

## **Effectiveness of Further Vocational Training in Germany – Empirical Findings for Persons Receiving Means-tested Unemployment Benefits**

By Sarah Bernhard and Thomas Kruppe\*

### **Abstract**

Further vocational training for the unemployed aims at enhancing their job prospects. This paper analyzes the effectiveness of subsidized training programs for means-tested unemployment benefit recipients in Germany. The empirical findings are based on rich administrative data from the German Federal Employment Agency using propensity score matching to construct a suitable comparison group. We consider the initiation of training in early 2005, just after the reform of the German means-tested benefit system, which aimed at activating hard-to-place job-seekers, 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, program duration, length of time since last job and differences between East and West Germany. As a result, we show that vocational training has a considerable beneficial impact on participants as it raises the employment rate in the intermediate term by up to 13 percentage points, and – with a slightly lower impact – it reduces the number of unemployment benefit II recipients.

### **Zusammenfassung**

Geförderte berufliche Weiterbildung soll die Beschäftigungschancen von Arbeitslosen 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 Zuweisungsmechanismus zu beruflicher Weiterbildung eingeführt worden.

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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 erhöht mittelfristig deren Anteil in Beschäftigung um bis zu 13 Prozentpunkte und reduziert – wenn auch in geringerem Ausmaß deren Anteile im Arbeitslosengeld-II-Bezug.

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## 1. Introduction

Many OECD countries use vocational training to help the unemployed find work and end their benefit dependency because the additional training may enhance their earnings potential and productivity prospects by increasing their skills. On average, among the OECD countries, training has been the largest category of spending in the active labor market programs since the year 2000 (OECD, 2010). Corresponding to the importance of training in the labor market policy, there is a growing amount of literature on evaluations of training programs for the unemployed.

This study updates former studies with a later entry cohort, namely, participants in programs 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 the unemployed. The voucher system primarily precludes individuals without any educational degree from participating in further vocational training (Kruppe, 2009). The second reform may work in the opposite direction by focusing on a disadvantaged group of unemployed. The unemployment benefit II for the long-term unemployed and the unemployed with no or little current work experience was introduced in 2005. As this newly composed group is comparatively disadvantaged, the program intends to activate them by an intense focus on their integration into the labor market. Further vocational training is one measure aimed toward that goal.

Therefore, this study asks whether the recipients of unemployment benefit II actually avoid further reliance on the unemployment benefit by participating in further vocational training and improving their employment prospects. Outcomes for participants in further vocational training with program entry between February and April 2005 are compared with those of a control group who did not start a training program during this initial three-month period. The control group is identified by means of propensity score matching. The effectiveness of further vocational training is estimated within a mid-term observation window that is just less than three years after the training ended.

When compared to the extant literature, this study is innovative in several respects. First, because the means test is not only on the individual but also on the household level, we take into account all relevant information regarding the household context. Second, we account for the employment history and education of individuals and of their partners in the household when estimating participation probabilities by combining two datasets: the well-known data from the Integrated Employment Biographies and the history of means-tested benefits (Leistungshistorik Grundsicherung). Third, we consider program entries in 2005, just after the reform of the means-tested benefit system that aimed to activate employable people in needy households. To our knowledge, there exists no evaluation that focuses on this group or on such a late entry cohort. Fourth, 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, program duration, amount of time since termination from the last job and differences between East and West Germany. None of the existing studies have investigated subgroups in such detail.

The paper is structured as follows. Section Two presents a brief overview of the existing literature on the 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 of the effectiveness of further vocational training for different groups. We summarize the results and draw some conclusions in Section Six.

## 2. Literature Review

Studies on the effectiveness of training vary by, e.g., analyzed outcomes, the length of time for which 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 ten years after training (Lechner/Wunsch, 2009). Most studies estimate effects for the entire number of participants; however, very few studies estimate heterogeneous training program effects for different labor 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 organization of training programs within different countries, meta analyses show that micro-level evaluations of training for the unemployed tend to demonstrate positive employment effects (Card et al., 2010; Kluge, 2010). This also holds for evaluations of German further vocational training programs that have been evaluated in a considerable number of studies by applying statistical matching techniques. Lechner et al. (2007, 2011) investigate program entries during the years 1993 and 1994. Fitzenberger et al. (2006) analyze program entries from inflows in unemployment in West Germany during the years 1986 and 1987 as well as 1993 and 1994, 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 programs have mostly significant positive effects on the employment prospects of participants. However, because the program effects are rather weak, it takes time before the estimated program effects become positive.

More recent program entries have been investigated by Biewen et al. (2007), Rinne et al. (2011) and Wunsch/Lechner (2008), who analyzed programs that started between 2000 and 2002. Estimates of Wunsch/Lechner (2008) indicated no positive effects of further vocational training on employment prospects of participants in West Germany.<sup>1</sup> In contrast, Biewen et al. (2007) found positive effects for programs of short and medium duration in West Germany (but not in East Germany) and for particular groups of unemployed. Similarly, Rinne et al. (2011) estimated positive effects of participation in medium length programs on the employment probabilities of participants in all subgroups investigated. Hujer et al. (2006), however, applied duration analysis to East German data for the years 1999 to 2002 and found that participation in further vocational training prolonged unemployment duration. Furthermore, Rinne et al. (2008) measured the effect of the Hartz reform in Germany and found a slightly negative selection effect and also determined that the voucher effect increased both the employment probability and the earnings of the participants. In contrast, Kruppe (2009) found a clear selection effect in the issuing and redemption of training vouchers.

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

### **3. Further Vocational Training in Germany and Potential Effects**

#### **3.1 Organization of Further Vocational Training in Germany**

In the last decade, the German government has implemented fundamental labor market reforms (Jacobi/Kluve, 2007; Ludwig-Mayerhofer, 2005). The legislature introduced the most important institutional reform in 2005 when it implemented a new benefit system for those unemployed who are not eligible for unemployment insurance benefits. People who have exhausted their unemployment insurance benefits, who have never worked, who have worked for only a short period of time in contributory jobs or who are low wage workers under a legally defined income threshold<sup>2</sup> receive the newly introduced tax-financed unemployment benefit II, provided they pass a means test not only at the individual level but at the household level as well. The new system focuses on the activation of unemployed welfare recipients that requires them to, e.g., sign an individual action plan and fulfill certain job-search requirements. If welfare recipients do not comply with the requirements, they 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 have not previously received labor market services, 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 labor market programs as well as by some prior programs, such as further vocational training.

Further vocational training has been a well-established measure of the active labor market policy in Germany for many decades. It encompasses a range of different types that can be broadly classified into short qualification programs that provide professional and practical skills and long retraining programs with a duration of up to two years that aim to provide a certified vocational training degree. Courses are mainly provided by private and non-profit sector companies.

With 65,000 program entries in 2005, further vocational training was a comparatively minor active labor market program for unemployment benefit II recipients.<sup>3</sup> This is consistent with the overall loss of importance of this program in

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<sup>2</sup> This is also the case for individuals receiving unemployment insurance benefits lower than this legally defined income threshold.

Germany since the beginning of the new century. Prior to this time, further vocational training was among the most important programs 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 has begun to increase again since 2006 (see Table 1 Appendix). The dramatic decrease of entries into further vocational training programs from 523,000 to 131,000 was a result of the restructuring of the Federal Employment Agency, which introduced a new business policy and new objectives. Longer – and therefore more expensive – measures experienced the most significant cuts.

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 must issue a training voucher to a person whose need for further vocational qualification has been ascertained and is therefore scheduled to undertake further vocational training. This change was motivated by arguments that vouchers increase clients' choices, increase competition among providers and enhance the quality of training.<sup>4</sup> This is, in general, consistent with the recommendation of Barnow (2009), who analyzed the use of training vouchers in the U.S. and concluded that “A targeted training program should include assessment and counseling 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, which is valid for up to three months, are the educational goal, the core theme of the qualification and the duration of the course. Both the provider and the training schemes must be certified.

Further vocational training could be an important element in the strategy of lifelong learning (Expertenkommission Finanzierung Lebenslangen Lernens, 2004) by targeting groups otherwise underrepresented in training. Thus, such trainings could provide a substantial contribution toward equal opportunities (Becker, 2004). However, the results indicate that labor market segmentation due to educational inequalities is not reduced by participation in further vocational training (Schömann/Leschke, 2004). The voucher system has a clear impact on selection into further vocational training in that individuals without any

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<sup>3</sup> More important were a workfare program in the public sector, the so-called One-Euro-Jobs (Article 16 (3) SGB II), with an inflow of more than 600,000 people (Hohmeyer/Kopf, 2009); short-term training programs (Article 48 SGB III) with an inflow of more than 400,000 people; contracting out placement services with more than 270,000 assignments of unemployment benefit II recipients.

<sup>4</sup> For an international overview on the use of (training) vouchers, see West et al. (2000) and Dohmen/Clevers (2002); for the variety of the use of vouchers in the US, see Steuerle et al. (2000).

educational degree are much less likely to receive, as well as to redeem, a voucher (Kruppe, 2009).<sup>5</sup>

### 3.2 Theoretical Considerations on Effects of Further Vocational Training

According to job search theory, active labor market policies such as further vocational training may raise the employment prospects of participants by improving their skills and by signaling their willingness to work to employers (Calmfors, 1994; Mortensen, 1986). Human capital theory interprets participation in further vocational training as an investment in human capital. On the one hand, such investments could guarantee that the recipient will secure a job and will earn (higher) wages (Becker, 1962). Accordingly, the probability of dropping out of the labor market may be decreased, and job search efficiency may be enhanced. It is worth noting that training may also prevent social isolation (Raaum/Torp, 2002).

On the other hand, the costs for 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 had not participated in the training and had, instead, searched and found a job. Participants reduce their job search intensity during the training program. Because of this, they have lower employment prospects than non-participants and are, accordingly, locked in the measure. While this locking-in effect is interpreted as negative in general, this is not the case if the program leads to a (vocational) certificate. Obtaining such certification reduces the risk of being unemployed again and leads to a more stable employment career. Nevertheless, due to the specific composition of the group of unemployment benefit II recipients, the benefit of participating in such training programs is not quite clear and could vary between subgroups.

Combining these arguments, we expect that participants have better chances of finding and keeping a regular job after completing the vocational training than non-participants. We also find that participants are less likely to receive unemployment benefit II. Furthermore, we expect lower employment prospects for participants during the vocational training program (the locking-in effect), and we interpret participation in the training as an investment in human capital.

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<sup>5</sup> For the probability of the redemption of vouchers (the uptake of a training program) in the context of the SGB II, Kruppe (2009, 17) identified a negative and significant (0.01 level) impact from not having any educational degree, having any health restrictions, living in East Germany, taking part in any training program before and from some regional characteristics. Factors leading to a positive and significant (0.01 level) impact include short-term unemployment up to six months, immigration less than 5 years ago, less than 25 years of age and some regional characteristics.

## 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 an unemployed person did start further vocational training during a certain time interval. 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 program effects, we must consider the fundamental evaluation problem, the problem of unobservable possible outcomes. That is, for each individual, we can only 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 program during the interval.

If the program does not have any effect on the labor 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

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

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

In this paper, to solve this problem, we use a standard approach, that is, we balance 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 program and the expected success of a program, are known and available. Conditioning on these variables, the expected outcome under non-treatment should not depend on the decision to join:  $Y_0 \perp D | X$ , where  $\perp$  denotes independence. If this conditional independence assumption (CIA) holds, the  $ATT$  may be represented as

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

where the outer expectation of the second term on the right-hand side is preferred 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 program, thus guaranteeing that all treated individuals 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 begin treatment until the beginning of the evaluation period (but eventually at a later date). Frederiksson/Johansson (2004) define this as a time-varying treatment indicator. To formalize this, let the  $ATT$  be given more specifically as

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

where  $t$  is the timing of treatment and  $t+h$  is the point in time when the outcome is observed. This “joining versus waiting” approach has been adopted, for instance, in a comprehensive evaluation of recent German labor market reforms (Deutscher Bundestag, 2006). The estimated effects display the advantage of joining at a given time compared to waiting longer, and the effects are useful for testing for the existence of a treatment effect (Frederiksson/Johansson, 2004).<sup>6</sup>

## 4.2 Data

We use rich administrative data from the Federal Employment Agency for the empirical analysis. The Integrated Employment Biographies<sup>7</sup> (IEB, Versions 5.1 and 6.0) contain socio-demographic characteristics and individual daily information about employment history, benefit receipt, job search history and participation in several programs in the active labor market policy. It was updated using the latest information on employment status from the 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 is drawn from the history of means-tested benefits (LHG, Leistungshistorik Grundsicherung, Version 2.0 and 3.0). The household information from 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 also for the partner’s employment history when estimating the propensity scores.

<sup>6</sup> Besides this standard approach, another control group could be constructed using only those who received a voucher but did not redeem it. Due to a low number of cases – i.e., only 17 percent of all vouchers issued in 2005 were not redeemed – this is not possible. Additionally, there is a broad range of reasons for not redeeming a voucher, which could be accounted for by the administration, the market or even the individual (Kruppe, 2009).

<sup>7</sup> Dorner et al. (2010), Jacobebbinghaus/Seth (2007) and Waller (2008) describe in detail a sample of the Integrated Employment Biographies.

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.<sup>8</sup> The potential control group consists of a 20 percent random sample of the stock of the unemployed who were 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 in any active labor market program after that period in time. Both the treatment group and the control group are restricted to persons who received unemployment benefit II, who were not older than 57 years of age and who did not have missing data in the basic socio-demographic characteristics, such as age, sex, occupational qualification, migration background<sup>9</sup> and location in East or West Germany on 31 January 2005.

### 4.3 Propensity Score Estimation

We include a vast number of variables for the sample members' characteristics in our probit estimates.<sup>10</sup> Based on the probit estimates, we calculated propensity scores, which were then used to match control group members to the treated individuals. This was done separately for each subgroup and 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),
- 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 of age (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 the household.

The information regarding realized sample sizes is included in Table 2 (Appendix). Table 3 (Appendix) describes participants and non-participants before

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<sup>8</sup> 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.

<sup>9</sup> Due to data restrictions, migration background is defined in terms of actual or former non-German citizenship; therefore, this group could be identified only partially.

<sup>10</sup> For a detailed list of these variables, see below.

matching. The conditional independence assumption requires observing all explaining variables that determine starting a further vocational training as well as the outcome of such training. 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 level:**

- socio-demographic characteristics: age, migration background, health restrictions, qualifications;
- labor market history: duration of employment, unemployment and not observable states, such as dropped out of labor force; participation in active labor market programs; receipt of unemployment assistance in December 2004; characteristics of the last job, such as real earnings, full-/part-time, duration since its end;

**Household level:**

- characteristics of the needy household: single/partner, children, qualifications of the partner;
- labor market history of the partner in the household: duration of employment, unemployment and not observable states, such as dropped out of labor force; participation in active labor market programs;

**Local labor 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 percent of change of these three indicators against the previous year, type of district according to the classification of Rüb/Werner, 2007;

**Interaction effects:**

- individual labor market history and age, partner's labor 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, the conditional independence assumption holds. However, there may still be unobserved characteristics that determine the participation decision and the outcomes. Two important unobservable characteristics are individual talents and motivation of individuals. However, both of these characteristics should also be important determinants of the past labor market performance of the sample members, and they may also be determinants of their partner's labor 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 less than 0.5. This threshold value is stepwise decreased to 0.1 for the following probit models. The propensity scores are computed for the resulting reduced group specific models, and they always contain individual socio-demographic characteristics independent of the previous test procedures.

We evaluate two outcomes on a monthly base. The first outcome is ‘unsubsidized employment that is subject to social insurance contribution’, and the second one is ‘no unemployment benefit II receipt’.<sup>11</sup> We define both types of outcomes in terms of a success criterion. Therefore, positive average treatment effects will indicate a positive impact of the training, and negative average treatment effects will indicate a negative impact.

#### 4.4 Matching Algorithms, Quality and Sensitivity

We execute different matching algorithms<sup>12</sup> to check for sensitivity of the estimated ATTs (one to five nearest neighbors matching with and without replacement and radius matching with caliper 0.001). Average treatment effects computed with different matching algorithms only minimally 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 standardized bias (Rosenbaum/Rubin, 1985). Table 2 (Appendix) shows the mean standardized bias before and after matching for every group. The remaining bias after matching never rises above 2.6 percent. A bias of less than 3 (or even 5) percent is considered in most empirical studies to be sufficient (Caliendo/Kopeinig, 2008). 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 balance.

Another sensitivity analysis can inform 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 under-

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<sup>11</sup> Data are available for 28 months (‘unsubsidised employment’) and for 30 months (‘no unemployment benefit II receipt’) since assignment.

<sup>12</sup> We apply the STATA-module `psmatch2` (Leuven/Sianesi, 2003).

mine the implications of the analysis. We applied the Stata ado-file 'mhbounds' by Becker/Caliendo (2007), available for nearest neighbor 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 the comparison groups. As a result, these threshold values were quite low (1.45 or less). Hence, the results are, to a certain degree, sensitive to possible deviations from the identifying unconfoundedness assumption. This does not mean, however, that there is an unobserved influence on the selection process into further vocational training. Given the massive set of variables on individual, household and local characteristics, we are confident that we have not missed an important factor.

## 5. Results

Have different groups of unemployment benefit II recipients benefitted from participating in 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 analyzed. As discussed herein, the average treatment effect is the difference between employment shares (unemployment benefit II receipt shares) within participants and the 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 several months after the further vocational training started, all groups of participants have significantly lower employment prospects and more often receive unemployment benefit II than do matched non-participants. The locking-in effect arises due to the reduced job search activities of participants, which we interpret as an investment in human capital. For example, half a year after the initiation of the program, male participants in West Germany had 6 percentage points fewer employment shares than did the matched non-participants. Considering effects for all groups and both outcomes in the sixth month after the start of the program, a broad range of effects emerges. At this time, participants in longer lasting training programs still suffer from the locking-in effect, having a 14 percentage points greater probability of receiving unemployment benefit II. At the same time, however, male participants in East Germany increased their employment probabilities by almost 4 percentage points. It is apparent that the locking-in effect is highly correlated with the duration of the training course - the longer the training, the greater and 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 the start of

the program. The results for most groups under consideration do not show a substantial effect for heterogeneity, and every group gains from participation in further vocational training. At the end of the observation window, the participant's probability of unsubsidized contributory employment is 4 to 13 percentage points higher than it is for the comparison group. The impact on no longer receiving unemployment benefit II is slightly less at 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 one year at the end of the observation window, while there is no effect on avoiding receipt of unemployment benefit II. The trend of a reduction in the negative difference for the control group up to an insignificant effect after 30 months is consistent with prior evaluations on further vocational training. Lechner et al. (2007, 2011) found that participants in retraining reached the highest positive average treatment effects of the treated within the observation window of 8 years after the start of training.<sup>13</sup>

Comparing effects on both outcome variables – unsubsidized 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 it is on employment prospects. This is simply because unemployment benefit II is means-tested and oriented toward the needs of the entire household and is thus a more difficult criterion to fulfill. A participant not only has to gain employment, but also has to find a job with a wage high enough to meet the financial needs of the entire household. This implies, first, that the larger the household, the higher the wage required to avoid benefit receipt based on household size. Second, among those with low income potential, the probability of avoiding benefit receipt is less even if they have a job. For this reason, there are no positive effects on avoiding unemployment benefit II receipt for women or for the younger unemployed. Although both groups benefitted 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 the active labor market policy, aims at improving individuals' employment prospects to

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<sup>13</sup> Results of separate estimates on short-term training for each of the subgroups are mainly consistent with the overall estimates. This is due to the low number of participants in long-lasting measures. Only for women in East Germany and for women with children were more and earlier positive significant effects found for both outcome variables.

end unemployment. This paper analyzed the effectiveness of such training programs for means-tested unemployment benefit recipients in Germany. We consider training entries in the beginning of 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 to analyze the effectiveness of training after this reform and after the introduction of the voucher system for further vocational training established in 2003.

The empirical findings are consistent with hypotheses derived from human capital theory (Becker, 1962). As long as the vocational training lasts, participants are less likely to be employed and to not receive unemployment benefit II than non-participants. This period, known as the locking-in effect, can be interpreted as a phase of investment. After further vocational training is completed, participants' employment prospects increase by up to 13 percentage points, and their shares of benefit receipt decline by up to 10 percentage points when compared to the employment prospects and benefit receipt for non-participants.

The empirical findings of this study are mainly consistent with results of earlier evaluations of further vocational training in Germany (Stephan, 2008; Biewen et al., 2007, Rinne et al., 2011) that even the substantial reform of the institutional setting, namely, the introduction of vouchers and a new activation system for the long-term unemployed, did not change the effectiveness of the training, either for the better or for the worse.

Nevertheless, there is scope for discrimination against those unemployed who have no vocational degree when training vouchers are delivered and redeemed (Kruppe, 2009). The introduction of the voucher system as a 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 programs, while the more disadvantaged unemployed have little chance to participate at all.

The results of this study demonstrate that the more disadvantaged groups benefit from participation in further vocational training to pretty much the same degree as the less disadvantaged groups. This applies for all analyzed disadvantaged groups, e.g., foreigners, migrants, the elderly, individuals without qualification and those who have been unemployed for an extended period of time. If these more disadvantaged groups were comprehensively encouraged to participate in further vocational training, it would generate opportunities for them to gain from such training. As a consequence, to make a contribution toward equal opportunities, disadvantaged groups should be offered sufficient opportunities to participate in further vocational training programs. Nevertheless, to assure that these groups attain such training opportunities, additional targeted counseling can help to overcome possible thresholds.

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**Appendix: Tables***Table 1***Program entries in further vocational training**

Year	Entries in further vocational training in 1,000		Share of persons (%) by duration of further vocational training in months							
	all	UB II recipients only	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 and mean standardized bias before and after matching**

	Number of treated	Number of controls	Mean bias before	Mean bias after matching
<b>Duration of further vocational training</b>				
<= 1 year	3,376	67,753	23.9	0.7
>1 year	362	67,740	29.2	2.6
<b>Sex and Region</b>				
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
<b>Age</b>				
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
<b>Occupational qualification</b>				
qualification	2,499	24,774	19.3	0.6
No qualification	1,302	42,964	30.1	0.9
<b>Nationality</b>				
Germans	3,048	47,336	26.2	0.9
Foreigners/migrants	753	20,400	28.3	1.6
<b>Age &gt;= 30 and last regular job in</b>				
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
<b>Women with and without children</b>				
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 percent**

	treated	non-participants
Woman	34.6	56.8
West Germany	61.8	65.0
<i>Age in years</i>		
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
Impairment of health or disabled	6.0	7.6
<i>Education</i>		
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
<i>Household context</i>		
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
<i>Cumulated duration of unemployment 2000/02–2004/01</i>		
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
<i>Cumulated duration of unemployment 2004/02–2005/01</i>		
1–9 months	43.7	63.2
10–12 months	56.3	36.8
<i>ALMP participation during 2000/02–2005/01</i>		
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

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*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

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*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, in percentage points**

	6th	12th month after programme start	24th month after programme start	28th	6th	12th month after programme start	24th month after programme start	30th
	unsubsidised contributory employment				no unemployment benefit II receipt			
	average treatment effect and <i>standard deviation</i> (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***
> 1 year	0.007	0.008	0.009	0.009	0.007	0.008	0.009	0.010
	-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	0.028**	0.083***	0.091***	-0.066***	-0.010	0.052***	0.073***					
	0.008	0.010	0.010	0.007	0.009	0.010	0.010					
Foreigners/migrants	-0.030*	0.082***	0.100***	-0.047***	0.020	0.052**	0.065**					
	0.014	0.019	0.020	0.012	0.017	0.020	0.021					
Age >= 30 and last regular job in												
1 year before	-0.049**	0.079***	0.091***	-0.094***	-0.048	0.037	0.072***					
	0.018	0.021	0.021	0.015	0.018	0.021	0.022					
2 or 3 years before	-0.003	0.095***	0.106***	-0.060***	0.040	0.096***	0.103***					
	0.017	0.022	0.022	0.016	0.020	0.022	0.023					
>3 years before	0.011	0.069***	0.111***	-0.014	0.036	0.074***	0.087***					
	0.012	0.018	0.019	0.012	0.016	0.019	0.020					
Women with and without children												
with	-0.003	0.026	0.041	-0.040***	-0.028	0.020	0.057**					
	0.015	0.020	0.021	0.012	0.015	0.020	0.022					
without	-0.026	0.064**	0.049*	-0.058***	-0.014	0.021	0.024					
	0.016	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 from the Statistics Department of the Federal Employment Agency Germany, own calculations