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ABSTRACT

Benefit-Entitlement Effects and the Duration of Unemployment: An Ex-Ante Evaluation of Recent Labour Market Reforms in Germany*

We analyse benefit-entitlement effects and the likely impact of the recent reform of the unemployment compensation system on the duration of unemployment in Germany on the basis of a flexible discrete-time hazard rate model estimated on pre-reform data from the German Socioeconomic Panel (SOEP). We find (i) relatively strong benefit-entitlement effects for the unemployed who are eligible to means-tested unemployment assistance after the exhaustion of unemployment benefit, but not for those without such entitlement; (ii) non-monotonic benefit-entitlement effects on hazard rates with pronounced spikes around the month of benefit-exhaustion, and (iii) relatively small marginal effects of the amount of unemployment compensation on the duration of unemployment. Our simulation results show that the recent labour market reform is unlikely to have a major impact on the average duration of unemployment in the population as a whole, but will significantly reduce the level of long-term unemployment among older workers.

JEL Classification: J64, J65, H31

Keywords: unemployment duration, unemployment insurance, benefit-entitlement effects, German labour market reforms, ex-ante evaluation, hazard rate model

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1 Introduction

Benefit-entitlement effects of unemployment insurance on the duration of unemployment have been the subject of much theoretical and empirical analysis in labour and public economics (for surveys see, e.g., Atkinson and Micklewright 1991, Krueger and Meyer 2002: 2334-2354). Both microeconomic models of individual labour supply and the theory of optimal job search imply that a more generous unemployment compensation system will increase the duration of unemployment (see, e.g., Moffitt and Nicholson 1982, Mortensen 1977, 1986). The economic rationale for this prediction is simple: Unemployment benefits act as a search subsidy, thus reducing the cost of leisure or increasing the reservation wage thereby inducing the unemployed to search longer for a job. More specifically, as shown by Mortensen (1977), the simple job-search model implies that the hazard rate from unemployment is continuously increasing as the remaining duration of benefit-entitlement decreases until the benefit-exhaustion point is reached, and remains constant thereafter.

Although these models are somewhat restrictive regarding their focus on the supply side of the labor market, they have widely been used as a theoretical basis for the empirical analysis of benefit-entitlement effects on the duration of unemployment behavior (see, e.g., Meyer 1990, Katz and Meyer 1990). For Germany, benefit-entitlement effects also have been analysed in several previous empirical studies (e.g., Hunt 1995, Hujer and Schneider 1996, Steiner 1997, Wolff 2003, Fitzenberger and Wilke 2004). These studies used the successive extension of unemployment benefit entitlement periods that took place in the 1980s to estimate the effect of these changes on the duration of unemployment. Estimating simple hazard rate models, these studies established some evidence that the extension of benefit-entitlement periods increased the duration of unemployment, especially among the older unemployed for whom the extension of maximum entitlement was most pronounced (see section 2). Some of these studies also found that, compared to these entitlement effects, the effects of marginal changes in the income replacement ratio, i.e. the share of (previous) net earnings replaced by the amount of unemployment compensation, on the duration of unemployment are quite small.

All the studies mentioned above refer to the period before the recent major reform of the German unemployment compensation system, which partly was a reaction to the perceived disincentive problems related to two features of the previous fairly generous system: First, the rather long maximum unemployment benefit entitlement periods especially for older workers and, secondly, the generally unlimited eligibility for means-tested unemployment assistance after the expiration of the entitlement to Unemployment Benefit. Both of these regulations were changed by the recent reform, and the new rules became effective in 2005 and 2006, respectively. In particular, maximum entitlement periods for

unemployment benefits were cut, especially for the older unemployed, and Unemployment Assistance was changed into Unemployment Benefit II. This implied a tighter means test and, depending on previous earnings, may result in a reduced level of benefits.

Since this reform has only recently become effective, its likely effects on the duration of unemployment in Germany can only be assessed based on an ex-ante evaluation. Christensen (2005) examines potential effects of the reform on the duration of unemployment by simulating reservation wages on the basis of a non-stationary job search model for a couple of stylised households differently affected by the reform under various simplifying assumptions. Calibrating the model to an empirically estimated reservation wage elasticity of the hazard rate to employment of 2 % assumed the same for all groups, his simulations indicate that the reform will reduce unemployment by 200,000 to 250,000 persons. One limitation of this approach is that it does not adequately account for the fact that the effects of the analysed reform vary substantially across individuals, even for claimants with the same age and the same previous earnings. Another limitation is the rather restrictive model specification regarding benefit-entitlement effects on the hazard rate from unemployment.

The aim of our paper is to empirically assess the importance of benefit-entitlement effects and the likely impact of the mentioned recent reform on the duration of unemployment. For this purpose, we specify a flexible hazard rate model and estimate it on pre-reform data. In the next section, we provide some information on the German unemployment compensation system and the recent reform mentioned above. The empirical model is described in section 3, estimation results are presented and discussed in section 4. These are then used in section 5 to simulate the effects of the recent reform on the completed duration of unemployment, and on long-term unemployment in particular. Our main results are summarised in section 6, which also concludes.

2 The German Unemployment Compensation System – Structure and Recent Reforms

Until the recent reforms of the German unemployment compensation system there were two types of unemployment benefits. Unemployment Benefit (UB, "*Arbeitslosengeld*"), which is funded by contributions of employers and jobholders, and Unemployment Assistance (UA, "*Arbeitslosenhilfe*"), which is funded from government revenues. While the former was granted for a certain number of months depending on the age and the length of an individual's previous contribution period, the latter was generally granted as long as the means test was passed.

To be eligible for UB, a number of conditions have to be fulfilled: One has to be registered as unemployed at the local labour office, be not older than 65 years and available for work on short notice and prepared to accept "suitable" job offers. Unemployed people aged 58 years or older who formally agreed to retire at the age of 60 years could receive the UB without being registered as searching for work. Employees who quit their job or did not accept suitable job offers could be sanctioned up to a length of 12 weeks. Until the recent reform, the maximum UB entitlement period depended on the number of months worked in the last seven years and the age of the claimant. Unemployed people younger than 42 years were only entitled to a maximum duration of 12 months, people younger than 44 to a length of 18 months, and so on (see Table 1). The longest possible duration was 32 months for people older than 54 years, who had worked at least 64 months in the last seven years. In April 1997 the Employment Promotion Act increased the age limits by three years and reduced the maximum entitlement length for the most people older than 42. Those who became unemployed after April 1997 but had worked at least 12 months out of the last three years prior to the spell before April 1997 were entitled to UB according to the old regulation

Table 1 Changes in unemployment benefit entitlement periods over time by age and previous work experience

until April 1997			from April 1997 until Jan 2006			since Feb 2006		
length of entitlement to UB (months)	age	months worked in last seven years	length of entitlement to UB (months)	age	months worked in last seven years	length of entitlement to UB (months)	age	months worked in last seven years
6	-	12	6	-	12	6	-	12
8	-	16	8	-	16	8	-	16
10	-	20	10	-	20	10	-	20
12	-	24	12	-	24	12	-	24
14	42	28	14	45	28			
16	42	32	16	45	32	15	55	30
18	42	36	18	45	36	18	55	36
20	44	40	20	47	40			
22	44	44	22	47	44			
24	49	48	24	52	48			
26	49	52	26	52	52			
28	54	56	28	57	56			
30	54	60	30	57	60			
32	54	64	32	57	64			

Source: Adapted from Wolff (2003), own extensions

The recent reform which became effective in February 2006 tightened the criteria to eligibility for ALG. Now, to become eligible for UB one has to have worked for at least 12 months in the last two years (instead of three years). The maximum entitlement period depends on the number of months worked in the last three years (instead of seven). Also the age limit was increased again; from now on only individuals older than 55 years are possibly entitled to UB for more than 12 months. But even for this group the maximum length of entitlement decreased and is now 18 months.

For unemployed people who already received UB in the last seven years (the last three years since February 2006) the period between the last and the new unemployment spell determines the entitlement length. The number of months worked in this shorter period divided by two yields the potential duration of UB receipt. Potential remaining months of UB entitlement from the last spell are added. Again the sum is limited by the maximum duration which is determined by the age of the individual (see Table 1). The amount of UB depends on the earnings in the former job. Individuals with children receive 67% of their former net income, individuals without children get 60%. The income-replacement rate did not change since 1995.

Until January 2005, people who were not eligible for UB could receive UA if they passed a means test that also included the income of other household members. It could either be received from the beginning of the unemployment spell (if people were not entitled to UB because of their work-history) or after the claimant had exhausted his UB benefits. In principle, it was not time-limited but initially only granted for a year and then prolonged every year if another means test was passed and the claimant was younger than 65 years. The replacement ratio was 57% (53% without children) of the former net earnings.

In January 2005, UA was integrated with Social Assistance to become Unemployment Benefit II which remains to be means-tested and principally granted indefinitely. However, the amount does not depend on the former net income of the unemployed individual anymore, but on the legally defined social minimum of the household which depends on the number and age of the household members and includes costs for renting and heating costs up to certain amounts.

3 Empirical Model

3.1 Hazard Rate Specification

We model the transition from unemployment to, respectively, employment and out-of-the-labour-force using a discrete-time hazard rate approach.[1] We use a discrete-time hazard rate model because the duration of unemployment and benefit receipt are coded on a monthly basis in our data (see section 3.2). The specification of the hazard rate model follows Steiner (2001), although the focus here is on the effects of regulations concerning unemployment compensation on the hazard rate from unemployment.

Let T_{ik} denote the length of the k^{th} unemployment spell of individual *i* and be assumed to be a discrete non-negative random variable. It takes on the value *t* if the unemployment spell ends in interval $[I_{t-1},I_t)$ by one of the two exit states. The hazard rate, $\lambda_{ij}^{k}(t)$, is the conditional probability of transition from unemployment to the exit state *j* in interval *t*, given the individual has been unemployed until the beginning of this interval.

$$(1) \qquad \lambda_{ij}^{k}\left(t\left|x_i(t),\varepsilon_i^m\right.\right)=P\left(T_{ik}=t,\Omega=j\left|T_{ik}\geq t,x_i(t),\varepsilon_i^m\right.\right),$$

where $j = 1$ is transition to employment, $j = 2$ transition to out-of-the-labour-force, and $x_i(t)$ denote the vector of covariates of individual *i* in interval *t*. In addition to a set of control variables, such as individual characteristics, indicators of an individual's previous labour market history, and the regional unemployment rate, $x_i(t)$ also includes unemployment benefit variables, as described in the next section.

Following Heckman and Singer (1984), the time–invariant unobserved individual effect, ε_i^m, is assumed to come from an arbitrary discrete probability distribution with a small number of mass points, *m*=1, 2, ... M:

$$(2) \qquad E(\varepsilon_i)=\sum_{m=1}^{M}P(\varepsilon_i^{m})\varepsilon_i^{m}=0;\ \sum_{m=1}^{M}P(\varepsilon_i^{m})=1;\quad E(\varepsilon_i^m x_i(t))=0,\ \forall\ m\ (m=1,2,...M).$$

These mass points and their probabilities, $P(\varepsilon_i^m)$, which can be interpreted as the respective proportion of the unemployed in the sample belonging to a particular heterogeneity group, are simultaneously

estimated with the parameters of the model. The time-invariant individual effect ε_i^m is assumed to be uncorrelated with the set of explanatory variables in the model, $x_i(t)$.

Assuming that, conditional on the vector of covariates and the individual effect, ε_i^m, the two exit states are independent and can thus be modeled as competing risks[2], the overall hazard rate from unemployment is the sum of the two state-specific hazard rates:

$$(3) \qquad \lambda^k\left(t\left|x_i(t),\varepsilon_i^m\right.\right)=\sum_{j=1}^{2}\lambda_j^k\left(t\left|x_i(t),\varepsilon_i^m\right.\right)$$

Hence, the conditional probability of remaining unemployed in interval t, given the spell has already lasted until t-1 is

$$(4) \qquad P\left(T_{ik}>t\left|T_{ik}\geq t, x_i(t),\varepsilon_i^m\right.\right)=1-\lambda^k\left(t\left|x_i(t),\varepsilon_i^m\right.\right)$$

The survivor function is the unconditional probability of still being unemployed after the end of interval *t*. It is the product of the probabilities of remaining unemployed in all previous periods until t:

$$(5) \qquad S^k\left(t\left|x_i\left(t\right),\varepsilon_i^m\right.\right)=P\left(T_{ik}>t\left|x_i(t),\varepsilon_i^m\right.\right)=\prod_{\tau=1}^{t}\left(1-\lambda^k\left(\tau\left|x_i(\tau),\varepsilon_i^m\right.\right)\right)$$

Finally, the unconditional probability that individual *i* leaves unemployment in interval *t* into state *j* can be expressed in terms of the hazard rate as:

$$(6) \qquad P\left(T_{ik}=t\left|x_i(t),\varepsilon_i^m\right.\right)=\lambda_j^k\left(t\left|x_i(t),\varepsilon_i^m\right.\right)\prod_{\tau=1}^{t-1}\left(1-\lambda^k\left(\tau\left|x_i(\tau),\varepsilon_i^m\right.\right)\right)$$

The specification of the hazard rate is a multinomial logit with the three alternatives unemployment, employment and out-of-the-labour-force.

$$(7) \qquad \lambda_{ij}^k\left(t\left|x_i(t),\varepsilon_i^m\right.\right)=\frac{\exp(\alpha_j(t)+\beta_j^{'}x_i(t)+\varepsilon_i^m)}{1+\sum_{l=1}^{2}\exp(\alpha_l(t)+\beta_l^{'}x_i(t)+\varepsilon_i^m)},$$

---

[1] Full-time work, part-time work, temporary work, and vocational training are grouped to the state "employment", while all other states except for unemployment are grouped to "Out-of-the-labour-force". The latter are for example retirement, education or working at home.

[2] Of course, without conditioning on the individual effect transitions into the two states will be correlated.

where $\alpha_j(t)$ denotes the baseline hazard which is common to all individuals and depends only on elapsed spell duration. In the empirical model we specify the baseline hazard by a set of dummy variables, with the first month as the base category. In order to avoid duration categories containing only a few exits from unemployment, we aggregate months referring to longer durations. Estimated coefficients of these baseline dummies represent the average effect of a single month within a duration category. Due to the inclusion of the error component ε_i^m, the multinomial logit specification does not imply the IIA assumption, i.e., the effect of some component in $x_i(t)$ on the relative odds-ratio between two alternatives, e.g.. unemployment and employment, does depend on the presence of other alternatives, the out-of-the-labour-force state in this case.

Given the multinomial logit specification, the survivor function is

$$(8) \qquad S_k^u\left(t_i \mid x_i(t), \varepsilon_i^m\right) = \prod_{\tau=1}^{t-1} \frac{1}{1+\sum_{l=1}^{2} \exp\left(\alpha_l(\tau) + \beta_l' x_{il}(\tau) + \varepsilon_i^m\right)}$$

For completed spells the likelihood contribution is given by (6), and by the survivor function in (8) for a right-censored spell. Introducing the indicator variable δ_{ijk} with is 1 if the *k*-th unemployment spell of individual *i* ends in state *j* (0 otherwise), and c_{ik} which takes on the value 1 if the *k*-th spell of individuals i is right-censored (0 otherwise), the likelihood function is given by:

$$(9) \qquad \begin{aligned} L = \prod_{i=1}^{n} \sum_{m=1}^{M} P(\varepsilon_i^m) \prod_{k=1}^{K_i} \prod_{j=1}^{2} \left[\frac{\exp\left(\alpha_j(t) + \beta_j' x_{ij}(t) + \varepsilon_i^m\right)}{1+\sum_{l=1}^{2} \exp\left(\alpha_l(t) + \beta_l' x_{il}(t) + \varepsilon_i^m\right)} \right]^{\delta_{ikj}} \\ \times \prod_{\tau=1}^{t-1} \frac{1}{1+\sum_{l=1}^{2} \exp\left(\alpha_l(\tau) + \beta_l' x_{ij}(\tau) + \varepsilon_i^m\right)} \end{aligned}$$

where *n* is the number of individuals in the sample, and K_i the number of spells of individual i. This function is maximized with respect to the coefficients on the baseline hazard, α_j, the coefficients on the explanatory variables, β_j, and the mass–points together with the corresponding probabilities, $P\left(\varepsilon_i^m\right)$, taking into account the restrictions on the individual effects given in equation (2) above by standard numerical optimization procedures.[3]

[3] The Stata programme gllamm version 2.3.10 was used for the estimations (see Rabe-Hesketh and Skrondal 2004).

3.2 Data and Variables

The data base for the empirical analysis is the German Socioeconomic Panel (SOEP), which started in 1984 in West Germany with 12,245 persons and 5,912 households. Since then, the sample has been continuously followed up every year. In June 1990 it was extended to include East Germany with 2,179 households and 4,453 persons. There were refreshments in 1998 and 2000, resulting in a sample size of 24,586 adult individuals living in 13,258 households that participated in the SOEP survey in 2000 (SOEP 2004).

Constructing Unemployment Spells from Calendar Data in the SOEP

The SOEP contains retrospective monthly calendar information on the labour force status in the previous year (there are 14 different states). Unemployment duration is coded on a monthly basis. We restrict the sample to unemployment spells that started between January 1995 and December 2003 using retrospective information of the waves from 1996 to 2004. Spells that have not been finished in December 2003 are treated as right-censored in the empirical analysis. We use information from waves 1988 to 2004 because an individual's work history up to seven years prior to the beginning of an unemployment spell is needed to compute UB eligibility (see section 2).

Table 2 Construction of unemployment spells

	Men		Women		
	West	East	West	East	Total
Spells between 1995 and 2003	3,194	2,361	2,510	2,071	10,193
Spells dropped:					
Left censored	349	162	242	211	992
Work history information missing	169	103	135	59	483
58 years and older	179	130	98	62	469
Covariates missing	250	184	244	211	900
Spells used	2,247	1,782	1,791	1,528	7,348
Individuals	1,451	972	1,307	882	4,612
Person-months	21,349	14,882	17,586	18,445	72,262
Exit to					
Employment	1,534	1,302	1,043	982	4,861
Out-of-the-labour-force	273	206	358	257	1094
Right-censored	440	274	390	289	1393
Average duration of spell (months)	9.50	8.35	9.82	12.07	9.83

Source: SOEP, waves 1995-2003, own calculations.

We distinguish between two transitions from unemployment: employment and out-of-the-labour-force. Spells of unemployed aged 58 years and older are excluded because of special regulations for this group (see section 2). Spells are also dropped from the sample if information on one or more covariates required for the subsequent analysis is missing, or if there is no full information on the work history for at least three years prior to the spell to compute eligibility for unemployment insurance benefits. Information on the number of excluded spells and exit states of the spells that enter the analysis is given in Table 2. There is a total of 10,193 spells between 1995 and 2003.

The variables representing the unemployment insurance system are the remaining months of entitlement to UB and the income-replacement ratio. Both of them are time-varying covariates, that is, they may take on different values for the same spell at different points of time. They are not directly available in the SOEP and have to be computed, as described below.

Computation of Remaining Benefit-Entitlement Period

To identify possible spikes in the hazard around the time of benefit exhaustion, we construct a set of dummy variables measuring the remaining months of UB entitlement by deducting the elapsed spell duration from an individual's maximum (potential) entitlement period. There are two possible ways to determine an individual's potential benefit-entitlement period from the information provided in the SOEP: First, for persons whose unemployment duration exceeds the period of actual UB receipt it can be assumed that their UB entitlement ended during the spell, and the observed period of UB receipt equals their potential entitlement period. This reasoning cannot be applied to persons who still received UB in the month when their unemployment spell ended. Hence, to make sure that an individual's UB entitlement really expired before unemployment ended, spell duration has to exceed the period of benefit receipt by at least one month. To account for the possibility of a waiting period at the beginning of the unemployment spell in case the previous job was voluntarily terminated or benefit sanctions for other reasons, the duration of unemployment should exceed the period of benefit receipt by at least two months.

Since the unemployment duration exceeds the duration of benefit receipt by two months for only about half of all spells in our data, and in order to be able to perform the ex-ante simulations of the recent policy reform described below, we compute the potential benefit-entitlement duration using the information on the work history seven years prior to the spell and the age of the unemployed according to Table 1 in section 2. Thereby, we also take into account the regulatory change in April 1997 including the transition period. For about 37% of all spells the entitlement durations were computed

according to the regulations before the change. Most of these spells began after April 1997 but, due to the transition period, were subject to the pre-reform regulations.

Table 3 Information on previous labour market state for the computation of entitlement to UB

Information on previous labour market state	# spells	%
(1) Full Information for seven years prior to the spell begin	3,030	41.24
(2) Full Information for seven years when using tenure	1,302	17.72
Only full information for the last three years:		
(3) Enough information to detect maximum entitlement duration	752	10.23
(4) Not eligible	516	7.02
(5) Eligible, assigned to the maximum duration	284	3.86
(6) Not enough Information but original value observed	288	3.92
(7) Multiple Spell	307	4.18
(8) corrected to observed value	459	6.25
(9) corrected to 0	410	5.58
Total	7,348	100.00

Source: SOEP, waves 1995-2003, own calculations.

Table 3 summarizes the information available in the SOEP used to construct the entitlement variable. For 483 spells information on labour market status for the last three years previous was insufficient to construct the entitlement variable; these spells had therefore to be dropped from the subsequent analysis. In order not to lose too many observations, another 284 spells without sufficient information but observable duration of UB receipt were assigned to the observed duration. If the duration of UB receipt coded in the SOEP exceeded an individual's computed potential duration, the observed value was used. On the other hand, the expected amount of UB entitlement was set to zero if no UB receipt for the person was coded in the data and the length of the unemployment spell exceeded two months. Possible reasons for this discrepancy are measurement error, suspension of UB up to 3 months because of voluntary termination of the previous job or imposition of a sanction because of the rejection of a suitable job offer.

Computation of the Income-Replacement Ratio

The income-replacement ratio (IRR) is defined as the amount of UB received divided by an individual's potential net earnings if she took up a job. This counterfactual is computed in three steps.

– First, we estimate for each unemployed expected hourly wages on the pooled sample of the SOEP for the years 1995 to 2004 accounting for potential selectivity bias using the two-step Heckman (1979) procedure. The wage equations and the selection equations are estimated separately for men

and women in East and West Germany; regression results are reported in Table A1 in the appendix. Instruments in the participation equation are education, experience, reduction in earning capacity, nationality, marital status, children, region, and other household income. As in the wage equations, experience is divided into years of full-time and part-time employment for women.

- From these selectivity-corrected wage equations we derive expected gross hourly wages, conditional of being non-employed. Since the variance of estimated wages is much lower than the variance of observed wages we adjust the former by adding a stochastic term to expected wages of the unemployed, where this error term is drawn form the residuals obtained from the estimated selectivity-corrected wage equation. Potential gross earnings are computed by multiplying the estimated conditional gross hourly wage by four times the number of weekly working hours. It is assumed that individuals who worked full-time before are willing to work full-time in the new job, while individuals who used to work part-time, also want to work part-time in their future job. Further assuming that individuals do not change industry, we have calculated the average working hours of full-time and part-time employed people in each industry by gender and regions and assigned each individual the number of expected working hours to calculate gross earnings per calendar year.
- Finally, net earnings are computed by applying a simple tax function to gross earnings derived in the previous step, where the log of the gross-net earnings differential is regressed on a polynomial in the gross wage, some characteristics known to affect the tax rate due to special legislation in the tax code, and year dummies (see Table A2 in the Appendix).

Dividing the amount of UB or UA per month by monthly net earnings yields IRR exceeding one for some individuals, which implies that they receive higher benefits than they would be able to earn if they took up a job. One reason for this might be that our procedure to compute expected wages does still not well predict very high wages. That is, an unemployed who would receive a very high wage if he took up a job could be assigned a predicted wage that is only one third of the real potential wage. Even if one takes into account the social insurance contribution ceiling that results in benefits lower than 60-67% of the former net wage (in case of UB), the replacement rate could be rather high. To avoid bias due to measurement errors of the numerator (the benefits), we excluded 187 spells with replacement rates of more than 1.5.

Since the SOEP only contains information on the average amount of UB or UA received during a year, we have to allocate this amount to particular months within that year. Following Wolff (2003), we assume that if a person received UB for *n* months, she received it during the first *n* months of the

unemployment spell. If she also received UA in the same year, it is assumed that it is received after UB entitlement is exhausted. For people who are not entitled to UB but receive UA we assume that entitlement to the latter starts at the beginning of the spell. For a number of people, the length of unemployment exceeds the length of UB receipt by one month in a given calendar year – e.g. a person is unemployed from June until December in the year 1999, but the duration of benefit receipt in 1999 is only six months. In this case it is sometimes difficult to distinguish whether they were not eligible for UB anymore in the last month and left unemployment then or if they did not receive benefits in the first month due to sanctions or some type of rounding error[4] but were still entitled when they left unemployment. This is important because we want to identify the effect the last months of UB entitlement has on an individual's probability to leave unemployment. For people who are still unemployed and receive UB in the following year we assumed that they did not receive UB in the first month of their spell but in the last month of the last year. If UB is not received in the following year, we assume that entitlement ended in the last month. For people who are not unemployed in the following year, it is assumed that they did receive UB benefits in the first month of their spell and ran out of entitlement in the last month.

To analyse if there is a different impact of the receipt of UB rather than of UA on the behaviour of the unemployed, we use two different replacement rates. The first one, "replacement UB", takes on the value of the replacement rate if the person receives UB, and zero otherwise. The second one, "replacement UA" takes on the value of the replacement rate if the individual receives UA, and zero otherwise. To account for non-linear effects of the replacement rate on the hazard rate, the squares of both interaction terms will also be included in the regression.

Structure of Unemployment Compensation

Table 4 summarizes relevant information on the variables used to describe the structure of unemployment compensation in the subsequent empirical analysis. In the observation period, men in East Germany have been more likely to be eligible for both UB and UA, and they have longer maximum entitlement durations. Roughly 30% of all unemployed are not eligible for UB, whereas about 43% have a maximum entitlement duration of 7-12 months. The latter results from the majority of unemployed being entitled to UB for a maximum of 12 months. As could be expected, men in West Germany have the highest potential net income and amount of both UB and UA. While their amount of

[4] Because the data are grouped to monthly observations, while entitlement periods are calculated on a daily basis in reality.

UB exceeds that of men in East Germany by about 15%, the potential net income is even 22% higher. This leads to a lower income replacement rate for men in the West compared to those in East Germany. Women have much lower amounts of UB and UA due to lower average hourly wages and the prevalence of part-time work. The higher amount of UB for East-German women compared to those in West Germany is related to higher average hours in the former job (37.9 hours compared to 34.5). Nevertheless, women in West Germany have higher potential net wages, again resulting in lower replacement rates.

Table 4 Descriptive statistics on variables concerning unemployment and the UI system

	Men		Women		Total
	West	East	West	East	
Average entitlement to UB (months)	9.20	10.53	8.68	9.02	9.36
Maximum UB entitlement period					
0 months	31.73%	24.19%	36.01%	31.41%	30.88%
1-6 months	7.12%	9.88%	4.91%	11.39%	8.14%
7-12 months	45.62%	43.88%	45.00%	39.33%	43.74%
13-18 months	3.56%	5.39%	4.08%	5.10%	4.45%
> 18 months	11.97%	16.67%	9.99%	12.76%	12.79%
(1) UB received	64.89%	74.41%	58.12%	67.28%	66.05%
(2) UB exhausted (of 1)	29.90%	22.78%	35.16%	36.38%	30.46%
(3) UA after exhaustion of UB (of 2)	46.79%	59.27%	36.61%	66.31%	51.76%
(4) Neither UB nor ALH	27.33%	15.77%	33.61%	20.16%	24.56%
Mean amount of UB (> 0)	831.61	721.43	544.21	595.67	684.25
Mean amount of UA (> 0)	608.04	557.23	444.67	430.31	509.34
Mean Potential Net Income	1313.27	1075.38	881.52	877.67	1048.07
Mean Potential Net Income (at begin)	1340.94	1103.26	908.05	886.76	1083.46
Income Replacement Ratio, IRR	0.40	0.54	0.38	0.48	0.44
IRR (> 0)	0.57	0.64	0.59	0.62	0.60
IRR if received UB	0.62	0.67	0.64	0.69	0.65
IRR if received UA	0.50	0.57	0.52	0.53	0.53

Source: SOEP, waves 1995-2003, own calculations.

Control variables

In addition to unemployment variables, we include a number of variables that control for differences in individual characteristics and other observed factors affecting individual unemployment behavior through their effects on reservation wages, job offer arrival rates and wage offer distributions. These include personal characteristics, indicators of household composition, human capital variables and

indicators for the state of the aggregate labor market. Human capital variables include education and position in the last job, and previous unemployment experience. Some of these variables, e.g. the regional unemployment rate, depend on both process and calendar time. We also include a "December dummy" to account for "heaping effects", i.e. the disproportionate number of spells ending in December due to rounding errors of interviewees' responses in the calendar data (see Hunt 1995, Kraus and Steiner 1997). Means of control variables are contained in Table A1 in the appendix.

4 Estimation Results

The estimations are carried out separately for men and women in East and West Germany because there are still marked differences by gender and the structure of labour markets between the two regions. Detailed estimation results are reported in Table A4 for men and Table A5 for women in the Appendix. Since the focus of the analysis is on the effects of the unemployment compensation system on these hazard rates, we will not discuss estimation results for the control variables here. Although we include a fairly large number of control variables in the hazard rate models, unobserved heterogeneity remains quantitatively important. Statistical tests based on the Akaike Information Criterion (AIC)[5] indicate that two heterogeneity groups, i.e. mass points, are sufficient to account for remaining unobserved heterogeneity for men and women in West Germany, whereas three mass points are required for both men and women in East Germany. These mass points and their probabilities are reported at the bottom of Tables A4 and A5, respectively. Except for the coefficients of the baseline dummies, controlling for unobserved heterogeneity had very little effect on the parameter estimates, however.

Estimation results for the unemployment compensation variables defined in the previous section are summarised in Table 5. Estimated coefficients on the remaining benefit-entitlement dummies are to be interpreted relative to the base category, which is remaining entitlement of more than 19 months. Differences in the coefficients of two remaining entitlement categories show the effect of the transition from one category to the other one on the hazard rate to the respective exit state. As described in section 3, entitlement durations do not only differ by age and previous labour market experience, but also by entry cohort due to the regulatory changes of April 1997 and the special regulations for multiple UB receipt within the base periods.

[5] Defined as AIC = ln*lik* – k, where *k* is the number of parameters and ln*lik* is the log likelihood of the model at its maximum. The decision rule is to take the model with the highest AIC.

A "real" entitlement effect would imply that coefficients on the entitlement dummies are monotonically increasing as remaining entitlement duration decreases. As shown in Table 5, there seems to be no strictly monotonic relation between the hazard rate from unemployment neither to employment nor out-of-the-labour force. For example, the coefficient of the 3-4 months remaining entitlement dummy is higher than the one indicating a remaining period of two months in some cases. However, the hazard rate from unemployment to employment increases significantly for most groups close to the month of benefit-exhaustion. For example, for men in West Germany the coefficient on the remaining entitlement dummy increases from about 0.19 to 0.47 when the unemployed moves form one remaining month of UB entitlement to the month when UB is exhausted (0 months). Similar effects of benefit exhaustion on the hazard rate to employment are also obtained for East-German men and for women in both regions. There is also a strong effect of UB exhaustion on the hazard rate to out-of-the-labour force for women, especially in East Germany. This indicates that some of the unemployed wait until exhaustion of UB eligibility before they take up a new job or drop out of the labour force.

After benefit exhaustion (remaining entitlement < 0 months), the hazard rate from unemployment to employment, and to a lesser degree also to out-of-the-labour-force, seems to increase further. However, to compare these two months one also has to consider the effects induced by changes in the income replacement ratio (IRR) as well. Since the unemployed could be entitled to Unemployment Assistance after exhaustion of the UB, the IRR need not drop to zero but could take on a positive – if lower – value. It is therefore important also to account for this effect when simulating the total effect of changes in unemployment compensation on the hazard rate from unemployment.

Estimated coefficients of the IRR interaction variables described in the previous section are summarised in the lower part of Table 5. The interaction terms between the IRR and the dummy variables for, respectively, entitlement to UB and UA on the hazard rate to both employment and out-of-the-labour-force are negative for all groups, as expected, and statistically significant in most cases. The positive sign of the coefficients on the squared interaction terms may seem unexpected at first sight, because it indicates that the negative effect of the amount of UB received on the hazard rate from unemployment is diminishing in its level. However, the relative size of estimated coefficients on the respective interaction term and its square implies that the overall effect remains negative as long as the IRR is smaller than about 0.75, which is the case for almost 90% of all observations. The estimates have the plausible implication that an increase in UB at low levels of the IRR has a stronger negative effect on the hazard rate than at high levels, at least up to an IRR of about 75%. For UA estimated coefficients imply marginal effects that are much higher (in absolute values) and decrease faster than for UB receipt, with the sign of the total effect turning positive for only about 5% of all observations.

Table 5 Estimated effects of unemployment compensation on hazard rates to employment and out-of-the-labour force by gender and region

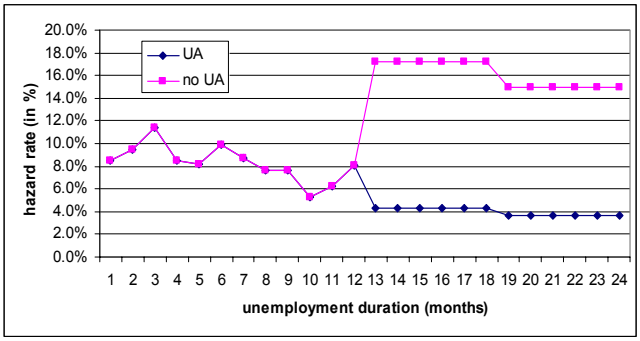
	Men - West		Men - East		Women - West		Women - East	
	Employment	**Out-of-the-labour-force**	**Employment**	**Out-of-the-labour-force**	**Employment**	**Out-of-the-labour-force**	**Employment**	**Out-of-the-labour-force**
Not entitled to UB	0.129	0.534	0.115	1.863	0.367	-0.035	0.233	0.648
	(0.75)	(1.97)*	(0.55)	(3.89)***	(1.87)	(-0.10)	(0.94)	(1.42)
Remaining Entitlement:								
< 0 Months	0.985	1.364	0.847	2.244	1.150	1.102	1.101	1.304
	(5.81)***	(4.49)***	(4.01)***	(4.70)***	(5.60)***	(3.03)**	(4.54)***	(2.91)**
0 Months	0.47	0.885	0.699	1.821	0.928	0.912	0.732	1.322
	(1.92)	(1.69)	(2.78)**	(2.78)**	(3.23)**	(2.25)*	(2.59)**	(2.64)**
1 Month	0.189	0.692	0.561	2.071	0.538	0.322	0.375	-0.019
	(0.74)	(1.23)	(2.25)*	(3.56)***	(1.88)	(0.71)	(1.30)	(-0.03)
2 Months	0.005	0.836	0.169	2.261	0.317	0.127	0.488	1.031
	(0.02)	(1.58)	(0.65)	(4.22)***	(1.07)	(0.28)	(1.74)	(2.11)*
3-4 Months	0.462	0.666	0.157	1.952	0.626	0.832	0.446	-0.264
	(2.42)*	(1.49)	(0.78)	(4.59)***	(2.93)**	(2.21)*	(1.88)	(-0.53)
5-6 Months	0.603	0.419	0.300	0.666	0.495	0.523	0.163	0.148
	(3.5)***	(1.04)	(1.57)	(1.21)	(2.41)*	(1.39)	(0.69)	(0.34)
7-8 Months	0.398	0.642	0.147	1.761	0.674	0.283	0.006	-0.004
	(2.31)*	(1.73)	(0.78)	(3.77)***	(3.26)**	(0.72)	(0.02)	(-0.01)
9-12 Months	0.579	1.546	0.298	1.615	0.744	0.138	0.185	0.12
	(3.84)***	(6.26)***	(1.81)	(4.05)***	(4.40)***	(0.40)	(0.84)	(0.29)
13-18 Months	0.097	0.632	0.053	0.480	0.490	-0.158	0.470	0.121
	(0.45)	(1.74)	(0.33)	(0.78)	(2.06)*	(-0.36)	(2.01)*	(0.26)
Income Replacement Rate (IRR)								
IRR × received UB	-2.131	-2.457	-1.467	-1.416	-2.078	-2.283	-1.166	-1.365
	(-6.27)***	(-3.17)**	(-3.75)***	(-1.42)	(-5.11)***	(-3.74)***	(-2.69)**	(-1.51)
(IRR × received UB) squared	1.476	1.302	0.758	0.198	1.379	0.951	0.726	0.715
	(4.88)***	(1.52)	(2.45)*	(0.21)	(4.26)***	(1.69)	(2.24)*	(1.05)
IRR × received UA	-5.114	-5.182	-3.453	-5.86	-4.315	-8.298	-3.669	-2.975
	(-9.87)***	(-5.41)***	(-5.99)***	(-5.36)***	(-7.6)***	(-6.66)***	(-6.90)***	(-3.03)**
(IRR. × received UA) squared	3.89	3.245	2.194	4.375	2.686	5.099	2.587	0.642
	(6.6)***	(3.36)***	(3.51)***	(3.99)***	(4.76)***	(4.24)***	(4.77)***	(0.53)

Notes: For full estimation results see Tables A4and A5 in the Appendix. t-values are given in parantheses; * p<0.05, ** p<0.01, *** p<0.001

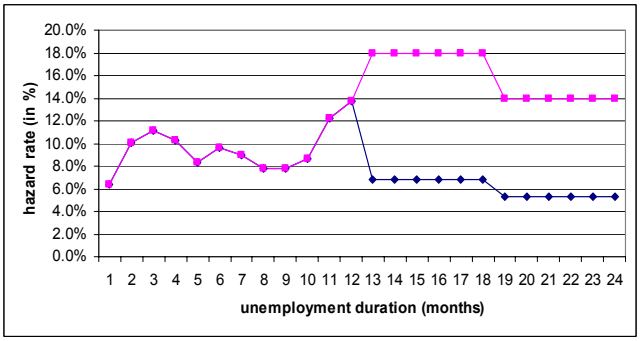
Figure 1 Benefit-entitlement effects on hazard rates to … - men

Employment

a) ***UB entitlement = 12 months, West Germany***



b) ***UB entitlement = 12 months, East Germany***



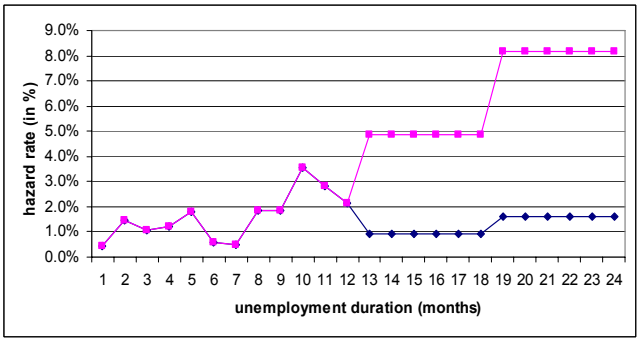
c) ***UB entitlement = 18 months, West Germany***

d) ***UB entitlement = 18 months, East Germany***

Out-of-the-labour-force

e) ***UB entitlement = 12 months, West Germany***

f) ***UB entitlement = 12 months, East Germany***



g) ***UB entitlement = 18 months, West Germany***

h) ***UB entitlement = 18 months, East Germany***

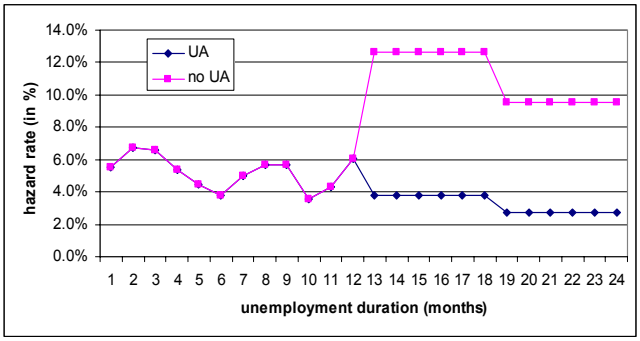
Notes: Explanatory variables are evaluated at base categories for dummy variables and at sample means for metric variables; hazard rates are 'averaged' across heterogeneity groups, see text.

Source: Estimation results as reported in Table A4 in the Appendix.

Figure 2 Benefit-entitlement effects on hazard rates to … - women

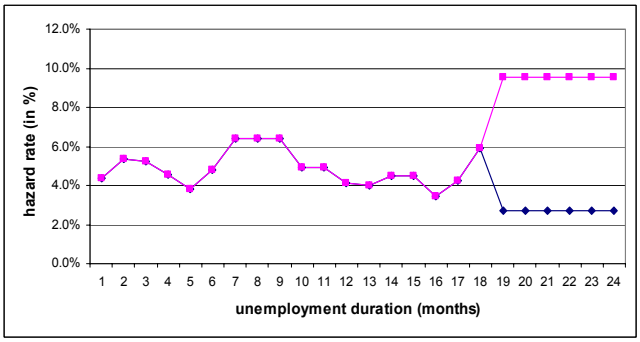
Employment

a) ***UB entitlement = 12 months, West Germany***



b) ***UB entitlement = 12 months, East Germany***

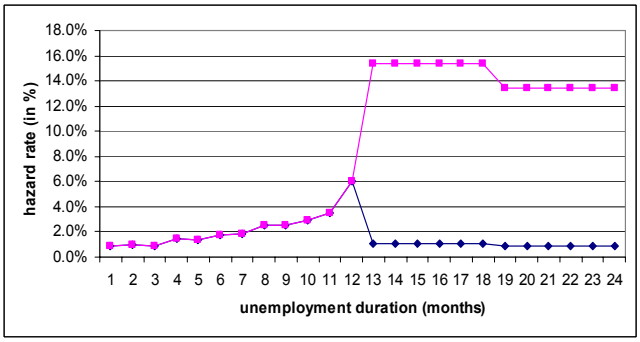
c) ***UB entitlement = 18 months, West Germany***



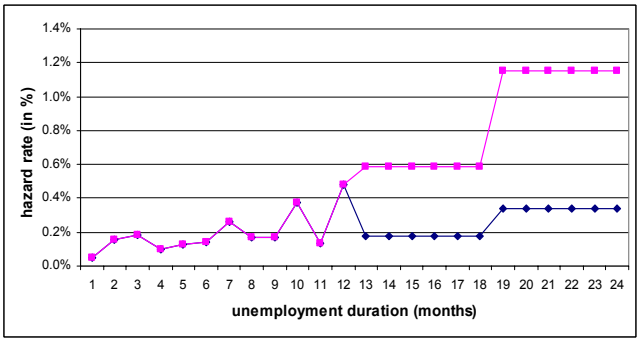
d) ***UB entitlement = 18 months, East Germany***

Out-of-the-labour-force

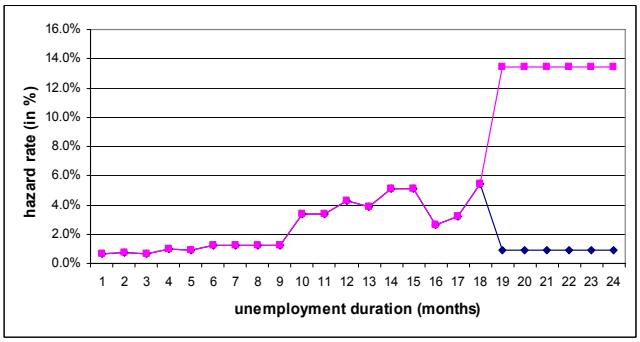
e) ***UB entitlement = 12 months, West Germany***



f) ***UB entitlement = 12 months, East Germany***



g) ***UB entitlement = 18 months, West Germany***



h) ***UB entitlement = 18 months, East Germany***

Notes: Explanatory variables are evaluated at base categories for dummy variables and at sample means for metric variables; hazard rates are 'averaged' across heterogeneity groups, see text.

Source: Estimation results as reported in Table A5 in the Appendix.

To compute the effects of unemployment compensation on hazard rates in a given month of the unemployment spell, the effect of the remaining UB-entitlement period in the respective month as well as the impact of changes in the IRR on the hazard rate have to be considered. Furthermore, because of the non-linearity of the hazard rate, the impact of the benefit-entitlement variables and the IRR will also depend on its level, changes in the baseline hazard rate also have to be considered. To account for all these effects, we simulate the evolution of the hazard rates from unemployment for different groups, and conditional on alternative assumptions concerning UB entitlement at the beginning of an individual's unemployment spell. The control variables are assumed constant and take on the following values: Variables with metric measurement (except for the IRR) are set to the respective sample means; dummy variables are set to represent a person who is between 44 and 52 years, married, without children, German, not disabled, with vocational training and A-levels, who lives in North-Rhine Westphalia (Saxony for East Germans) and was not unemployed before. The other dummy variables also take on mean values, except for the baseline hazard and the remaining entitlement variables. The baseline dummies and the remaining entitlement duration change with elapsed spell duration. The replacement rates are set to the respective means for each group - as reported in Table 4 - in case of eligibility, and zero otherwise. The hazard rates are the expected values for unemployed people of the reference group, i.e. we take the expectation over the estimated heterogeneity groups. Empirically, this expectation is calculated as the weighted sum of the hazard rates over the two (three) mass points (heterogeneity groups), with their estimated probabilities as weights.

As Figures 1 and 2 show, simulated hazard rates to employment are fairly constant or slightly decreasing until UB entitlement is exhausted, and increase immediately before that month. To this point, the pattern of hazard rates more or less corresponds to the estimated entitlement coefficients summarised in Table 5 above. After UB-entitlement exhaustion, simulated hazard rates depend very much on whether or not the unemployed are entitled to UA. In case they do, the hazard rate stays more or less constant or slightly declines with increasing unemployment duration; if they are not entitled to draw UA, the hazard rate jumps to a much higher level in the month following and subsequently stays there or declines only slightly. For example, the average hazard rate from unemployment to employment in the group of West German men with an assumed initial UB-entitlement period of 12 months has reached about 8 percent after 12 month, virtually the same level as at the beginning of the spell. If UA is not available for a typical person in this group, his hazard rate more than doubles in the month following the exhaustion of UB-entitlement to almost 18%, and subsequently remains at this high level. In contrast, in case UA is not available to this person there is no upward-jump in the hazard rate in the month following UB-entitlement exhaustion, and the hazard rate declines slightly in the

subsequent months (Figure 1a). A similar pattern can also be observed for East-German men (Figure 1b) as well as women in both regions (Figures 2a and 2b), although the hazard rates differ somewhat in levels between these groups. Furthermore, a similar pattern regarding the spike in the hazard rate in the month following UB-benefit exhaustion also obtains in case the initial UB-entitlement period is set to, e.g., 18 months, as illustrated in Figures 1c and 1d for men and Figures 2c and 2d for women, or for other assumed maximum initial benefit-entitlement periods defined in section 2 as well.

Simulated hazard rates to out-of-the-labour-force, too, exhibit an upward-jump in the month following UB-entitlement exhaustion in case there is no subsequent eligibility to UA (see lower part of Figures 1 and 2). Again, this effect can be observed for the various initial UB-entitlement periods defined above, and for all groups considered here. Since the male out-of-the-labour-force hazard rate is rather low, for men this effect is of limited quantitative importance. Especially for women in West Germany, however, this effect is rather large and suggests that only after UB-entitlement has been exhausted is unemployment terminated by way of labour force withdrawal. This effect is much less pronounced for women in East Germany, which is compatible with the higher labour force participation rate of East German women compared to the West.

5 Policy Simulations

On the basis of the estimation results described in the previous section, we now simulate the effects of the two main regulatory changes considered in section 2, i.e. the reduction of the potential entitlement period to UB (including tightened eligibility criteria) which came into effect in February 2006, and the replacement of UA by UB II enacted in January 2005. The calculation of the potential entitlement periods after the reforms assumes that the changes have already been fully phased in, i.e. the existing transition periods are not modelled. That is, the analysis examines the long-term effects of the reform.

In Table 6, we compare the distribution of UB-entitlement periods in the sample before and after the reforms. There is no change for about 80% of all unemployed people in the West and for 70% in the East. Those affected are especially older unemployed men with relatively long previous insured employment histories whose maximum entitlement duration is cut. Whereas between 14% (women/West) and 22% (men/East) of all unemployed were entitled to at least 13 months of UB before 2006, this share now ranges between 2,4% and about 4%. Although this change is mainly related to the marked reduction of maximum UB-entitlement periods for the older unemployed, part of the younger unemployed are also affected. Roughly 5% of all unemployed people who would have been eligible for UB before the reform are not entitled anymore under the new regulations.

Since UB II is means tested and depends on household income rather than previous individual net income, the effects of the reform differ for claimants in the same age group, with the same work history. As described in section 2, until 2005 a household with an unemployed receiving UA or UB could also receive "Supplementary Social Assistance" if total net household income was below the household's social minimum. For example, a single unemployed person with previous gross income of 1,500 € would, after exhaustion of UB and if eligible, have been entitled to UA in the amount of 552 €. Since this amount was below the Social Assistance of 664 €, the person could obtain Supplementary Social Assistance of 112 €. After the reform, UB II including allowances for housing and heating for a single person amounts, on average, to about 670 €. Thus, the reform has changed very little in this case. However, if the person had previously earned 3,000 € per month, say, UA would have been about 900 € before the reform, and he would have lost about 230 € due to the reform. Larger households that were already eligible to Supplementary Social Assistance before the reform, were hardly affected by the introduction of UB II if they still passed the slightly tighter means-test after the reform.[6]

Table 6 Distribution of benefit-entitlement durations before and after the reforms in the sample

	Men				Women			
	West		East		West		East	
	before	*after*	*before*	*after*	*before*	*after*	*before*	*after*
UB-entitlement (shares in %)								
0 months	31.7	36.5	24.2	29.3	36.0	39.7	31.4	35.8
1-12 months	52.7	60.2	53.8	66.5	49.9	57.9	50.7	61.1
13-18 months	3.6	3.4	5.4	4.1	4.1	2.4	5.1	3.1
> 19 months	12.0	0.0	16.7	0.0	10.0	0.0	12.8	0.0
Average entitlement duration (months)	9.2	6.9	10.5	7.4	8.7	6.8	9.0	6.5
UA-entitlement (shares in %)								
No change	78.0		70.2		80.3		72.6	
Reduced entitlement	22.0		29.8		19.7		27.4	
Entitlement completely lost	5.0		5.7		4.4		5.3	

Source: SOEP, waves 1995-2003, own calculations.

To account for the substantial heterogeneity across households in terms of benefit-entitlement and, at the same time, keep the empirical analysis comprehensible, in the following we distinguish between type of household (single, no children; couples with and without children), four age groups (40, 45, 52, and 57 years) and three income groups (low, average and high income). For simplicity, we use the

[6] Since the SOEP does not provide sufficient information on the assets of a households, we have to assume that all unemployed who were eligible for UA before also pass the means-test for UB II.

average IRR for to calculate the amount of UB for all income groups. The simulated replacement rates for UA and UB II are then computed assuming the same potential net income as before but with the adjusted amount of benefits. For example, a single unemployed person with gross income of 3,000 € in his previous job receives UB in the amount of 1,024.50 €. The assumed income-replacement ratio of 0.62 for West German men yields potential net income of 1024.5 € / 0.62 = 1652.4 €. The amount of UA of 905 € yields a replacement rate of 905 €/1652.42 € = 0.548, whereas the UB II amount of 666 € results in a replacement rate of 0.403.

Simulated survival rates before and after the reforms for the various household and income types are reported in Table A6 for men and in Table A7 for women in the Appendix. The simulations are based on estimation results for the hazard rate models summarized in Tables A4 and A5 and assume that the reform does not affect employment behaviour of potential claimants prior to the unemployment spell. Furthermore, we have to assume that job offer arrival rates and offered wages are not affected by the reform. The dynamic effects of the reform are assessed by comparing survival rates after 6, 12, 18, and 24 months of the unemployment spell before and after the reforms for some reference groups. These survival rates are calculated using equation (8) in section 3.1 and estimated coefficients from our preferred specifications of the hazard rate model. The survival rate after 6 months, for example, can be interpreted as the share of individuals who became unemployed in a given month and are still unemployed six months later. Except for age, benefit entitlement and household structure, the definition of the reference groups is the same as the one used in Figures 1 and 2.

As shown in Tables A6 and A7, there is substantial heterogeneity in simulated responses to the reform across the various groups. Block A of each table shows changes in survival rates for three age groups of unemployed people living in couple households with no children and an average level of gross earnings in the previous job. These age groups are differently affected by the reduction of the maximum UB-entitlement period after the reform, but are not affected by the reform of UA because they are not eligible to means-tested benefits under either regulation. This also means that a reduction in UB-entitlement effectively reduces household income.

For most of the groups shown in the tables, simulated survival rates decline substantially after the reform. For example, the 12-months' survival rate of West German unemployed men aged 52 declines by 12 percentage points, from 54% to 42%. For this group, the 18-months' survival rate declines from 37% to 14%, and the survival after 24 months is just 5% after the reform, compared to almost 30% before it. For East German men and women in both regions of the same age group, simulated reduction in survival rates due to the reform would also be substantial, although somewhat smaller in absolute magnitude. Smaller reductions in survival rate are also to be expected for the older (57 years) and

especially the younger (45 years) age groups for men and women in both regions, as shown in Tables A6 and A7.

Block B of Tables A6 and A7 shows changes in survival rates for a single unemployed person with alternative levels of previous gross earnings (low/high) by age group. In addition to the three age groups considered above, unemployed singles aged 40 years for whom there was no change in the UB-entitlement period are included in the comparison. For this latter group with low earnings in the previous job the reform did not affect net household incomes because the amount of UB II almost equals the former UA, as described above. Thus, the reform has no effect on survival rates for this group. Unemployed people of this age but with high previous earnings get less UB II after the reform, but this only becomes effective after exhaustion of regular UB after 12 months. This has very little effect on survival rates after 12 months. For the older age groups, for whom the maximum UB-entitlement period is cut depending on age, reductions of survival rates induced by the reform are somewhat larger but still rather modest. The largest effect occurs for East German men in the oldest age group, for whom the cut of the maximum UB-entitlement period from 32 to 18 months induces, irrespective of the level of previous earnings, a fall in this group's 18-months survival rate by 18 percentage points, from 56% to 37%. A similar pattern can also be observed for unemployed people living in couple households with a child, as shown in (block C). Still, these effects are limited relative to the impact the eligibility to UB II subsequent to the exhaustion of UB has on the survival rate in unemployment (see Figures 1 and 2).

Table 7 Simulated effects of reform on survival rates in and the median duration of unemployment

		Before reform					**After reform**				
		***Survival rates* (in %)**				***Median***	***Survival rates* (in %)**				***Median***
		6	**12**	**18**	**24**	**(months)**	**6**	**12**	**18**	**24**	**(months)**
Whole Sample	***men/West***	54	42	38	35	8.0	53	39	34	31	7.0
	men/East	47	29	22	17	6.8	45	25	18	12	5.0
	women/West	63	46	37	32	10.5	62	42	30	25	9.0
	women/East	64	46	37	33	10.0	63	41	31	25	9.0
45 years and older	***men/West***	74	61	55	49	23.0	68	53	46	40	14.0
	men/East	59	39	31	24	8.0	54	31	24	18	7.0
	women/West	80	63	52	45	20.0	75	57	42	34	14.0
	women/East	73	55	46	42	15.0	72	51	40	34	12.5

Notes: Simulations based on estimation results in Tables A4 and A5 and assumptions about benefit entitlement, see text.

Table 7 summarises simulation results more comprehensively in terms of average survival rates and median unemployment durations before and after the reform for those unemployed actually affected by the reform as derived from the information in the data and summarised in Table 6. The upper part of the table reports results for the whole sample, the lower part for unemployed people older than 45 years.

Whereas the reform seems to have only minor effects on survival rates in unemployment, and also on its median duration, in the whole sample, the impact on the unemployed older than 45 years is substantial. For example, for West-German men older than 45 years the survival rate after 18 (24) months would fall from 55% to 46% (49% to 40%), and the median completed duration of unemployment form about 23 to 14 months. The share of long-term unemployed people (> 24 months) among East German men in this age group would fall from 24% to 18%, and the median duration of unemployment from 8 to 7 months. The reform also has a relatively strong impact on older West German women, for whom the simulated median unemployment duration falls from 20 to 14 months, whereas for East German women of the same age this reduction amounts to less than 3 months.

Thus, the relatively small effects of the reform on long-term unemployment we obtain for the whole sample are almost completely driven by the impact the reform has on older unemployed men and women in West Germany, whereas the relatively small overall impact on the East-German unemployed is more evenly distributed across all age groups. The stronger impact the reform seems to have on younger people in East Germany can be explained by the fact that the share of unemployed people living in the East whose amount of UA was cut partly or completely is markedly higher than in the West, as shown in Table 6

6 Summary and Conclusion

Our empirical analysis of the impact of the German unemployment compensation system and its recent reform on the duration of unemployment has yielded a number of noteworthy results. First, eligibility to unemployment benefit reduces both the transition rate to employment and, especially for women, to the out-of-the-labour-force state. Second, benefit-entitlement effects on hazard rates are not monotonically increasing as time to exhaustion of UB gets shorter but rather concentrated around the month of benefit-exhaustion. These effects differ significantly between the unemployed who are not entitled to means-tested Unemployment Assistance subsequent to the exhaustion of UB-entitlement and those who are not. For the former group, there is a huge spike in the hazard rate to both employment and to the out-of-the-labour-force state in the month following benefit-exhaustion, with both hazard

rates thereafter remaining at much higher levels. In contrast, for the latter group the hazard rates more or less remain at the previous level or decline slightly after benefit exhaustion. These patterns indicate that eligible unemployed wait until benefit-exhaustion before they take up a new job or drop out of the labour force. Third, the marginal effects of the amount of both UB and UA are negative and highly non-linear but of modest size. These results are qualitatively similar for men and women in East and West Germany, although the magnitude of estimated effects differs between groups.

Our ex-ante evaluation of the recent reform of the unemployment compensation, which reduced maximum UB-entitlement periods, especially for the older unemployed, and introduced Unemployment Benefit II as a substitute for the previously existing Unemployment Assistance, has shown that the reform has only small effects on the duration of unemployment for the population as a whole. However, our simulation results also indicate that the share of the long-term unemployed among older people is substantially reduced, as is the median unemployment duration for this age group. These effects are stronger in West Germany than in the East where the relatively small overall impact on the East-German unemployed is more evenly distributed across all age groups. In West Germany, the reduction in long-term unemployment of older men and women is mainly induced by the shortened UB-entitlement periods, whereas the introduction of UB II seems to have relatively little impact. However, we might underestimate this latter effect because the available data do not allow us to model the somewhat stricter means test applied to UB II.

Overall, our simulation results indicate that the recent labour market reform which aroused much heated debates and even some political unrest, especially regarding the repeal of UA and the introduction of UB II, is unlikely to have a major impact on the average duration of unemployment in the population as a whole. However, it will significantly reduce the level of long-term unemployment among older workers, and in particular of those aged above 55 years who effectively used the previously existing UB-entitlement periods of up to 32 months as a way to early retirement. The reduction of long UB-entitlement periods for older people should also reduce incentives to become unemployed in the first place, thereby also contributing to a lower level of unemployment among older workers. This latter effect which was not analysed in the current paper remains an important topic for future research.

References

Atkinson, Anthony B. and John Micklewright (1991): Unemployment compensation and labor market transitions: a critical review. *Journal of Economic Literature* 24, 1679-1727

Christensen, Björn (2005): Die Lohnansprüche deutscher Arbeitsloser: Determinanten und Auswirkungen von Reservationslöhnen, Springer.

Fitzenberger Bernd and Ralf Wilke (2004): Unemployment durations in West-Germany before and after the reform of the unemployment compensation system during the 1980s. *ZEW Discussion Paper* No. 04-24, Mannheim, Germany.

Heckman, James J. (1979): Sample selection bias as a specification error, Econometrica 47, 153–161.

Heckman, James J. and Burton Singer (1984): A method for minimizing the impact of distributional assumptions in econometric models for duration data. *Econometrica* 52(2), 271-320.

Hujer, Reinhard and Hilmar Schneider (1996): Institutionelle und strukturelle Determinanten der Arbeitslosigkeit in Westdeutschland: Eine mikroökonomische Analyse mit Paneldaten. In: Bernhard Gahlen, Helmut Hesse and Hans–Jürgen Ramser (eds.) *Arbeitslosigkeit und Möglichkeiten ihrer Überwindung*, Wirtschafswissenschaftliches Seminar Ottobeuren, Band 25, J.C.B. Mohr, Tübingen.

Hunt, J. (1995) The effect of unemployment compensation on unemployment duration in Germany. *Journal of Labor Economics* 13(1), 88–120.

Katz, Lawrence and Bruce Meyer (1990): The impact of the potential duration of unemployment benefits on the duration of unemployment, *Journal of Public Economics* 41, 45-72.

Kraus, Florian and Viktor Steiner (1998): Modelling Heaping Effects in Unemployment Duration Models - With an Application to Retrospective Event Data in the German Socio-Economic Panel. *Jahrbücher für Nationalökonomie und Statistik* 217, 550-573.

Krueger, Alan B. and Bruce D. Meyer (2002): Labor supply effects of social insurance. In: Alan J. Auerbach and Martin Feldstein, *Handbook of Public Economics* 4, Chapter 33, North-Holland.

Meyer, Bruce D. (1990): Unemployment Insurance and Unemployment Spells, *Econometrica* 58(4), 757–782.

Moffitt, Robert and Nicholson, Walter (1982): The Effect of Unemployment Insurance on Unemployment: The Case of Federal Supplemental Benefits, *The Review of Economics and Statistics*. LXIV(1), 1–11.

Mortensen, Dale T. (1977): Unemployment and Job Search Decisions, Industrial and Labor Relations Review, Vol. 30, pp. 505–517.

Mortensen, Dale T. (1986): Job Search and Labor Market Analysis. In: Orley Ashenfelter and David Card (eds.), Handbook of Labor Economics, Vol. II, pp. 849-919, North-Holland.

Rabe-Hesketh, Sophia, Andrew Pickles and Anders Skrondal (2004). Gllamm Manual, U.C. Berkley, Division of Biostatistics, WP Series.

SOEP (2004): A general introduction to the German Socio-Economic Panel Study (SOEP) – Design, Contents and Data Structure. DIW Berlin (www.diw.de/soep).

Steiner, Viktor (1997) Extended Benefit-Entitlement Periods and the Duration of Unemployment in West Germany. *ZEW-Discussion Paper* No. 97-14, Mannheim, Germany.

Steiner, Viktor (2001) Unemployment Persistence in the West German Labour Market: Negative Duration Dependence or Sorting?, *Oxford Bulletin of Economics and Statistics* 63, 91- 113.

Wolff, Joachim (2003) Unemployment compensation and the duration of unemployment in East Germany. *Sfb 386 Discussion Papers 344*, University of Munich.

Appendix

Table A1 Selectivity-corrected wage regressions– dependent variable*: ln(gross hourly wage)*

	Men				Women			
	West		East		West		East	
	coefficent	*t-value*	*coefficent*	*t-value*	*coefficent*	*t-value*	*coefficent*	*t-value*
Years of education	0.059	49.95	0.040	20.46	0.062	39.42	0.029	13.95
Experience	0.019	12.97	0.015	10.56				
Experience squared/100	-0.037	-10.65	-0.033	-9.2				
Full-time					0.011	5.74	0.014	9.33
Full-time squared/100					-0.023	-3.82	-0.037	-8.87
Part-time					0.001	0.07	-0.004	-2.49
Part-time squared/100					-0.001	-0.09	0.01	1.1
Tenure	0.009	5.05	0.003	2.44	0.01	4.14	0.018	12.31
Tenure squared/100	-0.016	-2.8	0.001	0.04	-0.015	-1.93	-0.025	-6.03
Human capital depreciation	-0.051	-6.5	-0.131	-17.04	-0.025	-4.3	-0.058	-9.81
Years of education x German	0.006	6.05			0.002	1.84		
Experience x German	0.001	-0.28						
Experience sq./100 x German	-0.002	-0.59						
Full-time x German					0.005	2.32		
Full-time sq./100 x German					-0.017	-2.72		
Part-time x German					0.002	0.83		
Part-time sq /100 x German					-0.017	-1.31		
Tenure x German	-0.001	-0.72			0.004	1.78		
Tenure sq. /100 x German	0.013	2.17			-0.002	-0.22		
Human cap. depreciation x German	-0.071	-7.86			0.003	0.51		
Region:								
Schl.-Holstein. Hamburg	0.017	1.27			0.034	2.28		
Lower Saxony. Bremen	-0.004	-0.31			-0.015	-1.14		
North Rhine-Westphalia	0.029	2.42			0.005	0.37		
Hesse	0.049	3.86			0.049	3.62		
Rhineland-Palat.. Saarland	-0.006	-0.49			-0.017	-1.23		
Baden-Wuerttemberg	0.073	6.02			0.037	2.87		
Bavaria	0.02	1.69			0.012	0.93		
Mecklenburg-Western Pom.			-0.086	-5.18			-0.130	-7.71
Brandenburg			-0.092	-6.1			-0.139	-8.96
Saxony-Anhalt			-0.122	-8.12			-0.16	-10.51
Thuringia			-0.157	-10.6			-0.156	-9.98
Saxony			-0.148	-10.5			-0.176	-12.27
Year:								
1995	-0.197	-27.67	-0.246	-18.74	-0.147	-17.16	-0.199	-14.06
1996	-0.163	-22.5	-0.196	-14.53	-0.132	-15.2	-0.172	-11.95
1997	-0.152	-21.08	-0.162	-12.04	-0.116	-13.43	-0.133	-9.37
1998	-0.134	-18.67	-0.149	-11.17	-0.092	-10.85	-0.111	-7.8
1999	-0.129	-17.86	-0.144	-10.71	-0.09	-10.53	-0.099	-7.03
2000	-0.109	-18.22	-0.135	-11.42	-0.091	-13.13	-0.105	-8.42
2001	-0.11	-17.62	-0.115	-9.53	-0.078	-10.9	-0.084	-6.61
2002	-0.031	-5	-0.041	-3.39	-0.022	-3.22	-0.039	-3.09
Industrial Sector:								
Agriculture. Forestry	0.058	15.08	0.008	0.8	0.009	1.22	-0.091	-5.27
Mining. Energy	0.031	2.63	0.095	5.38	0.172	5.88	0.11	3.54
Chemical Ind.. Synthetics	0.051	8.73	0.041	2.81	0.03	3.7	-0.063	-2.85
Construction Industry	-0.01	-1.87	-0.005	-0.71	-0.018	-1.25	0.026	1.45
Heavy Industry	0.016	2.9	-0.027	-2.47	0.021	1.76	-0.048	-1.82
Textile Industry	-0.132	-7.24	-0.166	-3.43	-0.142	-8.19	-0.298	-10.23
Retail	-0.071	-12.42	-0.105	-9.78	-0.098	-21.05	-0.152	-16.67
Railway. Post. Transport	-0.116	-17.92	-0.07	-5.85	-0.01	-0.97	-0.097	-5.57
Public Services	-0.023	-5.91	0.06	8.67	0.033	12.78	0.084	23.03
Private Services	0.107	17.36	0.093	7.2	0.042	7.61	0.003	0.28
Others and Missing	-0.016	-2.24	0.003	0.27	-0.034	-4.55	-0.082	-6.49
Firm Size:								
Small	-0.188	-20.88	-0.193	-14.41	-0.188	-27.17	-0.237	-20.25
Middle	-0.104	-21.59	-0.115	-16.89	-0.063	-13.84	-0.079	-10.46
Middle-Big	-0.027	-8.88	-0.008	-1.87	-0.014	-3.9	-0.01	-1.78
Big	0.022	7.2	0.102	14.11	0.048	12.9	0.048	7.56
Public	-0.016	-6.92	0.023	3.97	0.027	9.13	0.015	2.05
Constant	1.734	94.83	1.985	57.1	1.516	59.99	2.017	51.96
mills								
lambda	0.0002	-0.07	-0.014	-1.34	0.045	6.25	-0.007	-0.6
Number of observations	51329		17534		57731		19896	
Adjusted R^2								

Table A2 Tax function regressions – dependent variable: *ln[(gross wage - net wage)/(gross wage)]*

	Men				Women			
	West		East		West		East	
	Coeff.	*t-value*	*Coeff.*	*t-value*	*Coeff.*	*t-value*	*Coeff.*	*t-value*
year_1996	0.0002	0.01	0.0249	1.50	0.0211	1.45	0.0014	0.08
year_1997	0.0108	1.02	0.0351	2.12	0.0440	3.01	0.0203	1.13
year_1998	0.0154	1.50	0.0555	3.39	0.0338	2.38	0.0382	2.14
year_1999	0.0010	0.10	0.0464	2.79	0.0344	2.37	0.0368	2.03
year_2000	-0.0143	-1.55	0.0149	0.98	-0.0054	-0.43	0.0006	0.03
year_2001	-0.0361	-3.80	-0.0264	-1.69	-0.0252	-1.94	-0.0483	-2.87
year_2002	-0.0593	-6.36	-0.0452	-2.92	-0.0459	-3.65	-0.0658	-3.93
year_2003	-0.0319	-3.32	-0.0252	-1.57	-0.0397	-3.08	-0.0076	-0.44
year_2004	-0.0582	-6.05	-0.0458	-2.88	-0.0564	-4.39	-0.0292	-1.71
gross wage	-3.4e-05	-13.67	-3.6e-05	-6.31	-1.1e-04	-21.07	3.2e-05	1.74
(gross wage)sq./10000	2.8e-06	6.77	3.0e-06	4.38	9.7e-06	13.20	-6.4e-05	-4.35
ln(gross wage)	0.3797	53.76	0.3866	33.54	0.4613	55.35	0.3052	15.35
married	-0.1901	-37.89	-0.0578	-7.27	0.1234	21.31	0.0949	11.62
children	-0.0452	-21.54	-0.0481	-11.71	0.0104	3.17	0.0009	0.20
public sector	-0.2436	-46.93	-0.1227	-14.24	-0.0891	-14.95	-0.0682	-8.54
constant	-3.815	-77.80	-3.9282	-51.51	-4.3055	-79.03	-3.4469	-28.59
Observations	43161		12823		30629		11143	
Adjusted R^2	0.182		0.186		0.170		0.190	

Table A3 Means of variables in the hazard rate models

Variable	Men		Women	
	West	East	West	East
Personal characteristics				
25 <= Age < 35	25.7	19.6	27.2	20.8
35 <= Age < 44	19.7	21.9	21.1	26.0
44 <= Age < 52	15.0	21.8	18.0	19.8
52 <= Age < 56	8.4	8.9	8.5	9.4
Age >= 56	14.2	13.7	9.0	13,5
Foreigner	33.2	-	24.0	-
Disabled	13.0	5.9	7.7	3,3
Education and Vocational Qualification				
General elementary	25.2	10.0	26.9	12.5
Middle vocational	46.8	68.3	43.1	68.1
Vocational plus college	3.8	1.7	5.9	2.2
Higher vocational	3.0	5.3	5.2	3.1
Higher education	10.5	11.5	9.6	11.8
Trained worker	15.7	29.8	2.5	10.0
Foreman	8.8	13.3	3.8	2.9
Self-employed	2.1	2.8	2.7	2.4
Household variables				
Spouse employed	28.8	32.9	43.1	48.6
Earnings of spouse/1000	0.25	0.37	0.77	0.63
Other household income /1000	1.01	0.70	0.84	0.60
Married	56.0	52.4	55.5	65,1
Children <= 6 years	30.4	15.9	27.7	20.3
Children <= 6 years × single	1.5	0.8	6.4	3.8
Regional dummies				
Northern States	18.6	-	19.4	-
Hesse	8.3	-	7.6	-
Rhineland-Palatinate, Saarland	8.2	-	8.2	-
Baden-Wuerttemberg	14.4	-	18.0	-
Bavaria	13.9	-	14.1	-
West Berlin	5.0	-	6.8	-
East Berlin	-	6.9	-	4.1
Mecklenburg-Western Pomerania	-	9.5	-	10.8
Brandenburg	-	16.6	-	16.3
Saxony-Anhalt	-	19.3	-	20.9
Thuringia	-	18.2	-	20.5
Regional unemployment rate	10.0	19.0	10.0	18.9
Regional unemployment rate squared	107.4	364.9	108.8	360.9
Number of previous unemployment spells	1.0	1.5	0.7	1.5
Not employed before	21.5	11.9	33.5	22.2
Part-time before	-	-	19.5	9
Vocational Training before	10.6	12.8	12.3	21.5
1st Quarter	37.2	33.5	39.4	36.8
2nd Quarter	22.7	19.6	21.4	21.0
3rd Quarter	22.1	23.4	22.2	24.0
December	9.3	9.2	9.1	8.7

Table A3 Continued

	Men		Women	
	West	**East**	**West**	**East**
Baseline hazard (month 1)				
month 2	9.0	10.4	9.0	7,5
month 3	7.7	8.5	7.8	6,8
month 4	6.4	7.0	6.8	6,1
months 5-6	10.6	11.1	11.5	10,6
months 19-32	14.3	12.1	12.2	15.2
months > 32	9.0	7.3	8.4	10,6
UB-entitlement				
Not entitled to UB	30.0	20.7	35.5	30.6
< 0 months	21.4	22.2	18.5	25,1
0 months	2.0	2.1	1.8	2,2
1 month	2.1	2.4	2.0	2,3
2 months	2.2	2.6	2.2	2,5
3-4 months	4.8	5.7	5.0	5,5
5-6 months	5.6	6.3	5.8	5,6
7-8 months	6.3	6.9	6.7	5,6
9-12 months	13.0	14.3	13.1	10,1
13-18 months	5.9	7.4	4.9	5.2
Income replacement ratios (IRR)				
IRR × received UB	0.27	0.37	0.26	0.29
(IRR × received UB)squared	0.19	0.28	0.20	0.23
IRR ×received UA	0.13	0.17	0.12	0.19
(IRR × received UA) squared	0.08	0.11	0.08	0.12
Number of observations	21349	14882	17586	18445
Number of spells	2247	1782	1791	1528
Number of persons	1451	972	1307	882

Note: Means of dummy variables are given in shares in percent. Means are averages over person months.

Source: German Socioeconomic Panel (SOEP); waves 1995-2003).

Table A4 Estimation results for other variables in the hazard rate model - men

	West		East	
	Employment	**Out-of-the-labour-force**	**Employment**	**Out-of-the-labour-force**
25 <= Age < 35	-0.111	-1.17	-0.165	-1.736
	(-1,06)	(-4,93)***	(-1,52)	(-5,21)
35 <= Age < 44	-0.376	-1.518	-0.462	-1.462
	(-2,88)**	(-5,5)***	(-3,87)	(-4,31)
44 <= Age < 52	-0.803	-1.438	-0.604	-1.369
	(-5,32)***	(-4,65)***	(-4,61)	(-3,46)
52 <= Age < 56	-1.026	-1.149	-0.747	-1.188
	(-4,99)***	(-3,13)**	(-4,32)	(-2,44)
Age >= 56	-2.252	-0.578	-1.314	-0.272
	(-8,04)***	(-1,81)	(-6,89)	(-0,66)
Foreigner	-0.424	-0.614	-	-
	(-4,78)***	(-3,48)***	-	-
Disabled	-0.474	0.371	-0.456	0.392
	(-3,01)**	(1,79)	(-2,53)	(1,30)
Married	0.115	-0.203	0.180	0.298
	(1,2)	(-1,06)	(2,02)	(1,13)
Children <= 6 years	-0.066	-0.061	0.010	-0.369
	(-1,16)	(-0,41)	(0,14)	(-1,04)
Children <= 6 years * single	-0.192	-0.213	-0.391	0.645
	(-0,73)	(-0,41)	(-1,08)	(1,03)
Spouse employed	0.369	0.381	0.224	-0.272
	(3,47)***	(1,44)	(2,37)	(-0,82)
Earnings of spouse/1000	-0.177	0.165	0.117	0.017
	(-1,77)	(0,69)	(0,86)	(0,01)
Other household income/1000	0.056	0.073	0.098	0.177
	(1,77)	(1,44)	(2,40)	(2,55)
General elementary	-0.149	-0.568	0.160	-0.793
	(-1,16)	(-2,28)*	(0,79)	(-2,69)
Middle vocational	0.184	-0.079	0.382	-0.398
	(1,41)	(-0,34)	(2,07)	(-1,55)
Vocational plus college	0.684	0.309	0.223	0.459
	(4,02)***	(0,75)	(0,73)	(0,74)
Higher vocational	0.749	0.309	0.441	0.064
	(3,57)***	(0,76)	(1,94)	(0,13)
Higher Education	0.374	0.026	0.475	-0.508
	(2,42)*	(0,08)	(2,14)	(-1,13)
Regional Unemployment Rates	0.241	0.341	0.180	-0.406
	(2,37)*	(1,77)	(0,95)	(-1,29)
Reg. unempl. rate squared	-0.011	-0.014	-0.005	0.012
	(-2,41)*	(-1,7)	(-0,96)	(1,39)
# unemployment spells in the past	0.052	-0.208	-0.035	-0.033
	(1,86)	(-2,65)**	(-1,54)	(-0,48)
Trained worker	0.195	-0.008	0.216	-0.021
	(2,12)*	(-0,04)	(2,94)	(-0,09)
Foreman	0.275	-0.414	0.251	-0.128
	(2,19)*	(-1,62)	(2,11)	(-0,34)
Self-employed	0.292	-0.066	-0.400	-1.760
	(1,27)	(-0,12)	(-1,63)	(-1,63)
Not employed before	-0.438	0.27	-0.339	0.759
	(-4,97)***	(1,62)	(-3,27)	(3,48)
Vocational training before	-0.272	0.149	-0.218	0.329
	(-2,51)*	(0,68)	(-2,15)	(1,37)

Table A4 Continued

	West		East	
	Employment	**Out-of-the-labour-force**	**Employment**	**Out-of-the-labour-force**
Baseline Hazard				
Month 2	0.121	0.264	0.531	1.232
	(1,18)	(0.99)	(4.36)***	(3,93)***
Month 3	0.338	0.447	0.644	0.969
	(2,79)**	(1,56)	(4,62)***	(2,63)**
Month 4	0.181	0.49	0.699	0.899
	(1,24)	(1,45)	(4,61)***	(2,27)*
Months 5-6	0.142	0.892	0.463	1.268
	(1,06)	(3,24)**	(2,97)**	(3,37)***
Months 7-9	0.000	0.138	0.387	1.106
	(0.00)	(0,40)	(2,35)*	(2,77)**
Months 10-12	0.044	0.676	0.527	1.504
	(0,28)	(2,14)*	(2,91)**	(3,84)***
Months 13-18	-0.294	0.859	0.120	1.139
	(-1,73)	(3,03)**	(0,59)	(2,48)*
Months 19-32	-0.478	0.66	-0.144	1.649
	(-2,58)**	(2,12)*	(-0,61)	(4,11)***
Months > 32	-0.526	1.499	-0.488	2.144
	(-2,04)*	(4,32)***	(-1,60)	(4,46)***
Constant	-3.559	-6.323	-4.570	-3.063
	(-5,72)***	(-5,07)***	(-2,51)*	(-0,90)
ε^1	-.404**		-1.046***	
ε^2	0.673		1.875***	
ε^3	--		0.243	
$P(\varepsilon^1)$	0.625		0.261	
$P(\varepsilon^2)$	0.375		0.057	
$P(\varepsilon^3)$	--		0.682	
Number of observations	21349		14882	
Number of spells	2247		1782	
Log likelihood	-6145.953		-4891.52	
Number of parameters	122		120	
Akaike criterion	12535.91		10023.041	

Notes: Regional dummy variables and seasonal (quarterly) dummies are included in all regressions; t-values are given in parantheses; * $p<0.05$, ** $p<0.01$, *** $p<0.001$.

Table A5 Estimation results for other variables in the hazard rate model - women

	West		East	
	Employment	**Out-of-the-labour-force**	**Employment**	**Out-of-the-labour-force**
25 <= Age < 35	-0.156	-0.434	-0.730	-0.803
	(-1.39)	(-2.19)*	(-4.71)***	(-2.78)**
35 <= Age < 44	-0.364	-1.030	-0.991	-1.68
	(-2.99)**	(-4.61)***	(-5.97)***	(-5.36)***
44 <= Age < 52	-0.663	-1.249	-1.183	-1.592
	(-4.25)***	(-4.79)***	(-6.49)***	(-4.74)***
52 <= Age < 56	-1.024	-1.327	-1.58	-1.991
	(-4.22)***	(-4.03)***	(-7.06)***	(-4.29)***
Age >= 56	-2.448	-0.890	-2.558	-1.232
	(-6.88)***	(-2.96)**	(-8.93)***	(-3.80)***
Foreigner	-0.477	-0.499	-	-
	(-4.32)***	(-3.01)**	-	-
Disabled	-0.462	0.456	0.197	0.952
	(-2.31)*	(1.85)	(0.68)	(2.34)*
Married	-0.225	0.437	0.064	0.466
	(-2.19)*	(2.51)*	(0.56)	(2.27)*
Children <= 6 years	-0.279	0.207	-0.304	-0.117
	(-3.13)**	(1.77)	(-2.85)**	(-0.63)
Children <= 6 years * single	-0.533	-0.378	0.287	-0.042
	(-2.51)*	(-1.23)	(1.25)	(-0.10)
Spouse employed	0.138	0.072	0.098	-0.017
	(1.05)	(0.37)	(0.78)	(-0.09)
Earnings of spouse/1000	-0.011	-0.045	0.032	0.015
	(-0.17)	(-0.49)	(0.34)	(0.10)
Other household income/1000	0.049	0.011	0.160	0.223
	(1.35)	(0.19)	(2.90)**	(2.30)*
General elementary	0.086	-0.218	0.607	0.023
	(0.49)	(-1.02)	(1.89)	(0.07)
Middle vocational	0.470	-0.187	0.741	0.263
	(2.73)**	(-0.85)	(2.59)**	(0.87)
Vocational plus college	0.587	0.321	0.986	-0.731
	(2.85)**	(1.00)	(2.73)**	(-0.96)
Higher vocational	0.305	-0.263	1.391	0.569
	(1.29)	(-0.73)	(3.88)***	(1.14)
Higher education	0.682	-0.316	1.306	0.733
	(3.37)***	(-1.05)	(4.15)***	(1.99)*
Regional unemployment rates	0.013	-0.028	-0.142	-0.386
	(0.10)	(-0.16)	(-0.96)	(-1.23)
Reg. Unempl. Rate squared	-0.001	0.003	0.003	0.011
	(-0.23)	(0.39)	(0.75)	(1.32)
# unemployment spells in the past	0.036	0.013	0.006	-0.139
	(0.96)	(0.20)	(0.16)	(-1.95)
Trained worker	0.051	-0.474	0.094	0.285
	(0.26)	(-1.09)	(0.69)	(1.28)
Foreman	0.128	0.338	0.575	1.112
	(0.70)	(1.20)	(3.02)**	(3.48)***
Self-employed	0.079	-0.102	-0.162	-0.357
	(0.36)	(-0.17)	(-0.67)	(-0.52)
Not employed before	-0.59	-0.232	-0.552	0.445
	(-5.72)***	(-1.37)	(-4.43)***	(2.16)*
Vocational training before	-0.178	-0.399	-0.159	0.164
	(-1.57)	(-1.65)	(-1.46)	(0.80)

Table A5 Continued

	West		East	
	Employment	**Out-of-the-labour-force**	**Employment**	**Out-of-the-labour-force**
Baseline Hazard				
Month 2	0.210	0.174	-0.025	1.160
	(1.71)	(0.57)	(-0.17)	(3.12)**
Month 3	0.188	0.046	-0.028	1.333
	(1.40)	(0.14)	(-0.19)	(3.42)***
Month 4	0.043	0.389	0.068	0.784
	(0.27)	(1.15)	(0.37)	(1.73)
Months 5-6	-0.151	0.336	0.207	1.053
	(-1.05)	(1.10)	(1.42)	(2.60)**
Months 7-9	0.155	0.400	0.076	1.664
	(1.10)	(1.35)	-0.48)	(4.42)***
Months 10-12	-0.029	1.245	0.256	1.17
	(-0.18)	(4.37)***	(1.49)	(2.89)**
Months 13-18	-0.058	1.140	0.074	0.906
	(-0.32)	(3.81)***	(0.40)	(2.21)*
Months 19-32	-0.412	0.929	-0.159	1.541
	(-1.68)	(2.90)**	(-0.76)	(3.94)***
Months > 32	-0.875	0.956	-0.290	2.004
	(-2.34)*	(2.40)*	(-0.92)	(4.69)***
Constant	-2.484	-3.315	-1.131	-2.178
	(-3.14)**	(-2.64)**	(-0.81)	(-0.71)
ε^1	-.7597*		-2.66***	
ε^2	0.287		1.02***	
ε^3	--		-0.148	
$P(\varepsilon^1)$	0.274		0.042	
$P(\varepsilon^2)$	0.726		0.216	
$P(\varepsilon^3)$	--		0.742	
Number of observations	17586		18445	
Number of spells	1791		1528	
Log likelihood	-5078.174		-4735.3154	
Number of parameters	124		122	
Akaike criterion	10404.35		9714.6308	

Table A6 Simulated effects of policy reform on survival rates (in %) after 6. 12 … months of unemployment. men

		Age and entitlement to UB	Previous Income	West Germany								East Germany							
				Before reform				After reform				Before reform				After reform			
				6	12	18	24	6	12	18	24	6	12	18	24	6	12	18	24
A	No UA and no UB II; Couple. no children	45 (18 → 12)	*average*	65	38	27	9	55	35	10	3	60	32	19	4	54	26	6	1
		52 (24 → 12)	*average*	74	54	37	29	61	42	14	5	68	44	29	17	59	31	8	2
		57 (32 → 18)	*average*	89	81	69	58	84	69	59	33	79	61	48	29	74	45	27	5
B	UA and UB II; Single. no children	40 (12 → 12)	*low*	46	25	18	13	46	25	18	13	57	29	20	14	57	29	20	14
			high					46	25	16	11					57	29	18	12
		45 (18 → 12)	*low*	67	41	30	24	58	38	30	24	67	41	26	19	61	35	24	18
			high					58	38	28	22					61	35	23	16
		52 (24 → 12)	*low*	76	56	40	31	63	45	36	30	74	52	37	25	66	39	29	22
			high					63	45	34	27					66	39	27	20
		57 (32 → 18)	*low*	90	81	68	56	84	69	58	52	83	68	56	39	79	54	37	28
			high					84	69	58	50					79	54	37	26
C	UA and UB II; Couple. 1 child	40 (12 → 12)	*low*	45	24	16	12	45	24	17	12	50	23	14	9	50	23	14	9
			high					45	24	16	12					50	23	14	9
		45 (18 → 12)	*low*	66	41	29	23	57	37	29	24	60	33	20	13	55	27	18	13
			high					57	37	29	23					55	27	18	12
		52 (24 → 12)	*low*	76	56	40	31	63	44	35	30	68	44	30	19	60	32	23	16
			high					63	44	35	29					60	32	22	16
		57 (32 → 18)	*low*	90	82	70	60	85	71	61	55	80	63	50	34	75	49	33	24
			high					85	71	61	55					75	49	33	24

Source: Simulations based on estimation results in Table A4.

Table A7 Simulated effects of policy reform on survival rates (in %) after 6. 12 … months of unemployment. women

		Age and entitlement to UB	Previous Income	West Germany								East Germany							
				Before reform				After reform				Before reform				After reform			
				6	12	18	24	6	12	18	24	6	12	18	24	6	12	18	24
A	No UA and no UB II; Couple. no children	45 (18 → 12)	*average*	72	44	26	6	67	40	6	1	65	46	29	10	72	44	13	5
		52 (24 → 12)	*average*	84	62	42	30	74	49	10	3	80	58	47	36	80	57	24	12
		57 (32 → 18)	*average*	89	73	58	45	88	66	43	10	92	83	73	67	88	79	69	47
B	UA and UB II; Single. no children	40 (12 → 12)	*low*	55	28	19	14	55	28	19	14	70	40	26	19	70	40	26	19
			high					55	28	17	12					70	40	25	17
		45 (18 → 12)	*low*	69	41	25	20	64	38	28	23	67	48	32	24	74	47	33	25
			high					64	38	26	19					74	47	31	22
		52 (24 → 12)	*low*	83	60	42	31	72	49	39	33	82	60	49	39	81	59	47	38
			high					72	49	36	29					81	59	45	36
		57 (32 → 18)	*low*	91	79	66	55	90	72	53	49	93	84	75	70	89	81	72	66
			high					90	72	53	47					89	81	72	65
C	UA and UB II; Couple. 1 child	40 (12 → 12)	*low*	64	35	25	20	64	35	26	21	75	48	34	26	75	48	34	26
			high					64	35	25	20					75	48	34	26
		45 (18 → 12)	*low*	76	49	29	24	71	44	35	29	72	55	40	31	78	54	41	32
			high					71	44	34	29					78	54	40	32
		52 (24 → 12)	*low*	85	65	45	31	77	52	43	38	85	67	56	47	85	66	54	46
			high					77	52	43	37					85	66	54	46
		57 (32 → 18)	*low*	88	70	54	40	88	64	38	34	94	86	79	74	91	84	76	70
			high					88	64	38	34					91	84	76	70

Source: Simulations based on estimation results in Table A5.