the women who have a second child also have a third one.

Figure 1a: Kaplan-survival curves to first birth, West German women
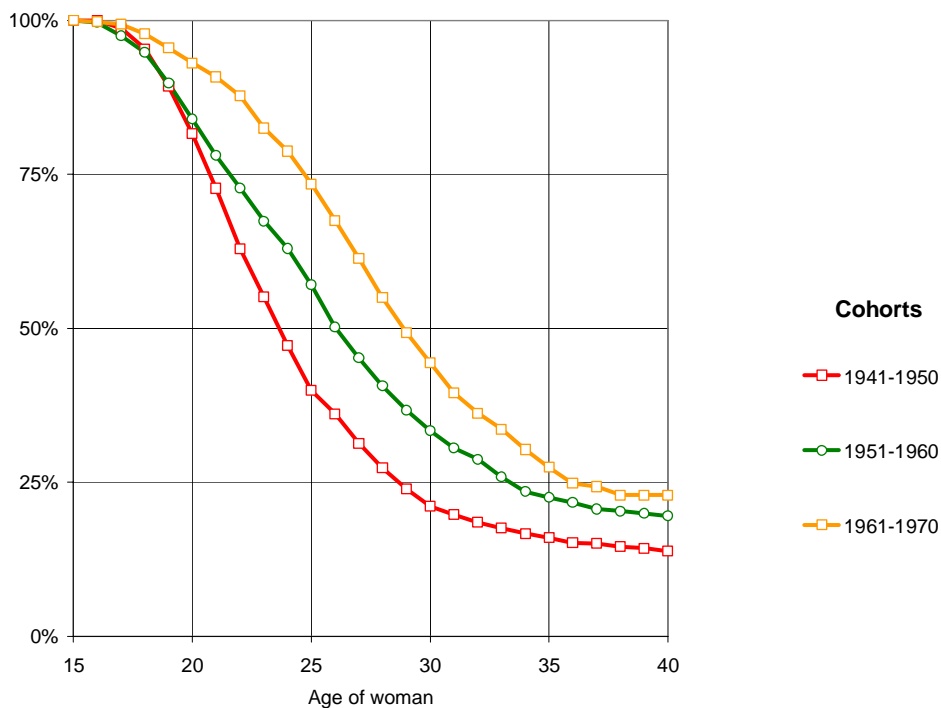
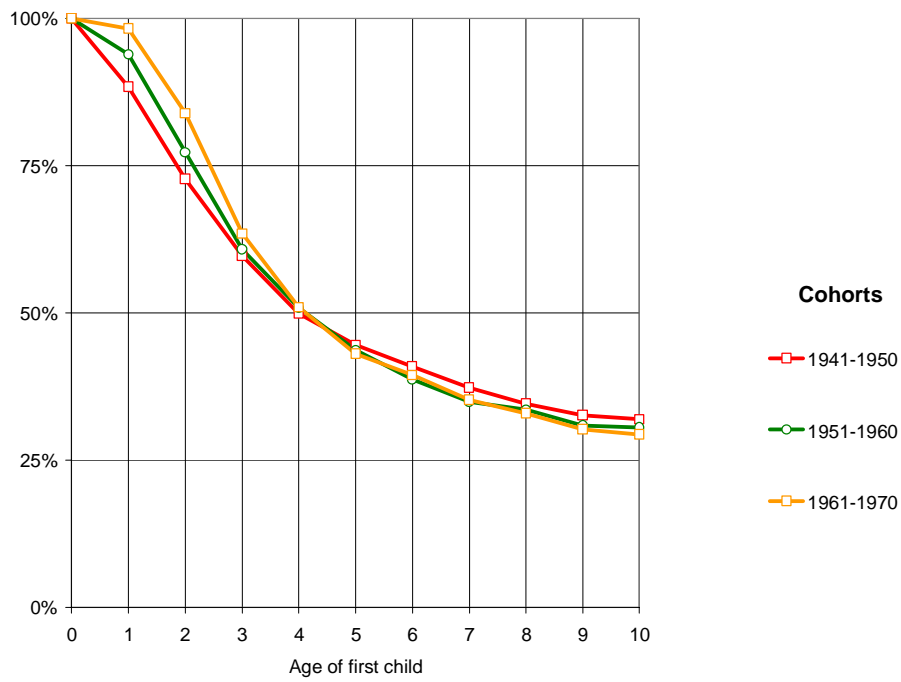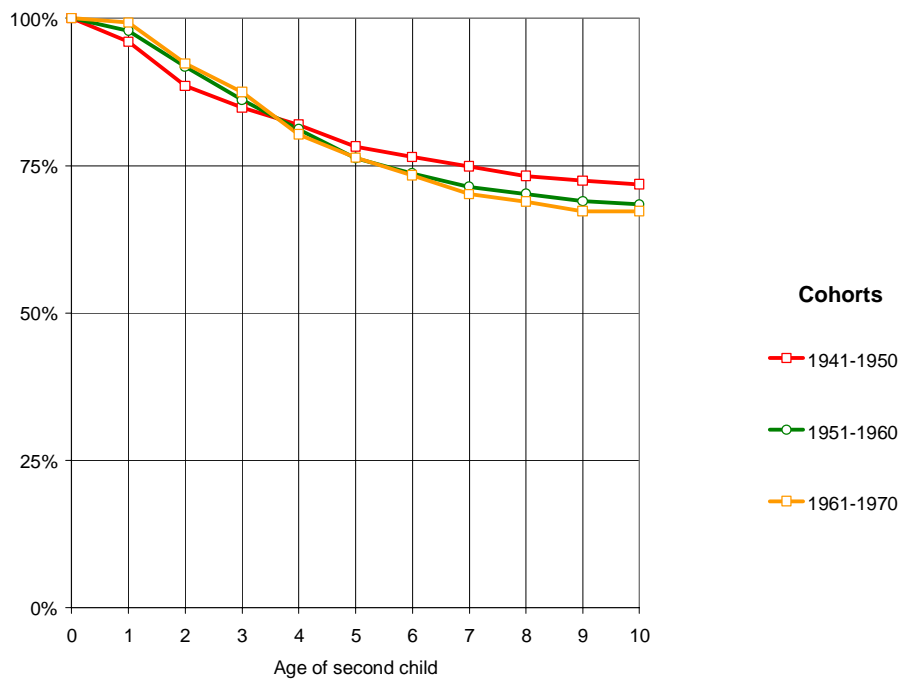*Figure 1b:* Kaplan-survival curves to second birth, West German women

Figure 1c: Kaplan-survival curves to third birth, West German women

Source: German Socio-Economic Panel 2003 (sample A), own estimations

4.2 Determinants of family formation

In the following empirical analysis, we investigate the determinants of first birth. Other chief variables of interest are the woman and her partner's education, employment status and the subjective perception of 'economic worries'. We apply a stepwise procedure. In the first step, we only include the woman's educational level, her employment status and the measure of subjective economic well-being. In the second step, we add the partner's characteristics.

Table 2 shows the results of the model which contains the woman's characteristics only. Let us first turn to the control variables which provide the expected results. There is a bell-shaped impact of age on first birth risks. The hazards for family formation (or rather first pregnancy) are highest in the age bracket 25 to 28. We also find a decline in first birth risks over time. A model that includes only age and calendar period (not presented here) shows a slightly more pronounced impact of the calendar period on first birth risks, suggesting that changes in educational participation explain some of the changes in first birth rates over time.

In line with other studies, we find that first birth risks are particularly low during educational participation. The educational level shows no significant results for West German women. This finding does not imply that university graduates are of the same age when they have children, but that they experience the same fertility rates as other educational groups *after they have finished their studies*. It would have even been plausible to find higher first birth risks for university graduates. Being rather old when they complete their studies, the approaching biological limits of fertility are likely to accelerate fertility transitions for the higher educational groups. The fact that we do not find such an effect suggests that, despite the pressing 'age clock', there are other forces which make university educated women postpone fertility. For foreign women, we even find a negative impact of educational level on first birth risks. Apparently, foreign women with a university degree are particularly prone to postpone parenthood. It should

be taken into account, though, that very few foreign women in our sample have a university degree.

Regarding women's employment, we do not find evidence that employed and not employed women differ significantly in their first birth risks. Neither does the subjective feeling of economic uncertainty show any effect. Only among the foreigners there is a decrease in first birth risks for women who feel somewhat worried about their economic situation. This effect is difficult to explain.

Model 2 provides the results for partner's characteristics. We only consider the partner's characteristics for the period that he is cohabiting with the female respondent. As expected, living with a partner has a strong bearing on first birth risks. For West Germans, the effect of unemployment and educational participation is negative, though insignificant. The insignificant impact of educational participation might partially be related to the fact that there are only few women who live with partners who are still in education. The partner's educational level provides some surprising results. We have argued that in the West German institutional context, men's labor market performance is particularly important for fertility decisions. Against this background, one would have expected a positive impact of men's education on first birth risks. However, we find that women whose partner only had compulsory schooling and a vocational training degree experience slightly elevated first birth risks.

Table 2: Results from event history model, relative risks of the transition to first birth

	West Germans		Foreigners	
	Model 1	**Model 2**	**Model 1**	**Model 2**
Age				
16-20	0.29 ***	0.44 ***	0.62 **	0.97
21-24	0.60 ***	0.74 ***	0.70 **	0.87
25-28	1	1	1	1
29-32	0.78 **	0.74 ***	0.80	0.76
33-45	0.26 ***	0.24 ***	0.14 ***	0.09 ***
Calendar Period				
1984-1990	1	1	1	1
1991-1996	0.88	0.86 *	0.94	0.89
1997-2002	0.81 *	0.82 *	0.81	0.75
Employment				
In education	0.54 ***	0.57 ***	0.63	0.92
Employed	1	1	1	1
Not employed	0.83	0.88	1.23	1.21
Education				
No degree	1.01	1.11	0.93	0.78
Vocational degree- low	1	1	1	1
Vocational degree- high	1.05	1.07	0.71	0.49 ***
University degree	1.06	1.18	0.56	0.38 *
Economic worries				
Worried	1.03	1.10	0.92	1.03
Somewhat worried	1.10	1.12	0.75 *	0.74 *
Not worried	1	1	1	1
Partner's employment				
No partner		0.30 ***		0.22 ***
In education		0.73		0.63
Employed		1		1
Not employed		0.66		1.17
Partner's education				
No degree		0.87		0.85
Vocational degree- low		1		1
Vocational degree- high		0.78 *		0.98
University degree		0.87		1.08
Sample size				
Occurrences		660		231
Subjects		2061		729

Notes: ***: p ≤ 0.01 **: 0.01≤ p ≤ 0.05 *: 0.05≤ p ≤0.10. Source: SOEP 2003 (own estimates)

4.3   The differential effect of uncertainty on family formation

Following our theoretical presumptions, the impact of economic uncertainty should vary by educational level. In order to address this issue, we employ an interaction model of educational level and employment status. Another model addresses the interrelation of economic uncertainty and education. We only use West German women, because the group of foreigners is too small for this investigation.

Table 3a reports the results of the education-employment interaction. For highly educated women, first birth risks are reduced by more than 80 percent if they are not employed. For all other educational categories of women, there is no impact of employment on fertility. Moreover, the interaction between economic uncertainty and education does not provide additional insights *(Table 3b)*.

Table 3a. Interaction effect between employment and education, relative risks

	No degree	Vocational (low)	Vocational (high)	University
Employed	0.89	0.87	0.94	1
Not employed	0.76	1.03	0.71	0.19 *

Controlled for age, period, educational participation

Table 3b. Interaction effects between *economic security (*worries) and education, relative risks

	No degree	Vocational (low)	Vocational (high)	University
Worried	1.36	0.70	0.97	1
Somewhat worried	0.92	1.12	1.09	0.90
Not worried	0.94	0.87	0.98	1.17

Controlled for age, period, employment status

4.4 Second and third births

So far, we have found some evidence that highly educated women are more ready to postpone parenthood when unemployed than other educational groups. However, we have found no evidence for the idea that the subjective feeling of uncertainty or partner's economic situation impacts first birth risks. In the next step, we investigate whether economic uncertainty and the partner's characteristics matter for higher order births.

Table 4 reports the results for second birth risks. The control variables provide the expected picture. Second birth risks are highest 3 to 4 years after fist birth. Age at first strongly affects second birth risks. Women who were older than age 33 at first birth experience low second birth risks. Women who had a first child when they were teenagers experience particularly high transition rates to a second child. There are no major changes in second birth risks over time.

Similar to other studies, we find a strong positive gradient for female education on second birth risks. Whether this relates to a 'time squeeze' in women's reproductive life course needs further investigation. It should be noted, though, that the coefficient of women's education is somewhat reduced after controlling for partner's characteristics. In contrast to the findings for first births, we find strong evidence that not employed women more readily opt for a second child.

The partner's employment status does not matter significantly for second birth risks, which might be attributed to small sample sizes of men who are not in the labor force while having a first child and living with a partner. In contrast to this, men's educational level has a very strong positive impact on second birth risks. Whether this can be attributed to better labor market chances for higher educated men needs further investigation.

Economic worries do not impact second births risks among West Germans. However, they play a significant (but rather surprising) role in fertility transitions of foreigners. Being worried or somewhat worried increases the transition rate to the second child compared to those who are worried. Again, this finding is difficult to explain.

Table 5 displays the results for the transition to the third child. For West German women, third birth risks are highest in the immediate 4 years after second birth. For foreign women, there is no clear spacing pattern discernable. Compared to the results for second birth risks, there is an even stronger impact of the age at first birth on third birth risks. Women who had a child as teenagers stand out as a group with particularly high third birth risks. Women who had their first child past age 28 encounter rather low chances of having a third child. Regarding calendar period, we find a strong negative time trend for West Germans, but not so for foreigners. The sex composition of the previous two children has an impact on subsequent births. Having two boys increase the chances of a third birth by more than 30 percent if compared to having a boy and a girl.

Similar to second births, women's employment status has a significant impact on third birth risks. Women who are not working have a 60 percent higher risk of having a third child than working women. Moreover, there is a polarized pattern with respect to educational level. Women without any degree and those with a university degree display the highest relative risks of having a third child.

If we also consider the partner's characteristic, the women's characteristics lose some of their significance. Partner's unemployment strongly reduces and a university increases third birth risks. All this is in line with the presumption that it needs a stable male employment situation to afford a larger family. However, a very low educational degree of the male partner also enhances the risk of having a third child. For foreigners, the relationship between partner's education and fertility is even more intangible.

Finally, economic worries do not provide any consistent picture, either. Women who are 'somewhat worried' encounter the highest third birth rates.

Table 4. Results from event history model, relative risks of the transition to second birth

	West Germans		Foreigners	
	Model 1	**Model 2**	**Model 1**	**Model 2**
Time since last birth				
0-2 years	0.43	2.12 ***	1.10	1.12
3-4 years	1.82 ***	1.77 ***	1.30	1.30
5-6 years	1	1	1	1
6-10 years	0.47 ***	0.47 ***	0.75	0.78
10+ years	0.12 ***	0.11 ***	0.17 ***	0.17 ***
Age at first birth				
16-20	1.29	1.54 ***	1.73 ***	2.00 ***
21-24	0.99	1.04	1.37 *	1.46 **
25-28	1	1	1	1
29-32	0.92	0.84	0.98	1.07
33-45	0.37 ***	0.33 ***	0.83	0.92
Calendar Period				
1984-1990	1	1	1	1
1991-1996	1.02	1.05	0.97	0.94
1997-2002	1.00	1.04	1.29	1.31
Employment				
In education	1.28	1.32	1.40	1.59
Employed	1	1	1	1
Not employed	1.59 ***	1.49 ***	1.38 **	1.30
Education				
No degree	0.99	1.03	1.05	0.99
Vocational degree- low	1	1	1	1
Vocational degree- high	1.36 ***	1.23 *	0.86	0.82
University degree	1.93 ***	1.69 ***	1.72	1.23
Economic worries				
Worried	0.83	0.93	1.51 **	1.39 **
Somewhat worried	1.07	1.12	1.63 ***	1.71 ***
Not worried	1	1	1	1
Partner's employment				
No partner		0.51 ***		0.41 ***
In education		1.38		0.82
Employed		1		1
Not employed		1.33		1.08
Partner's education				
No degree		1.07		0.92
Vocational degree- low		1		1
Vocational degree- high		1.49 ***		0.92
University degree		1.69 ***		2.18 **
Sample size				
Occurrences		2891		1515
Subjects		794		440

Notes: ***: p ≤ 0.01 **: 0.01≤ p ≤ 0.05 *: 0.05≤ p ≤0.10. Source: SOEP 2003 (own estimates)

Table 5. Results from event history model, relative risks of the transition to third birth

	West Germans		Foreigners	
	Model 1	**Model 2**	**Model 1**	**Model 2**
Time since last birth				
0-2 years	2.75 ***	2.81 ***	1.01	0.98
3-4 years	2.57 ***	2.59 ***	1.08	1.09
5-6 years	1	1	1	1
6-10 years	0.62	0.59	0.72	0.75
10+ years	0.25 ***	0.24 ***	0.22 ***	0.22 ***
Age at first birth				
16-20	1.94 ***	1.92 ***	2.40 ***	2.64 **
21-24	1.59 **	1.63 ***	1.65	1.81 *
25-28	1	1	1	1
29-32	0.48 ***	0.46 ***	0.81	0.60
33-45	0.31 *	0.29 **	0.00	0.00
Calendar Period				
1984-1990	1	1	1	1
1991-1996	0.70 *	0.69 **	1.16	1.16
1997-2002	0.60 **	0.58 ***	1.16	1.20
Gender of previous kids				
Two boys	1.36 *	1.34	1.50 *	1.39
Two girls	1.15	1.13	1.29	1.33
Mixed	1	1	1	1
Employment				
Employed	1	1	1	1
Not employed	1.68 ***	1.64 ***	1.40	1.33
Education				
No degree	1.96 ***	1.94 ***	1.68 *	1.65 *
Vocational degree- low	1	1	1	1
Vocational degree- high	1.85 ***	1.69 **	2.16 **	2.45 **
University degree	2.71 ***	1.89 *	0.88	0.52
Economic worries				
Worried	0.97	1.07	0.77	0.81
Somewhat worried	0.75 *	0.79	0.56 ***	0.54 ***
Not worried	1	1	1	1
Partner's employment				
No partner		1.58		0.92
Employed		1		1
Not employed		0.33 *		0.76
Partner's education				
No degree		1.32		1.49 *
Vocational degree- low		1		1
Vocational degree- high		0.99		0.58
University degree		1.87 ***		2.65 **
Sample size				
Occurrences		794		440
Subjects		2891		1515

5   Conclusions

What conclusions can we derive from our investigations? We raised two research questions: What is the role of women and their partner's education and employment in the postponement of fertility? What are the effects of economic uncertainty on fertility decisions? In line with previous research, we find that women postpone family formation during educational participation, while we do not find an independent effect of women's educational level. We neither find evidence that women's employment generally affects first birth risks. However, there are strong interaction effects between educational level and employment status. While unemployment does not impact first birth risks among the majority of women, it defers family formation for the highly educated.

Another aspect we investigated is the role of the partner's education and employment in fertility transitions. The only clear result is that partner's university education supports progressions to higher order births. Moreover, women's employment reduces the chances of having further children. Both findings support the over-all picture of West Germany being a male breadwinner regime.

Initially, we had great hopes that subjective measures of economic uncertainty are useful for analyzing the postponement of fertility. The potential of this variable to enhance our understanding of the timing of births in West Germany has not been supported by our analysis.

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