THE CURSE AND BLESSING OF TRAINING THE UNEMPLOYED IN A CHANGING ECONOMY: THE CASE OF EAST GERMANY AFTER UNIFICATION

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Abstract: We analyse the effects of government-sponsored training for the unemployed conducted during East German transition. For the microeconomic analysis, we use a new, large and informative administrative database that allows us to use matching methods to address potential selection bias, to study different types of programmes, and to observe labour market outcomes over 8 years. We find strong evidence that, on average, the training programmes under investigation increase long-term employment prospects and earnings. However, as an important exception, the longer training programmes are not helpful for their male participants. At least part of the explanation for this negative result is that caseworkers severely misjudged the structure of the future demand for skills.

Keywords: Active labour market policy, nonparametric identification, matching estimation, causal effects, programme evaluation, panel data, gender differences

JEL classification: J 68

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1 Introduction

In the course of the monetary, economic and social union in July 1990, East Germany adopted most of the regulations that govern economic life from West Germany (currency, legal order, wage structure, social system, etc.). Transitional arrangements were rare. For example, a low wage policy by devaluating the currency, as used by other transitions countries, was not possible. As a result, the formerly centrally planned East German economy - almost over night - faced the conditions of a modern Western-style market economy. Until December 1990, production of goods dropped to only 50% of its 1989 level and unemployment rose rapidly (Akerlof, Rose, Yellen and Hessenius, 1991). To accommodate the dramatic developments in the East German labour market, the German government used active labour market policies (ALMP) on a massive scale. At its peak in 1992, expenditures for ALMP summed up to more than 9% of East German GDP.

As part of the ALMP, government-sponsored training played an important role in adjusting the skills of the East German labour force, which had become largely obsolete under the new system, to the requirements of a modern market economy. A common feature of these training programmes was that, usually, the human capital investment was substantial. Durations of one or two years were not unusual. Some courses had durations of up to three years.

Here, we analyse the short- and long-run effects of government-sponsored training for the unemployed conducted in the period 1993-1994. Our findings point to two major issues. First, to fully understand the impact of training programmes on labour market outcomes, it is important to study short- and long-run effects of training programmes. Those effects may be distinctively different particularly for longer programmes. The importance of long-run effects was emphasised for Western market economies by e.g. Couch (1991), Hotz, Imbens and Klerman (2000), Jacobson, LaLonde and Sullivan (2004), Jespersen, Munch and Skipper (2004), Lechner, Miquel and Wunsch (2004), and Winter-Ebmer (2001). All these studies

agree that positive long-run effects of training are likely (as opposed to the previous literature, which, based on shorter follow-up periods, could not agree on any likely sign of the training effects; see e.g. Martin and Grubb, 2001). Our results confirm this view. Furthermore, we find negative lock-in effects in the short-run that are directly related to programme duration. Thus, following the evolution of the effects over time is crucial for understanding the impact of the programmes on individual labour market performance.

Second, we find considerable effect heterogeneity among participants as well as across types of programmes. In particular, we find no or even negative employment effects of longer training programmes for men, but positive effects for women. These gender differences occur because men and women were trained for different occupations. Unfortunately, many caseworkers misjudged the future demand for skills; the majority of male participants were trained towards occupations in the construction sector (about 70% of participants in the longest programme). Construction experienced a boom in the early 1990s (when caseworkers made their decision) but went into bust soon after the courses were completed. Thus, the blessing of having obtained funding for long vocational training became a curse for its participants. This finding pinpoints the importance of correct targeting of training and other ALMP measures, which is of course particularly difficult in a rapidly changing economy.

Earlier studies that analyse government-sponsored training in East Germany were not able to address these issues. Although evidence for other transition countries like Poland (O'Leary, 1998b; O'Leary, Kolodziejczyk and Lázár, 1998; Puhani, 1999; Kluve, Lehmann and Schmidt, 1999, 2004)¹, the Slovak Republic (Lubyova and Van Ours, 1999) and Hungary (O'Leary, 1998a; O'Leary, Kolodziejczyk and Lázár, 1998) suggests that training programmes succeeded in raising individual employment probabilities of participants, the evidence for East Germany is mixed, so far. The earlier studies for East Germany use survey data that are rather limited with respect to the length of the observation period, sample size and the avail-

ability of sufficiently detailed information to account for selectivity and programme heterogeneity.² Most of these studies use parametric models³ and find negative or insignificant short- to medium-term employment effects (e.g. Pannenberg, 1995; Hübler, 1998, Hujer and Wellner, 2000), but there are also studies that obtain positive effects (e.g. Pannenberg and Helberger, 1997; Prey, 1999). The lack of robustness is due to the sensitivity of the results to different parametric assumptions, small sample sizes, and the inability to measure long-run effects.

Recent evidence based on new administrative data shows that negative lock-in effects during and shortly after programme participation are important in East Germany. Hujer, Thomsen and Zeiss (2004) estimate a multivariate mixed proportional hazard rate model to analyse the effects of government-sponsored training conducted in the period 2000-2002 on the transition rate into regular employment. Because of the short time horizon available to observe outcomes, the negative lock-in effects drive their results. Speckesser (2004) and Fitzenberger and Speckesser (2005) draw their sample from the same administrative records than we do. However, they restrict their analysis to one special type of government-sponsored training and observe outcomes for 36 months after the beginning of the programme only, compared to 96 months in this study. Based on propensity score matching, they find negative lock-in effects up to 12-18 months after programme start. Speckesser (2004) who focuses on training conducted in the period 1993-1994 finds no significant effects thereafter, mainly because of rapidly decreasing sample size towards the end of his observation period. Fitzenberger and Speckesser (2005), who cover a longer period of programme participation (1990-1997), obtain positive employment effects of about 5-10 percentage points about 20 months after programme start.

¹ Earlier studies of Puhani (1996) and Puhani and Steiner (1997) find, however, no significant effects.

² Pannenberg (1995), Pannenberg and Helberger (1997), Fitzenberger and Prey (1998, 2000), Hübler (1997, 1998), Staat (1997), Kraus, Puhani and Steiner (1999), Lechner (1999, 2000), Prey (1999), Hujer and Wellner (2000), Bergemann, Fitzenberger and Speckesser (2004). These studies use the German Socioeconomic Panel or the Labour Market Monitor East or for Saxony-Anhalt (see the survey by Wunsch, 2005).

Altogether, we extend the literature in several dimensions. First, using a newly available administrative database allows us to measure the effects of different training programmes over 8 years, thereby uncovering the potentially important long-run effects of substantial government-sponsored training programmes and distinguishing these effects from the lock-in effects that occur in the short-run. Second, we check the heterogeneity across programmes and groups of participants which enables us to add to the discussion of correct targeting of ALMP measures. Third, the database is particularly rich with respect to information concerning the selection process, so we can address selection issues in a reasonable way. Finally, the sample used is large enough to allow non- or at least semi-parametric estimation of the effects using matching methods.

The remainder of the paper is organised as follows: In the next section, we outline those parts of the active labour market policies in East Germany that are important for our paper. Section 3 describes our data. Section 4 outlines our econometric strategy. Section 5 presents the main results as well as a summary of an extensive sensitivity analysis. Section 6 concludes. Two appendices provide additional information on the data and the estimation procedure.

2 Labour market policies in East Germany

2.1 *The use of ALMP during East German transition*

The rapid contraction of the East German economy after unification led to sharp reductions in labour demand. To cope with the immediate strongly adverse effects of this, different instruments of ALMP were used. Immediately after unification, short-time work (a reduction in work hours combined with a subsidy from the unemployment insurance system to compensate the earnings loss) and early retirement schemes played a major role. In East Germany, especially in 1991, the main objective of short-time work was to delay the transition into unem-

³ Semi- or non-parametric approaches are used by Lechner (1999, 2000), Hujer and Wellner (2000) and Bergemann, Fitzenberger and Speckesser (2004).

ployment to prevent the official unemployment rate from skyrocketing. In that year, more than 1.6 million people were directly absorbed into short-time work (see Table 1).

Since the skills of the labour force did not meet the requirements of a modern market economy, different kinds of training programmes were introduced on a large scale to lessen these skill deficits. In 1991, 800,000 individuals participated in some form of labour market training. Since then, the number of participants has declined, but with 468,000 participants in 2003, training is still the most important ALMP programme in East Germany.

Table 1: Participants in the quantitatively most important ALMP measures 1991-2003

	1991	1993	1995	1997	1999	2001	2003
Training ^{a)}	760	263	237	155	350	415	468
Temporary wage subsidies ^{a)}	133	31	20	11	65	99	107
Employment programmes ^{b)}	183	237	206	154	348	190	110
Short-time work ^{b)}	1616	181	71	49	27	27	35
Early retirement ^{b)}	189	639	341	58	-	-	-
Unemployment rate in %	10.2	15.4	14.8	19.1	18.7	18.8	20.1

Sources: BA (1992-2004).

Notes: ^{a)} Total number of inflows (1000 persons). ^{b)} Yearly average (1000 persons).

A third type of ALMP was subsidised employment which comprised temporary wage subsidies to compensate for reduced productivity during the phase of initial skill adaptation in a new job, and so-called employment programmes which provided subsidised jobs outside the regular labour market. In times of high and persistent unemployment, employment programmes are supposed to be an important measure to maintain the employability of unemployed and especially long-term unemployed persons, as well as to preserve social stability in regions with particularly high rates of unemployment.

2.2 Training as a part of German ALMP

In Germany, labour market training consists of very heterogeneous instruments that differ largely in the form and intensity of the human capital investment as well as in their respective duration. Traditionally, German training courses have the aim of assessing, maintaining or improving the occupational knowledge and skills of the participant, of adjusting skills to

technological changes, of facilitating a career improvement, or of awarding a first professional degree. In the East German transition process, however, the use of the two latter categories was negligible since the main objective of training programmes was to adjust the skills of the East German labour force to the requirements of a modern market economy. Usually, participants in such training programmes receive a transfer payment that is of the same amount as unemployment benefits.⁴ Moreover, the public employment service (PES) bears the direct cost of the programme, and it may cover parts of additional expenses for childcare, transportation and accommodation.

For our analysis, we aggregate the different programmes into groups according to their homogeneity with respect to selection of participants, educational contents and organisation, as well as sample size and information available to distinguish different types of programmes. Table 2 shows the resulting groups of training programmes plus a residual category. Ignoring the programme types for which the number of observations is too small, we restrict our analysis to general further vocational training and retraining programmes.

Further training comprises courses that provide a general adjustment of working skills or an additional qualification in the profession currently held, as well as courses that award a first professional degree. Planned durations range from one month to two years (cf. Figure 1). Since further training is a fairly large and heterogeneous group, we split it into two subgroups based on the planned duration of an individual course. As a characterisation of the programme and not its participants, *planned* instead of *actual* duration has the advantage that the behaviour of the individual during participation does not influence it (e.g. a short actual duration could be associated with a short course or a long course that a participant left early). Retraining enables working in a different profession than the one currently held by awarding a new professional degree. Planned durations are long (up to three years, 21 months on average).

⁴ Before 1994, the replacement rate was somewhat higher than for unemployment benefits.

The acquired skills are equivalent to an apprenticeship in the German apprenticeship system. Thus, the human capital investment is quite substantial.

Table 2: Definition of programmes

Programme	Description
Short training	Further training in the profession held with planned duration ≤ 6 months.
Long training	Further training in the profession held with planned duration > 6 months.
Retraining	Training to obtain a new professional degree in a field other than the profession currently held.
Other programmes	Practice firm: Further training that simulates a job in a specific field of profession Career improvement: Further training to obtain a higher professional degree, e.g. master craftsman, technician, or a (below university) degree in business administration. Residual category: Various very small and heterogeneous programmes.

Note: Due to insufficient sample size the category *other programmes* is not evaluated in this study.

Figure 1: Distribution of the planned programme duration in our data

Note that generally, the German programmes are long on average compared to other OECD and transition countries (e.g. OECD, 1996a, b). Moreover, most training courses are full-time courses, and in addition to classroom training, a course may include on-the-job training which is frequently the case in courses that award a professional degree.

3 Data and definition of the evaluation sample

3.1 The data

We use the same administrative database as in Lechner, Miquel and Wunsch (2004) and refer the reader to that paper for more details. It combines three different sources: the IAB Em-

ployment Subsample, the benefit payment register, and the training participants data.⁵ For East Germany, it covers the period 1990-2002. With this database, we are able to reconstruct up to 12 years of individual post-unification employment histories. It contains detailed personal, regional, employer and earnings information (see Appendix A for a complete list of variables). Thus, it allows controlling for many if not most of the factors that determine selection into programmes (see the detailed discussion in Section 4.2) as well as a precise measurement of interesting outcome variables (e.g. employment status, earnings). Moreover, we are able to distinguish different programme types and it has a sufficient number of observations for the major programme groups to account for programme heterogeneity.

Of course, there are several drawbacks as well. First, the data do not cover nonworking recipients of social assistance because they do not receive benefits from the PES but from the local authorities. Second, employment that is not subject to social security contributions is unobserved. On the one hand, this includes self-employment and working as a civil servant ("Beamter"). On the other hand, this regards minor employment below the relevant earnings threshold. Third, it is possible to distinguish between subsidised and regular employment only from the year 2000 onwards. This problem is particularly severe for East Germany, because a substantial part of the labour force were in subsidised employment during the 1990s (see Table 1). Fourth, the training information for East Germany prior to 1993 is incomplete and not correctly coded. Fifth, the unification process had a direct impact on the data gathering process. Data collection, which depends to a considerable part on reports from employers, was phased in after unification. Some employers provided information as early as 1991 whereas in most cases it took until 1992 until all employers were registered with the authorities. Therefore, our sample is selected on either having an initial employment or unemploy-

⁵ The common German abbreviations for these data sources are IABS, LED and FuU, respectively. A detailed description of the IABS and the LED is provided by Bender et al. (1996) and Bender, Haas and Klose (2000). For the FuU see Miquel, Wunsch and Lechner (2002). See also Bender et al. (2005) for how the data has been prepared for evaluation purposes.

ment spell in the data. Thus, later on, we condition on having observed an employment spell prior to the unemployment spell leading to participation. The sixth drawback is that information about long-term employment histories is absent. However, since in the German Democratic Republic unemployment was (officially) absent and labour force participation was very high, the resulting additional unobserved heterogeneity should be very small, in particular since unification per se certainly discounted the value of human capital and experience obtained under the old centrally planned economic system.

Despite these drawbacks, compared to what was used in the literature so far, this database is a substantial improvement in several dimensions, like sample size, selection and outcome information, as well as observable programme heterogeneity.

3.2 Definition of programme participation

In this section, we define 'participation in a programme' and our population of interest. First, since the programme participation data is of good quality only after 1992, we consider programme participation between 1993 and 1994. By choosing this period, we are able to focus on the most recent programmes that still allow for a long enough observation period for detecting long-run effects.⁶ Second, a person is included in our population of interest if he starts an unemployment spell between 1993 and 1994. The group of participants in training consists of all persons entering a programme between the beginning of the first unemployment spell after 1992 and the end of 1994. If there are multiple participations in this period, then only the first one is included in the analysis.

The left panel of Figure 2 shows the distribution of starting months in the two-year window we consider. Partly due to the construction of our sample, the probability of treatment increases over time. The right panel of Figure 2 shows the number of months it takes until

⁶ Furthermore, since we observe only training spells after the participant left training, and some courses have a duration of more than two years, and there is no training information after 1997, concentrating on the years 1993 and 1994 does not lead to a selective underrepresentation of long training spells.

participation after the beginning of the 'defining' unemployment spell (the first UE spell between 1993 and 1994). From the latter graph it seems that a considerable group of trainees enter training fairly (surprisingly) early in the spell, particularly for retraining.

Figure 2: Distribution of start dates and duration until start of programmes (in %)

Note: Monthly measurement based on estimation sample for participants.

Given our definition of a small treatment window (although often much smaller windows are used in the literature, e.g. Dorsett, 2005), and taking up the arguments in Fredriksson and Johansson (2003, 2004) it is particularly important for the interpretation of our results which share of the control groups receives treatment as well (similar to the problem of substitution bias in an experiment). The fact that we condition nonparticipation on ending unemployment without entering a programme (or not ending unemployment at all) before 1995 might lead to some bias in our results in favour of the so-defined nonparticipation status. This bias should be severe if nearly every unemployed has to participate. However, Table 3 shows that only about 17% of those classified as nonparticipants receive some training between 1995 and 1997 (the participation information in that database ends 1997).⁷

From Table 3 we also see that second or further participations ('programme careers') appear not to be a major problem for the interpretation of our results. Less than 20% of the trainees

⁷ Also note that the approach suggested by Fredriksson and Johansson (2003, 2004) as applied e.g. by Sianesi (2004) or Steiger (2004) estimates a different causal effect which is not of particular interest in our study.

participate a second time, often in the same programme type as they already participated in.⁸ The conceptual problem with analysing the effect of e.g. the second participation is that the second participation may be influenced by the success of the first programme. Thus, such an analysis of the effects of sequences of programmes requires a dynamic evaluation approach as suggested by Lechner and Miquel (2005) and Lechner (2004), which is not feasible with our data without further aggregation of programme types, which, in turn, is undesirable for obvious reasons.

Table 3: Participation in different programme types in % of participants in subsamples until 1997

Programme participation between 1993 and 1997	Treatment status in study (first treatment)				
	Nonparticipation	Short training	Long training	Retraining	Other
Short training	8.8	8.7	6.7	0.7	6.3
Long training	3.6	2.8	2.8	1.3	2.8
Retraining	1.8	2.2	0.9	0.9	1.7
Other	2.6	6.2	1.3	2.0	2.4
Total other treatments than first treatment	16.9	19.9	11.7	4.9	13.2

Note: Entries show the fraction (%) of members of the subsamples stated in the columns who participated at least once in the treatments stated in rows after their first treatment (programme participants) or after 1994 (nonparticipants). Due to data restrictions of the TPD data base only training spells completed by the end of 1997 are observable.

3.3 Selection of population and sample

When choosing the appropriate subpopulation from our inflow sample into unemployment, we aim at having a homogenous group of people that covers the prime age part of the East German population who is eligible for participation in training. Therefore, we require that all individuals were employed⁹ at least once before programme participation and that they received unemployment benefits (UB) or assistance (UA) in the month before programme start (as well as in the month of programme start for nonparticipants).¹⁰ This, however,

⁸ Overall, about 20% of registered unemployed enter government-sponsored training per year (BA, 1992-2004).

⁹ 'Employed' means that we observe the person at least once in insured employment in the IABS (for the majority of our individuals, the first observation in the data is an employment spell).

¹⁰ In fact, receipt of UB or UA directly before entering a programme is not entirely sufficient to ensure eligibility. Individuals must also have a formal professional degree plus three years of work experience (since 1994, zero years), or alternatively at least six years (since 1994, three years) of work experience. Thus by also requiring individuals to be employed at least once before the programme, the remaining group of participants and nonparticipants is most likely to be eligible.

requires the use of variables measured relatively to the start date of the programme.¹¹ In this paper, we follow one of the approaches suggested by Lechner (1999). We simulate start dates for nonparticipants by drawing start dates from the empirical distribution for participants and then ensuring that this date does not lie before the beginning of the 'defining' UE spell, or after 1994 or of the person's last spell that is observed in the data if it ended before 1995.¹²

To avoid most influences coming from retirement, early retirement and primary education, we also impose an age restriction (20-53 years) in the year of the (hypothetical) programme start. Concentrating on the main body of the active labour force, we exclude unemployed who were trainees, home workers, apprentices or without previous employment or whose last employment before the 'defining' UE spell was less intensive than half of the usual full-time work hours. Furthermore, since the group of foreigners is extremely heterogeneous in East Germany (there is no 'stable' and at least partly assimilated guest worker population, as in West Germany), we drop them as well.

Table 4: Sample selection rules and resulting sample sizes

	Nonpar- ticipation	Short Training	Long Train- ing	Retraining	Other
Persons entering unemployment between Jan. '93 and Dec. '94	17574	418	692	531	383
Simulated programme start after the entry in unemployment and before the end of the observation period					
Remaining observations	12904	418	692	531	383
Eligibility: Only individuals receiving UB or UA in the month before the programme start (also in the month of the programme start for nonparticipants)					
Remaining observations	6599	400	656	496	350
Personal characteristics : a) $20 \leq \text{age} \leq 53$; b) no trainees or apprentices; c) at least one observation of employment; d) no home workers; e) no part-time worker less than half of a full-time work; f) only German					
Final sample	4604	321	538	445	288
Note: All variables are measured before or in the year of the start of the programme.					

¹¹ Moreover, all variables potentially influencing both selection into programmes and outcomes are measured relatively to the start of the programme.

¹² Nonparticipants who do not satisfy this criterion are excluded. We tested an alternative procedure for assigning hypothetical start dates to nonparticipants. We randomly draw from the empirical distribution of elapsed unemployment durations before programme start of participants and check whether the respective nonparticipant has at least the same unemployment duration. If so, we assign as hypothetical starting date the month after the drawn unemployment duration. Our results remain almost unchanged (see Section 5.4).

Table 4 shows how the sample shrinks when imposing these criteria. The largest drop in the number of observations occurs for nonparticipants to make them a priori comparable to the treated using the criteria above, which they have to fulfil at the simulated start date. However, since we still keep almost 5,000 unemployed nonparticipants, the large reduction is of no serious concern. The reduction for participants is small (about 20% on average).

3.4 Descriptive statistics

Table 5 shows descriptive statistics for selected socio-economic variables for the different subsamples that are defined by treatment status.

Table 5: Selected descriptive statistics according to participation status (means or shares in %)

	Nonparticipation	Short training	Long training	Retraining
Number of observations	4604	321	538	445
Personal characteristics				
Women	63	65	65	43
Age*	37	36	38	32
Education: No professional degree	12	7	4	14
With professional degree	78	87	77	81
University, polytechnical degree	4	3	15	3
Position in last job				
Salaried employee	26	30	54	21
Part-time worker	26	20	17	10
Master craftsman	1	0	1	0
Unskilled worker	22	25	13	28
Skilled worker	26	26	16	40
Last monthly earnings				
Salary in Euros*	947	1053	1204	1144
Remaining UB claim (before entry into the programme)				
Remaining UB claim in months*	2.2	2.1	2.3	2.3
Legal UB claim at the beginning of the last unemployment spell before the programme				
Legal claim* (months)	5.7	5.2	5.8	5.5
Programme information				
Planned programme duration* (months)	0	3.4	10.5	20.5
Regional information				
Berlin, Postdam	11	7	7	9
Saxony, Thuringia	40	46	47	41
Mecklenburg-Western-Pomerania, Brandenb.	10	14	15	18
Saxony-Anhalt	17	10	14	13
Regional information missing	22	23	17	19
Local unemployment rate ≤ 15%	35	33	37	34
15% < UE rate ≤ 20%	58	58	56	56
UE rate > 20%	7	9	7	10
Subsidised employment in				
January 2002	5.8	7.3	6.5	4.2

Note: *Means rather than shares. ** Measured in the year of the programme start. Subsidised employment includes temporary wage subsidies, job creation schemes and structural adjustment measures. The sample used for the table is the one after all selection steps described in Section 3, but before imposing the common support requirement. See Appendix A for more descriptive statistics and a detailed list of variables.

The results can be summarised as follows: (i) Participants in retraining are on average 32 years old and thus on average about five years younger than other unemployed. This is in line with the idea that substantive human capital investments are more beneficial the longer the productive period of the new human capital is. (ii) Participants in retraining are less educated and skilled than the rest. (iii) Participants in short and particularly participants in long training are better educated and were in higher job positions in their previous job than the rest. (iv) Remaining unemployment benefit (UB) claims before participation do not show much variation. (v) The share of women among the unemployed is much higher in East Germany than for example in West Germany, which is reflected in their high share among nonparticipants and participants in long and short training, but not in their share observed in retraining which shows a 'male' bias. (vi) There are some regional differences that, however, do not appear to be related to the local unemployment rate (see Appendix A for a list of more disaggregated regional). (v) Finally, in 2002 subsidised employment is still a considerable part of employment (about 15% of all employment is subsidised; this information is unavailable before 2000 and incomplete for 2000-2001). Furthermore, Table A.1 in the Appendix shows that only very few people in our evaluation sample participated in a programme before the programme participation we are evaluating.

Figure 3 displays the time path of (subsidised and unsubsidised) employment and unemployment rates for the different groups of participants and nonparticipants relative to the actual or simulated beginning of the training. By construction of the sample, all members of these groups must be unemployed in the month before participation. Thus, the unemployment and employment rates show the usual increase/dip before participation (cf. Ashenfelter, 1978). Furthermore, note that all individuals must be employed at some point in time prior to the unemployment spell in which participation happens. Thus, there is a sharp increase in unemployment rates starting about one year before participation and a corresponding decline in employment rates.

After the programme, all employment measures show some recovery. The immediate speed of the recovery is negatively related to programme duration, pointing to a lock-in effect of participation (cf. Van Ours, 2004). None of the groups reaches its previous level, but the rate of recovery for nonparticipants is particularly low, already foreshadowing the results of the econometric part below. Note the interesting difference that appears between unemployment and employment. Both measures of labour market attachment show the same shape over time. However, for registered unemployed (defined as receipt of some form of benefits or participation in training) there does not appear to be any difference between the different groups of participants in the long-run, pointing to a significant group of people leaving the labour force (see the detailed statistics at the end of Table A.1 in Appendix A).

Figure 3: Employment and unemployment rates by participation status

Note: The employment and unemployment information is given only up to 36 months prior to training. Due to the process of gathering administrative data after unification, many unemployed may be observed for shorter periods.

4 Identification and estimation

4.1 Conditional independence and matching

We base our analysis on the 'multiple treatments' model of the microeconomic evaluation literature: An individual chooses between several states like participation in a specific training programme or nonparticipation in such a programme. The different *states* are called

treatments in the econometric evaluation literature. The potential participant in a programme gets a hypothetical outcome $\{Y^0, \dots, Y^M\}$, e.g. employment, in each state $S \in \{0, \dots, M\}$. This notation allows, us under the usual assumptions (see Rubin, 1974), to define our parameters of interest - the average treatment effects on the treated (ATETs) for pair-wise comparisons of the effects of different states (Lechner, 2001, 2002a, b):

$$\theta_0^{m,l} := E(Y^m - Y^l | S = m) = E(Y^m | S = m) - E(Y^l | S = m); \quad m \neq l; m, l \in \{0, \dots, M\}$$

ATET ($\theta_0^{m,l}$) is the expected effect for an individual that is drawn randomly from the population of participants in treatment m only. Without further assumptions, ATETs are not identified from the data. But if we can observe all factors that jointly influence outcomes and the participation decision, then - conditional on these factors (call them X) - the participation decision and the outcomes are independent. This property is exploited by the conditional independence assumption (CIA).

4.2 Is the conditional independence assumption plausible with our data?

Plausibility of the CIA requires that all major factors that jointly determine participation and outcomes are observed in the data. Thus, we should identify these variables and show that they are available in our data. This requires an understanding of the underlying participation decisions. Selection into programmes is determined by three main factors that are discussed in turn: eligibility, selection by caseworkers and self-selection by potential participants.

In Germany, eligibility requires that the potential participant qualifies for or receives unemployment insurance payments. Moreover, he must have a professional degree from the German apprenticeship or higher education system, or a minimum amount of work experience in one field of profession. We control for these factors by use of the education variables, the individual employment records and the entries from the benefit payment register.

Usually, it is the caseworker but it may also be the unemployed himself who proposes participation in training to improve employment prospects. In any case, the unemployed must apply before the beginning of the programme. The caseworker decides whether he will be admitted or not. There is no legal entitlement to participation, and caseworkers have a considerable amount of discretion. Usually, the caseworker decides in consultation with the potential participant whether or not and if so, what kind of training programme would be appropriate based on an assessment of the employment prospects and the specific qualification needs of the unemployed. According to German legislation, caseworkers have to take into account the chances of the unemployed for completing a specific programme successfully, and the situation in the local labour market. Variables capturing information about employment prospects and chances for successful completion of a programme include age, educational attainment, family status and past employment histories including information about past employers, earnings, position in job, specific occupation and industry. Moreover, our data contain detailed regional information that allow us to control for local labour market conditions, like the industrial, employment, population and wealth composition of the region as well as migration streams, tax revenues and local unemployment rates. In addition, since unemployment is rapidly rising during 1993 and 1994 and participation shows a varying pattern, we condition on the month of the start of the programmes thus netting out seasonal and timing effects.

From the point of view of the unemployed, his decision whether or not to participate in a programme is guided by considerations very similar to those of the caseworker. There are, however, additional reasons for joining or not joining a programme. If, for example, the unemployed sees no chance to find a job anyway, with or without a programme, he may prefer not to join a programme that reduces his leisure time (an important issue in the rapidly contracting East German economy). This again requires controlling for all factors that determine individual employment prospects and labour market conditions. Moreover, legislation provides rather strong incentives to participate in government-supported training. On the one hand,

unemployed who refuse to participate in a training course, risk suspension of their unemployment benefits. On the other hand, periods during which unemployed receive transfer payments while participating in a training programme count towards acquisition of unemployment benefit claims. Therefore, we constructed variables from the (un)employment histories that indicate the UB claim at the beginning and at the end of a spell.

Although this is much more information than usually available in studies that rely on the CIA (e.g. Heckman and Smith, 1999; Brodaty, Crépon and Fougère, 2001; Larsson, 2003; Dorsett, 2005), there are some potentially important factors missing. In contrast to Gerfin and Lechner (2002) or Sianesi (2004), there is no information about the caseworker's direct assessment of the characteristics and prospects of the unemployed, for example with respect to motivation and ability. Moreover, we do not observe things like jail and health histories. For these variables, we have to rely on their indirect effects, i.e. on their effects on the employment and earnings history that materialised in the past. The fact that we do not observe pre-unification employment histories should not lead to additional unobserved heterogeneity because in the German Democratic Republic, unemployment was (officially) absent and labour force participation was very high. In addition, unification per se certainly discounted the value of human capital and experience obtained under the old centrally planned economic system. Thus, what is important is what happened during the rapid transition period directly after unification. Although we do not fully observe this period due to the phasing in of the data, we capture the most important parts of it by the choice of our evaluation sample and period.

4.3 *A note on estimation*

Having established identification of the effects, i.e. the general feasibility of consistent estimation of the effects, the question of the appropriate estimator arises. All possible parametric, semi- and nonparametric estimators are implicitly or explicitly built on the principle that for every comparison of two programmes, for every participant of one of those programmes we

need a comparison observation from the other programme with the same characteristics regarding all factors that jointly influence selection and outcomes (see Section 4.2 for these variables). Here, we use propensity score matching estimators for multiple treatments as our baseline estimator to produce such comparisons. A clear advantage of these estimators is that they are essentially nonparametric and that they allow arbitrary individual effect heterogeneity (see Heckman, LaLonde and Smith, 1999, for matching with a binary treatment, and Imbens, 2000, and Lechner, 2001, for multiple treatments; Imbens, 2004, provides an excellent survey of the recent advances in this field). Gerfin and Lechner (2002) and Larsson (2003) used this estimator, among many others.

Appendix B contains the detailed results of a multivariate analysis that models selection into the different groups based on a multinomial probit model that is estimated by simulated maximum likelihood. Beyond providing useful descriptive statistics, the output from this selection model plays a key role in our selection correction mechanism since we use the estimated conditional on X choice probabilities (the so-called propensity scores) to form our comparison groups. The analysis revealed that gender, age, education, and last occupation are important individual characteristics that determine participation. Furthermore, although observed employment and unemployment histories are short, they are significantly correlated with participation choice. Regional information, such as the industrial, employment, population and wealth composition of the region as well as migration streams and tax revenues, which entered the probit in a highly disaggregated way to capture the specifics of supply and demand in the local labour market, play important roles in the selection process.

In addition to the propensity scores, we include as matching variables gender and the date of the beginning of the programme as well as three dummies which indicate whether the participant is observed employed 12, 24 and 36 months before the programme to make sure that we match correctly on these important variables. However, excluding all additional

matching variables except gender, or adding elapsed unemployment duration before the programme does not change the qualitative results that we obtain for the effects of training (see Section 5.4 and the internet appendix for details).

We improve the standard matching estimator for multiple treatments in two dimensions: To allow for higher precision when many 'good' comparison observations are available we incorporate the idea of calliper or radius matching (e.g. Dehejia and Wahba, 2002) into the standard algorithm. Furthermore, we increase the matching quality by exploiting the fact that appropriate weighted regressions that use the sampling weights from matching have the so-called double robustness property. This property implies that the estimator remains consistent if either the matching step is based on a correctly specified selection model, or the regression model is correctly specified (e.g. Rubin, 1979; Joffe, Ten Have, Feldman and Kimmel, 2004). Moreover, this procedure should reduce small sample as well as asymptotic bias of matching estimators (see Abadie and Imbens, 2006) and thus increase robustness of the estimator.

The actual matching protocol is presented in detail in Appendix C. All issues concerning the estimation and tests of its operational characteristics are contained in the internet appendix (see in particular Appendix IB for the implications of imposing common support, and match quality). Lechner, Miquel and Wunsch (2004) contains more technical information about the estimator that are omitted here for the sake of brevity. The most important sensitivity checks are also discussed in Section 5.4. In summary, our estimation results are not sensitive to issues concerning the implementation of the estimator.

5 The effects of training

5.1 *Measurement of the labour market outcomes*

According to German legislation, the most important objectives of ALMP are to increase re-employment chances and to reduce the probability of remaining unemployed. Therefore, our

outcome variables relate to the employment status, like registered unemployment and different types of employment (for example requiring a certain quality of the job, approximated by the job's duration or by the earnings compared to the previous job). Registered unemployment is defined as receipt of some form of benefits from the PES or participation in a training programme. We also consider gross earnings which is a crude measure for individual productivity. Below, we only present the results for those outcome variables that are most interesting. For all the others, the reader may consult the internet appendix which contains all background material.

Effects are measured monthly based on process time: *Month 1* in process time is the month after the programme started (with simulated start dates for nonparticipants). Focusing on the beginning instead of the end rules out that programmes appear to be successful just because they keep their participants busy by making them stay in the programme. We consider a programme to have a positive effect (in the short run) if everybody would leave for 'good' employment immediately after starting participation.

As noted earlier, our employment related outcome variables have the problem that we cannot distinguish subsidised and unsubsidised employment before the year 2000. Beginning in 2000, this becomes possible, although for 2000 and 2001 there is some underreporting. Since in East Germany subsidised jobs were used on a large scale in the early and mid 1990s, all results presented below that relate to this period have to be interpreted with that caveat in mind. Nevertheless, we do have a clean measure of the long-run effects in Tables 6-8.

5.2 Mean effects of the programmes for their participants

Table 6 shows the mean outcomes (ATETs) for all comparisons. We concentrate on the effects eight years after participation started and the three outcome variables unsubsidised employment, unemployment and earnings. Compared to nonparticipation and using unsubsidised employment as outcome variable, we find that short training and retraining have sub-

stantial positive effects on average, around a magnitude of a 10%-point gain in employment. The effects of long training are not significantly different from zero, though. The estimators of the pairwise comparisons are subject to more sampling error due to the much smaller comparison samples, thus requiring a larger magnitude of the effect to become significant. Therefore, it is not surprising that - with few exceptions like the dominance of retraining compared to long training for participants in long training - the effects are hardly significant.

Table 6: Estimated effects on unsubsidised employment 8 years after programme start

State m	State /	Sample size		Unsubsidised employment	Unemployment	Earnings
		m	l			
Short training	nonparticipation	292	3542	13.0*	3.3	208*
Long training	nonparticipation	502	3542	3.8	6.8	145
Retraining	nonparticipation	429	3542	7.3	-0.1	101
Short training	long training	292	502	4.3	-2.8	55
Short training	retraining	292	429	-5.2	0.6	-75
Long training	short training	502	292	3.2	3.8	-20
Long training	retraining	502	429	-14.7*	9.8	-102
Retraining	short training	429	292	<i>8.4</i>	1.5	120
Retraining	long training	429	502	-6.1	-5.2	-32

Note: **Bold** numbers indicate significance at the 5% level, numbers in *italics* relate to the 10% level and * to the 1% level.

The following figures show how the effects evolve over time. Figure 4 displays the estimates of the employment and unemployment effects of the different programmes (compared to all other states) for participants in the respective programme (ATETs). A line above zero indicates that the programme has a positive effect relative to the one (or nonparticipation) associated with that particular line. In other words, a line above zero is good news for the programme appearing in the header of the respective graph and bad news for the one associated with a particular line. Only effects significant at the 5% level are displayed. To use a consistent definition of employment over time, in these figures employment comprises both subsidised and unsubsidised employment. The difference between these two types is very small for about the last twenty months, but could be important for the short- and medium-run results given the number of employees in subsidised employment (see Section 2.1).

Figure 4: Dynamics of the effects after programme start (ATET; differences in %-points)

Note: Only effects that are significant at the 5% level (point wise) appear in the figures.

The results for long training and retraining show negative short-run effects that are the larger the longer the programme. However, since we are not able to distinguish subsidised and unsubsidised employment in the short run, the lock-in effects that are present in all figures may be just because nonparticipants and participants in short training move to employment pro-

grammes afterwards.¹³ In the longer run and with respect to employment, Figure 4 confirms the results of Table 6 in that retraining and short training dominate nonparticipation on average. Long training seems to have positive effects as well, although they are not significant at the end of the observation window. Yet, participants in long training would have benefited more had they participated in retraining instead. The effects with respect to unemployment are all zero in the long run (as suggested by Figure 3). This is probably related to the fact that training increases the period of receipt of unemployment benefits and/or that after remaining unemployed for such a long time, discouraged nonparticipants leave the labour force.

Figure 5: Dynamics of the effects monthly earnings (ATET; differences in EUR)

Note: Only effects that are significant at the 5% level (point wise) appear in the figures.

¹³ Because of this ambiguity, we do not present cumulated effects as we did for West Germany in Lechner, Miquel and Wunsch (2004).

The results in Figure 5 suggest that training consistently increases monthly earnings by about 100-200 EUR in the longer run for all training programmes (see also Table 6), although the results are not always significant for retrainees.

To check whether jobs are (somewhat) stable, we use an outcome variable which requires at least seven months of continuous employment (six months is the usual probation period in Germany, within which termination of a job is very easy for both sides). We obtain comparable results. The results are confirmed as well when we use employment that pays at least 90% of the job held prior to training (the results are available in the internet appendix).

5.3 Heterogeneity by types of unemployed

So far, we considered the average effects for the participants in the different programmes. Since participants are heterogeneous, there may be differences in how the programmes affect different types of individuals. Therefore, we stratify the sample along the dimensions unemployment duration, type of region, type of occupation and gender, and match within the strata. Note that the scope of this exercise is limited by the size of the subsamples. We find significant differences of the effects for the regional unemployment rate, the type of occupation before training, and gender (see Tables 7 and 8). The overall positive effect of short training is driven by its high effectiveness in regions with a comparatively low unemployment rate, whereas in the other regions it seems to be ineffective. Furthermore, the subsample results for different types of occupations suggest that *short training* may be the most effective programme for skilled workers. However, the samples underlying these estimates may be too small to draw robust inferences.

Table 7: Heterogeneity of the effects on unsubsidised employment eight years after the beginning of the programme (ATET; difference in %-points)

m - l	Regional UE rate		Type of occupation ^a		
	≤ 15%	> 15%	Unskilled	Skilled ^b	Salaried
Short training - nonparticipation	29.7*	3.2	7.1	20.1*	8.6
Short training - long training	17.4	2.3	-14.9	26.7*	-3.3
Short training - retraining	9.6	-10.9	-20.6	7.7	-28.0
Long training - nonparticipation	6.3	1.9	3.4	-4.3	2.6
Long training - short training	-23.5*	8.5	5.4	-25.2*	-4.5
Long training - retraining	<i>-16.8</i>	<i>-15.3</i>	-13.6	-3.1	-20.6
Retraining - nonparticipation	6.8	3.7	-1.6	6.1	17.4
Retraining - short training	-24.5*	0.8	0.5	-24.8*	1.8
Retraining - long training	0.8	<i>10.6</i>	7.9	23.8	1.2
Sample size					
Nonparticipation	1156	2232	680	810	946
Short training	91	187	55	68	80
Long training	174	309	58	74	263
Retraining	136	279	101	166	88

Note: Bold numbers indicate significance at the 5% level, numbers in *italics* at the 10% level and * at the 1% level. Cells shaded in grey indicate that the difference of the two estimated effects is significant at the 5% level. ^aFor the comparison short training - retraining, only the pairwise differences unskilled-skilled and skilled-salaried are significant. ^bIncl. master craftsman. MNP estimates from the joint model, but the remaining steps of the estimation are performed in the subsamples. The number of observations does not add up to the one in the full sample because the common support criterion must delete more observations if used in subsamples (see the internet appendix).

Clearly, the most substantial differences occur with respect to gender and the two longer training programmes (see Table 8). Compared to nonparticipation, retraining increases the employment rate of participating women by about 25%-points. It decreases unemployment by about 8%-points and increases monthly earnings by about 400 EUR. Retraining is, however, completely ineffective for participating men. The effects of long training exhibit gender differences, too. The negative effects for month 96 indicate that participating in long training really hurts men by reducing their employment probabilities and increasing their unemployment probabilities. But this month is really an exception. For almost all other months, a zero effect for long training compared to nonparticipation cannot be rejected by the data and the male-female difference is smaller than for retraining. Short training courses appear to be effective for both men and women.

Table 8: Effects 8 years after the beginning of the programme according to gender (ATET; difference in %-points and differences in EUR)

Treated	Obs.		Com- parison	Obs.		Unsubsidised employment		Unemployment		Earnings	
	M	W		M	W	M	W	M	W	M	W
Short training	98	160	nonpart.	1252	1888	20.7*	11.7	-9.2	2.6	355*	190
Long training	159	292	nonpart.			-11.2	11.0*	16.7*	1.7	-96	228*
Retraining	232	161	nonpart.			0.8	25.5*	2.3	-8.3	4	386*
Short training	98	160	long train.	159	292	13.7	-2.8	-11.1	4.2	142	-79
Short training			retraining	232	161	-0.8	-17.5	0.1	3.5	-84	-275
Long training	159	292	retraining			1.5	-19.5*	12.4	8.4	227	-199
Long training			short train.	98	160	0.7	3.2	7.2	-9	16	136
Retraining	232	161	short train.			-11.1	13.7	5.6	-23.3*	-154	198
Retraining			long train.	159	292	7.9	3.4	-5.7	-10.9	80	-16

Note: Bold numbers indicate significance at the 5% level, numbers in *italics* relate to the 10% level and * to the 1% level. Cells shaded in grey indicate that the difference of the two estimated effects is significant at the 5% level. M: Men, W: Women. Results are based on estimates in the different subsamples (including the MNP estimation) for men and women. Since the effects for men and women based on the common estimation of the MNP model show considerable effect heterogeneity, it appears to be possible that more flexibility is required when estimating the decision to participate in a programme. Therefore, we estimate MNP's for men and women separately, but we do not find significant differences in the effects compared to the case with a common MNP model.

The reason for these stark gender differences appears to be different types of training obtained by women and men. Table 9 shows the shares in the original professions (before training) and the profession a course is planned to qualify for (target profession) for our sample of training participants, for men (upper panel) and women (lower panel) and the different types of training. The last two columns state the profession-specific unemployment rates in 1994 and 2002. In general, we see that men in the metal production/processing and mechanics sector are much more likely to receive either short training or retraining, whereas long training is somewhat concentrated among technical professions. For women, long and short training is concentrated in office related occupations. Female retrainees are more evenly spread across occupations. Comparing original and target professions for short training, not many differences appear, which is in line with the aims of these programmes. For men in long training, some professions decline (agriculture, mining, forestry; metal related occupations; technical professions; health and social services; education related professions), but construction as well as office related professions increase. For women in long training we see a considerable increase in office related occupations, and a decrease everywhere else.

Table 9: Original and target professions by programme group in 1993-1994

Profession	Short training		Long training		Retraining		UE rate	
	Original	Target	Original	Target	Original	Target	1994	2002
Men								
No formal professional degree	13	-	8	-	14	-		
No information	-	22	-	4	-	4		
Agriculture, gardening, forestry, mining	8	3	5	2	10	2	24	31
Metal production/processing, mechanics	37	26	17	9	34	2	15	19
Textile/leather manufacturing	3	-	1	1	2	-	59	42
Food and nutrition	1	-	2	2	3	1	33	30
Construction	6	12	4	12	6	18	6	33
Construction related handcraft	12	12	8	13	5	53	9	28
Technical profession, other manufacturing	12	11	27	23	15	4	16	19
Office work	2	3	6	25	1	7	16	20
Health/social services, education	3	2	7	2	2	3	9	9
Other services	5	11	6	8	10	7	22	28
Correlation(% target - % origin, UE rate 1994)	-0.21		-0.15		-0.24			
Correlation(% target - % origin, UE rate 2002)	0.15		0.15		0.18			
Women								
No formal professional degree	12	-	3	-	7	-		
No information	1	34	1	9	-	8		
Agriculture, gardening, forestry, mining	5	2	6	3	12	9	24	31
Metal production/processing, mechanics	4	1	1	0	5	1	15	19
Textile/leather manufacturing	8	2	5	0	16	-	59	42
Food and nutrition	5	3	6	3	3	4	33	30
Construction	-	-	<1	1	-	-	6	33
Construction related handcraft	2	1	2	0	3	5	9	28
Technical profession, other manufacturing	13	2	15	6	12	5	16	19
Office work	36	42	42	65	16	36	16	20
Health/social services, education	6	6	13	6	13	18	9	9
Other services	10	7	7	6	12	14	22	28
Correlation(% target - % origin, UE rate 1994)	-0.34		-0.15		-0.56			
Correlation(% target - % origin, UE rate 2002)	-0.19		-0.09		-0.51			
Overall UE rate							15	22

Source: Own calculations on the basis of our evaluation sample. UE rates: BA (1992-2004).

Note: Entries in %. UE rate: number of unemployed in the respective profession as a percentage of the sum of socially insured employees and registered unemployed in 1996/2002.

The most interesting case is clearly retraining. For about 71% of the unemployed male the target profession of retraining was construction related (in particular craft related professions), whereas this share was only 5% for women. The male share of this type of occupation among original professions was only 11%.¹⁴ About one third of the women had some office related target profession, about another 20% were directed towards health, social and education re-

¹⁴ The inflow into construction comes from all occupations with the exception of the group health/social services, education (see Table IA.1 in the internet appendix).

lated professions. These choices of target professions by the caseworkers and the unemployed may have been rational in the years 1993 and 1994 when the major destinations for male and female unemployed showed average or below average unemployment rates. This is confirmed in Table 9 by the correlations between the difference in the shares in target and original profession and the unemployment rates, which are negative for all types of training and both men and women in 1994. However, as indicated by a positive correlation in 2002, the long-run prediction for men turned out to be very bad, because of the bust in the construction sector in the second half of the 1990s - just at the time most of the retrainees completed their programme. In 2002, the unemployment rates in the construction related professions were around 30% compared to an already high East German average of about 22%. In contrast, women were luckier. The unemployment rates in their main target professions were still below average in 2002, and the respective correlation is negative.

Significant gender differences in programme effects have been found in several other evaluation studies that analyse ALMPs, see e.g. Puhani (1999); Kluve, Lehmann and Schmidt (1999, 2004) for Poland as well as the surveys by Friedlander, Greenberg and Robins (1997); Heckman, LaLonde and Smith (1999) for Western market economies. Rather than indicating that a programme has different effects for men and women, our findings suggest that these differences may occur because women in fact attend different programmes than men.

5.4 Sensitivity analysis

We performed several sensitivity tests to check the robustness of our results to implementation issues. We only present a summary of the results and refer the interested reader to the internet appendix for any details.

We checked whether our sample selection and matching algorithm succeeds in balancing participants' and non-participants' elapsed unemployment duration before the actual or simulated programme start. On the one hand, we used a different procedure for simulating programme

start dates for nonparticipants. We randomly draw from the empirical distribution of elapsed unemployment durations before programme start of participants and check whether the respective nonparticipant has at least the same unemployment duration. If so, we assign as hypothetical starting date the month after the drawn unemployment duration.¹⁵ Our results are almost unchanged by this new procedure. On the other hand, we include the elapsed UE duration before programme start as additional matching variable to make sure that we match correctly on that variable. Again, our results remain largely unaffected.

In addition, the common support criterion is tightened by defining the upper and lower bounds as the 10th largest and smallest observation instead of the minimum or maximum. This leads to a better match in the tails of the propensity score distribution. Although a considerable number of observations is dropped, the effects hardly change in magnitude, though there is some change in significance levels. Nevertheless, the overall conclusions do not change.

Moreover, the additional matching variables other than gender that are included in the definition of the distance metric in the matching algorithm are not used. The results are qualitatively identical, but in particular for retraining, the effects are somewhat smaller and fewer of them are significant.

The fourth test concerned smoothing the estimated effects by computing three-month moving averages of the respective outcome variables, thus increasing precision. The efficiency gains are very small.

Finally, the region Berlin could be a special case because it combines East Berlin (former capital of the GDR) with West Berlin, which experienced the West German economic system even before unification. Therefore, we rerun all estimations excluding all inhabitants of Berlin (the distinction between East and West Berlin before unification is not possible with our data). Again, the results are qualitatively identical.

¹⁵ We thank Barbara Sianesi for suggesting this to us.

6 Conclusion

We analyse the effects of government-sponsored training for the unemployed in the beginning of the transition process in East Germany. Our analysis is based on new, large and very informative administrative data that allow us to control for potential selection bias, to use robust nonparametric matching estimators in a multiple treatment framework, to account for treatment effect heterogeneity with respect to both programmes and participants, and to observe interesting labour market outcomes over eight years after programme start.

Generally, training increases long-term employment prospects and earnings, but does not change registered unemployment. The positive long-run effects need some years to materialise because for all programmes there are initial negative (lock-in) effects. The magnitude of the lock-in effects is related to programme duration.

This general finding is however not at all true for men who participate in long training or retraining. At least part of the explanation for these negative results is that caseworkers in East Germany severely misjudged the future demand for skills for men. They tended to retrain many of the male unemployed towards occupations in the construction sector (about 70% of the participants in retraining) that experienced a boom during those years. Unfortunately, soon after the courses were completed, the boom went into a bust and the blessings of having obtained funding for long vocational training became a curse for its participants.

A caveat of our analyses is that we are not able to perform a cost-benefit analysis because of the unavailability of cost data both on the individual level and aggregated for each type of training. As another caveat, prior to the year 2000 it is impossible in our data to distinguish between subsidised employment, for example in an employment programme, and unsubsidised employment in the first labour market. This needs to be taken into account when interpreting the effects during the first six to seven years after programme start. However, since for 2002 this data is available, our long-term findings are not subject to this problem.

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Appendix A: Data

Table A.1: Descriptive statistics

	Non- participation	Short training	Long training	Retraining	Practice firm	Other
Number of observations	4604	321	538	445	162	118
Proportions in %						
Personal characteristics						
Women	63	65	65	43	58	36
Older than 50 years	8	7	6	1	9	1
Younger than 26 years	12	12	9	23	12	19
Age*	36.82	36.18	37.62	31.64	37.16	34.17
Marital status: Single	41	40	32	48	33	44
Married	59	60	68	52	67	56
Children: No child	40	35	32	40	43	41
At least one child	60	65	68	60	57	59
Education						
No professional degree	12	7	4	14	8	5
With professional degree	78	87	77	81	86	92
University degree, Polytechnical degree	4	3	15	3	4	4
Position in last job						
Salaried employee	26	30	54	21	31	31
Part-time worker	26	20	17	10	12	9
Master craftsman	1	0	1	0	0	0
Unskilled worker	22	25	13	28	23	14
Skilled worker	26	26	16	40	34	45
Last occupation						
Agriculture, forestry, fishing	6	7	4	9	7	8
Plumbing, metal construction technology, technology, natural sciences, machinist, electronics	9	11	14	14	14	19
Food and nutrition, merchant (goods and services), transportation, storage, administration, office work, business and social sciences, health services, hairdressing, guest assistance, house-keeping, cleaning, security services, social services, education, counselling, media, humanities, arts, unskilled worker	55	59	66	47	51	45
Construction, woodworking	9	8	4	11	17	14
Chemical worker, polymer processing, metal production and processing, textile, leather, clothing, paper manufacture and processing, printing, mining, stone, ceramics and glass making and/or processing	5	5	2	13	6	8
Industrial sector						
Construction	8	6	5	8	9	11
Commerce, banking, insurance, local and regional authorities, social insurance, non-profit organisations, private household, transportation, telecommunications, other services	58	64	60	54	59	42
Agriculture, forestry, fishing	2	2	1	2	1	3
Energy and supply industry, mining, manufacturing (without construction)	27	25	30	32	27	37

Table A.1 to be continued

Table: A.1: Descriptive statistics (continued-1)

	Non- participation	Short training	Long training	Retraining	Practice firm	Other
Last monthly earnings						
Salary in Euros*	947	1053	1204	1144	1137	1132
No information	20	12	13	9	9	8
1278 > salary	53	55	41	53	54	55
1278 ≤ salary < 2556	25	33	42	39	35	36
2556 ≥ salary	2	0	3	0	1	1
Remaining unemployment (UE) benefits claim at the end of the last unemployment spell before entry in the programme						
Remaining UE benefits claim (in months)*	2.24	2.08	2.25	2.34	2.08	3.42
No information or no claim	56	59	55	53	56	36
≤ 6 months	31	30	32	33	32	42
≤ 1 year	43	40	44	47	43	63
≤ 18	44	41	45	47	43	64
≤ 2 years	44	41	45	47	44	64
Legal UE benefits claim at the beginning of the last unemployment spell before the programme						
Legally claim* (months)	5.73	5.15	5.78	5.52	5.52	6.27
No information	25	27	21	22	20	16
No claim	8	10	9	7	10	5
≤ 6 months	15	16	19	20	22	23
≤ 1 year	63	61	65	70	68	78
≤ 18 months	66	62	69	70	69	79
Up to 2 years	67	63	69	71	70	79
Unemployment benefits or assistance in the month before beginning of the programme						
Unemployment benefits	74	73	79	78	80	84
Unemployment assistance	26	27	21	22	20	16
Various historical un/ out-of/employment information before the "first unemployment period"						
Months of last employment spell*	15.74	14.96	16.58	16.35	15.15	17.16
Proportion of employment months (in %)*	63.38	72.13	77.10	77.54	75.01	79.29
Proportion of out-of-labour months (in %)*	11.63	9.37	8.85	9.86	9.60	5.77
Proportion of UE months (in %)*	13.14	9.98	7.84	7.69	11.31	7.75
# of programs up to 2 years before the UE period*	0.18	0.17	0.11	0.11	0.11	0.14
# of programs up to 5 years before the UE period*	0.22	0.19	0.12	0.12	0.12	0.18
# of programs from entry in the data up to the UE period (UEP)*	0.23	0.19	0.12	0.12	0.14	0.18
Mean duration of UE spells up to 2 years before UEP*	2.06	1.94	1.37	1.37	1.74	1.23
... of UE spells up to 5 years before UEP*	3.08	2.24	1.79	1.73	2.16	1.75
... of UE spells from entry in data up to UEP*	3.12	2.24	1.79	1.72	2.14	1.75
... of employment spells up to 2 years before UEP*	7.28	9.40	9.93	9.80	10.62	10.35
... of employment spells up to 5 years before UEP*	13.06	13.42	15.21	14.73	13.29	15.51
... of employment spells from entry in data up to UEP*	14.78	14.11	15.64	15.74	14.10	15.51
... of out-of-labour spells up to 2 years before UEP*	1.88	1.60	1.63	1.70	1.52	0.76
... of out-of-labour spells up to 5 years before UEP*	3.00	2.30	2.10	2.27	2.31	1.64
... of out-of-labour spells from entry in data up to UEP*	3.34	2.33	2.26	2.32	2.31	1.64

Table A.1 to be continued

Table: A.1: Descriptive statistics (continued-2)

	Non-participation	Short training	Long training	Retraining	Practice firm	Other
Total months in all prog. up to 2 years before the UEP*	2.10	1.46	0.89	0.71	0.69	1.19
Total months in all prog. up to 5 years before the UEP*	2.42	1.66	0.95	0.77	0.75	1.51
Total months in all prog. before entry in sample*	2.47	1.66	0.95	0.77	0.85	1.51
----- Various un/employment information from the "first unemployment period" -----						
Duration of the "first UE spell"*	7.59	8.04	7.39	6.41	6.65	4.91
Duration of last UE spell before programme*	6.66	6.44	6.23	5.12	5.72	3.98
Time since beginning of last UE spell (before the prog.) even if other state between UE and prog.*	6.68	8.17	7.46	6.58	6.56	4.89
Time between the prog. and last job*	14.60	12.79	11.65	10.20	9.77	8.23
3 months ≥ time between prog. and last job	15	17	15	19	19	31
6 months ≥ time between prog. and last job	34	35	34	40	43	58
12 months ≥ time between prog. and last job	57	61	68	71	78	80
24 months ≥ time between prog. and the job)	78	86	87	93	94	92
Transition in 6 months before programme:						
UE. → UE	59	65	65	60	63	43
Empl. → UE	26	28	29	31	31	49
Out → UE	9	4	5	6	5	5
Prog. → UE	5	3	1	3	1	3
# of prog. in year before actual prog.*	0.11	0.05	0.02	0.05	0.02	0.08
# of prog.'s in 6 months before actual prog.*	0.05	0.03	0.01	0.03	0.01	0.03
----- Regional Information (level of regional administrative unit: town, local district) -----						
Big City	17	17	14	13	10	3
Net migration per 1000 inhabitants	14.16	13.41	9.75	9.84	6.38	3.76
Inhabitants below age 15 in % of the 15-65 year olds	19.42	20.19	21.00	21.48	21.40	23.39
Inhabitants above age 65 in % of the 15-65 year olds	18.30	19.12	19.69	20.10	20.85	21.82
Inhabitants of age 15-65 in % of all inhabitants	59.19	61.63	63.23	63.60	63.63	67.98
Inhabitants above age 75 in % of all inhabitants	4.23	4.68	4.94	5.07	5.23	5.82
Recipients of social assistance per 1000 inhabitants	15.07	15.94	15.95	16.43	16.68	16.39
Fraction of non-German nationals among recipients of social assistance ^a	10.51	8.10	9.71	9.98	14.75	11.51
Net migration per 1000 insured employees*	77.25	66.92	37.52	0.48	5.36	-83.82
Gross value added - fraction agriculture/forestry*	0.65	0.78	1.14	1.36	1.54	2.22
Gross value added - fraction other services*	42.08	44.10	45.44	44.90	45.91	47.07
Gross value added - fraction manufacturing*	30.55	31.63	32.41	33.39	32.32	37.65
Gross value added - fraction commerce / transport*	10.00	10.78	11.16	11.49	11.83	11.90
Gross value added in DM per inhabitant*	21290	22407	22540	22184	22067	21844
Tax revenue in DM per inhabitant	159	164	161	174	164	160
Rural areas	20	15	22	24	28	30
Core cities and highly concentrated districts in agglomerations	13	14	14	12	9	5
Concentrated and rural districts in agglomerations	19	21	20	21	14	23
Urbanised areas	36	40	37	36	42	42
Berlin, Postdam	11	7	7	9	4	1
Saxony, Thuringia	40	46	47	41	46	56
Mecklenburg-Western-Pomerania, Brandenburg	10	14	15	18	12	10
Saxony-Anhalt	17	10	14	13	27	19

Table A.1 to be continued

Table: A.1: Descriptive statistics (continued-3)

			Nonparticipation	Short training	Long training	Retraining	Practice firm	Other
UE rate ≤ 15%			35	33	37	34	27	29
15% < UE rate ≤ 20%			58	58	56	56	58	57
UE rate > 20%			7	9	7	10	15	14
			Firms size of the last employer					
No information			19	14	14	7	9	12
1 to 9 employees			15	12	14	14	10	26
10 to 99 employees			29	28	28	34	37	30
100 to 499 employees			21	25	23	24	20	18
500 employees or more			16	21	21	20	24	14
			Date of entry and exit from the sample					
Date of entry in the data*			Dec. 90	Jun. 91	Jun. 91	Apr. 91	Apr. 91	Jun. 91
Date of entry in the sample*			Nov. 93	Aug. 93	Sep. 93	Aug. 93	Jul. 93	Aug. 93
Date of beginning of prog.*			Jul. 94	Jun. 94	Mai 94	Apr. 94	Fev. 94	Fev. 94
			Outcome+					
Unemployment in Jan.	1991	3326	6.1	2.7	1.6	3.5	6.6	3.3
	1992	5911	31.2	23.9	20.1	16.8	19.4	25.9
	1993	6150	40.0	38.8	30.6	32.2	26.5	32.5
	1994	6194	71.2	76.6	80.7	80.7	86.4	51.7
	1995	6196	62.9	68.9	83.6	93.3	63.6	12.7
	1997	6196	46.2	43.0	37.9	51.2	44.4	21.2
	1999	6196	39.3	34.0	33.6	34.8	40.1	17.8
	2001	6196	33.7	33.0	30.0	30.3	35.2	15.3
	2002	6148	32.2	31.2	31.7	30.0	36.9	19.8
	Jan. 1991	3326	90.8	94.5	97.6	92.9	93.4	95.0
Employment in Jan.	1992	5911	60.0	69.2	73.7	75.2	70.3	71.6
	1993	6150	50.2	53.9	61.9	59.0	63.0	62.4
	1994	6194	21.9	20.9	16.0	16.0	12.4	47.5
	1995	6196	26.2	28.4	14.1	4.3	33.3	85.6
	1997	6196	34.4	48.6	51.5	40.2	46.3	72.0
	1999	6196	39.1	52.3	51.7	54.6	49.4	72.9
	2001	6196	37.3	49.5	49.3	52.6	47.5	71.2
	2002	6148	36.4	51.4	46.3	51.4	43.3	65.3
	Jan. 1991	3326	3.3	2.7	0.8	3.5	0.0	1.7
	1992	5911	8.8	6.9	6.2	7.8	10.3	2.6
Out-of-Labour in Jan.	1993	6150	9.8	7.3	7.5	8.6	10.5	5.1
	1994	6194	7.1	2.5	3.4	3.4	1.2	1.0
	1995	6196	10.8	2.8	2.2	2.5	3.1	1.7
	1997	6196	19.3	8.4	10.6	8.5	9.3	6.8
	1999	6196	21.7	13.7	14.5	10.6	10.5	9.3
	2001	6196	29.0	17.5	20.8	17.1	17.3	13.6
	2002	6148	31.4	17.4	22.1	18.6	19.7	14.9
	Jan. 2002	6148	5.8	7.3	6.5	4.2	7.6	4.1
	Subsidised empl.							

Note: The sample used for the table is the one after all selection steps described in Section 3, but before imposing the common support requirement. Entries that do not add up to 100% within a group of dummy variables are due to observations with missing information, and rounding. *The results for variables marked with an asterisk are means rather than proportions. **Local unemployment rates for each of the 141 local labour office districts. +The different outcomes do not add up to 100% because of some missing values. ++ The category 'No information' includes both cases with missing earnings information and with the entry '0'. Zero entries are made for so-called inactive employment which includes women on maternity leave, men in the military or civil service, as well as employees having been ill for more than six weeks. The first column gives the number of observations used to compute the proportions. The sample size decreases due to different entry dates into the sample (first UE spell in 93/94) and exit dates from the sample. Career improvement is omitted because it contains only 8 individuals.

Appendix B: Technical details of the matching estimator used

Table B.1: A matching protocol for the estimation of $\theta_0^{m,l}$

Step 1	Specify and estimate a multinomial probit model to obtain the marginal choice probabilities (see Appendix B): $[\hat{P}_N^0(x), \hat{P}_N^1(x), \hat{P}_N^2(x), \hat{P}_N^3(x)]$; $\hat{P}_N^l(x) := \hat{P}_N(S = l X = x)$
Step 2	Restrict sample to common support: Delete all observations with probabilities larger than the smallest maximum and smaller than the largest minimum of all subsamples defined by S.
Step 3	<p><i>Estimate the respective (counterfactual) expectations of the outcome variables.</i></p> <p>For a given value of m and l the following steps are performed:</p> <p>Standard propensity score matching step (multiple treatments)</p> <p>a-1) Choose one observation in the subsample defined by participation in m and delete it from that pool.</p> <p>b-1) Find an observation in the subsample of participants in l that is as close as possible to the one chosen in step a-1) in terms of $[\hat{P}_N^m(x), \hat{P}_N^l(x), \tilde{x}]$. 'Closeness' is based on the Mahalanobis distance. Do not remove that observation, so that it can be used again.</p> <p>c-1) Repeat a-1) and b-1) until no participant in m is left.</p> <p>Exploit thick support of X to increase efficiency (radius matching step)</p> <p>d-1) Compute the maximum distance (d) obtained for any comparison between treated and matched comparison observations.</p> <p>a-2) Repeat a-1).</p> <p>b-2) Repeat b-1). If possible, find other observations in the subsample of participants in l that are at least as close as $R \cdot d$ to the one chosen in step a-2) (to gain efficiency). Do not remove these observations, so that they can be used again. Compute weights for all chosen comparisons observations that are proportional to their distance. Normalise the weights such that they add to one.</p> <p>c-2) Repeat a-2) and b-2) until no participant in m is left.</p> <p>d-2) For any potential comparison observation, add the weights obtained in a-2) and b-2).</p> <p>Exploit double robustness properties to adjust small mismatches by regression</p> <p>e) Using the weights $w(x_i)$ obtained in d-2), run a weighted linear regression of the outcome variable on the variables used to define the distance (and an intercept).</p> <p>f-1) Predict the potential outcome $y^l(x_i)$ of every observation in l and m using the coefficients of this regression: $\hat{y}^l(x_i)$.</p> <p>f-2) Estimate the bias of the matching estimator for $E(Y^l S = m)$ as: $\sum_{i=1}^N \frac{1(S = m) \hat{y}^l(x_i)}{N^m} - \frac{1(S = l) w_i \hat{y}^l(x_i)}{N^m}$.</p> <p>g) Using the weights obtained by weighted matching in d-2), compute a weighted mean of the outcome variables in l. Subtract the bias from this estimate.</p> <p>Final estimate</p> <p>h) Compute the treatment effect by subtracting the weighted mean of the outcomes in the comparison group (l) from the weighted mean in the treatment group (m).</p>
Step 4	Repeat Step 3 for all combinations of m and l.

Note: Lechner (2001) suggests an estimator of the asymptotic standard errors for $\hat{\theta}_N^{m,l}$ conditional on the weights that we use here. $\tilde{x}$ includes the date of the beginning of the programme, sex, three dummies indicating if the individual is employed (and observed) 12, 24 and 36 months before the programme. $\tilde{x}$ is included to ensure a high match quality with respect to these critical variables. R is fixed to 90% in this application (different values are checked in the sensitivity analysis). Note that once we estimate all $E(Y^l | S = m)$ for all m, they can be directly used to obtain $E(Y^l)$.

Tables and Figures

Tables

Table 1: Expenditure on active and passive labour market policies 1991-2003

	1991	1993	1995	1997	1999	2001	2003
Total expenditure in million EUR	25,008	35,425	39,275	42,781	41,858	40,745	47,613
Shares of total expenditure for active and passive labour market policy in %							
Training	13	10	10	8	10	11	7
Temporary wage subsidy	1	<1	<1	<1	2	2	1
Short-time work	1	5	1	1	1	1	1
Job creation schemes	6	4	4	3	3	2	1
Early retirement	1	<1	<1	<1	<1	1	2
Rehabilitation programmes	7	6	4	4	4	5	5
Unemployment benefits	33	43	46	47	39	40	44
Unemployment assistance	14	15	19	23	24	18	19
Other expenditure	25	18	15	13	17	19	19
Unemployment rate in %	6.2	8.0	9.1	10.8	9.6	8.0	9.3

Sources: BA (1992-2004).

Notes: Training: further training, retraining, short training according to §41a EPA (abolished at the end of 1992). Temporary wage subsidies are subsidies during the phase of initial skill adaptation in a new job (*Einarbeitungs-zuschüsse*). 'Other expenditure' mainly includes counselling and job placement services as well as administrative costs of the public employment service (PES).

Table 2: Definition of programmes

Programme	Description
Short training	Further training in the profession held with planned duration ≤ 6 months.
Long training	Further training in the profession held with planned duration > 6 months.
Retraining	Training to obtain a new professional degree in a field other than the profession currently held.
Practice firm	Further training that simulates a job in a specific field of profession
Other programmes	Career improvement: Further training to obtain a higher professional degree, e.g. master craftsman, technician, or a (below university) degree in business administration. Residual category: Various very small and heterogeneous programmes.

Note: Due to insufficient sample size the category *other programmes* is not evaluated in this study.

Table 3: Combined data sources used

	ES	BPR	TPD
Source	Employer supplied mandatory social insurance entries.	Benefit payment register of the PES 1975-1997.	Questionnaires filled in by the labour officer for statistical purposes (ST35).
Population	1% random sample of persons covered by social insurance for at least one day 1975-1997. Self-employed, civil servants, university students are not included. Data until 2002.	Recipients of benefit payments from the PES 1975-2002.	Participants in further training, retraining, short training, German language courses and temporary wage subsidies 1975-1997.
Available information	Personal characteristics and history of employment.	Information about the receipt of benefit payments from the public employment service.	Personal characteristics of participants and information about training programmes.
Important variables	Gender, age, nationality, education, profession, occupational status, industry, firm size, earnings, regional information.	Type and amount of benefits received.	Type, duration and result of the programme, type of income support paid during participation.
Structure	Spells based on daily information.	Spells based on daily information.	Spells based on monthly information.
Note:	The merged data is based on monthly information. For detailed information on the merging and recoding procedures see Bender et al. (2005). The creation of this data base is a result of a three year joint project of research groups at the Universities of Mannheim (Bergemann, Fitzenberger, Speckesser) and St. Gallen (Lechner, Miquel, Wunsch) as well as the Institute for Employment Research of the FEA (Bender).		

Table 4: Future programme participation until 1997 by treatment status

Future programme participation until 1997	Treatment status in study (first treatment)				
	Nonparticipatio n	Practice firm	Short train- ing	Long training	Retraining
No future programme	89.1	81.5	76.3	86.0	90.7
Practice firm	1.7	8.5	1.5	0.8	0.8
Short training	-	-	1.5	-	0.3
Long training	7.6	8.1	13.5	10.6	4.4
Retraining	1.7	2.7	8.3	2.9	4.1
Other	0.3	0.4	0.6	0.3	0.3
Total other treatments than first treatment	10.9	18.5	23.7	14.0	9.3

Note: Entries show the fraction (%) of members of the subsamples stated in the columns who participated at least once in the treatments stated in rows after their first treatment (programme participants) or after 12 months after entering unemployment (nonparticipants). Due to data limitations only training spells completed by the end of 1997 are observable. *Other includes all training programmes we observe in the data but which we do not evaluate due to insufficient sample sizes (see Table 2).

Table 5: Means of selected variables by treatment status

	Non- participation	Practice firm	Short training	Long training	Re- training
Observations	15,687	259	482	385	387
Woman	46	37	43	45	38
Age in months ⁺	36	36	35	35	31
Age below 26 years	17	14	16	14	21
Age above 50 years	13	6	6	6	1
Married ⁺	53	44	47	42	43
No children ⁺	62	67	62	64	62
German citizenship ⁺	82	83	90	91	87
University entrance school degree ⁺	3	3	4	7	5
No vocational degree ⁺	25	20	16	13	28
Vocational degree ⁺	69	79	78	74	67
University or college degree ⁺	5	0	5	13	4
Unskilled worker*	37	38	29	22	48
Skilled worker*	22	21	21	14	18
White-collar worker*	29	32	37	52	25
Part-time worker*	11	6	8	10	7
Last monthly earnings from employment in EUR*	1,396	1,434	1,570	1,672	1,558
Federal state: Schleswig-Holstein, Hamburg, Bremen	22	31	22	22	23
Federal state: Northrhine-Westphalia	30	20	28	34	33
Federal state: Rhineland-Palatinate, Hesse, Saarland	17	20	16	18	17
Federal state: Baden-Württemberg, Bavaria	31	29	35	25	27
Legal unemployment benefit claim in months ⁺	10	9	10	9	8
Time to participation in months within relevant UE spell	4	6	5	6	5
Fraction of months unemployed since begin of first employment in life that was subject to social security contributions ⁺	8	10	9	7	7
Fraction of months employed since ... ⁺	71	67	69	68	67
Planned programme duration in months	-	7	4	10	21

Note: If not stated otherwise, entries are in per cent and measured at (simulated) programme start. *Refers to the last employment before relevant unemployment spell. ⁺Measured at entry into unemployment.

Table 6: Estimated employment effects eight years after programme start

	Nonparticipatio				
l	n	Practice firm	Short training	Long training	Retraining
m	(a) Estimate of $E(Y^l S = m)$				
Nonparticipation	49.4	58.4	64.5	58.5	68.1
Practice firm	46.4	55.1	62.1	61.8	66.1
Short training	48.7	59.1	62.4	60.9	75.6
Long training	52	61.3	59.8	61.1	75.3
Retraining	51.3	65.3	66	62.7	69.6
m	(b) Estimate of $\theta_0^{m,l} = E(Y^m - Y^l S = m)$				
Nonparticipation	0	-9.0	-15.1*	-9.1	-18.7*
Practice firm	8.7	0	-7.0	-6.7	-11.0
Short training	13.7*	3.3	0	1.5	-13.2*
Long training	9.1*	-0.2	1.3	0	-14.2*
Retraining	18.3*	4.3	3.6	6.9	0
(c) Sample size after imposing common support					
	12,681	243	431	303	352
(d) Approximate average programme cost per participant in EUR ⁺					
	-	6,565	4,439	9,930	20,983

Note: **Bold** numbers indicate significance at the 5% level, numbers in *italics* relate to the 10% level and * to the 1% level. ⁺ The approximate cost of one month spent in a programme is 1,200 EUR (incl. income support and direct programme cost). This number is multiplied by the mean programme duration in each group.

Table 7: Effect heterogeneity (employment) eight years after programme start (difference in %-points) ($\hat{\theta}_{96}^{ml}$)

Regional unemployment rate			Sex		Unemployment duration		Type of worker			Education		Employability+	
< 8% ≥ 8%			Men	Women	< 6	≥ 6 months	Unskilled	Skilled	Salaried	Without vocational	With degree	Below median	Above median
m - l													
Practice firm -													
Nonparticipation	6.5	11.0	3.7	<i>11.2</i>	4.7	15.5*	10.0		11.0		5.9	12.1	7.5
- Short training	-6.3	-3.9	-16.6	5.8	-7.8	7.8	-16.7		5.2		-5.3	-0.5	-6.9
- Long training	-4.6	1.2	-9.3	0.0	-1.9	-1.0	-2.6		-6.9		-8.3	-9.8	-3.5
- Retraining	-19.9*	1.1	-14.9	-3.5	-8.0	-18.1	-9.2		-9.5		-12.9	-2.3	-21.0*
Short training -													
Nonparticipation	11.2*	13.1*	17.8*	6.6	13.3*	11.2	16.2*	8.6	7.8		11.4*	11.1	10.8*
- Practice firm	9.7	-5.3	<i>10.3</i>	-5.5	2.6*	-4.0	20.8		-7.7		4.5	-2.7	3.2
- Long training	-1.2	2.6	9.6	-6.4	-0.4	1.0	7.4		-8.2		-0.6	-4.4	0.4
- Retraining	-13.8	-6.3	-8.5	-17.3	-4.5	-16.0	-1.1	-18.9	-8.6		-12.5*	-10.2	-9.2
Long training -													
Nonparticipation	9.3	8.6	6.4	7.3	6.1	8.6	-3.9		11.4		7.9	21.2*	4.4
- Practice firm	-3.6	-3.0	3.0	-9.5	-7.1	-2.6	-2.1		-3.9		-0.2	-6.7	0.3
- Short training	1.0	7.7	-4.8	5.2	-2.1	2.6	-13.6		11.2		4.2	12.5	-1.4
- Retraining	-18.6*	-1.8	<i>-11.6</i>	-15.3	-14.8	<i>-11.5</i>	-23.0*		5.4		-11.4	-9.6	-13.7
Retraining -													
Nonparticipation	19.7*	20.3*	18.8*	23.2*	18.5*	17.9*	15.4*	16.8	14.4	23.8*	19.3*	14.1	16.0*
- Practice firm	17.0	6.0	6.6	12.9	10.9	-1.7	8.7		1.9		<i>10.9</i>	9.1	5.4
- Short training	8.7	0.4	-3.0	9.6	3.3	11.0	-1.7	13.7	-4.0		6.0	11.2	3.8
- Long training	5.6	1.7	6.4	6.9	9.1	11.8	<i>16.1</i>		-5.6		2.9	7.9	3.4
Number of observations in each subsample													
Nonparticipation	4313	4473	6480	4518	6041	2632	3502	1827	2207	2391	9004	4970	6377
Practice firm	103	118	153	72	116	97	81	46	68	42	190	108	122
Short training	204	179	218	146	222	159	122	89	137	48	358	138	268
Long training	124	150	140	129	146	133	69	41	128	34	256	88	195
Retraining	146	161	202	119	185	133	167	54	72	85	243	114	220

Note: **Bold** numbers indicate significance at the 5% level, numbers in *italics* relate to the 10% level and * to the 1% level. Comparisons based on less than 50 observations are not reported in the table. Cells shaded in grey indicate that the difference of the two estimated effects is significant at the 5% level. + Predicted probability to be employed 4 years after programme start where the underlying coefficients are estimated by a probit model using nonparticipants only. To split the sample the median of the distribution among nonparticipants is used (0.448).

Table 8: Long-run outcomes of alternative assignment rules

No.	Assignment rule	Mean employ- ment rate in %	Approximate programme cost in million EUR
1	Actual allocation	50.7	13.0
2	Everyone assigned to nonparticipation	49.4	-
3	Everyone assigned to practice firm	58.6	82.7
4	Everyone assigned to short training	64.3	55.9
5	Everyone assigned to long training	58.8	125.0
6	Everyone assigned to retraining	68.5	264.2
7	Participants in practice firm assigned to short training, participants in long training assigned to retraining	51.2	15.9
8	Same as 7 but 50% of nonparticipants assigned to short training and 50% of nonparticipants assigned to retraining	66.4	160.0
9	Participants in practice firm assigned to long training, corresponding number of participants in long training assigned to practice firm such that the overall fractions of participants in each programme remain unchanged	50.8	13.0
Note:	Mean employment rates are calculated from Table 6 panel (a) and the fraction of people in each state after imposing common support. The approximate cost of one month spent in a programme is 1,200 EUR (incl. income support and direct programme cost).		

Table A.1: Sample selection rules and remaining numbers of observations

	Nonparticipation	Practice firm	Short training	Long training	Retraining	Other
Persons entering unemployment between Jan. 1992 and Jun. 1994	37,440	289	520	429	452	317
Eligibility: Only individuals receiving UB or UA in the month before (simulated) programme start						
Remaining observations	24,354	279	505	412	412	288
Simulated programme start of nonparticipants within 12 months after entering unemployment and receipt of UB or UA in this month						
Remaining observations	21,379	279	505	412	412	288
Personal characteristics : a) $20 \leq \text{age} \leq 55$; b) no trainees or apprentices; c) at least one observation of employment;						
d) no home workers; e) no part-time worker below half of full-time equivalent						
Final sample	15,687	259	482	385	387	263

Note: All variables are measured in the period before programme start.

Table B.1: Descriptive statistics

	Nonpar- ticipation	Practice firm	Short training	Long training	Retraining
Observations	15,687	259	482	385	387
Personal characteristics					
Woman	45.7	37.1	42.9	45.2	38.2
Age in years	36.0	36.0	34.8	35.2	31.0
Below age 25	17.0	14.3	16.2	13.8	20.7
Above age 50	12.9	6.2	6.0	6.0	0.8
Not married	46.8	55.6	52.7	57.9	57.1
Married	53.2	44.4	47.3	42.1	42.9
No child	62.1	66.8	62.0	63.6	62.3
At least one child	37.9	33.2	38.0	36.4	37.7
German nationality	82.0	82.6	89.6	90.9	86.6
Western European nationality	11.1	7.7	6.2	3.4	8.0
Eastern European nationality	3.7	5.8	1.2	2.6	2.3
Other nationality	3.2	3.9	2.9	3.1	3.1
No university entrance school degree, no vocational degree	23.9	19.7	15.4	11.9	26.1
No university entrance school degree, vocational degree	66.4	76.8	74.3	68.1	63.8
University entrance school degree, no vocational degree	0.8	0.8	0.6	1.0	2.3
University entrance school degree, vocational degree	2.6	2.3	3.7	5.7	2.8
College degree	1.7	0.4	3.1	5.2	1.6
University degree	3.2	0.0	2.3	7.5	2.8
Regional information					
Schleswig-Holstein, Hamburg, Bremen	21.8	31.3	21.8	22.1	22.7
Northrhine-Westphalia	29.6	20.5	27.6	33.5	33.1
Rhineland-Palatinate, Hesse, Saarland	17.5	19.7	15.8	18.2	16.5
Baden-Württemberg, Bavaria	30.8	28.6	34.9	25.2	27.1
Local unemployment rate	8.3	8.3	8.1	8.4	8.4

Table B.1 to be continued

Table B.1: Descriptive statistics (continued-1)

	Nonpar- ticipation	Practice firm	Short training	Long training	Retraining
City with more than 100,000 inhabitants	30.8	24.7	18.3	20.0	24.3
City with more than 300,000 inhabitants	16.1	8.5	5.0	4.2	8.5
Timing variables					
Beginning of unemployment spell	Mar 93	Feb 93	Feb 93	Apr 96	Apr 93
Programme start date	Aug 93	Sep 93	Jul 93	Oct 93	Oct 93
Time to treatment in months	4.3	5.7	5.2	5.6	5.0
Benefit claim					
Receipt of unemployment benefits (UB)	90.0	86.5	91.7	89.1	86.8
Receipt of unemployment assistance	10.0	13.5	8.3	10.9	13.2
UB claim at beginning of unemployment in months ⁺	10.5	9.3	9.6	9.4	8.1
UB claim at programme start in months	7.3	5.3	5.6	5.2	4.4
Characteristics of last employment*					
Unskilled worker	36.9	38.2	29.0	21.6	48.3
Skilled worker	20.8	20.8	21.4	14.3	17.8
Master craftsman	0.9	0.8	0.4	0.5	0.5
White-collar worker	28.6	32.0	36.9	51.7	24.5
Part-time worker	10.6	5.8	8.1	9.9	6.7
Last monthly earnings in EUR	1396	1434	1570	1672	1558
Firm size 1-9 employees	20.6	18.1	20.7	20.0	21.2
Firm size 10-99 employees	36.0	39.4	35.7	36.1	35.1
Firm size 100-499 employees	20.2	22.0	18.7	20.3	21.2
Firm size 500 or more employees	17.5	15.1	15.6	17.7	18.6
Technical profession	16.9	17	17	12.1	20.7
Construction worker	9.1	9.7	6.4	4.9	7.2
Office worker	13.9	24.7	22.4	25.5	12.7
Service provider	15.7	11.6	10.7	9.9	19.9
Production worker	12	10.1	9.4	9.1	11.4
Other occupation	32.4	26.9	34.1	38.5	28.1
Agriculture, forestry, fishing, mining, electricity supply	1.6	4.2	0.8	0.3	1.8
Manufacturing	37.8	39.8	36.7	37.9	37.7
Construction	7.7	6.6	6.2	4.7	5.4
Commerce	15.3	13.5	18.5	16.9	10.9
Logistics	4.4	2.7	6.0	6.2	7.8
Services	30.7	30.5	27.7	31.5	34.5
Employment history					
Number of programmes in last 2 years	0.0	0.1	0.1	0.1	0.0
Number of programmes in last 5 years	0.1	0.2	0.2	0.2	0.1
Number of programmes in the past	0.2	0.3	0.2	0.3	0.2
Months in programmes in last 2 years	0.2	0.4	0.5	0.5	0.1
Months in programmes in last 5 years	0.7	1.5	1.3	1.4	0.6
Months in programmes in the past	1.1	2.0	1.7	1.9	1.1
Number of employments in last 2 years	1.2	1.2	1.2	1.2	1.2
Number of employments in last 5 years	1.7	1.9	1.7	1.7	1.8
Number of employments in the past	2.8	3.2	2.9	2.6	3.0
Months in employment in last 2 years	18.2	18.1	18.3	18.6	18.5
Months in employment in last 5 years	40.8	38.9	41.2	40.3	38.0
Months in employment in the past	84.7	81.3	85.1	83.9	69.7

Table B.1 to be continued

Table B.1: Descriptive statistics (continued-2)

	Nonpar- ticipation	Practice firm	Short training	Long training	Retraining
Number of unemployment spells in last 2 years	1.2	1.3	1.3	1.2	1.2
Number of unemployment spells in last 5 years	1.7	1.9	1.7	1.7	1.6
Number of unemployment spells in the past	2.4	2.9	2.5	2.4	2.4
Months in unemployment in last 2 years	1.2	1.9	1.4	1.1	1.0
Months in unemployment in last 5 years	4.3	6.0	4.4	4.0	4.0
Months in unemployment in the past	10.2	13.0	10.6	8.8	8.7
Number of spells out of labour force in last 2 years	0.6	0.6	0.5	0.5	0.5
Number of spells out of labour force in last 5 years	0.9	1.0	0.9	0.8	1.1
Number of spells out of labour force in the past	1.5	1.7	1.5	1.3	1.7
Months out of labour force in last 2 years	3.5	3.0	2.9	2.7	3.1
Months out of labour force in last 5 years	7.6	7.2	7.1	7.6	9.1
Months out of labour force in the past	15.7	15.4	15.3	18.0	19.2
Fraction unemployed	7.8	10.0	8.6	7.2	7.0
Fraction employed	71.2	67.0	68.8	68.0	66.8
Fraction out of labour force	13.1	12.5	12.5	13.5	15.9
Mean duration of unemployment in last 2 years	0.5	0.8	0.6	0.5	0.5
Mean duration of unemployment in last 5 years	1.5	2.0	1.5	1.3	1.3
Mean duration of unemployment in the past	2.5	3.1	2.6	2.2	2.0
Mean duration of employment in last 2 years	16.5	16.2	16.7	17.2	17.0
Mean duration of employment in last 5 years	30.9	28.9	31.5	31.8	28.1
Mean duration of employment in the past	48.3	42.2	48.9	49.3	35.9
Mean duration out of labour force in last 2 years	3.0	2.5	2.5	2.4	2.7
Mean duration out of labour force in last 5 years	5.2	4.4	4.7	5.4	6.0
Mean duration out of labour force in the past	8.0	6.5	7.6	9.3	9.5

Note: Sample before imposing the common support requirement. If not stated otherwise, entries are in per cent and measured at (simulated) programme start. *Refers to the last employment before (simulated) programme start. +Measured at entry into unemployment. See also note below Table 5 as well as the more extensive definition of variables.

Table C.1: A matching protocol for the estimation of $\theta_0^{m,l}$

Step 1	Specify and estimate a multinomial probit model to obtain the marginal choice probabilities (see Internet-Appendix): $[\hat{P}_N^0(x), \hat{P}_N^1(x), \hat{P}_N^2(x), \hat{P}_N^3(x), \hat{P}_N^4(x)]$; $\hat{P}_N^l(x) \equiv \hat{P}_N(S = l X = x)$
Step 2	Restrict sample to common support: Delete all observations with probabilities larger than the smallest maximum and smaller than the largest minimum of all subsamples defined by S .
Step 3	<p>Estimate the (counterfactual) expectations of the outcome variables for any given pair m and l.</p> <p>1. Standard propensity score matching step (multiple treatments)</p> <p>a-1) Choose one observation in the subsample defined by participation in m and delete it from that pool.</p> <p>b-1) Find an observation in the subsample of participants in l that is as close as possible to the one chosen in step a-1) in terms of $[\hat{P}_N^m(x), \hat{P}_N^l(x), \tilde{x}]$. 'Closeness' is based on the Mahalanobis distance. Do not remove that observation, so that it can be used again.</p> <p>c-1) Repeat a-1) and b-1) until no participant in m is left.</p> <p>2. Exploit thick support of X to increase efficiency (radius matching step)</p> <p>d-1) Compute the maximum distance (d) obtained for any comparison between treated and matched comparison observations.</p> <p>a-2) Repeat a-1).</p> <p>b-2) Repeat b-1). If possible, find other observations in the subsample of participants in l that are at least as close as $R * d$ to the one chosen in step a-2) (to gain efficiency); R is fixed to 90% in this application but different values are checked in the sensitivity analysis). Do not remove these observations, so that they can be used again. Compute weights for all chosen comparisons observations that are proportional to their distance (calculated in b-1). Normalise the weights such that they add to one.</p> <p>c-2) Repeat a-2) and b-2) until no participant in m is left.</p> <p>d-2) For any potential comparison observation, add the weights obtained in a-2) and b-2).</p> <p>3. Exploit double robustness properties to adjust small mismatches by regression</p> <p>e) Using the weights $w(x_i)$ obtained in d-2), run a weighted linear regression of the outcome variable on the variables used to define the distance (and an intercept).</p> <p>f-1) Predict the potential outcome $y^l(x_i)$ of every observation using the coefficients of this regression: $\hat{y}^l(x_i)$</p> <p>f-2) Estimate the bias of the matching estimator for $E(Y^l S = m)$ as: $\sum_{i=1}^N \frac{1(S=m)\hat{y}^l(x_i)}{N^m} - \frac{1(S=l)w_i\hat{y}^l(x_i)}{N^l}$.</p> <p>g) Using the weights obtained by weighted matching in d-2), compute a weighted mean of the outcome variables in l. Subtract the bias from this estimate.</p> <p>4. Final estimate</p> <p>h) Compute the treatment effect by subtracting the weighted mean of the outcomes in the comparison group (l) from the weighted mean in the treatment group (m).</p>
Step 4	Repeat Step 3 for all combinations of m and l .

Note: Lechner (2001) suggests an estimator of the asymptotic standard errors for $\hat{\theta}_N^{m,l}$ conditional on the weights that we use here. $\tilde{x}$ includes the date of the beginning of the programme, gender, three dummies indicating if the individual is employed (and observed) 12, 24 and 48 months before the programme. $\tilde{x}$ is included to ensure a high match quality with respect to these critical variables.

Figures

Figure 1: Distribution of the planned programme duration

Note: Horizontal axis: planned duration of a programme determined before programme start in months.

Figure 2: Employment and unemployment rates by participation status

Note: Horizontal axis: months relative to programme start (0); negative: before, positive: after programme start. The number of observations before programme start decreases with increasing distance to programme start.

Figure 3: Dynamics of the effects ($\hat{\theta}_t^{m,l}$): Employment differences in %-points

Note: Horizontal axis: months after programme start. Sig.: significant at the 5% level (point-wise, symmetric t-test).

Figure 4: Cumulated employment effects ($\hat{\theta}_t^{m,l} = \sum_{\tau=1}^t \hat{\theta}_{\tau}^{m,l}$) in months

Note: Horizontal axis: months after programme start. Sig.: significant at the 5% level (point-wise, symmetric t-test). Read entry for $\hat{\theta}_t^{m,l}$ as: "On average for participants in m , t months after beginning participation in m , it increased the total time in employment compared to l by $\hat{\theta}_t^{m,l}$ months."

Figure B.1: Distribution of (assigned) programme start dates (frequencies in %)

Note: Left panel: calendar month. Right panel: months from entry into unemployment to programme start.

THE CURSE AND BLESSING OF TRAINING THE UNEMPLOYED IN A CHANGING ECONOMY: THE CASE OF EAST GERMANY AFTER UNIFICATION

- *INTERNET APPENDIX* -

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Appendix IA: Supplementary information about the data

Appendix IA.1: Original and target professions of retrainees 1993-1994

Table IA.1: Transitions between original and target professions of retrainees 1993-1994

		Original profession											% of all	UE rate	
		None	1	2	3	4	5	6	7	8	9	10		1994	2002
Target profession		Men													
0	No information	11	4	2	-	-	-	15	-	-	-	-	4		
1	Agriculture, gardening, forestry, mining	6	4	2	-	-	-	-	-	-	-	-	2	24	31
2	Metal production/processing, mechanics	3	-	4	-	-	-	-	-	-	-	-	2	15	19
3	Textile/leather manufacturing	-	-	-	-	-	-	-	-	-	-	-	-	59	42
4	Food and nutrition	-	-	1	-	-	-	-	4	-	-	-	1	33	30
5	Construction	25	24	12	40	14	29	8	17	-	-	23	18	6	33
6	Construction related handcraft	39	56	62	60	86	36	54	52	100	-	42	53	9	28
7	Technical profess., other manufacturing	3	-	5	-	-	7	8	5	-	-	8	4	16	19
8	Office work	6	-	5	-	-	14	8	14	-	50	8	7	16	20
9	Health/social services, education	-	8	1	-	-	-	-	3	-	25	8	3	9	9
10	Other services	8	4	6	-	-	14	8	3	-	25	12	7	22	28
% of all		14	10	34	2	3	6	5	15	1	2	10	100	15	22
		Women												UE rate	
0	No information	-	-	10	6	-	-	-	5	16	13	13	8		
1	Agriculture, gardening, forestry, mining	7	26	30	3	33	-	17	9	-	-	4	9	24	31
2	Metal production/processing, mechanics	-	4	-	-	-	-	-	-	-	-	-	1	15	19
3	Textile/leather manufacturing	-	-	-	-	-	-	-	-	-	-	-	-	59	42
4	Food and nutrition	14	9	-	6	17	-	-	5	-	-	-	4	33	30
5	Construction	-	-	-	-	-	-	-	-	-	-	-	-	6	33
6	Construction related handcraft	-	9	20	6	17	-	-	-	-	-	13	5	9	28
7	Technical profess., other manufacturing	7	-	10	3	-	-	17	18	3	-	-	5	16	19
8	Office work	43	22	10	36	33	-	33	46	61	21	35	36	16	20
9	Health/social services, education	-	17	-	16	-	-	17	9	13	63	17	18	9	9
10	Other services	29	13	20	23	-	-	17	9	7	4	17	14	22	28
% of all		7	12	5	16	3	-	3	12	16	13	12	100	15	22

Source: Own calculations on the basis of our evaluation sample (see Section 3). UE rates: BA (1992-2004).

Note: Entries for the target professions are in per cent of the number of individuals in the respective original profession (except for % of all). UE rate: number of unemployed in the respective profession as a percentage of the sum of socially insured employees and registered unemployed.

Appendix IA.2: Additional descriptive statistics

Figure IA.2: Month of beginning of first UE spell between 1993 and 1994

Note: Month 1 corresponds to January 1993.

Appendix IB: Common support and match quality

Appendix IB.1: Common support

As proposed, discussed and applied in Lechner (2001, 2002a, b) we base the common support requirement on the marginal choice probabilities (conditional on X) for all alternatives under consideration. By doing so, we ensure that all effects are estimated for the same underlying support. Table IB.1a shows the minima and the maxima of the estimated probabilities. Figure IB.1 displays the distribution of the estimated probabilities for all subsamples defined by participation status before and after imposing common support. In addition, Table IB.1c shows the mean of all variables in the selected and excluded subsample for all groups of participants. Tables IB.1b and IB.1d display the loss of observations as a result of imposing the common support criterion for the full sample and the subsample analysis, respectively.

Table IB.1a: Minima and maxima of $[\hat{P}_N^1(x), \hat{P}_N^2(x), \hat{P}_N^3(x), \hat{P}_N^4(x)]$ in subsamples

Subsamples	$\hat{P}_N^1(x)$	$\hat{P}_N^2(x)$	$\hat{P}_N^3(x)$	$\hat{P}_N^4(x)$
Maximum in subsample				
Nonparticipation	100	52.33	63.45	84.05
Short training	99.42	59.90	71.99	70.19
Long training	99.69	60.20	73.79	66.08
Retraining	98.19	55.15	67.94	88.02
Minimum of maxima	98.19	52.33	63.45	66.08
Minimum in subsample				
Nonparticipation	0.04	0.0	0.0	0.0
Short training	0.0	0.04	0.05	0.0
Long training	0.04	0.0	0.19	0.01
Retraining	0.02	0.03	0.06	0.19
Maximum of minima	0.04	0.04	0.19	0.19

Note: Estimated probabilities in %.

Figure IB.1: Distribution of $[\hat{p}_N^1(x), \hat{p}_N^2(x), \hat{p}_N^3(x), \hat{p}_N^4(x)]$ in the respective subsamples before and after imposing the common support requirement

Note: Figures show the actual number of observations in deciles before (right panel) and after (left panel) imposing the common support requirement.

Table IB.1b: Loss of observations due to imposition of the common support criterion

	Nonparticipation	Short training	Long training	Retraining
Observations before	4604	321	538	445
Observations after	3542	292	502	429
Percent deleted	23.1	9.0	6.7	3.6

Table IB.1c: Comparison of means of selected variables in the subsample used for matching and the subsample not used for matching because of insufficient overlap

	Included in the estimation				Excluded from the estimation			
	Non-part.	Short train.	Long train.	Retrain.	Non-part.	Short train.	Long train.	Retrain.
Number of observations	3542	292	502	429	1062	29	36	16
Shares in %								
Personal characteristics								
Women	60	64	64	43	74	72	72	38
Older than 50 years	6	5	5	1	14	28	17	0
Younger than 26 years	14	12	9	22	8	14	0	44
Age*	36	36	37	32	39	41	44	28
Marital status: Single	40	39	33	47	42	45	28	81
Married	60	61	67	53	58	55	72	19
Children: No child	39	33	31	40	45	59	47	56
At least one child	61	67	69	60	55	41	53	44
Education:								
No professional degree	10	7	4	14	18	10	3	13
With professional degree	81	88	78	81	69	76	56	81
University degree, polytechnical degree	5	2	14	3	3	7	36	6
Position in last job								
Salaried employee	28	30	54	21	19	28	56	13
Part-time worker	21	18	16	10	41	38	28	0
Master craftsman	1	0	1	0	0	0	3	0
Unskilled worker	22	24	13	28	21	31	8	44
Skilled worker	28	28	17	40	19	3	6	44
Last occupation								
Agriculture, forestry, fishing	6	6	4	9	5	10	6	0
Plumbing, metal construction technology, technology, natural sciences, machinist, electronics	11	12	15	14	5	0	8	19
Food and nutrition, merchant (goods and services), transportation, storage, administration, office work, business and social sciences, health services, hairdressing, guest assistance, housekeeping, cleaning, security services, social services, education, counselling, media, humanities, arts, unskilled worker	43	42	35	38	40	34	31	31
Construction, woodworking	9	8	5	11	7	3	0	13
Chemical worker, polymer processing, metal production and processing, textile, leather, clothing, paper manufacture and processing, printing, mining, stone, ceramics and glass making and/or processing	4	3	1	7	3	10	0	31

Table IB.1c to be continued

Table IB.1c: Comparison of means of selected variables (continued-1)

	Included in the estimation				Excluded from the estimation			
	Non-part.	Short train.	Long train.	Retrain.	Non-part.	Short train.	Long train.	Retrain.
Industrial sector								
Construction	8	6	5	8	7	3	0	6
Commerce, banking, insurance, local and regional authorities, social insurance, non-profit organisations, private household, transportation, telecommunications, other services	59	63	61	54	54	72	47	44
Agriculture, forestry, fishing	2	2	1	3	3	0	0	0
Energy and supply industry, mining, manufacturing (without construction)	27	26	29	31	29	21	44	50
Last monthly earnings								
Salary in Euros*	2001	2099	2361	2227	1354	1654	2261	2534
No information	17	12	13	9	33	14	22	0
1278 > salary	53	53	42	52	56	72	36	56
1278 ≤ salary < 2556	29	34	42	39	11	17	39	44
2556 ≥ salary	2	0	3	0	1	0	3	0
Remaining unemployment (UE) benefits claim at the end of the last unemployment spell before entry in the programme								
Remaining UE benefits claim (in months)*	2.6	2.3	2.4	2.4	1	0.3	0.7	1.8
No information or no claim	49	55	53	52	79	93	83	75
≤ 6 months	36	33	34	34	15	3	11	6
≤ 1 year	50	44	46	47	20	7	17	25
≤ 18 months	51	45	47	48	20	7	17	25
Legal UE benefits claim at the beginning of the last unemployment spell before the programme								
Legal claim* (in months)	6.4	5.4	5.9	5.6	3.4	2.9	3.5	2.5
No information	16	25	21	21	55	55	31	63
No claim	9	11	9	7	6	3	17	0
≤ 6 months	17	15	18	20	11	17	31	13
≤ 1 year	71	63	66	71	36	41	53	38
≤ 18 months	74	64	70	72	38	41	53	38
Unemployment benefits or assistance in the month before beginning of the programme								
UE benefits	83	75	79	79	45	45	69	38
UE assistance	17	25	21	21	55	55	31	63
Various historical un-/ out-of/employment information before the "first unemployment period"								
Months of last employment spell*	16.7	15.2	16.8	16.2	12.6	12.2	13.5	20.4
Proportion of employment months (in %)*	68.7	72.6	78.0	77.9	45.8	67.8	64.0	67.7
Proportion of out-of-labour months (in %)*	11.1	10.1	9.0	10.0	13.6	1.6	6.5	7.5
Proportion of UE months (in %)*	10.5	9.6	7.3	7.7	21.9	13.8	14.8	4.3
# of programs up to 2 years before the UE period*	0.14	0.16	0.10	0.10	0.32	0.28	0.25	0.38
# of programs up to 5 years before the UE period*	0.17	0.18	0.11	0.11	0.38	0.28	0.25	0.44
Mean duration of UE spells up to 2 years before the UEP*	1.65	1.92	1.30	1.37	3.44	2.09	2.32	1.19
Mean duration of UE spells up to 5 years before UEP*	2.47	2.21	1.65	1.75	5.09	2.53	3.65	1.25
Mean duration of employment spells up to 2 years before UEP*	7.99	9.33	9.99	9.83	4.90	10.17	9.01	8.94
Mean duration of employment spells up to 5 years before UEP*	14.09	13.54	15.38	14.91	9.62	12.21	12.78	9.88
Mean duration of out-of-labour spells up to 2 years before UEP*	1.78	1.72	1.67	1.71	2.19	0.38	1.03	1.56
Mean duration of out-of-labour spells up to 5 years before UEP*	2.90	2.49	2.16	2.30	3.33	0.45	1.19	1.50

Table IB.1c to be continued

Table IB.1c: Comparison of means of selected variables (continued-2)

	Included in the estimation				Excluded from the estimation			
	Non-part.	Short train.	Long train.	Retrain.	Non-part.	Short train.	Long train.	Retrain.
Total months in all programmes up to 2 years before the UEP*	1.65	1.35	0.77	0.60	3.62	2.59	2.44	3.56
Total months in all programmes up to 5 years before the UEP*	1.89	1.57	0.84	0.65	4.18	2.59	2.44	4.06
Various un-/employment information from the "first unemployment period"								
Duration of the "first UE spell"	7.0	7.6	7.2	6.3	9.7	12.5	10.7	8.8
Duration of last UE spell before programme*	6.2	6.3	6.1	5.2	8.2	8.3	7.7	4.2
Time since beginning of last UE spell (before the prog.) even if other state between UE and prog.*	6.2	7.7	7.3	6.4	8.2	13.1	9.8	10.8
Time between the prog. and last job*	12.5	12.1	11.4	10.0	21.5	19.9	14.8	16.5
3 months ≥ time between prog. and last job	18	18	16	20	8	0	8	6
6 months ≥ time between prog. and last job	39	38	34	41	18	7	31	19
12 months ≥ time between prog. and last job	65	64	69	73	32	28	53	31
24 months ≥ time between prog. and last job	84	87	88	93	56	69	78	81
Transition in 6 months before programme: UE → UE	58	63	64	60	65	90	72	69
Transition in 6 months before the programme: empl. → UE	30	30	29	31	14	3	25	6
Transition in 6 months before programme: out → UE	8	4	5	6	13	7	3	19
Transition in 6 months before programme: prog. → UE	4	3	1	3	8	0	0	6
Number of prog. in year before actual programme*	0.09	0.05	0.02	0.05	0.17	0.03	0.03	0.13
Number of prog.'s in 6 months before actual programme*	0.04	0.03	0.01	0.03	0.09	0	0	0.06
Regional information								
Big City	16	18	15	13	20	14	8	19
Net migration per 1000 inhabitants	12.4	13.5	9.5	9.9	20.0	12.2	13.0	7.7
Inhabitants below age 15 in % of the 15-65 year olds	20.2	20.1	21.0	21.5	17.0	20.8	20.8	21.3
Inhabitants above age 65 in % of the 15-65 year olds	19.0	19.0	19.7	20.1	15.9	20.2	19.9	19.6
Inhabitants of age 15-65 in % of all inhabitants	60.9	61.5	63.3	63.6	53.5	63.5	62.1	64.2
Inhabitants above age 75 in % of all inhabitants	4.6	4.6	4.9	5.1	3.1	5.2	4.9	5.0
Recipients of social assistance per 1000 inhabitants	15.5	16.0	16.1	16.5	13.6	14.9	14.5	14.8
Fraction of non-German nationals among recipients of social assistance ^a	10.5	8.4	9.2	10.0	10.6	5.2	17.4	8.4
Net migration per 1000 insured employees*	53.0	66.8	38.5	1.6	158	-93	-0.1	58
Gross value added - fraction agriculture and forestry*	0.9	0.8	1.1	1.4	-0.1	0.8	1.1	1.1
Gross value added - fraction other services*	43.2	43.7	45.6	44.9	38.4	48.4	42.9	44.4
Gross value added - fraction manufacturing*	31.7	31.8	32.3	33.4	26.7	30.5	33.8	34.0
Gross value added - fraction commerce and transportations*	10.5	10.8	11.2	11.5	8.3	11.0	10.9	12.0
Gross value added in DM per inhabitant*	21749	22515	22670	22103	19758	21314	20720	24377
Tax revenue in DM per inhabitant	163	166	160	172	144	145	166	242
Rural areas	21	15	22	24	19	17	19	19
Core cities and highly concentrated districts in agglomerations	13	13	15	12	13	24	6	31

Table IB.1c to be continued

Table IB.1c: Comparison of means of selected variables (continued-3)

	Included in the estimation				Excluded from the estimation			
	Non-part.	Short train.	Long train.	Retrain.	Non-part.	Short train.	Long train.	Retrain.
Concentrated and rural districts in agglomerations	20	22	20	21	14	10	22	13
Urbanised areas	36	40	36	37	34	41	44	31
Berlin, Postdam	11	8	8	9	13	0	6	6
Saxony, Thuringia	41	45	48	41	35	66	42	38
Mecklenburg-Western-Pomerania, Brandenburg	12	13	16	18	5	21	3	19
Saxony-Anhalt	14	11	13	13	19	3	31	6
UE rate $\leq$ 15%	35	34	37	34	34	24	42	38
15% < UE rate $\leq$ 20%	57	57	57	57	62	62	44	44
UE rate > 20%	7	9	6	10	5	14	14	19
Firms size of the last employer								
No information	15	13	13	8	32	28	19	0
1 to 9 employees	15	13	14	13	13	3	17	25
10 to 99 employees	31	29	28	34	25	17	36	25
100 to 499 employees	22	25	23	24	16	24	19	31
500 employees or more	17	21	22	20	14	28	8	19
Date of entry in and exit from the sample								
Date of entry in the data*	Jan 91	Jun 91	Jun 91	Apr 91	Aug 90	Sep 91	Mar 91	Sep 90
Date of entry in the sample*	Nov 93	Aug 93	Sep 93	Aug 93	Sep 93	Jun 93	Jul 93	Jun 93
Date of beginning of prog.*	Jun 94	May 94	May 94	Apr 94	Aug 94	Sep 94	Jul 94	Jul 94

Note: *The results for variables marked with an asterisk are means rather than proportions.

Table IB.1d: Loss of observations due to common support requirement in subsample analysis

			Nonparticipation		Short training		Long training			Retraining		
			Men	Women	Men	Women	Men	Women		Men	Women	
Observations before			1690	2914	112	209	190	348		255	190	
Observations after			1367	2013	101	164	170	305		242	174	
Percent deleted			19.1	30.9	9.8	21.5	10.5	12.4		5.1	8.4	
Separate MNP estimation for men and women in 1 st stage												
			Men	Women	Men	Women	Men	Women		Men	Women	
Observations before			1690	2914	112	209	190	348		255	190	
Observations after			1252	1888	98	160	159	292		232	161	
Percent deleted			25.9	35.2	12.5	23.4	16.3	16.1		9.0	15.3	
Skill level												
Obs.	unskilled	skilled	salaried	unsk.	sk.	sal.	unsk.	sk.	sal.	unsk.	sk.	sal.
before	997	1225	1193	79	83	95	68	90	291	126	181	94
after	680	810	946	55	68	80	58	74	263	101	166	88
% deleted	31.8	33.9	20.7	30.4	18.1	15.8	14.7	17.8	9.6	19.8	8.3	6.4
Big town (at least 100,000 inhabitants)												
Obs.	<100000	≥100000	<100000	≥100000	<100000	≥100000	<100000	≥100000	<100000	≥100000	<100000	≥100000
before	3500	915	235	77	382	144	364	76				
after	2696	639	211	61	347	122	351	63				
% deleted	23.0	30.2	10.2	20.8	9.2	15.3	3.6	17.1				
Regional unemployment rate												
Obs.	≤ 15%	> 15%	≤ 15%	> 15%	≤ 15%	> 15%	≤ 15%	> 15%	≤ 15%	> 15%	≤ 15%	> 15%
before	1609	2984	107	214	201	337	151	294				
after	1156	2232	91	187	174	309	136	279				
% deleted	28.2	25.2	15.0	12.6	13.4	8.3	9.9	5.1				
Total number of months spent in unemployment in the 3 years before the programme												
Obs.	< 12	≥ 12	< 12	≥ 12	< 12	≥ 12	< 12	≥ 12	< 12	≥ 12	< 12	≥ 12
before	2101	2503	159	162	324	214	275	170				
after	1856	1502	149	130	291	186	261	156				
% deleted	11.7	40.0	6.3	19.8	10.2	13.1	5.1	8.2				

Appendix IB.2: Match quality

Table IB.2a: Concentration of the weights due to matching with replacement

Control	Treated			
	Nonparticipation	Short training	Long training	Retraining
Nonparticipation		58.45	59.52	59.14
Short training	41.95		34.87	35.02
Long training	46.39	36.11		43.69
Retraining	51.66	40.42	45.86	

Note: Share of the largest 10% of the weights of the respective comparison group relative to the total sum of weights in that comparison group (concentration ratio) in %.

Figure IB.2: Effects prior to the programme ($\theta_0^{m,l}$): difference in %-points

Note: Figure shows significant (point wise at the 5% level) differences of outcome variable prior to the programme (after matching).

Table IB.2b: Differences in means of the matching variables and selected additional variables which are included in the propensity scores

Treated	Nonparticipation	Control		
		Short training	Long training	Retraining
Date of beginning of programme ^a				
Short training	-0.636		0.222	0.434
Long training	-0.814	-1.071		-0.504
Retraining	-0.928	-0.156	-0.438	
Woman ^a				
Short training	0.002		-0.007	0.006
Long training	-0.041	-0.065		-0.004
Retraining	-0.013	0	-0.018	
Employed 12 months before programme ^a				
Short training	-0.029		0.014	0.022
Long training	-0.04	0.024		-0.001
Retraining	-0.087	-0.029	-0.013	
Employed 24 months before programme ^a				
Short training	-0.058		0.007	0
Long training	-0.034	-0.011		-0.021
Retraining	-0.035	0.006	-0.017	
Employed 36 months before programme ^a				
Short training	0.038		0	0.021
Long training	0.039	0.012		0.004
Retraining	0.029	0.007	0.019	
Time between start last UE spell before prog. and prog. start				
Short training	-0.12		0.008	-0.079
Long training	-0.026	-0.225		-0.268
Retraining	0.089	0.405	-0.285	
Duration of the last UE benefit spell before programme				
Short training	-1.053*		0.291	-0.032
Long training	-0.666	-0.276		-0.021
Retraining	-0.78	0.159	-0.109	
Duration of the first UE spell 1993-1994				
Short training	1.354*		-0.072	-0.054
Long training	1.1*	-0.465		-0.326
Retraining	0.692	0.364	-0.133	
Remaining UB claim at the end of last UE spell before prog.				
Short training	0.03		0.138	0.376
Long training	0.145	-0.028		-0.13
Retraining	0.077	-0.649	0.231	
Legal UB claim at the beginning of last UE spell before prog.				
Short training	-2.788*		0.558	0.061
Long training	-1.904*	-0.298		-0.103
Retraining	-1.841*	-1.198	0.44	
Propensity score control				
Short training	-0.025		-0.01	-0.007
Long training	-0.025	-0.005		-0.017
Retraining	-0.035	-0.005	-0.022	

Table IB.2b to be continued

Table IB.2b: Differences in means of the matching variables and selected additional variables which are included in the propensity scores (continued)

Treated	Nonparticipation	Control		
		Short training	Long training	Retraining
		Propensity score treated ^a		
Short training	0.008		0.006	0.008
Long training	0.013	0.015		0.013
Retraining	0.018	0.013	0.014	

Note: Bold numbers indicate significance at the 5% level, numbers in *italics* relate to the 10% level and * to the 1% level. ^a Variables used for calculating the distance metric in the matching procedure.

Appendix IC: Detailed estimation results from the multinomial probit model

Table IC.1 shows the estimation results of a multinomial probit model (MNP) using simulated maximum likelihood with the GHK simulator.¹ Although being fully parametric, the MNP is a flexible version of a discrete choice model, because it does not require the Independence of Irrelevant Alternatives assumption to hold. With respect to the specification of the covariance structure of choice specific error terms, we impose the normalisation that all correlations with nonparticipation are zero. Furthermore, the correlation between *short training* and *retraining* is set to zero for reasons of numerical stability (this should not be very restrictive since those types of programme cannot not be considered as close substitutes). Furthermore, to increase the numerical stability of the results we exclude some regional variables and some interaction terms from the choice indices related to long training and retraining (these variables are insignificant in a binary probit of this group against nonparticipation). As shown in Table B.2, it turns out that covariance terms are however not significant. The number of draws per equation and observation is another choice parameter. We choose 1000 draws, which is very large by usual standards.

Table IC.1: Estimated coefficients of a multinomial probit model for participation in a programme

	Short Training		Long Training		Retraining	
	Coeff.	Std.	Coeff.	Std.	Coeff.	Std.
Constant	-4.40	2.78	-3.32	1.81	-1.71	1.68
Women	0.01	0.17	-0.13	0.11	-0.46*	0.11
Age/10	-0.26	0.85	1.19	0.61	0.92	0.59
(Age/10)^2	0.01	0.11	-0.17	-2.08	-0.22*	0.08
Marital status: Single	0.03	0.15	-0.08	0.10	-0.15	0.11
Children: No child	-0.08	0.16	-0.04	0.10	-0.01	0.11
Education (reference category: polytechnical degree, University degree)						
No professional degree	-0.12	0.36	-1.16*	0.21	-0.23	0.26
Professional degree	0.39	0.34	-0.58*	0.14	-0.24	0.21
Position in last job (reference category: master craftsman, skilled and unskilled worker)						
Salaried employee	-0.28	0.23	0.53*	0.12	-0.12	0.14
Part-time worker	0.11	0.22	0.26	0.16	-0.24	0.17

Table B.1 to be continued

¹ See for example Börsch-Supan, Hajivassiliou (1993) and Geweke, Keane and Runkle (1994).

Table IC.1: Estimated coefficients of a multinomial probit model for participation (continued-1)

	Short Training		Long Training		Retraining	
	Coeff.	Std.	Coeff.	Std.	Coeff.	Std.
Last occupation (reference category: Chemical worker, polymer processing, metal production and processing, textile, leather, clothing, paper manufacture and processing, printing, mining, stone, ceramics and glass making and/or processing)						
Plumbing, metal construction technology, technology, natural sciences, machinist, electronics	0.10	0.28	0.57*	0.22	-0.30	0.19
Food and nutrition, merchant (goods and services), transportation, storage, health services, hairdressing, guest assistance, house-keeping, cleaning, security services, social services, education, counselling, media, humanities, arts, unskilled worker	-0.11	0.25	0.17	0.19	-0.48*	0.15
Construction, woodworking	0.04	0.33	0.18	0.27	-0.39	0.21
Agriculture, forestry, fishing	0.02	0.37	0.31	0.28	-0.27	0.21
Administration, office work, business and social sciences	0.24	0.31	0.71*	0.22	-0.28	0.22
Industrial sector (reference category: Energy and supply industry, mining, manufacturing (without construction))						
Commerce, banking, insurance, local and regional authorities, social insurance, non-profit organisations, private household, transportation, telecommunications, other services	0.19	0.17	-0.12	0.10	0.08	0.11
Agriculture, forestry, fishing	-0.43	0.62	-0.38	0.36	-0.05	0.29
Construction	-0.25	0.30	-0.38	0.20	-0.34	0.19
Last monthly earnings						
log(last monthly earnings)	0.48	0.33	0.33	0.32	0.35	0.29
No information	1.07	1.08	0.96	1.12	0.78	0.99
2500 > salary	-0.09	0.16	-0.21	0.11	-0.20	0.11
Remaining unemployment (UE) benefits claim at the end of the last unemployment spell before entry in the programme						
Remaining UE benefits claim (in months)	0.20	0.09	0.06	0.04	0.11	0.05
No information	2.71*	0.67	2.00*	0.21	1.91*	0.18
≤ 6 months	0.23	0.34	-0.08	0.22	-0.07	0.22
≤ 2 years (and > 0)	2.06*	0.69	1.85*	0.35	1.41*	0.36
Legal UE benefits claim at the beginning of the last unemployment spell before the programme						
Legally claim* (in months)	-0.08	0.06	-0.04	0.04	-0.06	0.04
No claim	-0.91	0.36	-0.79*	0.21	-0.74*	0.22
≤ 6 months	-0.23	0.29	0.10	0.17	-0.18	0.17
≤ 18 months	-0.52	0.52	-0.72	0.30	0.04	0.32
Various historical un/ out-of/employment information before the "first unemployment period"						
Months of last employment spell ^a	-1.09	1.51	-1.00	1.11	-1.87	1.01
Months of last employment spell ^a ^2	0.22	0.98	0.01	0.68	0.97	0.62
Proportion of employment months (in %) before the UE spell ^a	0.04	0.04	0.09*	0.03	0.09*	0.03
Proportion of UE months (in %) before the UE spell ^a	0.09	0.06	0.07	0.04	0.11*	0.04
Mean duration of employment spells up to 2 years before UEP ^a	-3.39	3.72	-5.46	2.49	-2.28	2.48
Mean duration of employment spells up to 2 years before UEP ^a ^2	20.63	16.47	30.15*	11.01	14.89	10.83
Duration of last UE spell before programme ^a	-0.51	0.85	-0.71	0.64	-1.24	0.71
Duration of last UE spell before programme ^a ^2	-0.73	0.42	-0.66	0.33	-0.75	0.39
Duration of the "first UE spell" ^a	-1.61*	0.38	-1.54*	0.25	-1.76*	0.23
Time since beginning of last UE spell (before the prog.) even if other state between UE and prog. ^a	5.30*	0.98	3.59*	0.52	4.30*	0.48
Log(time since beginning of last UE spell (before the prog.) even if other state between UE and prog. ^a)	-1.37	0.77	0.07	0.52	-0.16	0.52
12 months ≥ time between prog. and last job	0.61	0.28	0.41*	0.15	0.35	0.16
Transition in 6 months before the programme: empl. → UE	0.55	0.31	0.30	0.16	-0.12	0.16
Number of prog. in year before actual programme	0.11	0.35	-0.47	0.26	0.05	0.22
Unemployed and employment status before programme (reference categories: out-of-labour, missing)						
Unemployed the 6 th . month before prog.	-0.44	0.37	-0.35	0.21	-0.14	0.22
Unemployed the 24 th . month before prog.	-0.30	0.25	-0.37	0.18	-0.63*	0.18
Unemployed the 36 th . month before prog.	-0.74	0.33	-0.13	0.19	-0.49	0.22
Employed the 6 th . month before prog.	-0.33	0.35	-0.53	0.22	-0.16	0.24
Employed the 24 th . month before prog.	-0.08	0.19	-0.13	0.13	-0.09	0.12
Employed the 36 th . month before prog.	-0.27	0.17	-0.02	0.10	-0.16	0.11

Table B.1 to be continued

Table IC.1: Estimated coefficients of a multinomial probit model for participation (continued-2)

	Short Training		Long Training		Retraining	
	Coeff.	Std.	Coeff.	Std.	Coeff.	Std.
Regional information						
Big City	0.24	0.32	-0.27	0.18	-0.31	0.20
Net migration per 1000 inhabitants. ^a (if local district not missing)	0.12	0.06	0.02	0.03	0.04	0.04
Inhabitants below age 15 in % of the 15-65 year olds. ^{a,b}	11.94	5.36			7.02*	2.60
Inhabitants above age 65 in % of the 15-65 year olds. ^{a,b}	11.84	5.22			6.21	2.49
Inhabitants of age 15-65 in % of all inhabitants. ^{a,b}	25.30	11.17	-0.11	0.16	13.92*	5.40
Inhabitants above age 75 in % of all inhabitants. ^{a,b}	0.77	2.66	0.32	0.53	3.16	1.79
Recipients of social assistance per 1000 inhabitants. ^{a,b}	0.03	0.12	-0.06	0.08	-0.09	0.08
Fraction of non-German nationals among recipients of social assistance. ^{a,b}	-0.01	0.16	-0.10	0.11	0.06	0.10
Gross value added - fraction agriculture and forestry. ^{a,b}	-23.13	10.13			-13.6*	4.87
Gross value added - fraction other services. ^{a,b}	-22.96	10.13			-12.78*	4.89
Gross value added - fraction manufacturing. ^{a,b}	-22.95	10.11			-12.74*	4.88
Gross value added - fraction commerce and transportations. ^{a,b}	-23.01	10.13			-12.59*	4.88
Log(Gross value added in DM per inhabitant). ^{a,b}	0.42	1.21	0.73	0.73	-0.01	0.83
Log(Tax revenue in DM per inhabitant). ^{a,b}	-0.28	0.44	0.16	0.24	-0.27	0.28
Net migration per 1000 insured employees. ^{a,b}	0.01	0.01	0.00	0.00	-0.00	0.01
Rural area ^b	-0.43	0.23	-0.11	0.12		
(reference category: Saxony-Anhalt)						
No regional information	0.15	0.70	-0.42	0.49	0.44	0.48
Berlin, Potsdam	-0.52	0.76	-0.48	0.51	0.79	0.50
Saxony, Thuringia	0.23	0.71	-0.24	0.49	0.47	0.48
Mecklenburg-Western-Pomerania, Brandenburg	0.66	0.73	0.26	0.51	1.13	0.51
(reference category: UE rate > 20%)						
UE rate ≤ 15%	-0.51	0.28	-0.07	0.18	-0.37	0.19
15% < UE rate ≤ 20% (E)	-0.51	0.25	-0.22	0.18	-0.51*	0.17
Firms size of the last employer (reference category: 100 employees or more)						
No information	0.18	0.31	0.24	0.18	-0.22	0.22
1 to 9 employees	-0.24	0.19	-0.03	0.13	-0.16	0.13
10 to 99 employees	-0.26	0.15	-0.09	0.10	-0.16	0.10
Date of entry in the sample ^a	-0.49*	0.17	-0.52*	0.11	-0.61*	0.10
Age < 26 * time since beginning of last UE spell (before the prog. even if other state between UE and prog.) ^a	-0.21	0.32	0.27	0.23	-0.04	0.21
Age ≥ 50 * months of last employment spells ^a	-0.75	1.74	-1.94	1.23		
Empl. → UE in 6 months before prog * claim ^a	-0.10	0.06				
Polytechnical degree *time since beginning of last UE spell (before the prog. even if other state between UE and prog.) ^a	-0.61	0.65	-0.36	0.32	-0.43	0.52

Note: Simulated maximum likelihood estimates using the GHK simulator (1000 draws in simulator for each observation and choice equation). Coefficients of the category NONPARTICIPATION are normalised to zero. Inference is based on the outer product of the gradient estimate of the covariance matrix of the coefficients ignoring simulation error. N = 5908. Value of the log-likelihood function: -0.570502. Bold numbers indicate significance at the 5% level, numbers in *italics* relate to the 10 % level and * to the 1 % level. ^a The variable is scaled. ^b If local district not missing.

Table IC.2: Estimated covariance and correlation matrices of the error terms in the multinomial
probit

	Nonparticipation		Short Training		Long Training		Retraining	
	Coef	t-val	Coef	t-val	Coef	t-val	Coef	t-val
NONP	1	-	0	-	0	-	0	-
ST	0		1	-	0.25	0.53	0	-
LT	0		0.24		1.06	4.59	-1.00	-1.22
RT	0		0		-0.69		2.01	1.21

Note: Diagonal and upper triangular matrix shows covariance terms. Correlations are shown in the part below the main diagonal. In the estimation Cholesky factors are used for parameterisation to ensure that the estimated covariance matrix of the error terms is positive definite.

Appendix ID: Additional estimation results

Appendix ID.1: Effects without significance levels

Figure ID.1a: Dynamics of the effects (ATET) without significance levels

Figure ID.1b: Dynamics of the effects (ATET) without significance levels for men -

MNP estimation different for men and women

Employment

Unemployment

Figure ID.1c: Dynamics of the effects (ATET) without significance levels for women -

MNP estimation different for men and women

Appendix ID.2: Additional outcome variables

Table ID.2a: Estimated employment effects 8 years after programme start

State m	State l	Sample size		$E(Y^m)$	$E(Y^m)$	$E(Y^l)$	$E(Y^l)$	$\theta_0^{m,l}$	$-\theta_0^{l,m}$	$\gamma_0^{m,l}$
		m	l	S = m)	S = l)	S = m)	S = l)			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Short training	nonparticip.	292	3542	52.7	55.4	40.2	40.4	12.5*	15.0*	14.3*
Short training	long training	292	502	52.7	52.0	46.9	47.4	5.8	4.6	11.5
Short training	retraining	292	429	52.7	59.6	56.6	53.1	-3.9	6.5	-0.1
Long training	nonparticip.	502	3542	47.4	41.1	42.8	40.4	4.6	0.7	1.4
Long training	retraining	502	429	47.4	45.9	61.7	53.1	-14.3*	-7.2	-11.5
Retraining	nonparticip.	429	3542	53.1	52.7	44.6	40.4	8.5	12.3*	12.8*

Note: Bold numbers indicate significance at the 5% level, numbers in *italics* relate to the 10% level and * to the 1% level. Outcome variable: subsidised and unsubsidised employment.

Table ID.2b: Estimated 'Job creation schemes and structural adjustment measures' (employment) effects 8 years after programme start

State m	State l	Sample size		$E(Y^m)$	$E(Y^m)$	$E(Y^l)$	$E(Y^l)$	$\theta_0^{m,l}$	$-\theta_0^{l,m}$	$\gamma_0^{m,l}$
		m	l	S = m)	S = l)	S = m)	S = l)			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Short training	nonparticip.	292	3542	3.8	2.3	4.2	4.2	-0.4	-1.9	-1.2
Short training	long training	292	502	3.8	5.1	1.5	3.4	2.3	1.7	1.0
Short training	retraining	292	429	3.8	2.4	2.9	3.7	0.9	-1.3	-1.1
Long training	nonparticip.	502	3542	3.4	1.9	4.0	4.2	-0.6	-2.3	-2.1
Long training	retraining	502	429	3.4	1.0	5.0	3.7	-1.6	-2.7	-2.5
Retraining	nonparticip.	429	3542	3.7	4.1	3.4	4.2	0.3	-0.1	0.1

Note: Bold numbers indicate significance at the 5% level, numbers in *italics* relate to the 10% level and * to the 1% level. Outcome variable: subsidised employment in job creation schemes or structural adjustment measures.

Table ID.2c: Estimated 'temporary wage subsidies' (employment) effects 8 years after programme start

State m	State l	Sample size		$E(Y^m)$	$E(Y^m)$	$E(Y^l)$	$E(Y^l)$	$\theta_0^{m,l}$	$-\theta_0^{l,m}$	$\gamma_0^{m,l}$
		m	l	S = m)	S = l)	S = m)	S = l)			
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Short training	nonparticip.	292	3542	1.7	1.3	1.8	1.8	-0.1	-0.5	-0.2
Short training	long training	292	502	1.7	2.3	2.5	2.6	-0.8	-0.3	-2.2
Short training	retraining	292	429	1.7	1.4	1.3	1.9	0.4	-0.5	-0.5
Long training	nonparticip.	502	3542	2.6	4.3	1.2	1.8	1.4	2.5	2.3
Long training	retraining	502	429	2.6	3.5	0.6	1.9	2.0	1.6	2.3
Retraining	nonparticip.	429	3542	1.9	2.0	0.9	1.8	1.0	0.2	0.2

Note: Bold numbers indicate significance at the 5% level, numbers in *italics* relate to the 10% level and * to the 1% level. Outcome variable: employment subsidised with temporary wage subsidies.

Table ID.2d: Estimated employment with stable earnings effects 2 and 8 years after programme start

Outcome	Month after beginning	Sample size		$E(Y^m S = m)$	$E(Y^m S = l)$	$E(Y^l S = m)$	$E(Y^l S = l)$	$\theta_0^{m,l}$	$-\theta_0^{l,m}$	$\gamma_0^{m,l}$
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Short training (m) compared to nonparticipation (l)										
Employed	24	292	3541	39.0	57.6	28.0	27.4	11.0*	30.2*	25.1*
	96	292	3541	44.2	37.4	31.2	32.0	13.0*	15.4*	14.8*
Short training (m) compared to long training (l)										
Employed	24	292	502	39.0	34.3	41.2	37.1	-2.2	-2.8	8.9
	96	292	502	44.2	41.3	36.3	37.3	7.9	4.0	11.3
Short training (m) compared to retraining (l)										
Employed	24	292	429	39.0	42.1	19.0	22.6	20.0*	19.5*	27.9*
	96	292	429	44.2	49.8	46.2	44.5	-2.0	5.3	1.3
Long training (m) compared to nonparticipation (l)										
Employed	24	502	3541	37.1	42.1	28.0	27.4	9.1*	14.7*	12.9*
	96	502	3541	37.3	32.9	32.5	32.0	4.8	0.9	1.6
Long training (m) compared to retraining (l)										
Employed	24	502	429	37.1	41.0	23.7	22.6	13.4*	18.4*	15.9*
	96	502	429	37.3	37.0	53.4	44.5	-16.1*	-7.5	-10.9
Retraining (m) compared to nonparticipation (l)										
Employed	24	429	3541	22.6	25.0	33.0	27.4	-10.4*	-2.4	-4.2
	96	429	3541	44.5	43.6	35.7	32.0	8.8	11.6	12.5*

Note: Bold numbers indicate significance at the 5% level, numbers in *italics* relate to the 10% level and * to the 1% level. The outcome variable "employment with stable earnings" is a dummy that equals 1 if earnings in the respective month are at least 90% of monthly earnings during the last employment spell before entry in the programme.

Table ID.2e: Estimated unsubsidised employment with stable earnings effects 8 years after programme start

State m	State l	Sample size		$E(Y^m S = m)$	$E(Y^m S = l)$	$E(Y^l S = m)$	$E(Y^l S = l)$	$\theta_0^{m,l}$	$-\theta_0^{l,m}$	$\gamma_0^{m,l}$
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Short training	Nonparticip.	292	3541	39.4	44.2	26.8	27.4	12.6*	16.8*	15.3*
Short training	long training	292	502	39.4	36.2	33.1	32.9	6.3	3.3	12.7
Short training	Retraining	292	429	39.4	46.9	43.4	40.3	-4.0	6.3	1.5
Long training	Nonparticip.	502	3541	32.9	27.1	28.7	27.4	4.2	-0.3	0.6
Long training	Retraining	502	429	32.9	33.0	49.9	40.3	-17.0*	-7.3	-12.6
Retraining	Nonparticip.	429	3541	40.3	39.9	32.5	27.4	7.8	12.5	12.9*

Note: Bold numbers indicate significance at the 5% level, numbers in *italics* relate to the 10% level and * to the 1% level. The outcome variable "unsubsidised employment with stable earnings" is a dummy that equals 1 if earnings (employment other than a temporary wage subsidy or a job creation scheme or a structural adjustment measure) in the respective month are at least 90% of monthly earnings during the last employment spell before entry in the programme.

Figure ID.2a: Dynamics of the effects ($\theta_0^{m,l}$):(difference in %-points)

Note: The outcome variable "employment with stable earnings" is a dummy that equals 1 if earnings in the respective month are at least 90% of monthly earnings during the last employment spell before entry in the programme. The outcome "stable employment" is a dummy variable which is 1 for a particular month, if the individual is employed in this month as well as in the six months just before. Only effects that are significant at the 5% level (point wise) appear in the figures.

Table ID.2f: Estimated stable employment effects 2 and 8 years after programme start

Outcome	Month after beginning	Sample size		$E(Y^m S = m)$	$E(Y^m S = l)$	$E(Y^l S = m)$	$E(Y^l S = l)$	$\theta_0^{m,l}$	$-\theta_0^{l,m}$	$\gamma_0^{m,l}$
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Short training (m) compared to nonparticipation (l)										
Employed	24	292	3542	38.4	44.4	32.8	29.0	5.6	15.4*	14.2*
	96	292	3542	44.9	49.4	33.5	32.9	11.4*	16.5*	15.0*
Short training (m) compared to long training (l)										
Employed	24	292	502	38.4	41.8	34.1	32.9	4.3	8.9	10.4
	96	292	502	44.9	47.9	39.0	40.2	5.9	7.7	13.4
Short training (m) compared to retraining (l)										
Employed	24	292	429	38.4	39.1	8.1	7.0	30.3*	32.1*	32.2*
	96	292	429	44.9	49.2	48.0	44.3	-3.1	4.9	-0.1
Long training (m) compared to nonparticipation (l)										
Employed	24	502	3542	32.9	34.2	36.8	29.0	-3.9	5.2	2.7
	96	502	3542	40.2	33.5	36.5	32.9	3.7	0.6	0.8
Long training (m) compared to retraining (l)										
Employed	24	502	429	32.9	34.0	8.0	7.0	24.9*	27.0*	21.9*
	96	502	429	40.2	39.7	55.1	44.3	-14.9*	-4.6	-12.6
Retraining (m) compared to nonparticipation (l)										
Employed	24	429	3542	7.0	14.0	36.4	29.0	-29.4*	-15.0*	-19.2*
	96	429	3542	44.3	47.1	39.0	32.9	5.3	14.2*	13.5*

Note: The outcome is a dummy variable which is 1 for a particular month, if the individual is employed in this month as well as in the six months just before. Bold numbers indicate significance at the 5% level, numbers in *italics* relate to the 10% level and * to the 1% level.

Table ID.2g: Estimated stable unsubsidised employment effects 8 years after programme start

State m	State l	Sample size		$E(Y^m S = m)$	$E(Y^m S = l)$	$E(Y^l S = m)$	$E(Y^l S = l)$	$\theta_0^{m,l}$	$-\theta_0^{l,m}$	$\gamma_0^{m,l}$
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Short training	Nonparticip.	292	3542	41.8	47.6	30.4	29.6	11.4*	18.0*	15.9*
Short training	Long training	292	502	41.8	41.9	35.3	36.3	6.5	5.6	16.3*
Short training	Retraining	292	429	41.8	46.8	45.0	40.6	-3.2	6.2	1.2
Long training	Nonparticip.	502	3542	36.3	26.6	32.1	29.6	4.2	-3.0	-1.8
Long training	Retraining	502	429	36.3	35.3	51.5	40.6	-15.2*	-5.3	-14.7*
Retraining	Nonparticip.	429	3542	40.6	43.0	36.3	29.6	4.3	13.4*	13.0*

Note: The outcome is dummy variable which is 1 for a particular month, if the individual is employed (employment other than a temporary wage subsidy or a job creation scheme or a structural adjustment measure) in this month as well as in the six months just before. Bold numbers indicate significance at the 5% level, numbers in *italics* relate to the 10% level and * to the 1% level.

Table ID.2h: Estimated earnings effects 2 and 8 years after programme start

Outcome	Month after beginning	Sample size		$E(Y^m S = m)$	$E(Y^m S = l)$	$E(Y^l S = m)$	$E(Y^l S = l)$	$\theta_0^{m,l}$	$-\theta_0^{l,m}$	$\gamma_0^{m,l}$
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Short training (m) compared to nonparticipation (l)										
Employed	24	292	3541	710	877	522	492	188*	385*	344*
	96	292	3541	816	876	608	606	208*	270*	252*
Short training (m) compared to long training (l)										
Employed	24	292	502	710	716	687	740	23	-24	113
	96	292	502	816	825	761	845	55	-20	170
Short training (m) compared to retraining (l)										
Employed	24	292	429	710	774	393	437	317*	337*	392*
	96	292	429	816	956	891	836	-75	120	-13
Long training (m) compared to nonparticipation (l)										
Employed	24	502	3541	740	727	597	492	143*	235*	198*
	96	502	3541	845	657	700	606	145	51	61
Long training (m) compared to retraining (l)										
Employed	24	502	429	740	739	516	437	224*	302*	253*
	96	502	429	845	804	947	836	-102	-32	-161
Retraining (m) compared to nonparticipation (l)										
Employed	24	429	3541	437	434	595	492	-158*	-58	-74
	96	429	3541	836	850	735	606	101	244*	233*

Note: Monthly earnings in euros (without benefits). The earnings information is available for a slightly smaller sample than the employment information. Bold numbers indicate significance at the 5% level, numbers in *italics* relate to the 10% level and * to the 1% level.

Table ID.2i: Estimated unsubsidised earnings effects 8 years after programme start

State m	State l	Sample size		$E(Y^m S = m)$	$E(Y^m S = l)$	$E(Y^l S = m)$	$E(Y^l S = l)$	$\theta_0^{m,l}$	$-\theta_0^{l,m}$	$\gamma_0^{m,l}$
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Short training	Nonparticip.	292	3541	751	837	534	530	217*	307*	276*
Short training	Long training	292	502	751	739	714	767	37	-28	183
Short training	Retraining	292	429	751	912	835	765	-84	147	20
Long training	Nonparticip.	502	3541	767	590	631	530	136	60	67
Long training	Retraining	502	429	767	748	875	765	-108	-17	-147
Retraining	Nonparticip.	429	3541	765	768	681	530	87	238*	224*

Note: Monthly earnings in euros (without benefits, employment other than a temporary wage subsidy or a job creation scheme or a structural adjustment measure). The earnings information is available for a slightly smaller sample than the employment information. Bold numbers indicate significance at the 5% level, numbers in *italics* relate to the 10% level and * to the 1% level.

Figure ID.2b: Dynamics of the effects ($\theta_0^{m,l}$): Monthly earnings

Note: Earnings differences in Euros. Only effects that are significant at the 5% level (point wise) appear in the figures.

Table ID.2j: Estimated smooth employment effects 2 and 8 years after programme start

Outcome	Month after beginning	Sample size		$E(Y^m S = m)$	$E(Y^m S = l)$	$E(Y^l S = m)$	$E(Y^l S = l)$	$\theta_0^{m,l}$	$-\theta_0^{l,m}$	$\gamma_0^{m,l}$
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Short training (m) compared to nonparticipation (l)										
Employed	24	292	3542	52.4	67.4	42.3	39.3	10.1	28.1*	23.9*
	96	292	3542	52.4	55.0	40.5	39.6	11.9*	15.4*	14.3*
Short training (m) compared to long training (l)										
Employed	24	292	502	52.4	52.2	52.5	52.4	-0.1	-0.2	7.1
	96	292	502	52.4	51.8	47.6	47.5	4.8	4.3	9.6
Short training (m) compared to retraining (l)										
Employed	24	292	429	52.4	53.8	32.3	33.2	20.1*	20.6*	29.2*
	96	292	429	52.4	59.9	56.5	52.4	-4.1	7.5	0.0
Long training (m) compared to nonparticipation (l)										
Employed	24	502	3542	52.4	56.4	45.5	39.3	6.9	17.1*	14.3*
	96	502	3542	47.5	43.3	43.6	39.6	3.9	3.7	3.4
Long training (m) compared to retraining (l)										
Employed	24	502	429	52.4	55.1	36.5	33.2	15.9*	21.9*	20.2*
	96	502	429	47.5	46.7	60.4	52.4	-12.9*	-5.7	-9.1
Retraining (m) compared to nonparticipation (l)										
Employed	24	429	3542	33.2	33.6	46.6	39.3	-13.4*	-5.7	-7.1
	96	429	3542	52.4	52.2	45.5	39.6	6.9	12.6	12.5*

Note: Bold numbers indicate significance at the 5% level, numbers in *italics* relate to the 10% level and * to the 1% level. The outcome is the mean over three months of the employment state.

Table ID.2k: Estimated smooth unsubsidised employment effects 8 years after programme start

State m	State l	Sample size		$E(Y^m S = m)$	$E(Y^m S = l)$	$E(Y^l S = m)$	$E(Y^l S = l)$	$\theta_0^{m,l}$	$-\theta_0^{l,m}$	$\gamma_0^{m,l}$
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Short training	Nonparticip.	292	3542	46.9	51.7	34.2	33.6	12.7*	18.1*	16.2*
Short training	Long training	292	502	46.9	44.4	43.3	41.4	3.6	3.0	11.5
Short training	Retraining	292	429	46.9	56.4	52.5	47.2	-5.6	9.2	2.1
Long training	Nonparticip.	502	3542	41.4	36.6	38.0	33.6	3.4	3.0	2.9
Long training	Retraining	502	429	41.4	42.2	55.3	47.2	-13.9*	-5.0	-9.5
Retraining	Nonparticip.	429	3542	47.2	45.9	40.9	33.6	6.3	12.3	12.3*

Note: Bold numbers indicate significance at the 5% level, numbers in *italics* relate to the 10% level and * to the 1% level. The outcome is the mean over three months of the employment state (employment other than a temporary wage subsidy or a job creation scheme or a structural adjustment measure).

Figure ID.2c: Dynamics of the effects: Smoothed effect

Note: The outcome "employment" is a moving average over three months of the employment state. The outcome "earnings" is the moving average over three months of the earnings observations. Only effects that are significant at the 5% level (point wise) appear in the figures.

Table ID.2l: Estimated smooth earnings effects 2 and 8 years after programme start

Outcome	Month after beginning	Sample size		$E(Y^m)$ $S = m$	$E(Y^m)$ $S = l$	$E(Y^l)$ $S = m$	$E(Y^l)$ $S = l$	$\theta_0^{m,l}$	$-\theta_0^{l,m}$	$\gamma_0^{m,l}$
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Short training (m) compared to nonparticipation (l)										
Employed	24	292	3541	686	840	524	490	162*	350*	306*
	96	292	3541	810	872	611	595	199*	277*	254*
Short training (m) compared to long training (l)										
Employed	24	292	502	686	697	683	734	3	-37	82
	96	292	502	810	820	775	848	35	-28	149
Short training (m) compared to retraining (l)										
Employed	24	292	429	686	737	379	427	307*	310*	364*
	96	292	429	810	963	887	825	-77	138	-6
Long training (m) compared to nonparticipation (l)										
Employed	24	502	3541	734	727	604	490	130*	237*	195*
	96	502	3541	848	680	710	595	138	85	84
Long training (m) compared to retraining (l)										
Employed	24	502	429	734	720	498	427	236*	293*	259*
	96	502	429	848	824	929	825	-81	-1	-128
Retraining (m) compared to nonparticipation (l)										
Employed	24	429	3541	427	428	610	490	-183*	-62	-83
	96	429	3541	825	838	747	595	78	243*	224*

Note: Bold numbers indicate significance at the 5% level, numbers in *italics* relate to the 10% level and * to the 1% level. The outcome is the mean over three months of the earnings.

Table ID.2m: Estimated smooth unsubsidised earnings effects 8 years after programme start

State m	State l	Sample size		$E(Y^m)$ $S = m$	$E(Y^m)$ $S = l$	$E(Y^l)$ $S = m$	$E(Y^l)$ $S = l$	$\theta_0^{m,l}$	$-\theta_0^{l,m}$	$\gamma_0^{m,l}$
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
Short training	Nonparticip.	292	3541	746	836	634	521	212*	315*	282*
Short training	long training	292	502	746	733	726	767	20	-34	168
Short training	Retraining	292	429	746	922	832	758	-86	<i>163</i>	30
Long training	Nonparticip.	502	3541	767	608	635	521	132	87	86
Long training	Retraining	502	429	767	858	862	758	-95	10	-120
Retraining	Nonparticip.	429	3541	758	755	687	521	71	234*	217*

Note: Bold numbers indicate significance at the 5% level, numbers in *italics* relate to the 10% level and * to the 1% level. The outcome is the mean over three months of the earnings (employment other than a temporary wage subsidy or a job creation scheme or a structural adjustment measure).

Figure ID.2d: Dynamics of employment effects by gender (difference in %-points)

Note: Outcome: subsidised and unsubsidised employment. Only effects that are significant at the 5% level (point wise) appear in the figures.

Figure ID.2e: Dynamics of employment effects by gender (difference in %-points) -

MNP estimation different for men and women

Note: Outcome: subsidised and unsubsidised employment. Only effects that are significant at the 5% level (point wise) appear in the figures.

Figure ID.2f: Dynamics of monthly earnings effects by gender - MNP estimation different for men and

Note: Outcome: subsidised and unsubsidised employment. Only effects that are significant at the 5% level (point wise) appear in the figures.

Figure ID.2g: Dynamics of employment effects by gender (difference in %-points) -
MNP different for men and women, without Berlin

Note: Outcome: subsidised and unsubsidised employment. Only effects that are significant at the 5% level (point wise) appear in the figures.

Appendix ID.3: Effect heterogeneity

Table ID.3a: Effect heterogeneity 8 years after programme start (difference in %-points) ($\theta_0^{m,l}$) -

Separate MNP estimation for men and women

m - l	Employment		Unsubsidised Employment	
	Men	Women	Men	Women
Short training - nonparticipation	18.7*	11.8	20.7*	11.7
Short training - long training	<i>15.5</i>	-0.4	13.7	-2.8
Short training - retraining	0.2	-14.7	-0.8	-17.5
Long training - nonparticipation	-11.7	9.4	-11.2	11.0*
Long training - short training	-13.4	4.7	0.7	3.2
Long training - retraining	1.6	-17.0	1.5	-19.5*
Retraining - nonparticipation	1.2	25.3*	0.8	25.5*
Retraining - short training	-9.3	16.3	-11.1	13.7
Retraining - long training	7.6	6.5	7.9	3.4
Nonparticipation	1252	1888	1252	1888
Short training	98	160	98	160
Long training	159	292	159	292
Retraining	232	161	232	161

Note: Bold numbers indicate significance at the 5% level, numbers in *italics* relate to the 10% level and * to the 1% level. Cells shaded in grey indicate that the difference of the two estimated effects is significant at the 5% level. Employment is the combination of subsidised and nonsubsidised employment.

Table ID.3b: Effect heterogeneity 8 years after programme start ($\theta_0^{m,l}$) - Separate MNP estimation for

men and women

m - l	Earnings		Unsubsidised Earnings	
	Men	Women	Men	Women
Short training - nonparticipation	355*	190	397*	197
Short training - long training	142	-79	124	-106
Short training - retraining	-84	-275	-94	-307
Long training - nonparticipation	-96	228*	-102	245*
Long training - short training	16	136	125	114
Long training - retraining	227	-199	231	-236
Retraining - nonparticipation	4	386*	-1	397*
Retraining - short training	-154	198	-182	169
Retraining - long training	80	-16	84	-51
Nonparticipation	1251	1888	1251	1888
Short training	98	160	98	160
Long training	159	292	159	292
Retraining	232	161	232	161

Note: Bold numbers indicate significance at the 5% level, numbers in *italics* relate to the 10% level and * to the 1% level. Cells shaded in grey indicate that the difference of the two estimated effects is significant at the 5% level. The outcome 'unsubsidised earnings' is the monthly earnings in euros (without benefits, employment other than a temporary wage subsidy or a Job creation scheme or a structural adjustment measure). The outcome 'earnings' is the monthly earnings in euros (without benefits).

Table ID.3c: Effect heterogeneity (employment) 8 years after programme start (difference in %-points) ($\theta_0^{m,l}$)

m - l	Regional UE-rate		Big town		Gender		Long-term UE		Type of occupation		
	≤ 15%	> 15%	<100,000 inhabit.	≥100,000 inhabit.	Men	Women	< 12 months	≥ 12 months	Unskilled	Skilled (incl. master craftsman)	Salaried
Short training - nonparticipation	26.4*	3.3	7.2	<i>15.0</i>	12.7	12.0	17.3*	<i>12.7</i>	1.7	16.4	6.7
Short training - long training	19.1	2.5	4.8	<i>16.0</i>	15.7	2.2	16.0*	2.3	-13.6	25.4*	-0.9
Short training - retraining	7.7	-6.8	-1.9	10.3	1.4	-10.8	<i>-12.2</i>	3.8	-22.4	3.3	-28.6*
Long training - nonparticipation	7.4	2.0	5.6	-6.7	-10.1	10.7	4.4	5.7	-1.4	-3.3	3.7
Long training - short training	-20.5*	4.8	-0.4	-13.3	-23.3	6.1	-1.4	-6.0	7.2	-21.0	-5.0
Long training - retraining	-18.2	<i>-11.4</i>	-12.5	<i>-21.2</i>	-2.0	<i>-17.2*</i>	-18.2*	-9.8	-14.7	-9.7	-18.1
Retraining - nonparticipation	11.0	3.7	6.7	4.9	-3.0	18.5*	14.4*	14.5	-0.3	8.3	<i>13.7</i>
Retraining - short training	-17.9	0.5	-4.1	-18.2	<i>-13.5</i>	2.8	-5.2	-11.1	2.9	-20.1	1.7
Retraining - long training	7.2	9.2	6.0	<i>20.9</i>	9.3	8.6	12.5	1.9	2.6	27.6*	1.1
Sample size											
Nonparticipation	1156	2232	2696	639	1367	2013	1856	1502	680	810	946
Short training	91	187	211	61	101	164	149	130	55	68	80
Long training	174	309	347	122	170	305	291	186	58	74	263
Retraining	136	279	351	63	242	174	261	156	101	166	88

Note: Outcome: subsidised and unsubsidised employment. Bold numbers indicate significance at the 5% level, numbers in *italics* relate to the 10% level and * to the 1% level. Comparisons based on less than 50 observations are not reported in the table. Cells shaded in grey indicate that the difference of the two estimated effects is significant at the 5% level.

Appendix IE: Results of the sensitivity analysis

Appendix IE.1: Different procedure for simulating starting dates for nonparticipants

Figure IE.1: Dynamics of the effects ($\hat{\theta}_t^{ml}$) after the start of the programme (differences in %-points)
(alternative starting dates for nonparticipants)

Note: Outcome: subsidised and unsubsidised employment. Only effects that are significant at the 5% level (point wise) appear in the figures. The effects can be displayed only for up to 36 months (1997) since we have the data until 2002 only available for the evaluation sample we have chosen originally.

Appendix IE.2: Stricter common support: Defining maximum and minimum using the 10th largest/smallest observations

Figure IE.2a: Distribution of marginal probabilities after imposing redefined common support rule

Figure IE.2b: Dynamics of the effects ($\theta_0^{m,l}$): Employment (difference in %-points)

Note: Outcome: subsidised and unsubsidised employment. Only effects that are significant at the 5% level (point wise) appear in the figures. Deleted observations in %: nonparticipants 53.7, short training 38.6, long training 35.3, retraining 23.8 .

Appendix IE.3: Only gender and the scores used in matching

Figure IE.3: Dynamics of the effects ($\theta_0^{m,l}$): Employment (difference in %-points)

Note: Outcome: subsidised and unsubsidised employment. Only effects that are significant at the 5% level (point wise) appear in the figures.

Appendix IF: Selected asymptotic bias estimates

Figure IF.1: Bias in terms of employment differences ($\sum_{\tau=1}^t \hat{\theta}_{\tau}^{ml}$) in months

Note: Outcome: subsidised and unsubsidised employment. Only effects that are significant at the 5% level (point wise) appear in the figures.