Schömann, Klaus; Becker, Rolf; Zühlke, Sylvia

Article — **Digitized Version**

Further Education and Occupational Careers in East Germany

Vierteljahrshefte zur Wirtschaftsforschung

Provided in Cooperation with:
German Institute for Economic Research (DIW Berlin)

This Version is available at:
https://hdl.handle.net/10419/141177

WWW.ECONSTOR.EU

Mitglied der

Leibniz-Gemeinschaft

East Germany in Transition

Further Education
and Occupational Careers in East Germany*

By Klaus Schömann, Rolf Becker,
and Sylvia Zühlke*

Summary

After the breakdown of the former East Germany, there was a boom in supply and demand of further education among East Germans. In this paper, we use event history analysis to address two questions from the perspective of individual life courses: (1) Is there selectivity into further education in eastern Germany? (2) Does participation in further education lead to a decreasing risk of unemployment? We find there is strong selectivity into further education according to gender, age, previous education, employment status, job characteristics and previous life course experiences. We also find that further education decreases the probability of becoming unemployed, in particular for women. However, the positive benefits depend on the type of education.

1. Introduction

The policy debate on further education and retraining in the new federal states of Eastern Germany is oscillating between two divergent points of view: on the one hand, government planners, employers, and researchers projected a vast demand for further education in the aftermath of the democratization and breakdown of the former East German economy. They estimated that about a third of the economically active population in 1990 would need to participate in further training. On the other hand, many researchers question the positive effects of further education on employment, citing the general lack of jobs and uncertainty about the direction of structural change in eastern Germany. Further education, in this case, may not generally be a sound investment for the individual or for society as a whole (Meier 1993).

There are few empirical studies on eastern Germany supporting such a view. An evaluation of further education and training must deal with selection and substitution bias (Heckman and Smith 1996). Additionally, it is difficult to take into account the far-reaching change of the institutional framework in eastern Germany, since little is known about the effects of changing institutional environments on individual behavior. We start from the premise that individuals adapt their labor market behavior toward the opportunities offered by the western-style institutions gradually being introduced in the new federal states (Esser 1996). Reaction and adaptation of behavior might involve a considerable time lag. Hence, the empirical part of the paper applies hazard rate models, which allow us to model the duration until an event such as transition into further education occurs. We investigate two research questions: (1) Is there selectivity into further education in eastern Germany? (2) Does participation in further education lead to a decreasing risk of unemployment?

2. The Changing Institutional Framework

The opportunities and incentives for eastern Germans to engage in further education during transition are likely to be very different than they were in the former East and West Germany prior to reunification. In the former East Germany, firms played a crucial role in the development of human capital because further education was mainly organized by firms and was closely linked to the firm's demand for specific skills. There were few opportunities for workers to pursue their own interests and the training helped workers adapt their skills to new requirements on the current job, for example, to master new accounting techniques or operate new equipment, rather than to retrain them for new occupations. In the empirical analysis we expect a higher amount of firm-initiated participation in further education. An individual's record of previous participation in further education, job mobility, and job tenure should also predict the probability of participation in training.

Firms in the eastern states cut back on their internal training activities because they were no longer appropriate or affordable in the new, more competitive environment. This had the effect that internal on-the job training did not play an important role in the process of transformation (Dobischat and Husemann 1994). In order to bridge the growing gap in further education facilities between eastern and western Germany, the federal employment service substantially increased its support of external training.

Some regulations of the German labor promotion act were reformulated to accommodate the special situation in East Germany, particularly to support persons threatened by unemployment and to link further education with job creation schemes. The employment service financed the creation of several new training institutions, which led to the criticism that the employment service was subsidizing some suppliers of poor quality training (Brinkmann 1995). Expenditures for further training grew very quickly from 4.2 billion DM in 1991 to 10.3 billion DM in 1993. In 1993, the employment service stopped this trend and reduced its budget by about 30 percent. These cuts led to a reduction of new entries into further training program from 900,000 in 1992 to only 300,000 in 1993 and 1994.

As a hypothesis, we might expect that during the period 1990-1994 the social selectivity into further training increased. This selectivity might, as an alternative hypothesis, translate into a selectivity between specific further training measures in case of existing choices between courses. A differentiation according to birth cohorts in the participation process is likely to occur. Specifically, the eldest cohorts, those born between 1930-40, are unlikely to undergo extensive retraining or longer duration courses due to the short period of time until retirement. Their most likely behavioral response to the institutional changes is to hang on to the current job as long as possible or take early retirement, if this is a financially viable option. Huinink and Mayer (1993) described those born around 1940 as "being too old to start anew and too young to stop working." The cohort born in 1940, in particular, is labeled as the "lost generation."

3. Description of Data and Definition of Variables

The hypotheses are tested using data from the German Socio-Economic Panel (GSOEP) in an event history format. In the fourth wave for East Germany (1993), detailed information on job-related further education was obtained. Respondents were asked about their participation in different further education and vocational training programs including the start date and duration of their participation as well as type of course. We were also able to differentiate among full-time, part-time and correspondence courses. We restricted our sample to respondents who participated in the fourth wave and at least one other wave. Such a restriction might lead to sample selection bias. Therefore, we control for sample selection bias and panel attrition in

our multivariate analysis (Rendtel 1995). However, the total pattern, real amount and exact volume of participation in further education could be underestimated because respondents were asked retrospectively about their last three further education courses since spring 1993. The retrospective question might also lead to the problem of telescoping and selection. We assume that only the three most important courses among other arrangements were remembered.

In the second step we combined individuals' information collected in the fourth wave with longitudinal data on their previous life course, especially educational and occupational careers (using calendar data and the biographical file). However, for the construction of the event history data set we excluded respondents with incomplete information in their biography. We integrated the episodes of further education along with other episodes in the individuals' life course. Such a procedure allows us to control the state dependence and simultaneous processes having an impact on the likelihood of participating in further education. When merging this information, it was necessary to split the life course episodes into sub-episodes lasting exactly one month. Then it was possible to merge cross-sectional information into the event history data set. Cross-section information collected in June 1990 was linked to the sub-episodes falling between November 1989 and December 1990, cross-sectional data reported in the second wave merged with the sub-episodes between January 1991 and December 1991, and so on (Steiner 1994). To minimize errors in the data set we recorded changes in the life course and job characteristics between waves using the retrospective questions in the questionnaire (see Table 1).

We limited the risk set to individuals between ages 16 and 65 who finished their schooling and/or first vocational training and were employed in their life at least once. For the descriptive analysis we considered men and women born between 1925 and 1974 and for multivariate analysis only individuals born between 1930 and 1974. In the fourth wave, there were 3,973 respondents (1,887 men and 2,086 women). Almost 84.6 percent of them participated in all of the four waves between 1990 and 1993 while 3.3 percent were new entries between 1991 and 1992, 6.4 percent entered in the 1992-93 period, and 5.7 percent of respondents participated only in the fourth wave. Our data set was ultimately comprised of 3,523 (1,715 men and 1,808 women). When we combined the cross-sectional data with the longitudinal data the risk set for the transition to further education included 3,075 respondents (1,507 men and 1,568 women). The data set for the analysis of the impact of further education on employment duration contains only employment episodes. This selection has not lead to a decrease of cases.

To introduce time-varying covariates into the causal analysis and to control for time-dependence, we use the method of episode splitting (Blossfeld and Rohwer 1995).

Table 1

Definition of Independent Variables

Independent Variables	Explanation
Education	Certificates are measured according to the average number of years required to obtain them.
Cohort membership	Indication of cohort by dummy variables (reference category: "cohort 1930 to 1934").
Probability of inclusion in the survey	Logarithm of [(1/projection factor at first participation) multiplied with the probability of remaining in the panel for each wave].
Type of employment Full-Time Employment; Part-Time Employment; Short-Time Work; Unemployment	These dummies indicate the employment status of the individuals. Excluded are individuals who have not finished their initial education or have retired. (Reference category: Out of labor force).
Fixed-Term Employment	(Reference category: no fixed-term employment).
Employment according to qualification	(Reference category: other job).
Weekly working time	Actual working time per week, measured in hours.
Large firm, public sector	Dummy variable for a private firm with more than 200 employees (reference category: private firm with less than 200 employees).
Period	Time since November 1989 on monthly basis.
Duration of Full-Time Employment, Part-Time Employment, and Out of Labor Force	Tenure in previous state in the former East Germany on yearly basis.
Further Education Participation	Dummy for participation in further education (reference category: no participation).
Retraining, Adjustment, Career-related Course, Adaptation and Other Courses	Dummies for several types of further education arrangement (reference category: no participation) (see Schömann and Becker 1995 for definitions of types of further education arrangements).
Source: Compiled by authors.	

Our "observation window" includes the period between January 1990 and April 1993. This procedure generates 101,711 records for the process of further education participation and 93,347 records for analysis of the impact of further education participation on employment duration. In the calculations each record was treated as a separate observation. This procedure does not change episodes and, therefore, does not affect the estimates of the effects of other covariates. We make use of a transition rate model. The first dependent variable is the hazard rate for participation in further education during the time interval $(t, t + \Delta t)$, provided that such an event has not occurred before the beginning of this time interval. The second dependent variable is the transition rate from employment to unemployment. For estimation of these processes the exponential model with maximum likelihood test is applied. In this model we assume a constant hazard rate for each of the sub-episodes and incorporate the time-constant and time-

dependent covariates $r(t \mid \chi(t)) = \exp(\beta' \chi(t))$, where $\chi(t)$ is the time-dependent vector of exogenous covariates.

4. Describing Participation Patterns in Eastern Germany Since 1989

Since an extensive description of the participation patterns has been presented by Behringer (1995) we present results of rates of transition into further education and total participation. Transitions into further education reflect only new entrants into such activities, whereas figures on participation show the total stock of all persons between ages 16 and 65 in such activities during a reference period (one month) between November 1989 and the middle of 1993.

The GSOEP data on eastern Germany reflect the well-known increasing participation in further education and training between November 1989 and the peak of participa-

Source GSOEP (DIW, Berlin), own calculations.
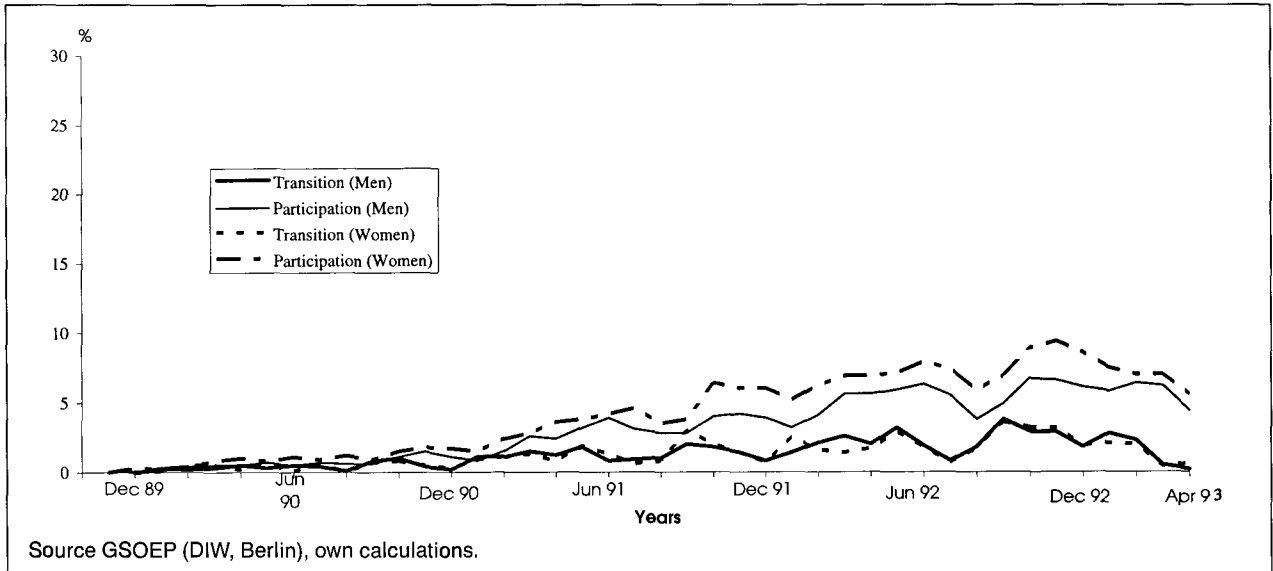
tion at the end of 1992. During this time period the participation increased steadily up to 6.7 percent of all men and 9.4 percent of women between ages 16 and 65 (see the Figure). Since then both participation and new entry rates dropped quite sharply due to substantial budget cuts by the federal employment service (Bundesanstalt für Arbeit 1995, p.15). Whereas the patterns for new transitions into further education of men and women are almost identical, total female participation is higher than male participation throughout. This reflects the different types training chosen by men and women. Women are more likely to start longer lasting retraining courses (*Umschulung*) whereas men are overrepresented in workplace integration measures (*Einarbeitung*). Official statistics from the federal employment service similarly distinguish three categories of (1) further training, (2) retraining, and (3) workplace integration training. In 1992 only 36 percent of all participants in workplace integration training, which was usually of short duration, were women (Bundesanstalt für Arbeit 1995). In both other types of further education women represented about two-thirds of all participants. The peak months of participation are around March and October, which corresponds to the starting times of further training programs in Germany.

5. Explaining Transitions to Further Education

First we analyze participation patterns of all kinds of further education episodes separately for men and women since labor market participation, risk of unemployment, and subsequent reemployment probabilities are different between men and women. Table 2 shows the estimated

coefficients of the transition rates of new entries into further education for women and men. All models are based on about 50,000 sub-episodes with more than 600 events of transitions into further education and training in eastern Germany. Chi-square values show significance at the 1 percent level for models compared to a specification with no covariates. The insignificant effect of the probability of inclusion shows that panel attrition and sample selection does not have an influence on the estimated effects.

In columns 1 and 2 of Table 2 we estimate participation of women using four dummy variables to indicate employment status. All of them are significant; the reference category is women out of the labor force. From this we conclude that all eastern German women with a link to the labor market have a higher probability of participating in some form of further education and training. Full-time employees and employees on short-time work are most likely to undertake some form of training, whereas part-time employees are more likely than the unemployed and those out-of-the labor force to be involved in further education and training. The attachment and degree of involvement in work is a determining factor for women to keep their skills up-to-date or to retrain in case of need. For men (columns 3 and 4 of Table 2) none of the employment dummies is significant when the reference group is either unemployed or out of the labor force. Regardless of employment status, men sought further education and training.

Next we test for cohort and age effects using grouped measures of five-year birth cohorts. The reference category is the eldest cohort, born between 1930 to 1934, who reached age 60 after 1990 and were at high risk of taking early retirement after reunification. Relative to this cohort,

Table 2

Participation in Further Education and Training in Eastern Germany[1]

	Model I		Model II	
	Women	Men	Women	Men
Constant	−10.837*** (1.1784)	−7.596*** (0.9512)	−9.646*** (1.1285)	−7.713*** (0.9517)
Full-Time Employment+	1.7775*** (0.3390)	0.3208 (0.4206)		0.0448 (0.4338)
Part—Time Employment+	1.4815*** (0.3578)			
Short—Time Work+	1.8709*** (0.3827)	0.1677 (0.4721)		0.0062 (0.4773)
Unemployment+	1.0834** (0.3706)	Ref. Cat.	0.0019 (0.1952)	Ref. Cat.
Out of Labor Force	Ref. Cat.		Ref. Cat.	
Cohorts				
1935 to 1939	1.0889 (0.6004)	0.0887 (0.2614)	1.1503 (0.6005)	0.0853 (0.2614)
1940 to 1944	1.2345* (0.5986)	0.2755 (0.2460)	1.3313* (0.5983)	0.2499 (0.2461)
1945 to 1949	1.2450* (0.6086)	0.1558 (0.2568)	1.2945* (0.6083)	0.1543 (0.2565)
1950 to 1954	0.9660 (0.6165)	0.1792 (0.2579)	1.0435 (0.6153)	0.1520 (0.2581)
1955 to 1959	1.0445 (0.6268)	0.0403 (0.2654)	1.1038 - (0.6253)	0.0064 (0.2655)
1960 to 1964	1.0813 (0.6421)	0.1257 (0.2783)	1.1391 (0.6400)	0.1018 (0.2781)
1965 to 1969	0.8612 (0.6665)	0.3460 (0.3006)	0.9354 (0.6633)	0.3114 (0.3006)
1970 to 1974	0.9610 (0.6939)	0.2588 (0.3348)	1.0305 (0.6894)	0.2395 (0.3347)
Perod+	0.0409*** (0.0035)	0.0380*** (0.0034)	0.0406*** (0.0034)	0.0377*** (0.0034)
Education+	0.2158*** (0.0169)	0.2107*** (0.0158)	0.2097*** (0.0170)	0.2121*** (0.0161)
Duration of Full-Time Employment	−0.0001 (0.0092)	−0.0085 (0.0050)	−0.0001 (0.0090)	−0.0088 (0.0050)
Duration of Part-Time Employment	−0.0073 (0.0060)		−0.0070 (0.0060)	
Duration Out of Labor Force	−0.0315 (0.0250)		−0.0358 (0.0246)	
Employment According to Qualification+			0.0897 (0.0760)	−0.1295* (0.0562)
Weekly Working Time+			0.0155*** (0.0029)	0.0080** (0.0027)
Probability of Inclusion	−0.0133 (0.1038)	0.0804 (0.0923)	−0.0020 (0.1042)	0.0640 (0.0922)
Number of Episodes	51,275	50,436	51,275	50,436
Number of Events	660	672	660	672
Chi-Square Value	510.05	353.79	495.54	365.17
Degrees of Freedom	18	14	17	16

[1] Exponential model with episode splitting; β-coefficients; Standard errors in parentheses. — *) $p \leq 0.05$. — **) $p \leq 0.01$; — ***) $p \leq 0.001$; +) time-varying covariates.

Source: Authors' calculations using German Socio-Economic Panel (DIW, Berlin).

female employees born between 1940 and 1949 were more likely to seek training or retraining to either stay in employment or return to employment. Younger female birth cohorts are not more likely to participate. However, this result is remarkable since it does not square well with the usual finding for most modern industrialized societies that younger cohorts are more likely to participate than elder cohorts. This result is characteristic of the transformation period, since elder birth cohorts of female employees had a substantial amount of labor force experience before reunification and they apparently perceived that one way to stay in the new German labor market was to seek retraining as early as possible to regain "employability." Again, no significant differences are estimated for men.

For both men and women we find a significant effect of time since November 1989 (period effect), which means that employees who did not enter a training course immediately after reunification are more likely to do so later on. It appears as if further education and training has been the major option to adapt to the new production system in the unified German labor market. The effect of education on participation is in line with results for West Germany (Becker 1991) and also underscores the "resistant" education selectivity of further education during the early phase of the transformation. Variables measuring the duration of full-time or part-time employment prior to reunification as well as time spent out of the labor force had no effect on participation, contrary to the finding of similar indicators measuring previous labor force experience in the former West Germany.

If the current job corresponds to the level of education achieved, men are less likely to undertake training or retraining. Higher weekly working time increases the probability of participation in further education and training for both sexes. This factor indicates quite well a major controversial argument about labor market policy during the transformation period and in Germany as a whole. Employees working longer hours are more likely to spend time in further training, whereas those out of the labor force or in unemployment have lower rates of participation in further education and training. These results, significant for both men and women, make a strong case for rethinking and reorganizing the labor market, reducing stress for those at work, and countering the social exclusion of unemployment.

6. Further Education to Prevent Unemployment

Most evaluations of further education or life long learning policies have focused on post training employment probabilities or post training earnings as outcome measures of training success. Tuijnman and Schömann (1996) present an extensive review of the evidence for major industrialized countries within the OECD. Recent additions on Germany have been presented by Fitzenberger and Prey (1995) and Blaschke and Nagel (1995). Pannenberg (1995) estimated

reemployment probabilities of unemployed after participation in further education using transition rate models with a group-specific baseline hazard rate. Further education increases the probability of reemployment, with longer lasting programs being more beneficial. We focus on the reverse process of the transition into unemployment. Our interest in this section is to test the impact of further education in preventing unemployment.

Table 3 shows our results for women and men on the process of transition into unemployment in East Germany using an exponential transition rate model with episode splitting. In the two specifications reported in columns 1 and 2 for women, full-time and part-time employment are statistically significant and negative; the reference category is female short-time employees. However, part-time employees are at a higher risk of unemployment compared to full-time female employees. A higher level of educational attainment reduces the risk of unemployment for women in eastern Germany. Younger employees have a significantly higher risk of unemployment than middle-aged female employees (cohorts 1965-74, see also Berger et al. 1995, p.22). As the transformation period continues, unemployment becomes more likely to include women.

Turning to the group of variables measuring further education, we find a negative and significant effect on the probability of unemployment for women (column 1). Further education did help prevent of unemployment, at least for women. However, we have to restate that these are preliminary results since we have not yet estimated a simultaneous model which controls adequately for the selection into further education. When distinguishing retraining, integration, career-related, and adaptation arrangements from other forms it is the adaptation arrangement which shows the significant effect[1]. For women, the positive benefit of further education depends on their selection into adaptation courses.

After including additional job characteristics, the effect of further education is still statistically significant and different from zero on reducing the risk of unemployment. Employment where the level of qualifications corresponds well to the level of skills required on a job helps reduce unemployment. In other words, a good matching of skills supplied and skills required by the employer increases the probability that this match continues for some time. Fixed-term employment, relative to employment with an unspecified contract expiration date, increases the risk of unemployment for women in eastern Germany. This indicates that the bridge from fixed-term employment into more stable

---

[1] In previous estimates we found effects compatible to those reported here. When distinguishing among full-time, part-time, and correspondence courses, it is the part-time arrangements which show the positive benefit on employment prospects. In the same realm, participation during the working time rather than beyond working time and on the premises of the firm can reduce the risk of unemployment. This gives new impetus to claims for more flexible arrangements and combinations of the two worlds of working and learning (Schmid 1993).

Table 3

Transition into Unemployment in Eastern Germany*

	Model I		Model II	
	Women	Men	Women	Men
Constant	−2.8719** (0.9142)	−3.9055*** (0.9182)	−2.7088** (0.9079)	−3.4323*** (0.9056)
Full-Time Employment+	−2.0968*** (0.0915)	−1.6887*** (0.1157)	−1.9445*** (0.0942)	−1.7365*** (0.1190)
Part-Time Employment+	−1.5306*** (0.1147)	0.2627 (0.2241)	−1.4141*** (0.1171)	−0.0923 (0.2282)
Education	−0.0944*** (0.0200)	−0.0719*** (0.0212)	−0.0476* (0.0206)	−0.0273 (0.0217)
Cohorts				
1935 to 1939	0.3374 (0.3802)	−0.4681 (0.2500)	0.3225 (0.3805)	−0.5639* (0.2511)
1940 to 1944	0.4186 (0.3740)	−0.3533 (0.2319)	0.3655 (0.3744)	−0.4882* (0.2329)
1945 to 1949	0.5866 (0.3784)	−0.0585 (0.2351)	0.4965 (0.3793)	−0.2622 (0.2362)
1950 to 1954	0.7333* (0.3738)	−0.2797 (0.2327)	0.5982 (0.3748)	−0.4465 (0.2333)
1955 to 1959	0.6971 (0.3754)	−0.0295 (0.2217)	0.5660 (0.3761)	−0.2688 (0.2229)
1960 to 1964	0.5458 (0.3747)	−0.3426 (0.2309)	0.3682 (0.3754)	−0.5647* (0.2324)
1965 to 1969	0.9608* (0.3744)	−0.3601 (0.2436)	0.7778* (0.3754)	−0.6243* 0.2446)
1970 to 1974	0.9576* (0.3863)	0.6621** (0.2314)	0.7614* (0.3884)	0.3091 (0.2347)
Period+	0.0315*** (0.0037)	0.0206*** (0.0041)	0.0295*** (0.0038)	0.0210*** (0.0041)
Further Education Participation	−0.4509*** (0.1503)	−0.1988 (0.1539)		
Retraining			−0.3459 (0.5826)	1.2738*** (0.3157)
Integration			−0.3448 (0.3855)	−0.7865 (0.4585)
Career			−0.1004 (0.2805)	0.1563 (0.2542)
Adaptation			−0.3810* (0.1845)	−0.4300* (0.2109)
Other Further Education			0.4013 (0.4156)	−0.0228 (0.5064)
Employment According to Qualification			−0.3502*** (0.0752)	−0.6399*** (0.0838)
Fixed—Term Employment			0.5531*** (0.0913)	0.8419*** (0.0927)
Large Firm			−0.2690*** (0.0776)	−0.2996*** (0.0855)
Public Sector			−0.6347*** (0.1047)	−0.4261** (0.1351)
Probability of Inclusion	−0.0312 (0.0973)	−0.1769 (0.1040)	0.0071 (0.0969)	−0.1252 (0.1014)
Number of Episodes	43,584	49,763	43,584	49,763
Number of Events	660	505	660	505
Chi-Square Value	593,87	289.18	690.16	431.23
Degrees of Freedom	14	14	22	22

[1] Exponential model with episode splitting; β-coefficients; Standard errors in parentheses. — *) ≤ 0.05. — **) ≤ 0.01; — ***) p ≤ 0.001; — +) time-varying covariates.

Source: Authors' calculations using German Socio-Economic Panel (DIW, Berlin).

employment is rather shaky for women. Firm size affects the risk of becoming unemployed in eastern Germany. Employment in a large firm reduces the probability of "open" unemployment. In the transformation period in eastern Germany particularly large firms or combinates, which were broken up or privatized by the Treuhandanstalt, had access to public funds for temporary relief schemes or social plan negotiations. Therefore, early retirement was more common than releasing employees straight into unemployment. Similarly, public sector employees had a lower risk of unemployment in the early phase of the transformation, a result in line with findings by Berger et al. (1995, p. 21).

In the analysis of eastern German men (Table 3, columns 3 and 4) we also encounter the negative effect on becoming unemployed out of a full-time job when the reference category is employees on short-time work. Part-time work of men is still very scarce, so no significant effect is found. Alternatively, the estimated effects are dependent on the composition of the reference category.

The youngest cohort of employees (born between 1970 and 1974) have a higher risk of a transition into unemployment, which is lower among men than women in eastern Germany. However, male cohorts born between 1965 and 1969 have the lowest risk of unemployment, much lower than young female employees of the same cohort. This finding reveals the fact that during the transformation period employers developed a "taste" to lay off women who are most likely to take career breaks in connection with child rearing. The cohorts of men born between 1935-39 have the lowest risk of transition into unemployment relative to those born between 1930-34.

The period effects reported in Table 3 reflect the increasing risk to terminate an employment spell by unemployment. The reduction of public funds for active labor market policy over the transition period for eastern Germany makes a delayed experience of "open" unemployment more likely. It is likely that this period effect is reinforced by the recently proposed changes to the labor promotion act.

More highly educated employees, male and female, have a lower risk of becoming unemployed. Columns 2 and 4 in Table 3 show that this effect is considerably reduced when additional job characteristics are included in the model. This might be due to the fact that the correlation between our measure of education and the variable indicating employment according to level of qualification is strong. A greater share of workers with higher qualifications are employed in accordance with their educational level. Alternatively, and this needs further investigation, combining the effect of time since reunification and education suggests that employers originally used education certificates from the East German education system as a screening device. Subsequently these were replaced by other indicators of an individual's productivity.

Further education is included applying two different specifications. Columns 1 and 3 report findings collapsing all types of further education into one single unspecific variable measuring participation in further education. This form of participation does not significantly reduce the risk of transition into unemployment for men. A more detailed measure of participation in retraining, adjustment, career-related, adaptation and other further education courses versus no participation shows the differential impact of such training schemes for men, which is masked in the broad category of participation in further education tested in column 3[2].

Similar to women, we found a positive effect of adaptation course on reducing the risk of unemployment, but male participants in retraining courses were more likely to be unemployed than other participants or nonparticipants. Extensive retraining courses, usually full-time courses lasting more than six months, have not prevented unemployment[3]. This might be due to the fact that it was difficult to assess what kinds of occupational fields would be needed most during or even after the transformation period. It might also be due to the previously held occupation or other unobserved characteristics of those selected for retraining. A more careful assessment of the initial conditions (Fitzenberger and Prey 1995) before selection could provide information about this sizable positive effect on the risk of unemployment for men.

7. Conclusion

Our concluding remarks review the hypotheses stated above in light of the evidence of the transition processes we estimated. As in other recent studies of participation in further education and its impact on employment, unemployment, and earnings (Fitzenberger and Prey 1995; Pannenberg 1995; Becker and Schömann 1996) a great deal of care has to be exercised in the choice of "true" control groups against which to estimate further effects. Additionally, adequate treatment of selectivity issues is difficult to achieve and we have to carry out further analyses to corroborate our results.

Participation in further education is all the more likely if people, particularly women, have a strong foothold in the labor market. Age selectivity impedes little the ambitious

[2] From this set of effects a note of caution is indicated when insignificant results of estimates on further education and training are reported. There seems to be a great heterogeneity among different kinds of further education and training schemes which needs to be captured in a detailed way. Very often a small sample size and few training events are responsible for statistical artifacts in the insignificant effects of further education on employment and probably earnings (Becker and Schömann 1996).

[3] Although not reported here, we found for men that participation in full-time educational arrangements does not reduce the risk of unemployment while participation in full-time arrangements has positive effects on employment security. Part-time further education is most likely to assure the close connection of the two worlds of learning and work which is known to produce effective outcomes (Tuijnman and Schömann 1996).

goals of lifelong learning. As rebuilding an institutional basis to provide further training policies took some time after reunification, the probability to take up a course increased with the time since reunification. Education selectivity, however, is observed in a way comparable to the pattern in West Germany (Becker 1991; Schömann and Becker 1995). The joint occurrence of longer working hours and a higher probability of participation in further education hints at a form of segmentation of the labor market whereby those who have a job are at the same time those who invest more in further education. A reorganization of working and learning in a different way seems indicated.

Results indicate that part-time employees are less likely to start further training. This selectivity against part-time employees might help explain how part-time employment might lead to dead-end career tracks with low wage growth and low job security. Men in employment choose shorter types of skill adaptation courses, whereas the unemployed enter primarily longer lasting substantial retraining courses. Men and women of younger birth cohorts have a higher risk of unemployment in the coming years. The new phenomenon of unemployment among younger people, relatively scarce in West Germany, is becoming an issue in eastern Germany.

The impact of further education and training on the risk of becoming unemployed differs significantly between men and women. Further education reduces the risk of unemployment for women generally, but for men this impact depends on the specific type of further education. For female in full-time or part-time arrangements, further education during working time as well as adaptation courses lower the likelihood of becoming unemployed.

For men, we observe a greater heterogeneity of the impact of further education participation on employment prospects. Positive effects on men's employment duration correlates significantly with the type of further education courses. While male participants in full-time educational arrangements or retraining courses have higher risks of becoming unemployed, participation in part-time educational arrangements or adaptation courses decreases the likelihood of unemployment after further education. Entry conditions and factors of unobserved heterogeneity may play a role in this finding, hiding the underlying process that there is an accumulation of low employment security for specific groups of men in the labor force. Men who received retraining become more likely to be unemployed than men who have participated in integration or other further education courses. Perhaps there is an accumulation of disadvantages on the labor market for a specific group of men who need more than a retraining course to reach "employability." Such processes could lead to increasing polarization within the labor force.

References

Becker, Rolf. 1991. "Berufliche Weiterbildung und Berufsverlauf," Mitteilungen aus der Arbeitsmarkt- und Berufsforschung, 24: 351-64.

Becker, Rolf and Klaus *Schömann.* 1996. "Berufliche Weiterbildung und Arbeitseinkommen — Eine Längschnittstudie über den Einfluß beruflicher Weiterbildung auf Einkommensverläufe," Kölner Zeitschrift für Soziologie und Sozialpsychologie, Heft 48, pp. 426-61.

Behringer, Friederike. 1995. "Weiterbildung in Ost- und Westdeutschland," Vierteljahrshefte zur Wirtschaftsforschung, Heft 1, pp. 26-50.

Berger, Horst, Thomas *Bulmahn,* and Wilhelm *Hinrichs.* 1995. "Erwerbsverläufe in Ostdeutschland: Einflüsse und Folgen," WZB-Discussion Paper FS III 95-403. Berlin: Wissenschaftzentrum Berlin für Sozialforschung.

Blaschke, Dieter and Elisabeth *Nagel.* 1995. "Beschäftigungssituation von Teilnehmern an AFG-finanzierter beruflicher Weiterbildung," Mitteilungen aus der Arbeitsmarkt- und Berufsforschung, Heft 28, pp. 195-215.

Blossfeld, Hans-Peter and Götz *Rohwer.* 1995. Techniques of Event History Modeling New Approaches to Causal Analysis. Mawah, N.J.: Earlbaum.

Brinkmann, Christian. 1995. "Arbeitsmarktpolitik in Ostdeutschland: Eine Zwischenbilanz nach fünf Jahren Transformation," Beschäftigungsobservatorium Ostdeutschland, Heft 16/17, pp. 4-9.

Bundesanstalt für Arbeit. 1995. "Berufliche Weiterbildung: Förderung beruflicher Fortbildung," Umschulung und Einarbeitung im Jahr 1994. Nürnberg.

Dobischat, Rolf and Rudolf *Husemann.* 1994. "Betriebliche Weiterbildung als Element regionaler Arbeitsmarktpolitik in den neuen Bundesländern?" In Hubert Heinelt, Gerhard Bosch and Bernd Reissert (eds.), Arbeitsmarktpolitik nach der Vereinigung. Berlin: Rainer Bohn, pp. 197-213.

Esser, Hartmut 1996. "Die Definition der Situation," Kölner Zeitschrift für Soziologie und Sozialpsychologie, Heft 48, pp. 1-34.

Fitzenberger, Bernd and Hedwig *Prey.* 1995. "Assessing the Impact of Training on Employment. The Case of East Germany," Discussion Paper Nr. 23 — 1995, University of Konstanz CILE.

Heckman, James J. and Jeff *Smith.* 1996. "Experimental and Nonexperimental Evaluation." In Günther Schmid, Jacqueline O'Reilly and Klaus Schömann (eds.), International Handbook of Labour Market Policy and Evaluation. Aldershot: Edward Elgar, pp. 34-76.

Huinink, Johannes and Karl Ulrich *Mayer.* 1993. "Lebensverläufe im Wandel der DDR-Gesellschaft." In Hans Joas and Martin Kohli (eds.), Der Zusammenbruch der DDR. Frankfurt am Main: Suhrkamp, pp. 151-71.

Meier, Artur. 1993. "Die Probe aufs Exempel: Weiterbildung im sozialen Strukturwandel Ostdeutschlands." In Artur Meier and Ursula Rabe-Kleberg (eds), Weiterbildung, Lebenslauf, sozialer Wandel. Neuwied: Luchterhand, pp. 183-92.

Pannenberg, Markus. 1995. "Weiterbildungsaktivitäten und Erwerbsbiographie — Eine empirische Analyse für Deutschland," Frankfurt am Main: Campus.

Rendtel, Ulrich. 1995. Die Analyse von Paneldaten unter Berücksichtigung der Panelmortalität — Theorie und Empirie am Beispiel des Sozio-ökonomischen Panels (SOEP). Frankfurt am Main: Campus.

Schmid, Günther. 1993. "Übergänge in die Vollbeschäftigung. Formen und Finanzierung einer zukunftsgerechten Arbeitsmarktpolitik," WZB-Discussion Paper FS I 93 — 208. Berlin: Wissenschaftszentrum Berlin für Sozialforschung.

Schömann, Klaus. 1994. "The Dynamics of Labor Earnings over the Life Course. A Comparative and Longitudinal Analysis of Germany and Poland." Berlin: Max Planck Institute for Human Development and Education/edition sigma.

Schömann, Klaus and Rolf *Becker.* 1995. "Participation in Further Education Over the Life-Course: A Longitudinal Study of Three Birth Cohorts in the Federal Republic of Germany," European Sociological Review, Heft 11, pp. 187-208.

Steiner, Victor. 1994. "Langzeitarbeitslosigkeit während des Übergangs zur Marktwirtschaft — Ostdeutschland nach der Vereinigung." In Heinz König and Viktor Steiner (eds.), Arbeitsmarktdynamik und Unternehmensentwicklung in Ostdeutschland. Baden-Baden: Nomos, pp. 253-309.

Tuijnman, Albert C. and Klaus *Schömann.* 1996. "Life-long Learning and Skill Formation." In Günther Schmid, Jacqueline O'Reilly and Klaus Schömann (eds.), International Handbook of Labour Market Policy and Evaluation. Cheltenham: Edward Elgar, pp. 156-76.