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Effectiveness of further vocational training in Germany

Empirical findings for persons receiving means-tested unemployment benefit

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Mit der Reihe „IAB-Discussion Paper“ will das Forschungsinstitut der Bundesagentur für Arbeit den Dialog mit der externen Wissenschaft intensivieren. Durch die rasche Verbreitung von Forschungsergebnissen über das Internet soll noch vor Drucklegung Kritik angeregt und Qualität gesichert werden.

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Abstract

Further vocational training for the unemployed aims at enhancing their job prospects. This paper analyses the effectiveness of such subsidized training programmes for means-tested unemployment benefit recipients in Germany. The empirical findings are based on rich administrative data of the German Federal Employment Agency using propensity score matching to construct a suitable comparison group. We consider initiation of training in early 2005, just after the reform of the German means-tested benefit system, which aimed at activating hard-to-place jobseekers, and after the introduction of a voucher system as the sole assigning mechanism for vocational training. We estimated the effects of vocational training for several groups differentiated by age, gender, migration background, skills, programme duration, duration since the end of the last job and differences between East and West Germany. As a result we show that vocational training has a considerable beneficial impact on participants: It reduces the share of unemployment benefit II recipients and raises the employment rate in the intermediate term by up to 13 percentage points.

Zusammenfassung

Geförderte berufliche Weiterbildung soll die Beschäftigungschancen von Arbeits losen erhöhen. Diese Studie analysiert die Effektivität geförderter beruflicher Weiterbildung für Empfänger von Arbeitslosengeld II in Deutschland. Die empirischen Ergebnisse basieren auf administrativen Daten der Bundesagentur für Arbeit. Mittels Propensity Score Matching wird eine Vergleichsgruppe für die Teilnehmer gebildet. Die Studie betrachtet Eintritte in geförderte berufliche Weiterbildung Anfang des Jahres 2005, direkt nach der Einführung des SGB II, das besonders auf die stärkere Aktivierung von Problemgruppen des Arbeitsmarktes abzielt. Zudem war zu dieser Zeit auch schon der Bildungsgutschein als einziger Zuweisungsmechnismus zu beruflicher Weiterbildung eingeführt worden. Die Studie berücksichtigt Effekte beruflicher Weiterbildung für verschiedene Gruppen differenziert nach Alter, Geschlecht, Migrationshintergrund, Qualifikation, Dauer der Weiterbildung und Dauer seit der letzten Beschäftigung sowie Unterschiede zwischen Ost- und Westdeutschland. Als Ergebnis zeigt sich, dass sich berufliche Weiterbildung für die Teilnehmer lohnt: Sie reduziert mittelfristig deren Anteile im Arbeitslosengeld-II-Bezug und erhöht deren Anteil in Beschäftigung um bis zu 13 Prozentpunkte.

JEL classification: C13, I38, J69

Keywords: Propensity score matching, evaluation of active labour market policy, further vocational training, means-tested benefit recipients, women, migrants

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1 Introduction

Many OECD countries use vocational training to get the unemployed back to work and out of benefit dependency, because it may enhance their earnings potential and productivity prospects by increasing skills. On average over the OECD, training has been the largest category of spending on active labour market programmes since the year 2000 (OECD 2010). Corresponding to its importance in labour market policy, there is a growing amount of literature on evaluations of training programmes for the unemployed.

This study updates former studies with a later entry cohort, namely participants in programmes initiated in early 2005. This entry cohort is affected by two major reforms: First, a voucher was introduced in 2003 that is now the only assignment mechanism for further vocational training for unemployed. The voucher system precludes individuals without any educational degree from participating in further vocational training (Kruppe 2009). The second reform may work into the different direction by focusing on a disadvantaged group of unemployed. The unemployment benefit II for long-term unemployed and unemployed with no or little current work experience was introduced in 2005. This newly composed group is comparatively disadvantaged; the programme intends to activate them by an intense focus on their integration into the labour market. Further vocational training is one measure to reach this aim.

This study asks whether the recipients of unemployment benefit II benefit from participation in further vocational training by improving their employment prospects and avoiding further reliance on the unemployment benefit. Outcomes for participants in further vocational training are compared with those of a control group who did not start a training measure during this three months period. The control group is composed by means of a propensity score matching. The effectiveness of further vocational training is estimated within a mid-term observation window just less than 3 years after the training ended.

Compared to the existing literature, this study is innovative in several aspects. First, we account for the employment history and education of partners in the household when estimating participation probabilities by combining two datasets: the well known data on Integrated Employment Biographies with the new history of means-tested benefits (Leistungshistorik Grundsicherung). Second, we consider programme entries in 2005, just after the reform of the means-tested benefit system that aimed at activating employable people in needy households. To our knowledge, there exists no evaluation that focuses on this group or such a late entry cohort. Third, because participants with different characteristics may benefit differently from further vocational training, effects are estimated separately for several groups differentiated by age, migration background, skills, programme duration, duration since the end of the last job and differences between East and West Germany. None of the existing studies has investigated subgroups in such detail.

The paper is structured as follows: Section Two briefly overviews existing literature on effectiveness of training. Section Three describes the institutional framework and hypotheses about the impact of further vocational training. Section Four discusses the econometric evaluation approach and the micro data that we rely on. Section Five presents the results on the effectiveness of further vocational training for different groups. We summarise the results and draw some conclusions in Section Six.

2 Literature Review

Studies on the effectiveness of training vary by e.g. analysed outcomes, the timespan the impact is observed and group heterogeneity. Outcome variables in evaluation studies of training are usually employment rates (e.g. Andrén/Andrén 2006, Rosholm/Skipper 2009, Zweimüller/Winter-Ebmer 1996) or earnings (e.g. Raaum/Torp 2002, Raaum et al. 2002, Andrén/Gustafsson 2004) or transition rates out of unemployment (e.g. Crépon et al. 2007, Cockx 2003, Richardson/van den Berg 2001). In the majority of cases, the evaluation window covers no more than three years after training (e.g. Andrén/Gustafsson 2004, Albrecht et al. 2005, Cueto/Mato 2009). There are very few studies that observe long-term effects of training over a period of five years (Caliendo et al. 2011, Raaum et al. 2002, Winter-Ebmer 2006), seven years (Lechner et al. 2007, 2011) or even ten years after training (Lechner/Wunsch 2009). Most studies estimate effects for the entire number of participants. Very few studies estimate heterogeneous training programme effects for different labour market groups by age, gender or migration status (Andrén/Gustafsson 2004, Albrecht et al. 2005, Rinne et al. 2011) or for different lengths of training (Stephan/Pahnke 2011).

Ignoring differences in the type and organisation of training programmes within different countries, meta analyses show that micro-level evaluations of training for the unemployed tend to find positive employment effects (Card et al. 2010, Kluve 2010). This also holds for evaluations of German further vocational training programmes that have been evaluated in a considerable number of studies applying statistical matching techniques. Lechner et al. (2007, 2011) investigate programme entries during the years 1993 and 1994. Fitzenberger et al. (2006) analyse programme entries from inflows in unemployment during the years 1986 and 1987 as well as 1993 and 1994 in West Germany, while Fitzenberger/Völter (2007) focus on unemployment entries during 1993 and 1994 in East Germany. Generally, these studies obtain the result that - in the longer run - further vocational training programmes have mostly significant positive effects on the employment prospects of participants. However, since programme effects are rather weak, it takes time until the estimated programme effect turns positive.

More recent programme entries have been investigated by Biewen et al. (2007), Rinne et al. (2011) as well as Wunsch/Lechner (2008), who analysed programmes starting in the years 2000 to 2002. Estimates of Wunsch/Lechner (2008) indicated

no positive effects of further vocational training on employment prospects of participants in West Germany.[1] In contrast, Biewen et al. (2007) found positive effects for programmes of short and medium duration in West Germany (but not in East Germany) and particular groups of unemployed. Likewise, Rinne et al. (2011) estimated positive effects of participation in medium length programmes on the employment probabilities of participants in all subgroups investigated. Hujer et al. (2006), however, applied duration analysis to East German data from the years 1999 to 2002 and found that participation in further vocational training prolonged unemployment duration.

3 Further vocational training in Germany and potential effects

3.1 Organisation of further vocational training in Germany

In the last decade, the German government has implemented fundamental labour market reforms (Jacobi/Kluve 2007, Ludwig-Mayerhofer 2005). The legislature introduced the most important institutional reform in 2005, implementing a new benefit system for the unemployed not eligible for unemployment insurance benefit.[2] People, who exhausted their unemployment insurance benefits or who have never worked or worked only for a short period of time in contributory jobs, or low wage workers receive the newly introduced tax-financed unemployment benefit II, provided that they pass a means test. The new system focuses on the activation of unemployed welfare recipients: They have to, e.g., sign an individual action plan and fulfil certain job-search requirements. If welfare recipients do not comply with the requirements, they will face financial sanctions.

One goal of the reform was to activate needy unemployed individuals, including persons, who have not been in contact with the Federal Employment Agency and who did not receive labour market services before, i.e., previous social benefit recipients or inactive partners of previous unemployment assistance recipients. Therefore, unemployment benefit II recipients are a newly composed group of long-term unemployed, unemployed with no or little current work experience, and low-paid workers. This newly composed group is meant to be supported by newly introduced active labour market programmes as well as by some prior programmes, such as further vocational training.

Further vocational training has been a well established measure of active labour market policy in Germany for many decades. It encompasses a range of different types, which can be broadly classified into short qualification programmes, providing professional and practical skills, and long retraining programmes with a duration of

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1 The different results of Wunsch/Lechner (2008) may be due to a different approach on selection of the comparison group. For a discussion of the use of different definitions of comparison groups, see Stephan (2008).

2 Depending on age and previous history in contributory employment, previously employed job-seekers still receive unemployment insurance benefits for several months.

up to 2 years that aim at providing a certified vocational training degree. Courses are mainly provided by private and non-profit sector companies.

With 65 thousand programme entries in 2005, further vocational training was a comparatively minor active labour market programme for unemployment benefit II recipients.[3] This is in line with the overall loss of importance of this programme in Germany since the beginning of the new century. In former years, further vocational training was among the most important programmes in Germany. However, during the first half of this decade, entries as well as the duration of these measures were shrinking, whereas the number of entries increased again since 2006 (see Appendix table 1). The dramatic decrease of entries into further vocational training programmes from 523 thousand to 131 thousand was a result of the restructuring of the Federal Employment Agency, introducing a new business policy and new objectives. Longer - and therefore more expensive - measures were cut the most.

Another important change regards the assignment of the unemployed to further vocational training: Prior to 2003, a person was assigned directly to a specific course by the case worker. Since 2003, the case worker has to issue a training voucher to a person with the necessity of a further vocational qualification ascertained and therefore scheduled to undertake further vocational training. This change was motivated by arguments that vouchers increase clients' choice as well as increase competition among providers and enhance quality of training.[4] This is - in general - in line with recommendation of Barnow (2009), who analysed the use of training vouchers in the U.S. and concludes that "A targeted training program should include assessment and counselling to determine what training is appropriate for the participants and screening of vendors for quality of training and appropriate placement rates". The German training voucher guarantees the payment for the course by the Federal Employment Service, if the conditions of the voucher are met. Conditions stipulated on the voucher are the educational goal, the core theme of the qualification and the duration of the course. Both the provider and the training schemes have to be certified. The voucher is valid for up to three months.

Further vocational training could be an important element of a strategy of lifelong learning (Expertenkommission Finanzierung Lebenslangen Lernens 2004) by targeting groups otherwise underrepresented in training. Thus they could provide a substantial contribution towards equal opportunities (Becker 2004). But as a matter of fact, labour market segmentation due to educational inequalities is not reduced by

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[3] More important were: a workfare programme in the public sector, the so-called One-Euro-Jobs (Article 16 (3) SGB II) with an inflow of more than 600 thousand people (Hohmeyer/ Kopf 2009); short-term training programmes (Article 48 SGB III) with an inflow of more than 400 thousand people; contracting out placement services with more than 270 thousand assignments of unemployment benefit II recipients.

[4] For an international overview on the use of (training) vouchers, see West et al. (2000) and Dohmen/Cleuvers (2002), for the variety of the use of vouchers in the USA, see Steuerle et al. (2000).

participation in further vocational training (Schömann/Leschke 2004). The voucher system has a clear impact on selection into further vocational training: Individuals i.e. without any educational degree are much less likely to receive as well as to redeem a voucher (Kruppe 2009).

3.2 Theoretical considerations on effects of further vocational training

According to job search theory, active labour market policies such as further vocational training may raise the employment prospects of participants by improving their skills and by signalling their willingness to work to employers (Calmfors 1994, Mortensen, 1986). Human capital theory interprets participation at further vocational training as an investment in human capital. On the one hand, such investments could guarantee in the first place to have a job and to earn higher wages (Becker 1962). The probability to drop out of the labour market may be decreased and job search efficiency may be enhanced. Training may also prevent social isolation (Raaum Torp 2002).

On the other hand, the costs of human capital accumulation lower the present earnings (Becker 1962). Within the context of further vocational training, present earnings of a person could be interpreted as potential earnings, if he would not have participated in the training and had searched and found a job instead. Participants reduce their job search intensity during the training programme. Because of this, they have lower employment prospects than non-participants - they are locked in the measure. While this locking-in effect is interpreted as negative in general, this is not the case if the programme leads to a (vocational) certificate. Obtaining such a certification reduces the risk of being unemployed again and leads to a more stable employment career.

Putting these arguments together, we expect first that participants have better chances of finding and keeping a regular job after finishing the vocational training than non-participants. They should also be less likely to receive unemployment benefit II. Furthermore, we expect lower employment prospects for participants during the vocational training programme (the locking-in effect) and we interpret it as human capital investment.

4 Method and data

4.1 Evaluation approach

Let D = 0 indicate that an unemployed person did not start further vocational training during a certain time interval, while D = 1 indicates that there was a start of further vocational training. The outcome is measured by the variable Y, which takes the value Y_1 under treatment and Y_0 under non-treatment. Using non-experimental data to evaluate the programme effects, we have to consider the fundamental evaluation problem, the problem of unobservable possible outcomes: We only can observe either Y_0 that is the outcome if one does not start a further vocational training during

the interval or Y_1 that is the outcome if one starts a training during the interval for each individual.

If the programme does not have any effect on the labour market outcomes of non-participants - this is the "Stable Unit Treatment Value Assumption" (SUTVA) - the average treatment effect on the treated (ATT) is very generally given by

(1) $\Delta_{ATT} = E(Y_1 - Y_0 \mid D = 1) = E(Y_1 \mid D = 1) - E(Y_0 \mid D = 1).$

We only observe $E(Y_1 \mid D = 1)$, the average outcome of the treated with treatment, but we cannot observe the average outcome of the treated without treatment $E(Y_0 \mid D = 1)$ without finding a comparison group of non-treated individuals to impute the counterfactual outcome of the treated without treatment (Rubin 1974).

In this paper, we use a standard approach to solve this problem balancing the distribution of individual characteristics between the groups of treated and non-treated individuals. Therefore, we use statistical matching techniques. This method requires that all variables X, which determine the decision to join a programme and the expected success of a programme, are known and available. Conditioning on those variables, the expected outcome under non-treatment should not depend on the decision to join: $Y_0 \perp\!\!\!\perp D \mid X$, where $\perp\!\!\!\perp$ denotes independence. If this "Conditional Independence Assumption" (CIA) holds, the ATT may be represented as

(2) $\Delta_{ATT} = E(Y_1 - Y_0 \mid D = 1) = E(Y_1 \mid X, D = 1) - E_X\{E(Y_0 \mid X, D = 0) \mid D = 1\},$

where the outer expectation of the second term on the right hand side is taken over the distribution of X in the treated population (see for instance Caliendo/Hujer 2006). Furthermore, the "Common Support Condition" requires that each treated individual has a positive probability not to be in a programme, which guarantees that all of them have a counterpart in the group of non-participants.

In our empirical study, we use the implementation suggested by Sianesi (2004, 2008) with a narrow classification window. The treatment group consists of all individuals "joining" further vocational training between February and April 2005. Non-participants are defined as "waiting" in the sense that they do not take up treatment until the beginning of the evaluation period, but eventually at a later date. Frederiksson/Johansson (2004) define this a time-varying treatment indicator. To formalise this, let the ATT be given more specifically as

(3) $\Delta_{ATT}^{t+h,\,JW} = E(Y_1^{t+h} \mid X, D^t = 1) - E_X\{E(Y_0^{t+h} \mid X, D^t = 0) \mid D = 1\},$

where t is the timing of treatment and t+h the point of time when the outcome is observed. This "joining versus waiting" approach has been adopted for instance in a comprehensive evaluation of recent German labour market reforms (Deutscher Bundestag 2006). The estimated effects display the advantage of joining at a given time compared to waiting longer and are useful for testing for the existence of a treatment effect (Frederiksson/Johansson 2004).

4.2 Data

We use rich administrative data of the Federal Employment Agency for the empirical analysis. The Integrated Employment Biographies[5] (IEB, Version 5.1 and 6.0) contain socio-demographic characteristics and individual daily information about employment history, benefit receipt, job search history and participation on several programmes of active labour market policy. It was updated using latest information on the employment status from data marts of the data warehouse of the Statistics Department of the Federal Employment Service in Germany. Additional information about unemployment benefit II receipt and household structure are drawn from the history of means-tested benefits (LHG, Leistungshistorik Grundsicherung, Version 2.0 and 3.0). The household information of the LHG can be used to merge individual IEB data with the partner's IEB data. We account not only for the individual employment history, but for the partner's employment history as well, when estimating the propensity scores.

The potential treatment group consists of all persons registered as unemployed and receiving unemployment benefit II on 31 January 2005 and who started further vocational training between February and April 2005.[6] The potential control group consists of a 20 percent random sample of the stock of unemployed receiving unemployment benefit II on 31 January 2005. Control persons did not start further vocational training between February and April 2005, but they could have participated later on. Both treatment and control group are restricted to persons, who received unemployment benefit II, who were not older than 57 years and who did not have missing data in basic socio-demographic characteristics like age, sex, occupational qualification, migration background and location in East or West Germany on 31 January 2005.

4.3 Propensity score estimation

We include a vast number of variables on the sample members' characteristics in our probit estimates.[7] Based on the probit estimates, we calculated propensity scores, which were used to match control group members to the treated. This was done separately for each subgroup, differentiated according to the following characteristics:

- men and women in East and West Germany,
- duration of further vocational training (up to / more than one year),
- occupational qualification (with, without),

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5 Dorner et al. (2010), Jacobebbinghaus/Seth (2007) and Waller (2008) describe in detail a sample of the Integrated Employment Biographies.

6 Data on treatments in the 69 districts, in which only local authorities are in charge of administering the unemployment benefit II, are not available for the period under consideration. The Federal Employment Agency estimates that 13 percent of the unemployed are cared for in these districts.

7 For a detailed list of these variables see below.

- age (15-24, 25-44, 45-57 years),
- migration background (with, without),
- time since the end of the last job for people who are at least 30 years old (one year before, two or three years before, more than three years before or never had a job) and
- women with and without children in household.

The information on realised sample sizes are included in Table 2 (Appendix). Table 3 (Appendix) describes participants and non-participants before matching. The conditional independence assumption requires observing all explaining variables that determine starting a further vocational training as well as the outcome. All explanatory variables are measured as of 31 January 2005. As usual, we use the following information wherever possible as dummy variables (Jirhan et al. 2009):

- individual socio-demographic characteristics (age; migration background; health restrictions; qualification),
- characteristics of the needy household (single/partner; children; qualification of the partner),
- individual labour market history (duration of employment, unemployment and not observable states, such as dropped out of labour force; participation in active labour market programmes; receipt of unemployment assistance in December 2004; characteristics of the last job, such as real earnings, full-/part-time, duration since its end),
- labour market history of the partner (duration of employment, unemployment and not observable states, such as dropped out of labour force; participation in active labour market programmes),
- local labour market (unemployment rate, share of long-term unemployed among the unemployed, ratio between the number of vacancies and the number of unemployed in January 2005 as well as the percentage change of these three indicators against the previous year; type of district according to the classification of Rüb/Werner 2007) and
- interaction effects (individual labour market history and age; partner's labour market history and age).

These characteristics make it likely that the treatment and control outcomes given the propensity scores differ only due to treatment and hence that the conditional independence assumption holds. There may still be unobserved characteristics that determine the participation decision and the outcomes. Two important unobservable characteristics are talents and motivation of individuals. However, both should also be important determinants of the past labour market performance of the sample members and may also be determinants of their partner's labour market performance (Heckman et al. 1999). Therefore, the covariate set contributes to balancing these differences between treatments and controls with respect to these unobservable factors.

We estimate up to six different probit models for every group. We start with the maximum number of covariates and select sets of variables that enter the next estimation. A set of covariates is kept, if the Wald-Test on the hypothesis that their parameters are jointly zero achieves a p-value that is smaller than 0.5. This threshold value is stepwise decreased to 0.1 for the following probit models. The propensity scores are computed with the resulting reduced group specific models. They always contain individual socio-demographic characteristics independent of the previous test procedures.

We evaluate two outcomes on a monthly base: The first one is 'unsubsidised employment that is subject to social insurance contribution', the second one is 'no unemployment benefit II receipt'.[8] We define both kinds of outcomes in the sence of a success criterion. Therefore, positive average treatment effects will indicate a positive impact of the training, negative average treatment effects will indicate a negative one.

4.4 Matching algorithms, quality and sensitivity

We execute different matching algorithms[9] to check for sensitivity of the estimated ATTs (one to five nearest neighbour matching with and without replacement and radius-matching with calliper 0.001). Average treatment effects computed with different matching algorithms hardly differ from each other: The confidence intervals of the average treatment effects computed by a radius matching with caliper 0.001 comprise almost all the estimated effects by the other matching algorithms. We only present results from radius matching with caliper 0.001, because it produces the best control group with the smallest standardised bias (Rosenbaum/Rubin 1985). Table 2 (Appendix) shows the mean standardised bias before and after matching for every group. The remaining bias after matching never rises above 2.6 percent. Moreover, t-tests show that the hypothesis of equality of means of the covariates cannot be rejected after matching. Hence, we achieved a very good balancing.

Another sensitivity analysis can shed some light on the sensitivity of the estimated treatment effects to violations of the conditional independence assumption. A Rosenbaum bounds analysis determines how strongly an unobserved variable must influence the selection process into further vocational training to undermine the implications of the analysis. We applied the stata ado-file 'mhbounds' by Becker and Caliendo (2007) - available for nearest neighbour matching without replacement - to calculate Mantel-Haentzel test statistics for each combination of group, outcome and month. The confidence intervals for the effects would include zero, if an unobserved variable caused the odds ratio of treatment assignment to differ between the treatment and comparison groups. As a result these threshold values were quite low

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8 Data is available for 28 months ('unsubsidised employment') for 30 months ('no unemployment benefit II receipt') since assignment.

9 We apply the STATA-module psmatch2 (Leuven/Sianesi 2003).

(1.45 or less). Hence the results are to a certain degree sensitive to possible deviations from the identifying unconfoundedness assumption. But this does not mean that there is in fact an unobserved influence on the selection process into further vocational training. Given the huge set of variables on individual, household and local characteristics, we are confident not to have missed an important factor.

5 Results

Have different groups of unemployment benefit II recipients benefited from participating at further vocational training in terms of enhancing their employment prospects and avoiding unemployment benefit II receipt? Table 4 (Appendix) contains average treatment effects on participants only for certain points in time, but for all groups analysed. As discussed above, the average treatment effect is the difference between employment shares (unemployment benefit II receipt shares) within participants and matched comparison group of non-participants in percentage points. A positive treatment effect indicates better employment prospects for participants and lower shares in unemployment benefit II receipt and vice versa.

During the first months after the further vocational training started, all groups of participants have significant lower employment prospects and receipt more often unemployment benefit II than matched non-participants. The locking-in effect arises due to reduced job search activities of participants. We interpret it as an investment in human capital. For example, half a year after programme start, male participants in West Germany had 6 percentage points lower employment shares than the matched non-participants. Considering effects for all groups and both outcomes in the sixth month after programme start, a broad range of effects emerges. At this time, participants in longer lasting training programmes still suffer from the locking-in effect; they have a 14 percentage points higher probability to receive unemployment benefit II. But at the same time, male participants in East Germany already gain from almost 4 percentage points higher employment probabilities. It is apparent that the locking-in effect is highly correlated with the duration of the training course - the longer the training lasts, the higher and the longer lasting the locking-in effect (Stephan/Pahnke 2011).

Nevertheless, we observe positive effects of further vocational training for almost every group and both outcome variables several months after programme start. The results for most groups under consideration do not show substantial effect heterogeneity. Every group gains from participation in further vocational training. At the end of the observation window, the participants' probability of unsubsidised contributory employment is 4 to 13 percentage points higher than for the comparison group. The impact on no longer receiving unemployment benefit II is slightly lower and amounts to 10 percentage points at the most.

Due to the strong and long lasting locking-in effect, however, there is only a positive employment effect of almost six percentage points for participants in retraining that lasts longer than 1 year at the end of the observation window. But there is no effect

on avoiding unemployment benefit II receipt. The trend of reduction of negative difference to the control group up to an insignificant effect after 30 months is in line with prior evaluations on further vocational training. It was shown by Lechner et al. (2007, 2011) that participants in retraining reached the highest positive average treatment effects of the treated within the observation window of 8 years after start of training.

Comparing effects on both outcome variables - unsubsidised contributory employment and no longer receiving unemployment benefit II - it appears that the impact of further vocational training on avoiding benefit receipt is not as strong as on employment prospects. This is for the simple reason that unemployment benefit II is means-tested and oriented towards the needs of the entire household - therefore it is the more difficult criterion to fulfil: a participant not only has to get into employment, but also has to get a job with a wage high enough to meet the financial needs of the entire household. This implies first that a higher wage is required to avoid benefit receipt at increasing household size. Second, among those with low income potential, the probability to avoid benefit receipt is lower even if they have a job. Because of this reason, there are no positive effects on avoiding unemployment benefit II receipt for women in East Germany and for younger unemployed. Although both groups benefited from training in terms of improved employment prospects, they do not earn sufficient wages to sustain their family and to avoid additional benefit receipt.

6 Summary and conclusion

Participation in further vocational training, provided as part of active labour market policy, aims at improving the individual employment prospects to end unemployment. This paper analysed the effectiveness of such training programmes for means-tested unemployment benefit recipients in Germany. We consider training entries in the beginning of the year 2005, just after the reform of the German means-tested benefit system, which aimed at activating hard-to-place job-seekers. This paper is the first one that analyses effectiveness of training after this reform and after the introduction of the voucher system for further vocational training in 2003.

The empirical findings are consistent with hypotheses derived from human capital theory (Becker 1962). As long as the vocational training lasts, participants have lower chances to be employed and not to receive unemployment benefit II than non-participants. This period is the so called locking-in effect and it can be interpreted as a phase of investment. After the further vocational training is finished, participants gain from up to 13 percentage points higher employment prospects and up to 10 percentage points lower shares of benefit receipt than non-participants.

The empirical findings of this study are mainly in line with results of earlier evaluations of further vocational training in Germany (Stephan 2008, Biewen et al. 2007, Rinne et al. 2011). It follows that even the substantial reform of the institutional set-

ting, namely the introduction of vouchers and a new activation system for the long term unemployed, did not change the effectiveness of training, neither to the better nor to the worse.

Nevertheless, there is scope for discrimination against unemployed without any vocational degree when training vouchers are delivered and redeemed (Kruppe 2009). The introduction of the voucher system as delivering mechanism may not be the reason for such discrimination, but theoretical arguments support the hypothesis that it causes or increases discrimination (Kühnlein/Klein 2003, Faulstich et al. 2004). The discrimination is highly relevant for the interpretation of our results because the group of unemployed with a vocational degree benefits from further vocational training programmes, while the more disadvantaged unemployed only have a low chance to participate at all.

The results of this study demonstrate that more disadvantaged groups benefit from participation in further vocational training to pretty much the same degree as less disadvantaged groups. This applies for all analysed disadvantaged groups e.g. foreigners, migrants, the elderly, individuals without qualification and unemployed with long period out of work. If these more disadvantaged groups were comprehensively encouraged to participate on further vocational training, the effectiveness of this measure would not decrease. It would rather generate opportunities for these groups to gain from further vocational training. As a consequence, to make a contribution towards equal opportunities, disadvantaged groups should be offered sufficient opportunities to take part in such further vocational training. Nevertheless, to assure that these groups attain such training opportunities, additional targeted counselling can help to overcome possible thresholds.

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Appendix: Tables

Table 1
Programme Entries into Further Vocational Training

	Entries in further vocational training in 1,000		Share of persons (%) by duration of further vocational training in months							
			all				UB II recipients only			
Year	all	UB II recipients only	<4	4-8	8-13	>=13	<4	4-8	8-13	>=13
2000	523		28	24	30	17				
2001	442		28	23	30	20				
2002	455		29	24	27	20				
2003	255		28	29	17	25				
2004	185		40	31	9	21				
2005	131	65	46	33	9	12	37	38	12	12
2006	247	102	56	29	7	7	45	31	12	12
2007	341	140	59	29	6	6	51	30	9	10
2008	433	185	62	27	6	5	53	31	8	9
2009	587	200	64	24	6	6	54	29	8	9
2010	459	191	59	22	8	11	56	26	8	10

Source: Statistics Department of the Federal Employment Agency, Germany, own calculations

Table 2
Number of cases, Mean standardised bias before and after matching

	Number of treated	Number of controls	Mean bias before matching	Mean bias after matching
Duration of further vocational training				
<= 1 year	3.376	67.753	23,9	0,7
>1 year	362	67.740	29,2	2,6
Sex and Region				
Men in East Germany	917	10.611	21,5	0,9
Women in East Germany	490	12.970	23,3	1,5
Men in West Germany	1.508	18.539	24,4	1,1
Women in West Germany	762	25.379	34,1	1,4
Age				
15-24	950	18.579	31,0	1,1
25-44	2.391	32.147	26,6	0,7
45-57	439	16.990	40,4	1,5
Occupational qualification				
qualification	2.499	24.774	19,3	0,6
No qualification	1.302	42.964	30,1	0,9
Nationality				
Germans	3.048	47.336	26,2	0,9
Foreigners/migrants	753	20.400	28,3	1,6
Age >= 30 and last regular job in				
1 year before	806	5.169	16,7	0,9
2 or 3 years before	670	4.502	17,7	1,1
>3 years before	658	30.088	23,6	1,0
Women with and without children				
with	562	19.906	24,8	1,8
without	711	18.555	29,6	1,7

Note: Unemployment benefit II recipients, participants started further vocational training between February and April 2005

Source: IEB V5.01 and V6.01, LHG V2.0 and V3.0, data marts of the Statistics Department of the Federal Employment Agency Germany, own calculations

Table 3
Description of participants and non-participants before matching, selected variables (in %)

	treated	non-participants
Woman	34,6	56,8
West Germany	61,8	65,0
Age in years		
15-24	25,6	27,5
25-34	34,1	24,1
35-44	28,8	23,2
45-57	11,5	25,2
With migration background	20,6	30,4
Impairmant of health or disabled	6,0	7,6
Education		
No secondary schooling degree and no vocational education	7,6	32,5
Secondary school or GCSE or A-level and no vocational education	27,0	31,1
Secondary school, vocational education	24,0	15,4
GCSE or A-level, vocational training or college	41,4	21,0
Household context		
No partner, no children	63,9	59,3
Married or unmarried partner in household	36,1	40,7
Children	35,2	40,0
Partner more than 12 months out of labour force 2000/01-2004/12	24,7	23,9
Partner more than 12 months unemployed 2000/01-2004/12	3,8	8,7
Partner more than 12 months regular employed 2000/01-2004/12	10,0	11,0
Partner more than 12 months in ALMP 2000/01-2004/12	15,0	20,3
Cumulated duration of unemployment 2000/02-2004/01		
0 months	10,5	38,6
1-12 months	39,4	27,9
13-24 months	29,3	13,6
24-48 months	20,8	19,9
Cumulated duration of unemployment 2004/02-2005/01		
1-9 months	43,7	63,2
10-12 months	56,3	36,8
ALMP participation during 2000/02-2005/01		
Private employment subsidy	9,2	1,9
Job creation scheme	10,3	6,1
Practical short-term training	45,9	21,2
Classroom short-term training	33,3	18,8
Further vocational training	23,6	10,4
Other ALMP	47,3	21,5
Duration since end of last ALMP 2000/01-2005/01		
1-12 months	47,3	21,5
More than 13 months	52,7	78,5

Source: Integrated Employment Biographies, Unemployment Benefit II Receipt History (Leistungshistorik Grundsicherung), own calculations

Source: Integrated Employment Biographies, Unemployment Benefit II Receipt History (Leistungshistorik Grundsicherung), own calculations

Table 4
Average treatment effects on participants of further vocational training, radius matching with caliper 0.001

	unsubsidised contributory employment				no unemployment benefit II receipt			
	6th	12th	24th	28th	6th	12th	24th	30th
	month after programme start				month after programme start			
	average treatment effect and *standard deviation* (cursive typed)							
Duration of further vocational training								
<= 1 year	-0,009	0,051***	0,105***	0,102***	-0,051***	0,018*	0,078***	0,084***
	0,007	*0,008*	*0,009*	*0,009*	*0,007*	*0,008*	*0,009*	*0,010*
>1 year	-0,110***	-0,125***	-0,073**	0,057*	-0,143***	-0,179***	-0,162***	-0,024
	0,016	*0,017*	*0,022*	*0,026*	*0,009*	*0,011*	*0,020*	*0,026*
Sex and Region								
Men in East Germany	0,037*	0,075***	0,115***	0,133***	-0,031*	0,046**	0,076***	0,091***
	0,016	*0,016*	*0,018*	*0,018*	*0,013*	*0,016*	*0,018*	*0,019*
Women in East Germany	0,012	0,027	0,049*	0,055*	-0,015	-0,011	0,020	0,024
	0,019	*0,021*	*0,023*	*0,023*	*0,016*	*0,019*	*0,023*	*0,024*
Men in West Germany	-0,061***	0,022	0,083***	0,090***	-0,085***	-0,007	0,063***	0,078***
	0,012	*0,013*	*0,015*	*0,015*	*0,011*	*0,013*	*0,015*	*0,015*
Women in West Germany	-0,040**	-0,022	0,041*	0,040*	-0,074***	-0,039*	0,001	0,032
	0,014	*0,017*	*0,019*	*0,019*	*0,013*	*0,017*	*0,020*	*0,021*
Age								
15-24	-0,045**	-0,024	0,040*	0,065***	-0,067***	-0,038*	-0,005	0,027
	0,015	*0,016*	*0,019*	*0,019*	*0,014*	*0,017*	*0,019*	*0,020*
25-44	-0,029**	0,035***	0,084***	0,101***	-0,071***	0,000	0,064***	0,078***
	0,009	*0,010*	*0,011*	*0,011*	*0,008*	*0,010*	*0,011*	*0,012*
45-57	0,010	0,050*	0,106***	0,075**	-0,045*	0,009	0,067**	0,097***
	0,019	*0,021*	*0,024*	*0,024*	*0,018*	*0,022*	*0,025*	*0,026*
Occupational qualification								
qualification	-0,014	0,040***	0,096***	0,096***	-0,060***	0,008	0,067***	0,081***
	0,009	*0,010*	*0,011*	*0,011*	*0,008*	*0,010*	*0,011*	*0,011*
No qualification	-0,039***	0,016	0,064***	0,091***	-0,059***	-0,019	0,030*	0,064***
	0,011	*0,012*	*0,014*	*0,015*	*0,008*	*0,011*	*0,014*	*0,015*
Nationality								
Germans	-0,024**	0,028**	0,083***	0,091***	-0,066***	-0,010	0,052***	0,073***
	0,008	*0,009*	*0,010*	*0,010*	*0,007*	*0,009*	*0,010*	*0,010*
Foreigners/migrants	-0,030*	0,031	0,082***	0,100***	-0,04***7	0,020	0,052**	0,065**
	0,014	*0,017*	*0,019*	*0,020*	*0,012*	*0,017*	*0,020*	*0,021*
Age >= 30 and last regular job in								
1 year before	-0,049**	0,012	0,079***	0,09***1	-0,094***	-0,048	0,037	0,072***
	0,018	*0,020*	*0,021*	*0,021*	*0,015*	*0,018*	*0,021*	*0,022*
2 or 3 years before	-0,003	0,042*	0,095***	0,106***	-0,060***	0,040	0,096***	0,103***
	0,017	*0,020*	*0,022*	*0,022*	*0,016*	*0,020*	*0,022*	*0,023*
>3 years before	0,011	0,069***	0,099***	0,111***	-0,014	0,036	0,074***	0,087***
	0,012	*0,016*	*0,018*	*0,019*	*0,012*	*0,016*	*0,019*	*0,020*
Women with and without children								
with	-0,003	-0,032	0,026	0,041	-0,040***	-0,028	0,020	0,057**
	0,015	*0,017*	*0,020*	*0,021*	*0,012*	*0,015*	*0,020*	*0,022*
without	-0,026	0,023	0,064**	0,049*	-0,058***	-0,014	0,021	0,024
	0,016	*0,018*	*0,020*	*0,020*	*0,015*	*0,018*	*0,021*	*0,021*

Level of significance 0.01***/0.05**/0.10* based on analytical standard errors

Note: Unemployment benefit II recipients, participants started further vocational training between February and April 2005

Source: IEB V5.01 and V6.01, LHG V2.0 and V3.0, data marts of the Statistics Department of the Federal Employment Agency Germany, own calculations

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