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**Educational Attainment and First Births:
East Germany before and after
Unification**

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Educational Attainment and First Births: East Germany before and after Unification

*Michaela Kreyenfeld**

There is a general belief that female educational attainment has a delaying effect on the age at first birth. In this paper we argue that the validity of this hypothesis relies on at least three prerequisites. First, that child rearing and employment is incompatible. Second, that a withdrawal from the labor market harms labor market upward mobility. Third, that child rearing responsibilities are shared according to traditional gender roles. Using data from the German Socio-Economic Panel (SOEP), we analyze the impact of educational attainment on first birth risks in East and West Germany before and after unification. A major result is that, compared to West Germany, the impact of educational attainment on first birth risks is less strong in East Germany. This also applies to the period after unification. We attribute this to the relative abundance of public day care in the East.

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Introduction

It is generally believed that female educational attainment and fertility is negatively associated (e.g. Becker 1993: 140, Rindfuss, Morgan and Swicegood 1988, De Wit 1998). Women with a higher educational attainment are more inclined to pursue an employment career; therefore they will encounter higher opportunity costs of child rearing. This might induce them to either forgo parenthood altogether or at least postpone it to a later stage in their employment career. After some years of being on the job, career interruptions are considered to be less damaging to the future labor market situation. A woman should have settled into a stable “career track” by then, which allows her to temporarily withdraw from the labor market without having to fear a “regression” in her career path (e.g., Gustafsson and Kenjoh 2000: 6, Liefbroer and Corijn 1999, Taniguchi 1999: 1008).

In this paper, we base our analysis on the hypothesis that better educated women postpone parenthood because they fear that an early withdrawal from the labor market results in *status loss* in the labor market. Status loss includes missed chances of realizing an improvement of one’s position in the labor market or in one’s earnings, or the fear of facing problems of entering the labor market at all after childbirth. However, the validity of this argument relies on at least three prerequisites:

- It takes for granted that child rearing and employment are incompatible, which means that a woman is forced to interrupt her employment career after childbirth. The shorter the career interruptions, however, the less negative should be the impact of childbirth on employment. Among other aspects, the availability of public day care is often considered to be crucial in this respect.

- It relies on the assumption that there is a penalty for career interruptions. However, in a labor market that does not provide much room for up- and downward mobility, there should be less need to strategically time childbirth in accordance with the employment career.
- Finally, it assumes that it is the woman (and not the man) who withdraws from the labor market after childbirth.

The last assumption seems to fit East and West Germany equally well. There is consistent empirical evidence that child rearing responsibilities are shared according to traditional gender roles. This applies to the period before as well as after German unification in East and West Germany (Böckmann-Schewe, Röhrig and Kulke 1993: 50ff., Trappe 1995). However, the first and second assumptions do not hold equally well in the two parts of Germany. First of all, the former East German labor market provided less room for up- and downward mobility. Second, the GDR had policies that made it easier to reconcile child-rearing and employment due to a higher provision rate of public day care. Therefore, one would expect that there was less variation in the timing of first birth by educational attainment in the former East Germany compared to the (former) West Germany. After unification, major East-West differences should have diminished, since women in both parts of Germany are subject to similar labor market constraints now. However, there is still a relative abundance of public day care in East Germany. Therefore, one might expect that East German women somewhat have better chances of reconciling working and family life than West Germans even after unification.

In the first part of this paper, the institutional constraints in East Germany before and after unification are compared with respect to the compatibility of child rearing and

employment and with respect to status mobility after career interruptions. The second part consists of the empirical analysis. First, we analyze differences in the impact of educational attainment on first birth risks between East and West Germans before German unification. The major research question is how the impact of educational attainment on first birth risks changed in East Germany with German unification. There are two bases of comparison which are of interest. First: How did East Germany's fertility pattern change compared to "pre unification times"? Second: Do East Germans differ in their fertility behavior from their West German counterparts after unification?

1. Institutional Constraints before and after Unification

East Germany before Unification

From the very beginning of the GDR, the regime declared "gender equality" as a major public policy goal, which meant an integration of women into "public life" and particularly into the labor market (Obertreis 1986: 74ff., Koch and Knöbel 1986: 45). In the 1950s, public policy measures were directed towards encouraging women to participate in the labor market. In the firms, women's promotion schemes had to be set up that demonstrated how women were going to be hired and promoted. In the 1960s, it became obvious that public policy needed to better address time allocation problems that involved combining housework and employment. The most notable policy measure in reaction to this demand was the establishment of a network of public day care in the

following years (Cromm 1998: 420ff./ Frerich and Frey 1993: 416f.).¹ In the 1980s, almost complete coverage with public day care was achieved. In contrast to West Germany, where the increase in public day care in the 1970s was motivated by a desire to educate pre-school children, public day care in East Germany aimed particularly at serving the needs of working mothers (Kreyenfeld, Spiess and Wagner 2001). The day care system in the former East Germany therefore included all day care for children of all ages, flexible opening hours, meals at lunchtime etc. Furthermore, youth organizations took over substantial childcare responsibilities, e.g. by providing care for school-age children during term holidays (Cornelius 1990: 313).

The ready access to public day care certainly contributed to a short period of career interruptions among East German women. This was also enforced by the tax and transfer system and a “moral suasion”, i.e. a strong public pressure on women who did not work.² But childbirth was still followed by some time of absence from the labor market. In 1986, the former East German government introduced a one-year period of maternity leave, which was taken advantage of by the large majority of East German women (Sørensen and Trappe 1994: 19, Trappe 1995).³ Nevertheless, it seems safe to maintain that a career interruption had a weaker impact (compared to West Germany) on the subsequent labor market career (Trappe and Rosenfeld 1998, 2000).

¹ Other measures were, e.g., policies that intensified the service sector such as washing and ironing services. Obertreis (1986: 154) argues further that economic incentives might also have played a dominant role. At the end of the 1950s, food vouchers were abolished and prices raised. Although salaries were also increased, most families were subject to a relative decline in their living status. An increase in female employment might have been related to the wish to maintain living standards.

² East German legislation was set up in such a way that in case of divorce, women were essentially not granted maintenance claims. Unlike West German legislation, lone motherhood did not entitle one for social benefits, which were reserved for invalids in the GDR (Berghahn and Fritzsche 1991: 144ff., Frerich and Frey 1993: 396).

³ After 1976, women were allowed to take a year of paid leave after the birth of a second or higher

To begin with, earning differences in the centrally planned East German labor market were rather narrow compared to differences in the capitalist West German labor market (Szydlik 1994: 200). Nevertheless, also in East Germany, labor market positions varied by pay and prestige. The crucial question in this respect is how workers were allocated to job positions and how career interruptions affected the subsequent employment status. Solga and Konietzka (1999: 29) argue in this context that educational and vocational certificates served as a crucial mechanism for allocating workers to jobs. They even argue that “the provision of status-adequate job placement was guaranteed, as a device to ensure loyalty to the Party and the State.” Workers had good reason to believe that their educational certificates guaranteed them an adequate position in the labor market. This also means that career interruptions should have had little impact on their position in the labor market. Considering that labor market mobility was predetermined by educational certificates, there was little reason to postpone childbirth in order to realize labor market upward mobility.

However, there is some evidence that internal labor markets also played a role in the former East German labor market (e.g. Grünert and Karl 1997: 57ff., Lutz and Grünert 1996, Sackmann and Wingens 1996: 14). This mechanism should be more responsive to career interruptions, i.e., promotion in the firm should then depend on seniority and job performance. One might dispute whether the East German labor market did, in fact, offer greater upward mobility based on job performance (Zühlke and Goedicke 2000: 85).

order birth. In 1986 the *Babyjahr* was extended to all births.

It is clear, however, that the East German labor market provided two strong mechanisms that protected from downward mobility. First of all, there was a statutory right to work. This regulation basically operated as an insurance against unemployment. Second, East German women were more or less forced to work in full-time employment. In West Germany, the increase in female employment in the 1990s was largely an increase in part-time employment. Although part-time employment positions often offer only restricted chances of experiencing labor market upward mobility, the spread of part-time employment was considered a means of facilitating the return of mothers to the labor market at all (Drobnič 2000: 139, Holst and Schupp 1994). The East German government, on the other hand, actively worked against the spread of part-time employment (Obertreis 1986: 305ff.). Considering that there was a strong pressure to be employed and a relative abundance of vacant positions, East German women were basically forced to return to full-time employment. Both aspects, the statutory right to work and the restricted availability of part-time employment, restricted labor market downward mobility after career interruptions.

East Germany after Unification

After unification, the East German legal and political system was essentially replaced by the West German one. This means, for example, that the short period of maternity leave that was common in the former East Germany was abolished in favor of the 1½ (and since 1992, three years) of *Erziehungsurlaub*. The East German “marriage loan”, the birth grant and maternity benefits, were replaced by the West German tax and transfer

system, including the system of income splitting (e.g. Berghahn and Fritzsche 1991). Furthermore, East Germans are subject to a labor market which - compared to the former East Germany - offers more room for up and downward mobility. This is clearly linked to a high risk of unemployment, which is particularly widespread among women without formal qualifications (Bielinski, Brinkmann and Kohler 1995, Engelbrech and Reinberg 1997). Nevertheless, in present day Germany, a variety of labor market institutions also restrict labor market mobility. This applies to maternity leave regulations, which allow mothers to return to their previous employers during the first three years after the birth of a child. Furthermore, the (West) German labor market is (compared to the US labor market) often described as less flexible, i.e., career advancements depend on formal qualifications rather than on firm or work experience (e.g. Witte and Kalleberg 1995). However, in comparison to the former centrally planned East German labor market, it seems logical to assume that in the present day German labor market there is more room to experience up-and downward mobility based on job performance.

It was argued above that in a labor market, where job placement depends on performance on the job, better educated women should have a greater incentive to postpone parenthood. However, this aspect should be weaker, the better the compatibility between child rearing and employment. An interesting aspect of this might be that, despite a general “take over” of West German institutions, there is still a relative abundance of public day care in the East. This is crucially related to the nature of day care policies in Germany. They differ substantially from other family policies such as *Erziehungsgeld* (child rearing benefits) or *Kindergeld* (child allowance). First, day care is publicly provided, i.e., it is not a cash benefit. Second, it is, in almost all

respects, a local policy, i.e., the provision of care is not only planned on the local level, it is also financed out of the local budget. This contributes to a substantial variation in the provision of public day care across (West) Germany (Kreyenfeld and Hank 2000).

After German unification, there was great concern whether East German communities would be able to keep up the high level of day care that was common in the former East Germany (Deutsches Jugendinstitut 1993). So far, however, provision rates in the East are well above West German levels. Table 1 provides data on the use of day care in the period 1990-1998 for East and West Germany. Compared to the former East Germany, the provision of day care has decreased modestly after German unification.⁴ Witte and Wagner (1996: 235) argue that the decline in the provision rate might not even be supply driven in the first place. Instead, they argue that unemployed East German women or women on maternity leave might prefer to take care of their children themselves. One might disagree whether the decline in the provision of public day care reflects an adjustment to the demand for care or whether it is a first sign of rationing in the East. Up to now, East German women have much better opportunities to combine child-rearing and employment than their counterparts in the West.⁵

⁴ There are no recent data from the German Statistical Office on the public provision of daycare available. The table displays my own estimations of the use of day care. The table also includes child minders and private daycare centers. However, child-minders and private daycare centers play such a minor role in Germany that the table indeed provides a valid impression of the *public* provision of daycare. In 1995 fewer than two percent of children aged 0-10 were (predominantly) cared for by a child-minder or in a private day care center (my own calculations on the basis of the SOEP).

⁵ It should be noted that the high provision rate strongly profits from the low East German birth rates. In other words: day care slots were cut down in East Germany. But birth rates (and therefore the number of children to care for) decreased even faster. We have argued elsewhere that in the long run East German communities will most likely not be able to keep up the high provision rates with public day care (Kreyenfeld and Hank 2000, Kreyenfeld, Spiess and Wagner 2001).

[Table 1 about here]

To summarize:

We have argued that the *risk of status loss after childbirth* induces educated women to postpone childbirth to a later stage in their employment career. The risk of status downward mobility after childbirth, however, depends on whether or not and for how long women withdraw from the labor market after childbirth. This depends primarily on the *compatibility of child rearing and employment*. Furthermore, it depends on the labor market institutions that hamper or ease *labor market mobility* after career interruptions. In the former East Germany, child rearing and female employment were reasonably compatible. Furthermore, there was less room for upward and downward mobility in the East German labor market. Since unification, East Germans have been subject to labor market institutions similar to those experienced by West Germans. However, in contrast to West Germany, East German women still enjoy better chances of reconciling childbirth and employment due to the relative abundance of public day care in the East. Therefore, even after unification, there is still some reason to believe that the differences in the timing of first births based on educational attainment are smaller in the former East Germany.

2. Empirical Analysis

As a data source to test our hypothesis, we are using the German Socio-Economic Panel (SOEP). The SOEP is a panel data set, which means that the same individuals are re-interviewed on an annual basis. Although the focus of the SOEP is on its panel characteristics, it also provides retrospective information on the birth and employment histories for the time prior to entry into the panel. The analysis is restricted to East and West German women of the birth cohorts 1955-1980. A respondent is treated as East German if she lived in East Germany in 1990. A West German, in this study, is a respondent who is of German nationality and who was living in West Germany when the German Socio-Economic Panel (SOEP) undertook its first survey in 1984.

Time Scale: The dependent variable in our empirical analysis is the age of the woman measured in months since the year she turned 15. A case is censored if a respondent dropped out of the sample or when the last interview was conducted (in the spring of 1998). It should be noted that, for the time prior to unification, we only have annual information at our disposal. This means that we only know the year (or the age, respectively) at completion of education and first birth. Here, we assume that the birth happened in the beginning of the year, while education was terminated in the middle.

Educational Attainment: It was argued above that the educational attainment of a woman (i.e. the vocational certificate or the educational degree she holds) should determine her decisions concerning parenthood. So far, we have ignored the fact that individuals usually undergo education before acquiring a degree (and therefore before even entering the labor market). Hoem (1986) or Blossfeld and Huinink (1991) are among the authors who argue that one should make a clear distinction between periods

when individuals receive education and other periods. I follow their suggestion and I distinguish between “currently in education” and “out of education”. Periods out of education are subdivided further by the educational degree a woman holds when she enters the labor market. For simplicity, educational attainment is classified as follows:

- College Degree: This encompasses the German *Fachhochschulabschluß* (technical college) and a university degree received in (East or West) Germany or in a foreign country.
- Vocational Degree: This encompasses all (East or West) German vocational certificates surveyed by the SOEP (*Lehre, Berufsfachschule, Schule des Gesundheitswesens, Fachschule, Beamtenausbildung, other Ausbildung*) and vocational certificates from a foreign country.
- No Secondary Degree: This encompasses respondents who do not hold a college degree or a vocational certificate and who are not currently receiving schooling.

Method: In order to investigate the relationship between educational attainment and first birth, various piecewise constant models are estimated. The time axis is divided at three points in time, namely at age 20, 24, and 28. The analysis consists of three separate parts:

- (1) First, former East and West Germany are compared. We censor the cases in the beginning of the year 1991. We consider all births that happen in the year 1990 as “pre-unification births”. This is not completely accurate, since German unification took place in November 1990, but surely it is sufficiently precise. (Using the year 1990 as the censoring date does not change our results in any substantial manner.).

(2) Second, we compare East Germany before and after unification. Again, we use the beginning of the year 1991 as our dividing line.

(3) Third, we compare East and West Germany after unification. For this analysis, we left-censor the cases in the year 1991. Furthermore, we include only East and West Germans from the cohorts born 1961 and later.

Table 2 displays the composition of the sample. There is no difference in the ratio of college graduates among East and West Germans. Note, however, that there is only a small group of East German women who do not hold a vocational certificate or a college degree in 1998. This low ratio still reflects East German policy, which strongly encouraged individuals to undergo vocational training (Huinink, Mayer and Trappe 1995: 100).

[Table 2 about here]

East and West Germans before Unification

In this part of our analysis we address the impact of educational attainment on first birth risks before German unification. Table 3 displays the relative risks by educational attainment. An interaction with an indicator variable for “East German” reveals whether there are differences between East and West Germans before German unification. The results can be summarized as follows:

- Being in the educational or vocational training system reduced first birth risks substantially less in East Germany than in West Germany. Receiving education reduced first birth risks by some 65 percent (compared to having a vocational certificate) in West Germany. In East Germany, it reduced it by about 30 percent (for $2.23/3.09=0.72$).
- In West Germany, educational attainment strongly reduced first birth risks. Having a college degree reduced the chances of giving first birth by 25 percent (compared to having a vocational degree) and by some 50 percent compared to having no degree ($0.74/1.55=0.47$).
- In East Germany, educational attainment has a positive impact on first birth risks, i.e. women with a college degree have a significantly higher risk at first birth than women with a vocational degree (this is significant on the 95 percent level). This does not mean that college graduates were younger when they became mothers, but that they moved more quickly into motherhood once they finished their degree.

[Table 3 about here]

East Germans before and after Unification

In this part of the analysis, we compare the impact of educational attainment on first birth risks in the former GDR with the present-day East Germany. Therefore, only East Germans are considered in this part of the analysis. An interaction with a time-variant dummy variable for “German unification” is supposed to reveal differences in the effect of educational attainment on first birth risks before and after German unification. The results are displayed in Table 4:

- Compared to the former GDR, women in the new federal states were less likely to give birth during education after unification. This suggests that the compatibility of education and parenthood must have declined in the interim. In figures: The risks of giving first birth while receiving education or vocational training declined by about 90 percent after German unification ($0.39/3.28=0.12$).
- Before unification, educational attainment had a positive impact on first birth risks. After unification, having “no degree” (respectively no college degree or vocational certificate) increases first birth risks. However, the reader should remember at this point that only a minority of East German women have no formal qualifications. College education still has a positive but insignificant impact on first birth risks.

[Table 4 about here]

East and West Germans after Unification

It seems important to understand changes in the impact of education on first birth risks before and after unification in East Germany. It may even be more interesting to analyze whether differences between East and West Germans remain after unification. We now address this issue. It is important to remember that we left-censor the cases in the year 1991 for this analysis. Furthermore, we reduce the analysis to the birth cohorts born in 1961 or later. The results are displayed in Table 5.

- The most obvious result is that, across all educational groups, East Germans have a higher risk at first birth.⁶
- Compared to West Germans, East German women are twice as likely to have a child while still receiving education. This difference is significant on the 99 percent level.
- College education reduces first birth risks less among East than among West Germans (compared to similar respondents with a vocational certificate). On the other hand, having no degree increases first birth risks much more strongly among the East Germans.

[Table 5 about here]

⁶ For a more detailed discussion of this aspect, see Kreyenfeld (2000)

3. Conclusion

Particularly among economists, it has frequently been argued that the increase in female educational attainment and female employment is the major reason for the decline in fertility (e.g. Becker 1993: 140). Hirschman (1994: 222) even argues that one “of the most consistent findings in the literature is a negative relationship between women's education and fertility, both at the individual and the aggregate level.” In this paper, we argued that this correlation is not stable. It depends on a variety of factors. We discussed two of them: the social policies which made child rearing and employment more compatible and the labor market institutions that structure labor market mobility after career interruptions.

In the empirical part of this paper, we analyzed the transition to first birth in East and West Germany before and after unification. In the former GDR, educational attainment had a positive impact on first birth risks. Furthermore, education and parenthood was more compatible than in the West. In particular, college students often opted for parenthood while still receiving education. Compared to the situation before unification, parenthood and receiving education are significantly less compatible in present day East Germany. Second, college education has no longer a significant impact on first birth risks, while having no formal qualification fosters a transition to parenthood (compared to a vocational training certificate). These results are not too surprising to us, considering the drastic changes in the East German labor market after *die Wende* (the fall of the Berlin Wall). It is of great interest, however, that East Germans behave differently from their West German counterparts even after unification. The analysis reveals that the negative impact of educational participation on first birth risks is less strong among East Germans. Similarly, East German college graduates who

have just entered the labor market are more likely to opt for parenthood. Perhaps, a labor market career and having children are still more compatible in East Germany. This may be plausible considering the relatively greater abundance of public day care in the East.

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6. Tables

Table 1: Use of Day Care in Germany⁷ (in percent)

	West Germany			East Germany		
	1990	1995	1998	1990	1995	1998
Use of Care						
Children 0-3	6	6	8	62	22	27
Children 4-6	82	80	91	98	93	86
Children 7-11	1	3	4	35	26	28
Use of Full-time Care						
Children 4-6	21	15	16	80	60	49
Note:	(1) Age Categories: Children were categorized into different age groups according to their year of birth. In 1998, for example, children aged 0-3 were children born in the years 1994 to 1998. The SOEP survey is usually taken in the spring of each year. Thus, children born in 1994 are mostly aged 3 at the time of the interview. The age category 4-6 also includes children who are older than 6 years of age, provided they do not attend primary school yet. The age category 7-11 also includes children younger than 7, provided they already attend primary school. Children who attend secondary school are excluded. (2) Selection of the sample: only East and West Germans (sample A+C) (3) Source: SOEP					

Table 2: Descriptive Statistics

	West	East
Births		
Number of first births before 1991	722	634
Number of first births after 1990	146	364
Total number of first births	868	998
Number of respondents	2,536	1,367
Education (in %)		
In education	18	17
No degree	15	4
Vocational degree	59	71
College degree	9	8
Note:	(1) Sample: East and West Germans of the birth cohorts 1955-1980 (2) In this table the educational level refers to the highest educational level in 1998. In the multivariate analysis, however, education is treated as a time-variant covariate (3) Source: SOEP	

⁷ The underlying question is: "Is your child cared for in the 'Krippe, Kindergarten, Hort' or by a child-minder?" "At what time of the day is it cared for in this institution?" This information was surveyed for each child in the household. It should be noted that the phrasing of the question changed slightly in the different years. In most waves, the SOEP distinguishes between care in the morning, afternoon, and all day. In 1990, one distinguished only between part-time and full-time care. This might explain the relatively high ratio of full-time care in West Germany for the year 1990.

Table 3: East and West Germans before Unification (event history model on first birth risk)

	b	exp(b)	t	b	exp(b)	t
Baseline (age)						
15-20	-8.13	0.0003				
20-24	-6.54	0.0014				
24-28	-6.28	0.0019				
28-38	-6.52	0.0015				
Interaction with "West German"						
Education						
In education	0.80	2.23	9.02 ***	-1.36	0.26	-12.11 ***
No degree	1.08	2.93	4.58 ***	0.44	1.55	4.74 ***
Vocational degree	1.13	3.09	16.31 ***	0	1	
College degree	1.30	3.67	5.38 ***	-0.30	0.74	-1.56

Note: (1) Method: piece-wise constant model (2) Population: East and West German cohorts 1955-1980 (3) Censoring: beginning of 1991 (4) ***: $p \leq 0.01$ **: $0.01 \leq p \leq 0.05$ *: $0.05 \leq p \leq 0.10$ (5) Source: SOEP

Table 4: East Germans before and after Unification (event history model on first birth risk)

	b	exp(b)	t	b	exp(b)	t
Baseline (age)						
15-20	-8.62	0.0002				
20-24	-6.77	0.0012				
24-28	-6.68	0.0013				
28-38	-7.43	0.0006				
Interaction with "Unification"						
Education						
In education	1.19	3.28	9.09 ***	-0.94	0.39	-3.08 ***
No degree	1.44	4.24	5.73 ***	1.26	3.51	4.37 ***
Vocational degree	1.48	4.41	12.96 ***	0	1	
College degree	1.75	5.77	6.77 ***	0.48	1.61	1.62

Note: (1) Method: piece-wise constant model (2) Population: East German cohorts 1955-1980 (3) ***: $p \leq 0.01$ **: $0.01 \leq p \leq 0.05$ *: $0.05 \leq p \leq 0.10$ (4) Source: SOEP

Table 5: East and Germans after Unification (event history model on first birth risk)

	b	exp(b)	t	b	exp(b)	t
Baseline (age)						
15-20	-8.81	0.0001				
20-24	-7.51	0.0005				
24-28	-6.88	0.0010				
28-38	-6.53	0.0015				
Interaction with "West German"						
Education						
In education	-0.59	0.55	-1.97 **	-1.30	0.27	-5.01 ***
No degree	1.86	6.42	7.75 ***	0.47	1.60	3.10 ***
Vocational degree	0.45	1.57	3.73 ***	0	1	
College degree	0.42	1.51	1.46	-0.50	0.61	-2.44 **

Note: (1) Method: piece-wise constant model (2) Population: East and West German of the cohorts 1961-1980, who were childless in the beginning of 1991 (3) Cases were left-censored in the year 1991 (4) ***: $p \leq 0.01$ **: $0.01 \leq p \leq 0.05$ *: $0.05 \leq p \leq 0.10$ (5) Source: SOEP