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## Effectiveness of Sequences of Classroom Training for Welfare Recipients

What Works Best in West Germany?

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# Effectiveness of Sequences of Classroom Training for Welfare Recipients

What works best in West Germany?

Katharina Dengler (IAB)

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## Abstract

Sequences of active labour market programmes (ALMPs) may be part of an intensified activation strategy targeting hard-to-place individuals who may be long-term unemployed and who may encounter extreme difficulty in finding jobs. Such sequences are very common among welfare recipients in Germany, but most studies only evaluate either single ALMPs or unemployed individuals' first ALMP. Thus, I analyse the effects of participation in different sequences of classroom training, unemployment benefit II (UB-II)-receipt and One-Euro-Jobs for West German men and women on different labour market outcomes. Using rich administrative data and a dynamic matching approach, I can control for dynamic selection problems that occur during a sequence. My results show that two classroom trainings are more effective than two periods of UB-II-receipt in helping welfare recipients find regular employment, especially among West German women. In some cases, avoiding participation in multiple programmes is preferable: participation in two classroom trainings has mostly no beneficial effects over participation in one classroom training in the second period only and participation in one classroom training followed by a One-Euro-Job has mostly no beneficial effects over participation in a One-Euro-Job in the second period only. Moreover, immediately assigning individuals to classroom training is more effective than waiting and assigning them to classroom training in the second period (the effects of timing) because of the positive effects on avoiding UB-II-receipt (work-test function). However, evidence for programme careers or stepwise integration is only observed for the sequence of two classroom trainings versus the sequence of two periods of UB-II-receipt.

## Zusammenfassung

Maßnahmesequenzen können Teil einer intensivierten Aktivierungsstrategie für schwer vermittelbare Personen, die langzeitarbeitslos sind und Schwierigkeiten aufweisen, einen Job zu finden, darstellen. Solche Maßnahmesequenzen sind sehr häufig für ALG-II-Bezieher/-innen in Deutschland beobachtbar, aber bisherige Evaluationen von aktiven Arbeitsmarktprogrammen haben sich meist nur auf eine oder die erste Maßnahme von Arbeitslosen konzentriert. Deswegen werden in dieser Studie die Effekte der Teilnahme an verschiedenen Sequenzen, die aus nicht-betrieblichen Trainingsmaßnahmen, ALG-II-Bezug und Ein-Euro-Jobs bestehen, für Männer und Frauen in Westdeutschland auf verschiedene Arbeitsmarktzielgrößen untersucht. Auf Basis von umfangreichen, administrativen Daten und eines dynamischen Matching Ansatzes, kann für dynamische Selektionsprobleme, die während einer Sequenz auftreten, kontrolliert werden. Die Ergebnisse zeigen, dass zwei aufeinanderfolgende nicht-betriebliche Trainingsmaßnahmen im Vergleich zu zwei Perioden in ALG-II-Bezug ohne Maßnahmeteilnahme positive Effekte auf ungeforderte versicherungspflichtige Beschäftigung aufweisen, insbesondere für westdeutsche Frauen. In manchen Fällen ist eine Vermeidung der Teilnahme an mehrfachen Programmen empfehlenswert: sowohl die Teilnahme an zwei nicht-betrieblichen Trainingsmaßnahmen im Vergleich zur alleinigen Teilnahme an einer nicht-betrieblichen

Trainingsmaßnahme in der zweiten Periode als auch die Teilnahme an der Sequenz nicht-betriebliche Trainingsmaßnahme gefolgt von einem Ein-Euro-Job im Vergleich zur alleinigen Teilnahme an einem Ein-Euro-Job in der zweiten Periode weisen meistens keine positiven Effekte auf. Direkt nach Eintritt in den ALG-II-Bezug an einer nicht-betrieblichen Trainingsmaßnahme teilzunehmen ist effektiver als zu warten und erst in einer zweiten Periode an einer nicht-betrieblichen Trainingsmaßnahme teilzunehmen, da positive Effekte, den ALG-II-Bezug zu verlassen, auftreten. Hinweise auf Maßnahmekarrieren oder eine schrittweise Arbeitsmarktintegration ist nur für die Sequenz zwei nicht-betriebliche Trainingsmaßnahmen versus ALG-II-Bezug in zwei Perioden beobachtbar.

**JEL classification:** C13, I38, J68

**Keywords:** sequences, dynamic propensity score matching, activation, classroom training, One-Euro-Jobs, West Germany

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# 1 Introduction

Because unemployment rates were high in Germany after German reunification—up to 11.4 percent in 1997 (Department for Statistics of the Federal Employment Agency 2013) – the Hartz reforms were implemented between 2003 and 2005. Afterwards, the unemployment rate decreased to 6.9 percent by 2013 (Department for Statistics of the Federal Employment Agency 2013). However, the share of long-term unemployed per unemployed, defined as being unemployed for at least 12 months, is a major concern in many OECD countries: approximately one-third of the unemployed in 2011 were long-term unemployed (OECD 2013). In Germany, the share of long-term unemployment is above average among OECD countries (Figure 1) and long-term unemployed individuals primarily receive welfare benefits.

Sequences of active labour market programmes (ALMPs) may be more likely among the long-term unemployed, as an individual must be unemployed for an extended period to receive the opportunity to participate in a sequence of ALMPs. Furthermore, sequences of ALMPs may be part of an intensified activation strategy targeting hard-to-place individuals who may be long-term unemployed and who may encounter extreme difficulty in finding jobs. These individuals require more assistance from job centres. Thus, intensified activation packages comprising different phases of activation may help to integrate these individuals stepwise into regular employment. Some countries have implemented such intensified activation packages - some targeting these hard-to-place individuals. An intensified activation strategy could also consist of sequences comprising existing ALMPs, whereby case workers apply a strategic mix of programmes that increasingly aim to integrate hard-to-place individuals into regular employment. However, programme careers may arise, i.e., individuals may participate in many ALMPs for several years with no positive employment effects. Furthermore, such sequences may also be the only way for welfare recipients to become ‘employed’ (Dengler 2013).

Sequences of ALMPs are very common for German welfare recipients: approximately 40 percent of the individuals participating in a first ALMP also participate in a second ALMP (Dengler/Hohmeyer 2010). Thus, understanding the effectiveness of sequences of ALMPs on labour market outcomes is highly important for policy makers to improve the efficiency of the labour market, to foster welfare recipients’ successful and stepwise integration into the labour market and to avoid programme careers. However, most studies evaluate unemployed individuals’ first programme only. So far, empirical evidence on sequences of ALMPs for welfare recipients in Germany is scarce.

In this paper, I analyse sequences of classroom training for unemployed welfare recipients in West Germany by using a dynamic matching approach that addresses dynamic selection problems during a sequence. Because this approach is very data hungry, I use rich administrative data from the German Federal Employment Agency. Specifically, I draw an inflow sample of all individuals receiving unemployment

benefit II (UB II) without contributory employment for the period between October 1, 2005, and September 30, 2006.

Because classroom training shows the second-highest inflow between 2005 and 2008 and because classroom training is a very common component of sequences of ALMPs (Dengler/Hohmeyer 2010), I consider possible sequences of classroom training. I analyse four effects on different labour market outcomes. First, I consider a basic comparison similar to the static evaluation of participation in a programme compared with non-participation: i.e., the sequence of two classroom trainings compared with the sequence of two periods of UB-II-receipt. Second, I analyse the effect of timing: i.e., the sequence of classroom training followed by UB-II-receipt compared with the sequence of UB-II-receipt followed by classroom training. Third, I consider the effect of participation in multiple programmes by comparing participation in two programmes with participation in only one programme: i.e., the sequence of two classroom trainings versus the sequence of UB-II-receipt followed by classroom training. Fourth, I analyse the effect of participation in multiple programmes for one very common sequence: the sequence of classroom training followed by a One-Euro-Job compared with the sequence of UB-II-receipt followed by a One-Euro-Job.

My results reveal positive regular employment effects for individuals participating in classroom training in the first period if they participate in two classroom trainings compared with if they receive UB II for two periods, especially for West German women; however, I do not observe similar effects of such a sequence on avoiding UB-II-receipt. Regarding the effect of timing, the results show positive effects on avoiding UB-II-receipt. Thus, comparing the sequence of classroom training followed by UB-II-receipt with the sequence of UB-II-receipt followed by classroom training may test an individual's willingness to work. However, mostly no well-determined effects of participation in multiple programmes emerge. Only some positive effects on leaving UB-II-receipt arise for West German men participating in classroom training in the first period if they participate in the sequence of classroom training followed by a One-Euro-Job versus the sequence of UB-II-receipt followed by a One-Euro-Job. In general, evidence of programme careers of One-Euro-Jobs or stepwise integration with further vocational training is generally not observed (it is observed only for the sequence of two classroom trainings versus the sequence of two periods of UB-II-receipt).

The paper is structured as follows: Section 2 describes the institutional framework of UB II and the considered programmes (i.e., classroom training and One-Euro-Jobs). Section 3 discusses the potential effects of the considered programmes and the considered sequences from a theoretical perspective. Section 4 summarises the literature on the effects of participation in short-term training, One-Euro-Jobs, intensified activation packages and sequences. Section 5 describes the implementation of the dynamic window approach and the dynamic matching approach. Section 6 introduces the data and identification and presents some descriptive statistics. Section 7 presents the results and section 8 concludes.

## 2 Institutional Framework

Germany's high unemployment rates after German reunification led to the introduction of the four so-called Hartz reforms between 2003 and 2005. In 2005, the final reform, called 'Hartz IV', introduced a means-tested benefit, UB II, which is regulated in Social Code (SC) II and is the replacement of the formerly means-tested unemployment assistance and social assistance. Since 2005, a two-tier system has existed with a time-limited unemployment insurance benefit (unemployment benefit I (UB I)) and the means-tested UB II, which needy individuals who are capable of working receive if their other sources of (household) income are insufficient to achieve a minimum standard of living. Thus, not only unemployed individuals who either are not or are no longer entitled to UB I but also UB-I-recipients or even employed people whose household income is insufficient to achieve a minimum standard of living can receive UB II.<sup>1</sup> One important and new element of UB II is its focus on activation for all members of needy households who are capable of working to reduce their dependence on welfare. Thus, several ALMPs were implemented in 2005; in addition, ALMPs that existed before the reforms are now available for UB-II-recipients or are available in a new design. Since 2005, intensified activation packages such as the JobPerspective in 2007 or the so-called 'Bürgerarbeit' in 2010 have been introduced to integrate very disadvantaged welfare recipients; however, these programmes are not in place anymore. As case workers are very flexible in implementing ALMPs, sequences of ALMPs are a commonly used activation approach in Germany.

As I consider sequences of classroom training and One-Euro-Jobs in the period between 2005 and 2008, I describe the institutional background for this period. Classroom training consists of various programmes with different durations: application training lasts for up to 2 weeks, aptitude tests up to 4 weeks and skill training last for up to 8 weeks. If different types of classroom training are combined, the maximum duration is 12 weeks. The different types of classroom training also have different aims: application training should improve the effectiveness of welfare recipients' job search but can also test welfare recipients' willingness to work. Aptitude tests check welfare recipients' aptitude for a specific occupation or job, whereas skill training involves short-term computer, language, or occupation-specific courses and aims to increase human capital. Classroom training is part of so-called short-term training, which also includes in-firm training. In-firm training is similar to classroom training but is conducted within a company. Welfare recipients do not receive any wages in addition to their UB-II-benefits during short-term training; however, job centres pay additional costs that arise out of programme participation, such as childcare or travel costs.<sup>2</sup>

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<sup>1</sup> In my paper, I consider welfare recipients who are unemployed.

<sup>2</sup> See Kopf (2013) and Wolff/Jozwiak (2007).



Short-term training was introduced in 1998 with the SC III (Article 48-52), and it is available to UB-II-recipients via Article 16 of SC II.<sup>3</sup> In 2009, the German government reorganised the ALMPs on an evaluation-based level. The reform abolished inefficient ALMPs and modified existing ALMPs to increase their transparency and efficiency.<sup>4</sup> Since 2009, short-term training has been reorganised into various training modules at an individual or team level, and it is regulated in Article 46 of SC III as an element of ‘activation and occupational integration schemes’. In 2012, the German government continued the evaluation-based reforms of ALMPs with legislation on improving the integration opportunities on the labour market by reorganising existing instruments.<sup>5</sup> The reform aimed to increase decentralisation, flexibility, transparency and individual needs. Since 2012, short-term training has been regulated in Article 45 of SC III.

One-Euro-Jobs have been introduced via the enforcement of SC II (regulated in Article 16d of SC II) and are a public employment programme. One-Euro-Jobs (‘Arbeitsgelegenheiten in der Mehraufwandsvariante’) constitute work opportunities that provide additional jobs that would not be made available without a subsidy, that have a public interest and that pay 1-2 Euros per hour in addition to welfare benefits. The average duration of a One-Euro-Job is up to 6 months and the average working time is no more than 30 hours per week (Department for Statistics of the Federal Employment Agency 2006-2009). One-Euro-Jobs should focus on hard-to-place welfare recipients, such as uneducated individuals, older individuals or individuals with migration backgrounds. Furthermore, young adults are a special target group of the SC II because job centres have to place them without delay into employment, vocational training, or, as a last resort, a One-Euro-Job.<sup>6</sup> One-Euro-Jobs may have various purposes for different types of participants: First, One-Euro-Jobs should increase welfare recipients’ employability. Thus, the primary goal of One-Euro-Jobs is not welfare recipients’ integration into regular employment. Second, One-Euro-Jobs can also test welfare recipients’ willingness to work.<sup>7</sup>

Furthermore, I consider the inflow of West German men and women into major ALMPs for the period between 2005 and 2008 (Table 1).<sup>8</sup> One-Euro-Jobs are the most frequent ALMP: between 100,000 and 300,000 West German participants entered a One-Euro-Job each year. However, classroom training is the second most common ALMP: the annual inflow into classroom training amounts to approximately

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<sup>3</sup> See Wolff/Jozwiak (2007).

<sup>4</sup> See Steinke et al. (2012).

<sup>5</sup> See Bellmann et al. (2011).

<sup>6</sup> Since April 2012, job centres are no longer required to place young adults in One-Euro-Jobs without delay.

<sup>7</sup> See Dengler (2013).

<sup>8</sup> Figures on classroom training after the 2009 reform cannot be provided because classroom training is only one element of the new ‘activation and occupational integration scheme’ (Article 46, SC III) that summarises various ALMPs (e.g., classroom training, private placement services and personal service agencies).

100,000 for West German men and ranges from approximately 70,000 to 90,000 for West German women. Inflow into One-Euro-Jobs and classroom training is higher for West German men than for West German women. However, the average stock of unemployed UB-II-recipients is also higher for West German men.

### 3 Theory

In this section, I discuss not only the potential effects of the considered ALMPs (classroom training and One-Euro-Jobs) but also the potential effects of the considered sequences. In general, a priori the effects are unclear. Single ALMPs may have both positive and negative effects on wages and employment according to the matching theory (Pissarides 1979). Sequences of ALMPs may strengthen both positive and negative effects.

#### 3.1 Classroom Training

I discuss the potential effects of classroom training in a matching theory framework that implies both negative and positive effects of classroom training on employment (Calmfors 1994; Hagen/Steiner 2000).

Classroom training may have an effect on employment by increasing the efficiency of the matching process:<sup>9</sup> First, classroom training enhances participants' human capital. Classroom training such as skill training or aptitude tests may increase either general or job-specific human capital. Thus, classroom training improves matching quality because of participants' qualifications become better adapted to the labour demand. Second, classroom training supports and promotes job search activities among participants. Furthermore, classroom training such as application training can test participants' willingness to work. Thus, obligatory programme participation may lead to an increase in job search intensity as participants' free time declines and as earning additional money through illegal employment becomes impossible. Additionally, classroom training provides participants with information such as information about the regional labour market helping participants in their job search. In the same sense, aptitude tests provide participants with information by testing their aptitude to work in a specific occupation. Thus, classroom training can accelerate the matching process through better and higher job search activities. Third, classroom training may send positive signals to potential employers through certificates. Thus, classroom training facilitates the matching process through a screening function.

However, classroom training may also have negative employment effects. For instance, lock-in effects may arise because the participants have less time to search for a job. If individuals know that they will participate in a programme in advance, their job search effort may also decline prior to their participation in the programme (Ashenfelter's Dip). Stigma effects can also emerge if potential employers regard

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<sup>9</sup> See also Kopf (2013) for a discussion of the potential effects of short-term training.

classroom training as a negative signal. Furthermore, individuals may be assigned to classroom training when they need a different programme (wrong allocation) or no programme at all because they already have good employment prospects (creaming). Both creaming and wrong allocation may have long-lasting negative employment effects. Financial disincentives may also occur if job centres pay additional costs that arise out of programme participation.

Because classroom training consists of short courses, classroom training may prepare welfare recipients for other programmes to integrate them stepwise into regular employment. For example, classroom training may provide participants with basic or specific skills in short courses to prepare them for further vocational training that offers specific professional skills or a vocational training degree. Furthermore, classroom training may not subject participants to programme careers because classroom training consists of short courses only and because it cannot ‘employ’ welfare recipients for a longer time period, as with One-Euro-Jobs.

In summary, a priori the potential effects of classroom training are unclear. Because classroom training occurs over short periods of up to 12 weeks, considerable lock-in effects are unlikely. Thus, I expect classroom training to have positive employment effects.

### **3.2 One-Euro-Jobs**

In this section, I discuss the potential effects of One-Euro-Jobs again in a matching theory framework that implies both negative and positive effects of One-Euro-Jobs on employment (Calmfors 1994; Hagen/Steiner 2000).

Similar to short-term training, One-Euro-Jobs may have an effect on employment by increasing matching efficiency: First, participants in One-Euro-Jobs may become accustomed to regular work routines, are trained on the job and may experience an increase in their human capital because some One-Euro-Jobs may also include a qualification component. Second, One-Euro-Jobs may increase participants’ job search activities, as they may test participants’ willingness to work. Thus, obligatory participation may increase the intensity of job search as participants’ free time declines and as earning money by illegal employment becomes impossible. Third, One-Euro-Jobs may provide positive signals to potential employers.

One-Euro-Jobs may also have negative employment effects, however. For instance, lock-in effects, Ashenfelter’s dip and stigma effects may emerge. Because the average duration of One-Euro-Jobs is up to 6 months (Department for Statistics of the Federal Employment Agency 2006-2009), lock-in effects may be substantial. However, the average working time in a One-Euro-Job is no more than 30 hours per week (Department for Statistics of the Federal Employment Agency 2006-2009). Thus, sufficient time to search for a job may remain available. Moreover, because One-Euro-Jobs are generally held by hard-to-place individuals, stigma effects may

emerge. Creaming, wrong allocation and financial disincentives may also arise from One-Euro-Job participation.

Because One-Euro-Jobs are generally held by hard-to-place individuals who have very low chances of finding a job, One-Euro-Jobs need to only increase welfare recipients' employability and chances of finding regular employment; the primary goal does not need to be the integration of welfare recipients into regular employment. Thus, One-Euro-Jobs may be only a first step to prepare welfare recipients for other programmes that then aim to integrate welfare recipients into regular employment. However, One-Euro-Jobs might lead to programme careers.<sup>10</sup>

In summary, the potential effects of One-Euro-Jobs are a priori unclear. I expect to find only some small positive or negative employment effects for One-Euro-Job participation, as One-Euro-Jobs' primary goal is not integration into regular employment.

### 3.3 Considered Sequences

Sequences of ALMPs may arise for two reasons: First, such sequences may arise as part of a stepwise and intensified activation strategy. In particular, hard-to-place individuals may need more than one programme participation to find regular employment. Thus, case workers may integrate individuals stepwise into regular employment by employing a strategic mix of programmes. Second, sequences of ALMPs may also be part of a programme career as the only way for welfare recipients to be 'employed'.

In general, sequences of ALMPs may strengthen both the positive and the negative employment effects of single ALMPs. First, I discuss the potential effects of the sequence of two consecutive classroom trainings. Two consecutive classroom trainings may increase human capital because the participants may acquire more qualifications and skills. In particular, if the two classroom trainings build on one another and/or if a case worker assigns welfare recipients to two different types of classroom training (e.g., initial basic skill training followed by more specific skill training or initial basic application training followed by skill training), the positive effects of classroom training on employment may be increased. An aptitude test as a first programme followed by specific skill training may also be beneficial, as the case worker may first test the participant's aptitude in a specific occupation and skill training may then provide missing skills. Furthermore, two classroom trainings may enhance participants' job search activities, provide participants with more information and send more positive signals (e.g., two certificates) to potential employers. However, lock-in effects or stigma effects that are normally not a major concern in the case of classroom training may arise because of the longer duration of the programme participation. Because each of the two classroom trainings remains very short, I do not ex-

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<sup>10</sup> See Dengler (2013).

pect substantial lock-in or stigma effects. Thus, I expect a sequence of two consecutive classroom trainings to have positive effects on employment through higher accumulation of human capital and job search activities.

Second, I consider the potential effects of the sequence of UB-II-receipt followed by classroom training. On the one hand, individuals who wait for their first classroom training may obtain classroom training consistent with their preferences, former tasks and skills. Furthermore, such individuals may have sufficient time to search for a job (no lock-in effects) leading to a faster integration into regular employment, as they do not have to take part immediately in classroom training. On the other hand, the loss of human capital and efforts to integrate individuals into employment (matching efforts) may be higher because of their longer duration of unemployment (without programme participation). Furthermore, individuals who wait for their first classroom training cannot quickly leave UB-II-receipt and stigma effects arising from unemployment without programme participation may emerge. In summary, I expect negative effects dominate in the sequence of UB-II-receipt followed by classroom training because classroom training is a short programme that is cheap and that may be offered frequently; thus, it may be not necessary for individuals to wait to receive their first classroom training to obtain appropriate classroom training. Furthermore, considerable lock-in effects are unlikely for classroom training; thus, individuals that immediately receive classroom training may also have sufficient time to search for a job.

Third, I consider the potential effects of the sequence of classroom training followed by UB-II-receipt. Individuals who immediately receive classroom training after entry into UB-II-receipt may not experience a great loss of human capital, suffer from stigma effects or exert high matching efforts because they would avoid unemployment without programme participation. Furthermore, integration into regular employment may be faster for such individuals than for individuals who wait to receive their first classroom training. However, individuals who immediately receive classroom training are less likely to obtain appropriate classroom training and such individuals may not have sufficient time to search for a job immediately (lock-in effects). Because classroom training also tests individuals' willingness to work, individuals who immediately receive classroom training may leave UB-II-receipt more quickly. However, the work test function might lead to only the avoidance of UB-II-receipt, not necessarily positive regular employment effects. In summary, I expect to find positive effects of this sequence on employment because the diminished appropriateness of classroom training and potential lock-in effects may have only a small negative effect.

Fourth, I describe the potential effects of the sequence of classroom training followed by a One-Euro-Job. Beneficial effects of such a sequence may arise if individuals first obtain specific skill training and then become accustomed to basic work schedules – or if they train on the job in a consecutive One-Euro-Job. Thus, the sequence of classroom training followed by a One-Euro-Job may have positive effects

on employment. However, classroom training as first programme may also screen the participants' skills and productivity: case workers assign individuals who show low productivity in classroom training to a consecutive One-Euro-Job. As One-Euro-Jobs are a last resort, individuals may be assigned to One-Euro-Jobs after classroom training as the only alternative for being 'employed'. Furthermore, lock-in effects and especially stigma effects may be a notable concern with One-Euro-Jobs. Thus, in summary, negative effects on employment dominate for this sequence.

Fifth, I consider the potential effects of the sequence of UB-II-receipt followed by One-Euro-Job participation. Because individuals who wait for their first One-Euro-Job are more likely to receive an appropriate One-Euro-Job – e.g., a One-Euro-Job consistent with their preferences for specific tasks and former job skills – positive employment effects may arise. Furthermore, such individuals may have sufficient time to search for a job (no lock-in effects) leading to a faster integration into regular employment, as they do not have to take part immediately in a One-Euro-Job. However, for individuals who wait for their first One-Euro-Job, negative employment effects may arise because the loss of human capital, stigma effects and matching efforts may be higher due to the longer duration of unemployment (without programme participation). Furthermore, lock-in effects and especially stigma effects may be a notable concern with One-Euro-Jobs. In summary, I expect small positive effects on employment as the appropriateness of a One-Euro-Job may play a major role as various types of One-Euro-Jobs in different sectors exist.

Sixth, I consider the potential effects of the sequence of two periods of UB-II-receipt without programme participation, i.e., individuals receive only welfare benefits. Negative employment effects due to the loss of human capital, stigma effects and higher matching efforts may arise because of the high unemployment duration without programme participation. However, such individuals have sufficient time to search for a job as they are not locked in a programme. As lock-in effects may be also not considerable during classroom training and One-Euro-Jobs, but classroom training or One-Euro-Jobs provide at least, e.g., skills, training on the job or accustoming to basic work schedules, I expect negative effects of this sequence on employment.

## **4 Literature Review**

First, I review the empirical literature for evidence on short-term training for Germany and other countries. For Germany, I provide a short overview on the effectiveness of short-term training for unemployment insurance or unemployment assistance recipients before 2005. As I analyse classroom training for UB-II-recipients in Germany, the most relevant literature review relates to short-term training for welfare recipients after the introduction of UB II in 2005. Second, I provide a short overview on the effects of participation in public employment programmes for other countries and a broad overview on the effects of participation in One-Euro-Jobs for Germany. Third, I review the international literature on the effectiveness of intensified activation packages. Fourth, I summarise the literature on the effects of participation in sequences of ALMPs for Germany and other countries.



## 4.1 Empirical Evidence on Short-term Training

Training programmes are a very common type of ALMPs in many countries and different types of training programmes exist, including not only short-term training (classroom training and in-firm training) but also (further) vocational training or re-training to earn a vocational degree in a different occupation. Immervoll/Scarpetta (2012) show that in most OECD countries, training programmes compose the largest spending category in terms of overall spending on ALMPs. Several meta-analyses – e.g., Card/Kluve/Weber (2010) for various countries and ALMPs, Kluve (2010) for European countries and various ALMPs, Greenberg/Michalopoulos/Robins (2003) for the US and training programmes – summarise evaluation studies. For example, Card/Kluve/Weber (2010) reveal positive impacts for participation in short-term training in the medium run (measured approximately 2 years after programme completion), but negative impacts in the short run (measured approximately 1 year after programme completion).

For Germany, many studies analyse the effects of participation in short-term training for unemployment insurance recipients or unemployment assistance recipients prior to the Hartz IV reforms. Most of these studies use matching methods. Analysing short-term training in September 2002 on the avoidance of unemployment, Stephan/Rässler/Schewe (2006) find positive effects of participation in in-firm training for East Germany and negative or not well-determined effects for participation in classroom training 2 years after the start of the programme. Biewen et al. (2007) analyse Germany's short-term training in the early 2000s and their results indicate that such training has positive regular employment effects for West German men and women within 2 to 2.5 years after programme start following a short lock-in period of approximately 3 months, especially for those who began the programme later in their unemployment spell. Büttner (2008) analyses short-term training that tests individuals' willingness to work (part of the application training) by using experimental data for 2005. His results reveal some positive announcement effects (threat effects) and programme effects on avoiding unemployment and on unsubsidised employment up to 1 year after programme start, whereas the threat effects are higher. Stephan (2008) analyses short-term training starting in March 2003 and finds positive regular employment effects of participation in in-firm training 3.5 years after programme start but only some positive effects of participation in classroom training. Furthermore, the author finds evidence of programme careers. Wunsch/Lechner (2008) find no positive regular employment effects of participation in short-term training in the early 2000s within 2.5 years after programme start for West Germany (only some positive regular employment effects for the subgroup of participants with no vocational degree approximately 12 months after programme start). Stephan/Pahnke (2011) also investigate short-term training in Germany starting in March 2003 and find positive regular employment effects of participation in in-firm training and in classroom training within 3.5 years after programme start. For the periods between 1980 and 1992 (old short-term training) and between 2000 and 2003 (new short-term training), Fitzenberger et al. (2013) analyse the effects of par-

ticipation in short-term training on employment, earnings, and participation in long-term training programmes in West Germany. Their results for the new short-term training show positive regular employment effects after a short lock-in period (1 to 4 months) within 3 years after programme start and future participation in long-term training programmes that indicates stepwise integration with the combination of short-term training and long-term training.<sup>11</sup> Furthermore, two studies use a duration model framework: Hujer/Thomsen/Zeiss (2006) find positive effects of participation in short-term training in West Germany before 2005 because of a reduction in unemployment duration. Osikominu (2013) finds that short-term training reduces unemployment duration and increases employment stability for West German participants in the early 2000s.

Recently, an increasingly number of studies have analysed short-term training for welfare recipients in Germany after the introduction of the Hartz IV reforms that implemented short-term training for welfare recipients.<sup>12</sup> All these studies, except for Zabel (2013), use matching methods. Wolff/Jozwiak (2007) evaluate classroom training and in-firm training starting immediately after the Hartz IV reforms by using administrative data. They find nearly no lock-in effects and positive regular employment effects of participation in classroom training (approximately 3 to 4 percentage points 20 months after programme start) and in in-firm training (approximately 13 to 22 percentage points 20 months after programme start). Using a stock sample of welfare recipients in October 2006 and programme starts between October 2006 and March 2007, Huber et al. (2011) find positive insured employment effects<sup>13</sup> of participation in short-term training (approximately 9 percentage points from 7 to 17 months after programme start) based on survey and administrative data. Kopf (2013) analyses various types of short-term training based on the data of Wolff/Jozwiak (2007). Her results indicate that in-firm training has positive regular employment effects (approximately 13 to 20 percentage points 2 to 28 months after programme start) and that classroom skill training (approximately 2 to 5 percentage points 3 to 28 months after programme start), classroom aptitude tests (approximately 2 to 4 percentage points 6 to 28 months after programme start) and combinations of classroom training (approximately 2 percentage points 18 to 28 months only for West German men) also have some positive regular employment effects. However, her results show that classroom application training is rather ineffective (no well-determined or negative regular employment effects up to 28 months after the programme start).

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<sup>11</sup> Old short-term training shows not only positive and significant effects on employment (subsidised and unsubsidised) but also positive effects on future participation in long-term training.

<sup>12</sup> Because I consider welfare recipients in my paper, I provide only the size of the effects for the studies that also analyse welfare recipients.

<sup>13</sup> The authors define insured employment as regular employment that is subject to social contributions. It is not clear if only unsubsidised employment is considered.



Various studies also analyse short-term training for different subgroups. For example, Wolff/Jozwiak (2007) also analyse classroom training and in-firm training for different subgroups, such as age groups. They find that classroom training is less effective for young adults aged 18 to 24 years: only men show some positive regular employment effects (approximately 2 percentage points 6 months after programme start for East German men and 5 percentage points 20 months after programme start for West German men). Further, their results show that although in-firm training is effective for all age groups, its effectiveness increases with age. Hartig/Jozwiak/Wolff (2008) analyse short-term training for younger welfare recipients (aged 15 to 25 years) and find positive regular employment effects of participation in in-firm training (approximately 11 to 20 percentage points 12 months after programme start); however, the regular employment effects of participation in classroom training are mostly not well-determined. By contrast, analysing the effects of participation in short-term training on older German welfare recipients (aged 50 years or older) at the end of 2005, Romeu/Wolff (2011) find that classroom training has positive regular employment effects for West German men (approximately 2 percentage points 12 months after programme start) and some positive regular employment effects for East German women 3 to 8 months after programme start (approximately 1 percentage point) but find that in-firm training is quite effective in terms of regular employment (approximately 10 to more than 16 percentage points 3 to 21 months after programme start). Achatz et al. (2012) analyse One-Euro-Jobs, classroom training and in-firm training for young welfare recipients (aged 18 to 30 years) at the end of 2005 and find that in-firm training has positive regular employment effects (ranging from approximately 9 to more than 20 percentage points) 30 months after programme start. However, their results show that classroom training has positive effects 30 months after programme start only for some subgroups, such as single men or women without children (less than 5 percentage points). Examining short-term training for male immigrants and natives, Thomsen/Walter/Aldashev (2013) find mixed effects for different types of short-term training on the drop-off rate from welfare conditional on the take-up of contributory employment for men: aptitude training has positive employment effects for natives and immigrants (between approximately 4 to more than 15 percentage points during the first year after programme start), whereas skill training has positive employment effects only if it is applied early in the welfare spell (approximately 6 percentage points for immigrants and approximately 10 percentage points for natives 1 year after programme start). However, their results show that application training and combined short-term training are ineffective. Zabel (2013) evaluates One-Euro-Jobs and training programmes for single mothers by using a timing-of-events approach and her results regarding classroom training reveal positive regular employment effects for some groups of single mothers in West Germany.<sup>14</sup>

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<sup>14</sup> The effects relate to relative entry rates, with values above 1 indicating positive effects and values below 1 indicating negative effects. For example, entry rates into regular em-

## 4.2 Empirical Evidence on One-Euro-Jobs

Several studies analyse public employment programmes for different countries. Card/Kluve/Weber (2010) provide meta-analyses for various countries and find that public employment programmes are a less effective programme compared with other ALMPs in the short run (approximately 1 year after programme completion) and in the medium run (approximately 2 years after programme completion). The study of Kluve (2010) that provides a meta-analysis only for European countries also reveals that public sector employments are less likely to have positive impacts. However, evidence on workfare programmes such as the German One-Euro-Jobs is scarce. For example, Dahl (2003) analyse a workfare programme on earnings and employment in Norway for social assistance recipients, but he does not find significant effects.

For Germany, several studies analyse the effectiveness of single One-Euro-Jobs by using propensity score matching. I provide the most relevant studies in the following. Hohmeyer/Wolff (2010) analyse the effects of participation in different public employment programmes (traditional job creation schemes, work opportunities as contributory employment and One-Euro-Jobs) by using a stock sample of welfare recipients in April 2005. Their results reveal negative effects of One-Euro-Jobs compared with non-participation on regular employment during the first months after the start of the programme, but positive effects on regular employment arise for East German women and West German men and women 3 years after the start of the programme (e.g., approximately 3 percentage points for West German women). Huber et al. (2011) evaluate One-Euro-Jobs between October 2006 and March 2007 by using survey and administrative data. They find positive effects on insured employment<sup>15</sup> of participation in One-Euro-Jobs for men, for individuals who are not lone parents and for individuals who have no migration background (approximately 7 to 9 percentage points between 7 and 17 months after the programme start). Hohmeyer (2012) investigates the effects of participation in different types of One-Euro-Jobs by planned duration and weekly working hours compared with non-participation by using a stock sample of welfare recipients of January 2005. Her results reveal positive effects on regular employment in the medium run (e.g., approximately 3 percentage points 28 months after the start of the programme for West German women), but not for East German men. More intensive One-Euro-Jobs have negative effects on regular employment in the medium run for East German men (e.g., approximately –2 percentage points 28 months after the start of the programme for One-Euro-Jobs with planned durations of 8 to 12 months compared with non-participation). However, the most positive effects are found for East German women with a medium level of working hours between 21 and 29 hours compared with non-

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ployment are raised by a factor of 1.51 for single mothers with a youngest child aged 3 to 5 years in West Germany 12 months after programme start.

<sup>15</sup> The authors define insured employment as regular employment that is subject to social contributions. It is not clear if only unsubsidised employment is considered.

participation (approximately 3 percentage points 28 months after the start of the programme). For West Germany, participation with a planned duration longer than 4 months increases employment prospects. Hohmeyer/Wolff (2012) analyse One-Euro-Jobs versus non-participation by using the same stock sample as Hohmeyer (2012). They find that One-Euro-Jobs have small lock-in effects during the first months after the start of the programme, but positive effects on regular employment arise for women (approximately 3 percentage points 20 months after the start of the programme for West German women).

Furthermore, some studies analyse One-Euro-Jobs for specific subgroups. Hohmeyer/Wolff (2012) also analyse One-Euro-Jobs for different age groups and specific disadvantaged groups. Their results reveal negative and not well-determined effects on regular employment for young welfare recipients (aged 15 to 24 years) 20 months after programme start. Moreover, One-Euro-Jobs are quite effective for individuals who are jobless for longer periods. Thomsen/Walter (2010) analyse the effects of participation in One-Euro-Jobs compared with non-participation among immigrants and natives by using an inflow sample of welfare recipients in 2006. Their results reveal negative effects on regular employment conditional on leaving welfare receipt (approximately 3 percentage points for immigrants and natives 1 year after the start of the programme). Wolff/Popp/Zabel (2010) analyse One-Euro-Jobs for welfare recipients aged 15 to 24 years for different qualification and work experience levels. They find no or even negative effects on regular employment and on the avoidance of UB-II-receipt, but some positive effects for young welfare recipients with no qualifications or low work experience. Achatz et al. (2012) evaluate One-Euro-Jobs for young welfare recipients (aged 18 to 30 years). Their results reveal negative effects on regular employment 30 months after the start of the programme, but positive effects for women with a partner and children. Zabel (2013) analyses One-Euro-Jobs for single mothers and finds positive regular employment effects, but not for West German women with children aged 3 to 5 years.

### **4.3 Empirical Evidence on Intensified Activation Packages**

Some countries have implemented intensified activation packages comprising different phases of activation. I will provide some selected examples for Denmark, Germany, Great Britain and Norway. In Denmark, a social experiment with intensified activation has been introduced (Graversen/van Ours 2008). Approximately half of the unemployment insurance recipients who became unemployed between November 2005 and February 2006 were assigned to an intensified activation programme, while the other half only receives activation as usual. After 5 to 6 weeks of unemployment individuals have to participate in a two-week job search programme. Thereafter, individuals have meetings with a case worker every week or every second week and after 4 months of unemployment individuals have to participate in an activation programme with duration of at least 3 months. Graversen/van Ours (2008) analyse the effects of participation in the intensified activation programme on the job

finding rate<sup>16</sup> by directly comparing the job finding rates that are defined by mixed proportional hazard specifications of the treatment and control group. The authors find an on average higher job finding rate by 30 percent for the treatment group compared with the control group. Rosholm (2008) also analyse this social experiment, but in a more detailed manner by using a duration model approach to identify separate effects of each programme and to consider dynamic selection bias. He finds a high effectiveness of the intensified activation programme: the exit rate from unemployment ranges between 20 to 40 percent approximately 10 to 26 weeks after entry into unemployment. However, none of the single programmes have a positive effect on the exit rate from unemployment, but the risk of participation in a programme has a strong positive effect on the exit rate. Thus, a reason for the positive effect of the overall intensified activation programme could be threat effects. Pedersen/Rosholm/Svarer (2012) analyse the effects of a similar randomised experiment in Denmark implemented in 2008. The treatment group receives not an overall intensified activation programme, but an intensified treatment consisting of one out of four single elements—weekly group meetings of unemployed individuals with one or two case workers, individual meetings with case worker every 2 weeks, participation in an ALMP after approximately 3 months of unemployment or combination of group meetings and participation in an ALMP. However, the control group receives treatment as usual (meeting with a caseworker at least every 3 months and participation in an activation programme after 9 months of unemployment). The results reveal that individual meetings increase employment<sup>17</sup> by 5 weeks 2 years after the start of the experiment. For men, the effects of participation in the activation programme are positive and significant (approximately 5 weeks 2 years after the start of the experiment) that already arise before the start of the activation programme (threat effects).

In Germany, the so-called JobPerspective was introduced in 2007 for hard-to-place welfare recipients who have been long-term unemployed with at least two additional severe employment impediments. The JobPerspective provides a non-temporary wage subsidy to employers who hire these individuals. However, these individuals have to participate in an intensified activation phase for at least 6 months comprising existing ALMPs. They receive the wage subsidy only if they still do not find regular employment after they complete the activation phase. However, no study analyses the combination of the activation phase and the wage subsidy. Dengler et al. (2013) analyse only the implementation of the activation phase and their impact on the labour market by using administrative data and a difference-in-difference approach. The authors find a modestly intensified activation for the treatment group leading to subsidised employments other than the JobPerspective, especially in East Germany (e.g., treatment group members spend approximately 0.2 to 0.6 days more in subsidised employments).

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<sup>16</sup> The job finding rate is defined as transitions out of the benefit system into employment.

<sup>17</sup> Employment is not defined in a more detailed manner in the study.

In Great Britain, the (flexible) New Deals provide intensive employment assistance comprising a personal advisor and different programmes at certain points of time for different target groups of unemployed individuals (Finn/Schulte 2008). Several evaluation studies analyse the New Deals. For example, Lissenburgh (2004) analyse the relative effectiveness of various options of the New Deal for Young People (NDYP) between 1998 and 1999 in Scotland. The NDYP consists of the so-called Gateway period where individuals receive intensive help and counselling. If individuals still do not get a regular employment, they have to participate in an activation programme (subsidised employment in the private sector, full-time education, work for the voluntary sector or work with the environment task force). By using a matching approach, his results show that the subsidised employment option is the most effective one (e.g., positive effects to leave unemployment arise by approximately 7.7 percentage points 20 to 24 months after programme start if individuals participate in the subsidised employment option compared with the full-time education option).

In Norway, Rønsen/Skarðhamar (2009) analyse a comprehensive action plan for welfare recipients introduced in 2003. The programme consists of several rehabilitation and activation programmes and a strong cooperation between national and local welfare systems. By using administrative data and survival analysis, their results reveal positive effects on employment (unsubsidised and subsidised) for long-term unemployed welfare recipients: participants show a higher average employment entry rate by 37 percent compared with non-participants over the 20 months after entry into the programme.

#### **4.4 Empirical Evidence on Sequences**

In general, evidence on the effects of participation in sequences of ALMPs is scarce. For Germany, three studies analyse sequences of ALMPs. Jaenichen/Stephan (2011) analyse the sequence of in-firm training followed by a wage subsidy (paid to employers) versus only in-firm training for unemployed hard-to-place individuals in the early 2000s by using a static matching approach that does not consider intermediate outcomes. Their results show positive regular employment effects (approximately 14 to 31 percentage points 3 years after the start of the wage subsidy). Using a dynamic matching approach, Lechner/Miquel (2010) analyse training programmes for unemployment insurance and assistance benefit recipients in West Germany. They do not consider short-term training but instead the training programmes in the early 1990s, namely, vocational training programmes (T) and retraining (R). They evaluate the employment (subsidised and regular employment) effects of spending four quarters in the considered programmes or being unemployed (U): TTTT versus RRRR, TTTT versus UUUU and RRRR versus UUUU. Their results reveal positive employment effects for the sequence of four quarters of retraining versus the sequence of four quarters of unemployment (approximately 35 percentage points 4 years after entry into unemployment). In addition, regarding the comparison between the sequence of retraining and the sequence of vocational training programmes, vocational training programmes lead to faster integration into employment

than retraining (approximately –26 percentage points 2 years after entry into unemployment). Dengler (2013) analyses sequences of One-Euro-Jobs by using an inflow sample of welfare recipients between October 2005 and September 2006 and a dynamic matching approach. She applies a dynamic window approach for the definition of sequences and compares the sequence of two consecutive One-Euro-Jobs with the sequence of two periods in UB-II-receipt and the sequence of a One-Euro-Job followed by UB-II-receipt with the sequence of UB-II-receipt followed by a One-Euro-Job. Her results reveal positive effects on regular employment for female participants in One-Euro-Jobs in the first period, especially in West Germany, if they participate in two One-Euro-Jobs compared with receiving UB-II-receipt for two periods (approximately 12 percentage points 13 months after the start of the second programme). For male participants in One-Euro-Jobs in the first period, especially in East Germany, positive effects on regular employment arise if they participate immediately in a One-Euro-Job versus waiting for a One-Euro-Job in the second period (approximately up to 6 percentage points 13 months after the start of the second programme). Positive effects on regular employment also arise for East German women (approximately 3 percentage points 12 months after the start of the second programme).

Some studies examine the effectiveness of sequences of ALMPs in other countries. Using a dynamic matching approach, Lechner (2004) evaluates sequences of ALMPs for unemployed individuals in Switzerland in the late 1990s. He considers four different states: unemployment (U), training courses (C), employment programmes (E) and temporary wage subsidies (T).<sup>18</sup> One period contains an interval of 2 months. In addition, Lechner (2009) employs another estimator for this application: the inverse probability weighting (IPW) estimator. The results of these studies show that participating in a training course or receiving a temporary wage subsidy for two periods compared with remaining unemployed for two periods has positive effects on unsubsidised employment (approximately 10 percentage points 20 months after the end of the two periods). Using a timing-of-events approach, Graversen (2004) analyses the effects of sequences of different ALMPs (private sector employment programmes, public sector employment programmes, classroom

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<sup>18</sup> Training courses consist of basic courses, language courses, computer courses, further vocational training and courses for specific occupations but not occupational retraining. Employment programmes may be offered by public or private institutions and they should be similar to regular employment but should be neutral in terms of competition. Temporary wage subsidies for employees must target regular, but temporary, employment (Gerfin/Lechner 2002).



training and other programmes)<sup>19</sup> on the transition rate from welfare to regular employment for Danish welfare recipients for the period between 1994 and 1998. The results show that lock-in effects arise for all first and second programmes during the programme periods. In addition, treatment effects after the first programme are positive for private sector employment programmes (an approximately 340% increase in the transition rate), public sector employment programmes (an approximately 150% increase in the transition rate) and classroom training (an approximately 80% increase in the transition rate). However, the treatment effects after the second programme are mostly negative. Using the IPW estimator, Lechner/Wiehler (2013) evaluate sequences of five different states for unemployed individuals in Austria for the period between 2000 and 2002: unemployment (UE), orientation measure (OM), qualification measure (QM), active job search (AJS) and course subsidies (CS).<sup>20</sup> The authors consider both the timing and the order of the programmes. They find that earlier programme allocation has negative effects on unemployment (approximately –6 to –10 percentage points) for all programmes and target populations 4 years after initial entry into unemployment. However, the effects of the order of the programmes suggest that an active job search is more beneficial after a qualification measure: negative effects on unemployment (approximately –8 percentage points) arise 4 years after initial entry into unemployment.

## 5 Implementation and Method

Because the definition of periods is essential for analyses of sequences, I first describe the definition of states and sequences for the dynamic window approach of Dengler (2013). Second, I describe the dynamic matching approach and its assumptions.

### 5.1 Implementation of Dynamic Window Approach

I consider classroom training (denoted CT in the analysis) and all possible combinations of classroom training and UB-II-receipt (denoted UBII in the analysis). Moreover, I also consider One-Euro-Job participation (denoted 1EJ in the analysis). Final-

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<sup>19</sup> Private sector employment programmes consist of ordinary job training and individual job training to provide individuals with the experience of regular employment. The employer receives a wage subsidy in ordinary job training, whereas the earnings in individual job training consist of welfare benefits and an employment supplement. Public sector employment programmes include ordinary job training, individual job training and employment projects. Public job training programmes occur in the public sector but share similar characteristics with private sector employment programmes. However, employment projects are created by the municipality, consist of work that would not be performed otherwise (e.g., nature preservation) and only pay the amount of the welfare benefit (Graversen 2004).

<sup>20</sup> Orientation measures assess one's individual situation and aptitude. Qualification measures and active job search are components of the training programmes. Active job search should improve participants' job acquisition skills such as interview training. Qualification measures are offered by the Public Employment Service and they consist of both basic skill courses and training with a vocational degree. By contrast, course subsidies include financial support for courses that are offered by external providers (Lechner/Wiehler 2013).

ly, I analyse the following sequences: (CT,CT) versus (UBII,UBII), (CT,CT) versus (UBII,CT), (CT,UBII) versus (UBII,CT) and (CT,1EJ) versus (UBII,1EJ).

In this paper, I consider three periods ( $t=0, 1, 2$ ) and three different states (UBII, CT, 1EJ). Figure 2 presents the possible states and sequences. In period 0, all individuals have the same state: UB-II-receipt without contributory employment (entry into the sample). In period 1, an individual can participate in classroom training or merely receive UB II without participating in an ALMP. Again, in period 2, an individual can participate in classroom training (or in a One-Euro-Job) or merely receive UB II without participating in an ALMP. Thus, I obtain six different sequences: (CT,CT), (UBII,UBII), (CT,UBII), (UBII,CT), (CT,1EJ), and (UBII,1EJ).

In contrast to the studies (co-)authored by Lechner (e.g., Lechner/Miquel (2010)), who defines a period as an interval of time, I use the dynamic window approach of Dengler (2013), which consists of a first start and individual window and a second start and individual window (Figure 3). Following the timing of events approach of Sianesi (2004), I use a start window of up to 122 days, in which an individual can begin the considered programme (CT or 1EJ) or not (UBII). The individual window takes 30 days (or 183 days)<sup>21</sup> because of the average duration calculated by the different durations of the different types of classroom training set by law.<sup>22</sup>

I consider classroom training versus UB-II-receipt as the first state: individuals can begin their first valid classroom training up to 122 days after entry into the sample or can receive UB II without beginning a valid programme up to 122 days after entry into the sample (first start window). Programmes are valid if they occur during the same welfare spell, i.e., permanent UB-II-receipt (with gaps of less than 31 days) without contributory employment (exit condition). If the individual gets the state UBII, I calculate random programme starts as random durations of time after the entry date that are randomly drawn from the empirical distribution of durations of classroom training. To determine the end of the first period and the beginning of the second period, I construct a first individual window by adding 30 days to the (random) starts of the first programmes. I create the first individual window to guarantee comparability and to decrease variation across the sequences with respect to duration.

For the second state, I consider three different states: CT, UBII and 1EJ. Individuals can begin valid classroom training (or a valid One-Euro-Job) up to 122 days after the end of the first individual window or can receive UB II without beginning a valid programme up to 122 days after the end of the first individual window (second start

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<sup>21</sup> Because I also consider One-Euro-Jobs for the second state only, I use 183 days as the individual window for the second individual window because of the average planned duration of One-Euro-Jobs (Dengler 2013).

<sup>22</sup> By law, application training lasts up to 2 weeks, aptitude test up to 4 weeks and skill training up to 8 weeks. This yields an average duration of 32.6 days which I round down to 30 days (1 month). The average duration of classroom training in the sample also corresponds to these 30 days.



window). Again, if the individual achieves the state of UBII, I calculate random programme starts from the random durations of programme starts of classroom training or One-Euro-Jobs during the second period. Furthermore, I add 30 days (in the case of classroom training) or 183 days (in the case of One-Euro-Jobs) to the (random) starts of the second programmes to obtain the second individual window. As I measure outcomes since the (random) starts of the second programmes, the second individual window exists only for the sake of completeness.

If the first state consists of a valid first programme (CT), the second state consists of a valid programme (CT or 1EJ) only if it is the second programme after entry into the sample and if it starts during the second start window. Thus, the sequences (CT,CT) and (CT,1EJ) consist of the first programme after entry into the sample in the first period and the second programme after entry into the sample in the second period. If the first state is UBII, the second state consists of a valid programme only if it is the first programme after entry into the sample and if it starts during the second start window. Thus, the sequences (UBII,CT) and (UBII,1EJ) consist of the first programme in the second period. Consequently, no programmes are allowed in the first individual window for the sequences (CT,CT), (CT,1EJ), (UBII,CT), and (UBII,1EJ); thus, I also exclude programmes for the sequences (UBII,UBII) and (CT,UBII) from the first individual window.<sup>23</sup>

## 5.2 Method

I use the dynamic matching approach of Robins (1986), Lechner (2004), Lechner (2008), Lechner (2009) and Lechner/Miquel (2010) to analyse the effects of sequences. This approach solves dynamic selection problems during a sequence by considering intermediate variables that are influenced by the first state and that influence the second state.<sup>24</sup>

In this paper, I consider three periods and three different states (see section 5.1). However, to simplify the notations used in the method section, I consider three periods (0, 1, 2) and only two different states (UBII and CT). All individuals are in the same state in the first period 0: UB-II-receipt without contributory employment. The vector of random variables  $S = (S_0, S_1, S_2)$  describes the sequence in which an individual participates up to period 2, measured at the start of each period. A particular realisation of  $S_t$  is denoted by  $s_t \in \{0,1\}$ . A bar below a variable such as  $\underline{s}_2 = (s_1, s_2)$  denotes the history of variables up to period 2. In period 1, an individual can take part in CT or UBII. Again, in the second period, an individual can take part in CT or UBII. Thus, I get four different sequences for this example: (CT,CT), (CT,UBII), (UBII,CT) and (UBII,UBII).

<sup>23</sup> First programmes occurred between October 2005 and January 2007 and second programmes occurred between November 2005 and June 2007.

<sup>24</sup> See also Dengler (2013) for a detailed overview of the dynamic matching approach.

Similar to the static approach, I estimate the average causal effects of sequence  $k$  ( $\underline{s}_\tau^k$ ) versus sequence  $h$  ( $\underline{s}_\tau^h$ ) up to period  $\tau$  ( $=2$ ) for a specific subpopulation  $j$  ( $\underline{s}_\tau^j$ ) in period  $\tilde{\tau}$  ( $=1$ ) by calculating the differences between the potential outcomes of sequence  $k$  and sequence  $h$  measured at the start of period  $t$  ( $=2$ ),  $Y_t^{\underline{s}_\tau^k}$  and  $Y_t^{\underline{s}_\tau^h}$ .

$$\theta_{\tilde{\tau}}^{\underline{s}_\tau^k, \underline{s}_\tau^h}(\underline{s}_\tau^j) := E(Y_t^{\underline{s}_\tau^k} | \underline{s}_\tau = \underline{s}_\tau^j) - E(Y_t^{\underline{s}_\tau^h} | \underline{s}_\tau = \underline{s}_\tau^j)$$

$$0 \leq \tilde{\tau} \leq 2, \quad 1 \leq \tau \leq 2, \quad \tilde{\tau} \leq \tau, \quad k \neq h, \quad k, h \in (1, \dots, 2^\tau), \quad j \in (1, \dots, 2^{\tilde{\tau}})$$

The most interesting effects are the dynamic average treatment effects on the treated (DATET):  $\theta_{\underline{s}_2^k, \underline{s}_2^h}^{\underline{s}_1^k}(s_1^k)$ . Thus, I compare sequence  $k$  up to period 2 with the sequence  $h$  up to period 2 for individuals participating in the first state of sequence  $k$  in period 1. For example, the DATET of sequence (CT,CT) versus sequence (UBII,UBII) for individuals participating in classroom training in the first period. I use a sequential version of the propensity score matching estimator for the estimation.<sup>25</sup> The sequential matching aims to match sequence  $k$  (e.g., (CT,CT)) and sequence  $h$  (e.g., (UBII,UBII)) to the subpopulation  $j$  (e.g., the population participating in classroom training in the first period (CT)). Thus, for individuals participating in classroom training in the first period, I compare whether participating in sequence (CT,CT) or participating in sequence (UBII,UBII) is more beneficial.

To identify the effects, assumptions similar to the static approach must hold (Roy 1951; Rubin 1974). First, the Stable Unit Treatment Value Assumption (SUTVA) must hold. That is, an individuals' treatment and outcomes must not depend on other individuals' treatment and outcomes (Rubin 1980). This assumption is likely to hold if the considered programmes are not large scale (Frölich 2004). Second, the Weak Dynamic Conditional Independence Assumption (WDCIA) for dynamic propensity score matching (e.g., Lechner/Miquel (2010)), which is similar to the static Conditional Independence Assumption (CIA) of Lechner (1999), must hold. The CIA states that potential outcomes are independent of the treatment if all covariates that jointly influence the treatment and outcomes are controlled for (Caliendo/Kopeinig 2008). If the CIA is valid conditional on covariates, it is also valid conditional on balancing scores such as propensity scores (Rosenbaum/Rubin 1983). While the first part of the WDCIA comprises the usual CIA, its second part considers intermediate outcomes. First, potential outcomes are independent of the treatment in period 1 conditional on pre-treatment covariates (covariates of period 0 ( $X_0$ )). Second, potential outcomes are independent of the treatment in period 2 conditional on the treatment in period 1, the covariates of period 0 ( $X_0$ ) and the covariates and outcomes of period 1 ( $X_1$ ). Furthermore, the WDCIA of Lechner/Miquel (2010) includes the usual Common Support Requirement (CSR): individuals with the same characteristics ( $X_0$

<sup>25</sup> For a short matching protocol, see Table A-1 in the appendix.

and  $X_1$ ) must have a positive probability participating in all of the considered sequences and subpopulations.

## 6 Data and Descriptives

Because the dynamic matching approach is very data hungry, I use rich administrative data from the German Federal Employment Agency. First, I describe the data and discuss the identification of effects based on the WDCIA. Second, I provide some descriptive statistics.

### 6.1 Data and Identification

I use administrative data from the German Federal Employment Agency that have been prepared for scientific use by the Institute for Employment Research.<sup>26</sup> I draw a rich inflow sample of all UB-II-recipients without contributory employment for the period between October 2005 and September 2006.<sup>27</sup> In addition, the individuals are aged 18 to 57 years and had not received UB II 3 months before their entry date into the sample.<sup>28,29</sup>

I need rich data on covariates and intermediate outcomes for the justification of the WDCIA. Thus, I have to observe all covariates and intermediate outcomes that jointly influence the treatment and potential outcomes. Assignment into programmes depends on legal requirements, selection by case workers and self-selection by welfare recipients (Lechner/Miquel/Wunsch 2011). First, legal requirements for assignment into ALMPs are an important factor. In the case of classroom training and One-Euro-Jobs, the participants must be in UB-II-receipt, which is the sample condition. Additionally, young welfare recipients who are less than 25 years of age are a specific target group in the UB-II-system. Thus, I include age as a covariate.

Second, the case workers assign unemployed welfare recipients into programmes based on a detailed profiling process (Jacobi/Kluve 2007). This assignment into programmes depends on the welfare recipient's employment prospects and success in completing a specific programme and regional labour market conditions (Lechner/Miquel/Wunsch 2011). Thus, I include socio-demographic variables (i.e., age, education and nationality), variables related to the labour market history (i.e., employment history, unemployment history and ALMP history) and variables related to the last contributory employment (i.e., time since last contributory job, status,

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<sup>26</sup> I use data from the Integrated Employment Biographies (IEB) and the UB-II-Receipt History ('Leistungshistorik Grundsicherung' (LHG)).

<sup>27</sup> Data from local authorities ('zugelassene kommunale Träger') are not included because of data collection problems. In these 69 districts, the Federal Employment Agency did not administer UB II. For approximately 13% of unemployed welfare recipients between 2005 and 2008, UB II was administered by local authorities (Department for Statistics of the Federal Employment Agency 2014).

<sup>28</sup> For additional data preparations, see section 6.1 in Dengler (2013) for more details.

<sup>29</sup> The upper limit of the observation window is October 2009 and the upper limit of employment information is December 2008.

wage and industry type). Furthermore, I use information on household variables (i.e., partner, children, equivalent household income from welfare and variables capturing the partner's socio-demographic information and labour market history), because household context and partner employment prospects can also influence individuals' employment prospects and success in completing a specific ALMP. Furthermore, I consider regional labour market variables (i.e., unemployment rate, long-term unemployed per unemployed, vacancies per unemployed), because these variables also contribute to individuals' employment prospects (Lechner/Miquel/Wunsch 2011). All of these variables are measured before or at entry into the sample. In their case worker survey, Achatz et al. (2009) also report important assignment criteria for short-term training that are mostly captured by the variables included in this paper. However, the potential participants' motivation is an important assignment criterion for case workers that I measure only indirectly by labour market history.

Third, self-selection by welfare recipients into programmes could be also an important assignment factor. Normally, case workers decide together with the unemployed welfare recipient about participating in a programme and in which type of programme. The decision of a welfare recipient to participate in a programme or not is similar to that of the case workers, although additional reasons for participating or not could be important, e.g., the welfare recipient does not want to reduce his/her leisure time (Lechner/Miquel/Wunsch 2011). However, controlling for rich individuals' employment prospects and regional labour market variables will also capture welfare recipients' self-selection. Furthermore, case workers have the final decision about programme assignment (Yankova 2010) and if an unemployed welfare recipient refuses to participate in a programme, he/she also risks his/her benefit receipt due to sanctions. Thus, welfare recipients' self-selection into ALMPs is limited anyway.

Unobserved variables such as motivation, personality traits or information on the case workers are not controlled for, but are indirectly captured by rich information on individuals' (un-)employment histories. Caliendo/Mahlstedt/Mitnik (2014) also suggest that administrative data with detailed labour market history information are sufficient to control for usually unobserved variables.

To justify the WDCIA, I also need information on intermediate variables that are influenced by the first state and that influence the second state. Thus, I need information on time-varying variables that drive assignment to a second programme. First, Lechner/Wiehler (2013) assume that a case worker's decision to assign an unemployed welfare recipient to a further programme is based on intermediate employment prospects of the welfare recipients. Second, intermediate financial or individual and household criteria influence assignment to a second programme. The intermediate variables are measured before or at period 2.

Because the first individual window takes only 30 days, I only consider intermediate outcomes that may change during this time period (e.g., I do not consider education

as an intermediate outcome). Furthermore, because individuals must be in permanent UB-II-receipt (with gaps of less than 31 days) without contributory employment (exit condition), intermediate variables on employment prospects may change for the cumulated duration of UB-II-receipt to some extent and for the cumulated duration of minor employment measured 1 month<sup>30</sup> before period 2, but not for contributory employment. Equivalent household income from welfare in the month of period 2 captures not only intermediate financial aspects but also household aspects. Indeed, equivalent household income may change because of a change in household composition. Thus, I consider children at period 2 as part of the household or as individual aspects.<sup>31</sup> Sanctions may be an additional important intermediate variable, but because of the incomplete data on sanctions before January 1, 2007, I cannot use this information. However, both sanctions and changes in household composition are indirectly captured by the equivalent household income. Thus, I can control for all of the observed intermediate outcomes that are influenced by the first state and that influence the second state.

I account for various outcomes that are measured 1 month after the (random) start of the programme in the second period. First, I include regular employment rate (unsubsidised contributory employment). Second, I consider ALMP outcomes on qualification programmes (short-term training and further vocational training) and One-Euro-Jobs as indicators for stepwise integration through additional programmes or programme careers. Third, I regard the avoidance of UB-II-receipt as an outcome. Indeed, individuals may leave UB-II-receipt if their earnings or the earnings of the household are sufficiently high (e.g., by taking up a regular employment) or if they drop out of the labour market.

## 6.2 Descriptives

Table 2 presents the sample sizes and some descriptive statistics for the sample and the considered subpopulations and sequences. More than 350,000 West German men and women are included in the sample. However, the number of observations for the considered sequences sharply decreases, especially for sequences consisting of two consecutive programmes (e.g., the observations for women in the sequence (CT,1EJ) decrease to 380). Nevertheless, the number of observations is sufficiently high for estimation.

The sample consists of equal proportions of men and women, but men participate more frequently in classroom training in the first period. Women also participate in the considered sequences to a lesser extent than men, especially in sequences with One-Euro-Jobs ((CT,1EJ) and (UBII,1EJ)). Turning to some descriptive results, I find that the average age ranges from 30 to approximately 34 years, except for the se-

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<sup>30</sup> I use 1 month because my individual window is 30 days. Otherwise, the intermediate outcomes would extend into the pre-treatment period (before period 1).

<sup>31</sup> The variable pregnant can be constructed at period 2. However, the number of observations is too small for estimation.

quence (CT,1EJ) for men. In general, women are more likely than men to have children: for the considered sequences, the share of children is nearly twice as high for women as for men. Moreover, the average cumulated duration of minor employment 5 years before entry is higher for women than for men (men spent more than 100 days and women spent more than 200 days in minor employment), but for the sequences consisting of One-Euro-Jobs, the average durations are slightly lower for women. The average cumulated duration of UB-II-receipt 1 year before entry is approximately 1 month for men and approximately 23 to 26 days for women. However, the average duration of UB-II-receipt is higher for the sequences (CT,1EJ) and (UBII,1EJ). In addition, women more frequently had no contributory employment before entry (approximately 30 to 40%) compared with men (approximately 20 to 30%), and the average equivalent household income from welfare<sup>32</sup> in the month at entry is more than 380 Euros for men and approximately 300 to 400 Euros for women.

The intermediate variables present the average cumulated duration in minor employment 1 month before period 2 and a dummy for being in minor employment at period 2. The average duration in minor employment is higher for women than for men (approximately 2 to 5 days) and they are more frequently in minor employment at period 2. The average cumulated duration of UB-II-receipt 1 month before period 2 is approximately 1 month for both men and women. This result is not surprising because the programmes must be in the same welfare spell, i.e., permanent UB-II-receipt (with gaps of less than 31 days) without contributory employment (exit condition). The intermediate variable on children at period 2 shows a slightly higher share of children at period 2 than at entry for nearly all subpopulations and sequences, especially among women in (UBII,UBII). The intermediate variable on equivalent household income from welfare in the month before period 2 is approximately 100 to 190 Euros higher than the equivalent household income from welfare in the month at entry. One possible reason for this result may be that welfare recipients leave their minor employment and thus receive more income from welfare or that welfare recipients still have some income from other sources or employment at entry into UB II.

Table 3 presents the outcomes for all controls, treated individuals, matched controls and matched treated individuals 12 months after the programme start in the second period for the considered sequences. First, I find some positive selection for the sequence (CT,CT) because a higher proportion of the matched controls of the sequence (UBII,UBII) are in regular employment than all controls of the sequence (UBII,UBII). Second, a higher proportion of participants in the sequences (CT,CT) and (CT,1EJ) are in ALMPs, such as short-term training and One-Euro-Jobs, com-

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<sup>32</sup> To calculate the equivalent household income from welfare, I use the OECD modified scale, which assigns the head of household a weight of 1, each additional adult a weight of 0.5 and each child a weight of 0.3.



pared with participants in their respective counterparts ((UBII,UBII), (UBII,CT), and (UBII,1EJ)).

## 7 Results

In this section, I present the four DATET for different labour market outcomes. I also consider heterogeneous effects by calculating the DATET only for older individuals aged at least 25 years. Furthermore, I perform a robustness check by applying a different matching algorithm: caliper matching.

### 7.1 Overall Results

Before I discuss the four DATET for West German men and women, I present the matching quality by calculating the mean standardised absolute bias (MSB).

#### 7.1.1 Matching Quality

For each subgroup (i.e., West German men and women), I check the matching quality after each of the three matching steps (dynamic matching 1 to 3) and the final matching quality of the considered sequences at the end (final matching) by calculating the MSB.<sup>33</sup> The MSB is defined as the distance in the marginal distribution of the covariates for all of the covariates that are included in each of the probit models. The MSB is reduced if the matching is successful. Caliendo/Kopeinig (2008) suggest that a reduction of the bias to 3 to 5 percent after matching is sufficient.

For each of the three matching steps, I calculate the MSB for each covariate included in each of the probit models before and after matching. As I match the sequence k to the sequence h via these three matching steps, I also calculate the MSB for the final matching quality of the sequence k to the sequence h before and after matching by including all of the covariates.<sup>34</sup> Because the CSR also must hold, some observations are dropped before each matching step.

Table 4 includes the MSB before and after matching for West German men and women for each of the three matching steps. Before matching, the MSB ranges from approximately 4 percent to approximately 16 percent for dynamic matching steps 1 to 3 for West German men and women. After matching, the MSB is mostly below 3 percent for dynamic matching steps 1 to 3.

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<sup>33</sup> I also calculate the means for each covariate that is included in the probit models between the treated individuals and (matched) controls before and after matching and the p-values of the t-test of the differences between the means. Thus, I can check the matching quality after each of the three matching steps and the final matching quality of the considered sequences at the end for each subgroup and covariate. Due to space restrictions, results are only available upon request.

<sup>34</sup> Not all of the covariates must be included in all of the probit models of the three matching steps. Thus, this may lead to poorer final matching quality, as I consider all MSBs for all the covariates.

Table 4 also provides the MSB before and after matching for the final matching of the considered sequences: The MSB for the final matching is below 5 percent for (CT,UBII) versus (UBII,CT) and for (CT,CT) versus (UBII,CT) (for West German women, the MSB is slightly above 5%, at 5.2%). The MSB for (CT,CT) versus (UBII,UBII) and for (CT,1EJ) versus (UBII,1EJ) also considerably reduced after matching, reaching approximately 6 percent, but the MSB after matching for the final matching remains very high for West German women for (CT,CT) versus (UBII,UBII), at approximately 11.4 percent.

Previous studies on sequences that use the dynamic matching approach do not consider the matching quality for the three matching steps and for the final matching; thus, no recommendations for a successful final matching are available. Because the sequences are not directly matched but are matched only via three dynamic matching steps to the subpopulation of classroom training, the MSB after matching for the sequences may not be reduced below the level of 3 percent to 5 percent. The MSB for the final matching is only an approximation of the final matching quality. Thus, future research on the dynamic matching approach must quantify which reductions may be considered sufficient for the final matching.

However, I suggest that a reduction below 6 to 10 percent for the MSB after matching of the final matching may be sufficient. Thus, in summary, the matching quality for each of the three matching steps and the final matching is very good, but not for West German women for (CT,CT) versus (UBII,UBII).

## 7.1.2 Overall Effects

In this section, I present the DATET for the considered sequences for West German men and women:  $\theta_2^{(CT,CT)(UBII,UBII)}(CT)$ ,  $\theta_2^{(CT,UBII)(UBII,CT)}(CT)$ ,  $\theta_2^{(CT,CT)(UBII,CT)}(CT)$  and  $\theta_2^{(CT,1EJ)(UBII,1EJ)}(CT)$ . I estimate the DATET for the following outcomes which are measured 1 month after the (random) start of the programme in the second period: regular employment rate, short-term training, further vocational training, One-Euro-Jobs and no UB-II-receipt. All of the outcomes are available for up to 26 months after the start of the programme in the second period, but regular employment rate is only available up to 18 months after the start of the programme in the second period.

### 7.1.2.1 DATET for (CT,CT) versus (UBII,UBII)

First, I present the basic comparison, the DATET for (CT,CT) versus (UBII,UBII), for West German men and women participating in classroom training in the first period in Figure 4 through 8 for the different outcomes.

Figure 4 presents the DATET on regular employment rate. Initially negative but not significant regular employment effects emerge for West German men participating in classroom training in the first period if they participate in the sequence (CT,CT) versus the sequence (UBII,UBII). The effects turn positive in the medium run (approx-



mately 7 percentage points), but they are mostly not well-determined. However, well-determined regular employment effects arise for West German women 8 to 18 months after the (random) start of the programme in the second period—up to approximately 13 percentage points. One reason for the substantial effectiveness of the sequence (CT,CT) for West German women may be that West German women may be easily activated after the Hartz IV reform if their partners lost their jobs. Before the reform, social assistance recipients and members of unemployment assistance households were often not activated.<sup>35</sup> Bergemann/Van den Berg (2008) also find in their survey on the effects of ALMPs for European countries that the effects of skill training are higher for women compared with men, especially in countries with low female labour force participation. In addition, the authors show that the gap in labour force participation between men and women in West Germany remains very high (18 percentage points in 2004). The authors suggest that a possible reason for the substantial effectiveness of ALMPs for women may be that the female labour supply is more elastic than the male labour supply because women have more outside options (e.g., child bearing and/or child caring) than men.

In summary, two classroom trainings compared with two periods of UB-II-receipt are quite effective in terms of regular employment for West German women participating in classroom training in the first period. Thus, two classroom trainings may increase human capital, enhance one's job search activities and send positive signals to employers. Moreover, lock-in effects do not play a major role in classroom training because classroom training is short in duration and because it does not reduce the time available for job search. However, the effects for West German women may be biased because the final matching quality was not very good. I assume that the results on regular employment rate are upwardly biased because I find positive selection for the sequence (CT,CT): a higher proportion of the matched controls of the sequence (UBII,UBII) are in regular employment compared with all of the controls of the sequence (UBII,UBII).

In qualitative terms, my results are similar to those presented in the existing literature on classroom training that evaluates participating in a single classroom training compared with non-participation. For example, Wolff/Jozwiak (2007) find no initial lock-in effects and positive employment effects of classroom training (approximately 3 to 4 percentage points) that are smaller than the employment effects I find.

The effects on the avoidance of UB-II-receipt are mostly not well-determined (Figure 5). Thus, I cannot conclude that individuals participating in classroom training in the first period leave welfare if they participate in the sequence (CT,CT) versus the sequence (UBII,UBII). The positive regular employment effects for women may indi-

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<sup>35</sup> See Dengler (2013).

cate that women may receive low wages that are not sufficient for their households to leave welfare.<sup>36</sup>

Another reason for these results may be that the participants in the sequence (UBII,UBII) leave UB-II-receipt after the two periods for different reasons, but not because they obtain regular employment. Thus, I do not observe significant differences for no UB-II-receipt between participants of the sequence (CT,CT) and participants of the sequence (UBII,UBII). I also consider the DATET on the outcome without any status.<sup>37</sup> Not only individuals who are unavailable for employment or activation according to Article 10 SC II<sup>38</sup> but also individuals who are ill for more than 42 days or who are in retraining may be considered without any status. The effects on the outcome without any status are well-determined and negative (approximately –5 to –13 percentage points) for females participating in classroom training in the first period if they participate in the sequence (CT,CT) versus the sequence (UBII,UBII). Thus, positive effects on the outcome without any status emerge for female participants with the sequence (UBII,UBII). For example, women may enter UB-II-receipt because their partners have lost their jobs, but women may not be capable of working because of a pregnancy or childcare duties. Thus, these women obtain the status without any status and leave UB-II-receipt and the labour market after some time. Lechner/Whieler (2011) also find that Austrian ALMPs are highly effective for women. Controlling for pregnancies, they conclude that programme participants postpone pregnancies, whereas non-participants engage in childbearing, leave the labour force and have lower employment rates. Thus, the observed effectiveness of ALMPs for women stems from the greater number of outside options for women (such as pregnancies) compared with men.

Because programme careers can arise but further programmes might be necessary for a successful stepwise integration into regular employment, I also estimate the DATET for (CT,CT) versus (UBII,UBII) on certain ALMP outcomes: One-Euro-Jobs, short-term training and further vocational training<sup>39</sup>. Consecutive One-Euro-Jobs may reflect a programme career, as One-Euro-Jobs are a last resort: individuals

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<sup>36</sup> I also estimate the DATET on part-time regular employment rate (where an individual is part-time employed if his/her working hours are less than the common working hours in collective bargaining agreements or firms), but I mostly do not find well-determined effects. Furthermore, the data quality for part-time and full-time employment is not very good. Because of a change in the reporting process of contributory employment in 2011, the share of full-time employees is likely overestimated for past periods and, therefore, is likely overestimated in the considered data.

<sup>37</sup> The results are available upon request.

<sup>38</sup> In general, UB-II-recipients must be available for every job unless they must care for children under 3 years of age or other family members, unless they cannot perform a specific job owing to physical, mental, or psychological reasons, or unless the job would impede the performance of a former job that includes specific physical efforts.

<sup>39</sup> Further vocational training includes not only short qualification programmes (up to 1 year) but also long retraining programmes (up to 3 years) that result in a vocational training degree (Bernhard/Kruppe 2012).

may not find regular employment after the sequence of two classroom trainings and they may be assigned to One-Euro-Jobs, as the only alternative for being 'employed'. Consecutive short-term training may reflect both programme career and stepwise integration. However, consecutive further vocational training may indicate stepwise integration because it provides specific professional skills or even a vocational training degree for welfare recipients.

Figure 6 presents the DATET on One-Euro-Jobs. The effects on One-Euro-Jobs for West German men are positive and significant (approximately 4 to 5 percentage points) from 6 to 11 months after the (random) start of the programme in the second period. For West German women, I also find positive and well-determined effects (approximately 2 to 4 percentage points), but only 3 to 6 months after the (random) start of the programme in the second period. These results indicate that individuals participating in classroom training in the first period participate in One-Euro-Jobs in the first year after the (random) start of the programme in the second period if they participate in the sequence (CT,CT) versus the sequence (UBII,UBII). The results may reflect programme careers.

Figure 7 shows the DATET on short-term training. I find some well-determined and positive effects on short-term training in the first months after the (random) start of the programme in the second period for men and women participating in classroom training in the first period if they participate in two classroom trainings versus two periods of UB-II-receipt. At the beginning, the effects on short-term training are substantial (up to approximately 70 percentage points in the first month) because the participants remain in the second classroom training for the first 3 months. However, the effects decrease to approximately 4 percentage points after 4 months and they are mostly not well-determined afterwards. Thus, the results do not indicate any stepwise integration or programme careers consisting of short-term training.

Figure 8 provides the DATET on further vocational training. In the medium run, positive and significant effects on further vocational training (up to approximately 4 percentage points) arise for West German men and women participating in classroom training in the first period if they participate in the sequence (CT,CT) versus the sequence (UBII,UBII). Thus, the results indicate stepwise integration.

In summary, positive regular employment effects arise for individuals participating in classroom training in the first period if they participate in two classroom trainings versus two periods of UB-II-receipt, especially for West German women. However, I do not find positive and well-determined effects on the avoidance of UB-II-receipt. The effects on One-Euro-Jobs and further vocational training indicate both stepwise integration and programme careers.

### 7.1.2.2 DATET for (CT,UBII) versus (UBII,CT)

Figure 9 through 13 present the DATET for the sequence (CT,UBII) versus the sequence (UBII,CT) (i.e., the effects of timing) for West German males and females participating in classroom training in the first period.

The effects on regular employment rate are only well-determined and positive at the very beginning (Figure 9): I find positive regular employment effects (approximately 1 to 3 percentage points after 1 to 3 months) for West German males and West German females participating in classroom training in the first period if they do not wait for to receive classroom training in the second period. Thus, participating in classroom training immediately in the first period is better than waiting to participate in classroom training in a second period, but after the first 3 months, no well-determined effects emerge.

The results are in contrast to Dengler (2013) who analyses the effects of timing for One-Euro-Jobs (i.e., (1EJ,UBII) versus (UBII,1EJ)) for participants in One-Euro-Jobs in the first period and finds that West German women are better off if they wait for their first One-Euro-Job. The result may be observed because West German women may be able to obtain a more appropriate One-Euro-Job that is in line with their former skills and tasks if they wait. Because classroom training may be more quickly available and offered more frequently in shorter time intervals – in contrast to One-Euro-Jobs – individuals may not need to wait to receive their first classroom training to obtain appropriate classroom training.

Figure 10 presents the DATET for (CT,UBII) versus (UBII,CT) on avoiding UB-II-receipt: the effects are mostly well-determined and positive, especially in the first year after the (random) start of the programme in the second period for West German men and women (approximately 2 to 5 percentage points). For men, positive and significant effects are also observed after 21 to 26 months. One reason that individuals may leave welfare receipt is to begin regular, gainful employment, but I only observe positive effects on regular employment rate in the first 3 months for West German men and for West German women. Thus, other reasons may explain the positive effects on avoiding UB-II-receipt, such as leaving the labour market or leaving UB-II-receipt because of the work test function of classroom training or receiving income from other sources (e.g., wages from a partner that are sufficiently high to avoid UB-II-receipt).<sup>40</sup>

Figure 11 shows the DATET on One-Euro-Jobs. The effects on One-Euro-Jobs are mostly not well-determined for West German women. However, negative and significant effects arise for West German men (approximately 1 to 2 percentage points). Thus, I can conclude that males participating in classroom training in the first period

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<sup>40</sup> I also estimate the effects on subsidised employment, but I find mostly no well-determined effects or even negative effects.

are not subject to programme careers if they participate in the sequence (CT,UBII) versus the sequence (UBII,CT).

Figure 12 provides the DATET on short-term training: negative, well-determined effects emerge in the first 3 months because the participants in the sequence (UBII,CT) are still in their second period of classroom training, whereas the participants in the sequence (CT,UBII) are not. However, the effects become mostly not significant and close to zero afterwards.

Figure 13 presents the DATET on further vocational training: I find negative and well-determined effects for West German men for up to 19 months after the (random) start of the programme in the second period. However, only sporadically significant and negative effects emerge for West German women. Thus, males participating in classroom training in the first period avoid stepwise integration through further vocational training if they participate in the sequence (CT,UBII) versus the sequence (UBII,CT).

In summary, I find some positive regular employment effects in the beginning; however, afterwards, there are no beneficial effects of starting classroom training immediately versus waiting for classroom training in a second period. Thus, starting classroom training immediately may lead to faster integration into employment at the beginning because of reduced matching efforts or human capital losses. Because the effects of leaving UB-II-receipt are well-determined and positive, factors other than obtaining regular employment may be responsible for these effects. For instance, because classroom training tests welfare recipients' willingness to work, they may leave the labour market. Males participating in classroom training in the first period also avoid programme careers or stepwise integration if they immediately participate in classroom training versus if they participate in classroom training in the second period.

### **7.1.2.3 DATET for (CT,CT) versus (UBII,CT)**

Figure 14 through 18 present the effects of participation in multiple programmes, i.e., the sequence of two classroom trainings versus the sequence of UB-II-receipt followed by classroom training. However, I do not find well-determined effects, or I find such effects only sporadically. No well-determined effects on regular employment rate for West German men and women emerge: only one significant and positive effect (approximately 3 percentage points after 2 months) arises for West German women (Figure 14). Figure 15 presents the DATET on avoiding UB-II-receipt, which are also not well-determined: only males participating in classroom training in the first period show some sporadic positive effects on leaving UB II in the medium run (approximately 7 percentage points). The effects on ALMPs (One-Euro-Jobs, short-term training and further vocational training) are also mostly not well-determined (Figure 16 through 18).

### 7.1.2.4 DATET for (CT,1EJ) versus (UBII,1EJ)

Figure 19 through 23 show the DATET for the sequence (CT,1EJ) versus the sequence (UBII,1EJ) for individuals participating in classroom training in the first period. Again, these effects reflect the effect of participation in multiple programmes because participation in two programmes (i.e., classroom training followed by a One-Euro-Job) is compared with participation in only one programme (i.e., a One-Euro-Job).

Figure 19 presents the effects on regular employment rate. Most of the effects are not well-determined. The effects of leaving UB-II-receipt are also mostly not well-determined; however, for West German men, some positive effects (approximately 6 to 8 percentage points) emerge (Figure 20).

Figure 21 through 23 present the effects on One-Euro-Jobs, short-term training and further vocational training; however, only sporadically significant effects are observed. Specifically, I find positive but not well-determined effects on further vocational training (significant effects emerge only after 9 and 24 months, at approximately 4 percentage points) for West German women.

In summary, most effects for the sequence (CT,1EJ) versus the sequence (UBII,1EJ) are not well-determined. Thus, the potential positive effects of the strategic mix of first classroom training followed by a One-Euro-Job and the positive effects of waiting for a more appropriate One-Euro-Job in the second period seem to outweigh each other.

## 7.2 Heterogeneous Effects

In this section, I only consider individuals aged at least 25 years. Because the treatment effects may differ between different subgroups such as age groups, the heterogeneous effects may differ from the effects for the entire sample.<sup>41</sup>

Young adults aged 15 to 24 years are a special target group of the SC II that have to be placed without delay into employment, vocational training, or, as a last resort, a One-Euro-Job.<sup>42</sup> Furthermore, young adults may not be registered as unemployed for more than 3 months, leading to a potential widespread assignment of young adults into classroom training because such programmes are cheap and short (Wolff/Jozwiak 2007). Thus, the resulting poor matching of young adults to classroom training may diminish the effectiveness of the classroom training. Indeed, pre-

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<sup>41</sup> As the number of observations are too small for young adults aged 18-24 years, I estimate the DATET for individuals aged at least 25 years and compare the results to DATET of the entire sample of all individuals (chapter 7.1.2).

<sup>42</sup> Since April 2012, job centres are no longer required to place young adults in One-Euro-Jobs without delay.



vious studies on young adults mostly find no beneficial effects of classroom training.<sup>43</sup>

Table 5 presents the MSB before and after matching for West German men and women aged at least 25 years. In general, the results for matching quality are very similar to the results presented in section 7.1.1. The MSB after matching for the final matching is generally below 8 percent, but not for West German women for (CT,CT) versus (UBII,UBII) and for (CT,1EJ) versus (UBII,1EJ).

Figure 24 through 31 present the DATET on regular employment rate for all individuals of the entire sample and for older individuals aged at least 25 years, with 95 percent confidence bands plotted separately for West German men and women. Thus, no significant differences exist if the confidence bands for the entire sample overlap with the confidence bands for the older-aged individuals.

For older West German men, the effects on the regular employment rate are more significant and higher (approximately 6 to 10 percentage points) for the sequence (CT,CT) versus the sequence (UBII,UBII) than for all West German men (Figure 24). Thus, the sequence (CT,CT) may be less effective for young men in terms of regular employment. However, the differences are not significant. Figure 25 shows the effects on the regular employment rate for West German women for the sequence (CT,CT) versus the sequence (UBII,UBII), which are slightly smaller (approximately 6 to 10 percentage points) for older women than for all women. Thus, older-aged women may have slightly fewer outside options (e.g., child bearing or child caring), but the differences are not significant. In summary, the effects on not only regular employment rate but also all other outcomes are quite similar for all and older-aged individuals.<sup>44</sup> Furthermore, the differences in the effects between all individuals and older-aged individuals are not significant.

Figure 26 shows the effects of timing (i.e., the sequence (CT,UBII) versus the sequence (UBII,CT)) for all West German men and older-aged West German men on the regular employment rate. The effects are mostly not well-determined. Further, the initial positive and well-determined regular employment effects for all West German men are not observed for older-aged West German men. However, I find that the sequence (CT,UBII) versus the sequence (UBII,CT) may test individuals' willingness to work, leading to well-determined and positive effects on leaving UB-II-receipt for all West German men. For older individuals, the effects of leaving UB II are mostly smaller and less significant.<sup>45</sup> Thus, young adults seem more subject to the work test function of the sequence (CT,UBII) compared with the sequence

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<sup>43</sup> See section 4.1 for an overview of studies on young adults and training programmes.

<sup>44</sup> Because of space restrictions, I do not present the figures on all other outcomes (no UB-II-receipt, One-Euro-Jobs, short-term training and further vocational training), but they are available upon request.

<sup>45</sup> Results are available upon request.

(UBII,CT). However, the differences between all West German men and older-aged West German men are not significant. Similar patterns of results are observed for West German women (Figure 27).

The regular employment effects of the sequence (CT,CT) versus the sequence (UBII,CT) are presented in Figure 28 for West German men and in Figure 29 for West German women, whereas Figure 30 and 31 show the regular employment effects for the sequence (CT,1EJ) versus the sequence (UBII,1EJ) for West German men and women, respectively. The effects are mostly not well-determined for older-aged individuals and the differences between all individuals and older-aged individuals are generally not significant.

In summary, the effects for individuals aged at least 25 years are quite similar to the effects for the entire sample. However, some differences are observed, but they are not significant. Thus, poor matching of young adults to sequences of classroom training does not take place.

### 7.3 Robustness Check

In the following section, I present the results of a robustness check in which I apply a different matching algorithm, namely, caliper matching, to determine whether my results are robust to the use of different matching procedures.

I apply caliper matching instead of using nearest-neighbour matching (one-to-one) with replacement in matching steps 1 and 3. For the mahalanobis matching in matching step 2, I also employ a caliper. Thus, in all three matching steps, I calculate the calipers by estimating the 95 percent percentile of the differences between the propensity scores of the treated individuals and those of the controls by using nearest-neighbour matching (one-to-one) with replacement. Thus, I drop the poorest 5 percent of the matches.

First, I compare the matching quality results in this robustness check with the matching quality results from section 7.1.1. Table 6 presents the MSB before and after matching for West German men and women based on caliper matching. The MSB before matching with caliper matching is very similar to the MSB before matching in section 7.1.1. However, the MSB after matching is generally increased for the dynamic matching steps 1 to 3, but the MSB is only slightly increased compared with the MSB after matching in section 7.1.1. Thus, the MSB after matching for the final matching is also slightly higher than its counterpart in section 7.1.1. In summary, caliper matching (95 percent percentile) does not perform better than nearest-neighbour matching (one-to-one) with replacement and mahalanobis matching without any caliper. Rather, the matching quality is quite similar.

The results of the robustness check are presented in Figure 32 through 35 for the considered sequences and only for the outcome of regular employment rate. The



results on not only regular employment rate but also the other outcomes<sup>46</sup> are quite similar to the results presented in section 7.1.2. However, regarding the sequence (CT,CT) versus the sequence (UBII,CT), some positive and well-determined effects (approximately 6 percentage points) emerge for men approximately 1 year after the start of the programme in the second period, as well as some positive and well-determined effects on leaving UB-II-receipt. In summary, the results from this robustness check are quite similar to the results presented in section 7.1.2.

## 8 Summary and Conclusions

Sequences of ALMPs are very common among welfare recipients in Germany, but most studies evaluating ALMPs do not analyse such sequences. Given that One-Euro-Jobs and classroom training are very common ALMPs and are very common components of sequences of ALMPs, Dengler (2013) analyses sequences of One-Euro-Jobs for men and women in West and East Germany and this paper analyses sequences of classroom training for West German men and women.

The paper analyses the effects of different sequences of ALMPs for individuals participating in classroom training in the first period. First, I consider a basic comparison: the sequence of two classroom trainings compared with the sequence of two periods of UB-II-receipt. Second, I analyse the effect of timing by comparing the sequence of initial classroom training followed by UB-II-receipt with the sequence of UB-II-receipt followed by classroom training. Third, I consider the effect of participation in multiple programmes by comparing participation in two programmes with comparing participation in only one programme (i.e., the sequence of two classroom trainings versus the sequence of UB-II-receipt followed by classroom training). Fourth, I analyse the effect of participation in multiple programmes for one additional, very common sequence: the sequence of classroom training followed by a One-Euro-Job compared with the sequence of UB-II-receipt followed by a One-Euro-Job. By using rich administrative data and a dynamic matching approach, I control for dynamic selection problems that may occur during a sequence. I implement the dynamic matching approach introduced by Lechner (2004), Lechner (2008), Lechner (2009) and Lechner/Miquel (2010), but I use a different definition of period based on the dynamic window approach. Furthermore, I control for the final matching quality of the considered sequences, which are matched via three single matching steps to the subpopulation.

In summary, participating in two classroom trainings compared with receiving UB II for two periods is highly effective in terms of regular employment outcomes, especially for West German women. In some cases, participation in multiple programmes should be avoided: participation in two classroom trainings has mostly no beneficial

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<sup>46</sup> Because of space restrictions, I do not present the results for all outcomes but present the results for regular employment rate only. Figures are available from the author upon request.

effects over participation in only one classroom training in the second period and participation in one classroom training followed by a One-Euro-Job has mostly no beneficial effects over participation in a One-Euro-Job in the second period only. Moreover, immediately assigning individuals to classroom training is more effective than waiting and assigning them to classroom training in a second period (i.e., the effects of timing) by providing a work-test function. However, evidence of programme careers or stepwise integration is observed only for the sequence (CT,CT) versus the sequence (UBII,UBII). Because classroom training may target individuals with better labour market prospects, stepwise integration might not be necessary; however, programme careers might not arise for these individuals. Furthermore, the duration of classroom training and the considered periods are very short; therefore, individuals experience a smaller loss in human capital during their welfare receipt. In analysing longer duration of periods and sequences of One-Euro-Jobs that target hard-to-place individuals, Dengler (2013) finds that programme careers and stepwise integration do play a major role. Moreover, the effects for older-aged individuals aged at least 25 years are quite similar to the effects for the entire sample. Some differences are observed, but they are not significant.

Thus, some of the analysed sequences suggest a successful activation strategy to integrate individuals into regular employment. In particular, hard-to-place individuals who may be long-term unemployed and who may encounter extreme difficulty in finding jobs may require more assistance from job centres. Thus, intensified activation packages or sequences of ALMPs may be helpful for a successful integration into regular employment for such individuals, especially in times of high long-term unemployment. However, neither intensified activation packages nor strategic sequences of ALMPs are in place in many countries. Indeed, case workers often implement sequences very flexible: aspects of sequences such as the design of sequences, the upper limit of potential ALMPs per individual and the target groups are not regulated by legislation. However, targeting plays an even more important role in the case of sequences of ALMPs because negative effects that may arise from poorly targeting individuals into ALMPs may be strengthened. Moreover, programme careers may emerge if individuals participate in many ALMPs over several years without any positive employment effects. Many other countries have decentralised the activation of welfare recipients, leading to flexible activation schemes (Van Berkel 2010) and sequences may be also common in other countries, as studies on Switzerland (Lechner 2009), Austria (Lechner/Wiehler 2013), and Denmark (Graversen 2004) already have shown. Accordingly, flexible implementation of sequences may also arise in other countries. Thus, knowledge of the effectiveness of sequences or intensified activation packages is essential to implement successful strategic sequences or intensified activation packages that may integrate hard-to-place individuals into regular employment.

Several issues remain for future research. First, because this paper considers West Germany only, future research may analyse the effects of sequences of classroom training for East Germany. Second, longer sequences or sequences consisting of

ALMPs other than those analysed in either this paper or that of Dengler (2013) would be interesting. However, the dynamic matching approach is very data hungry and very restrictive because of the definition of periods. Third, sanctions may be an important intermediate outcome, but data on sanctions for the considered period in this paper is not available before 2007. Thus, future research may analyse a later period to obtain information on sanctions. Fourth, sequences of ALMPs are highly effective for female participants in terms of employment outcomes, but female participants do not leave UB-II-receipt at the same time if they participate in the sequence of two classroom trainings compared with two periods of UB-II-receipt. Thus, future research may analyse this subgroup in a more detailed manner.

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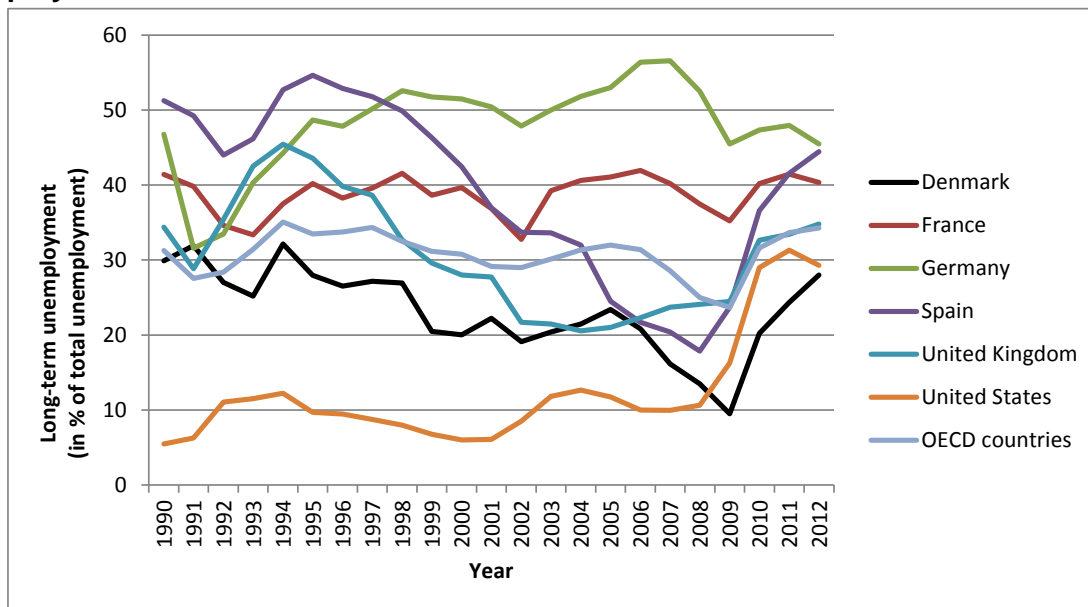
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## Figures and Tables

### Figures

**Figure 1**

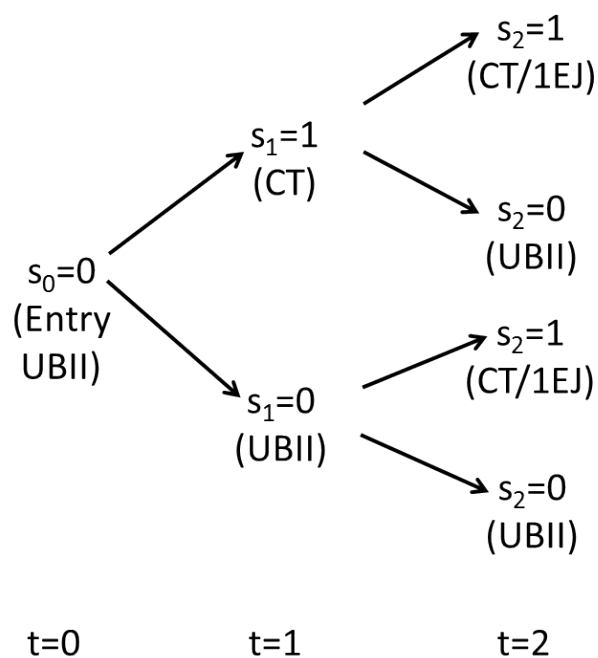
**Long-term unemployment (1 year and more) as percentage of total unemployment for selected OECD countries**



Source: OECD Statistics (2014).

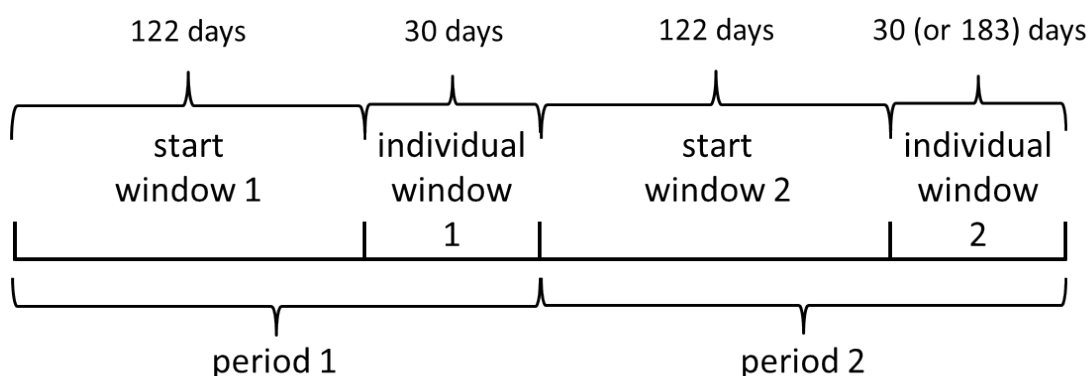
**Figure 2**

**Definition of states and sequences**



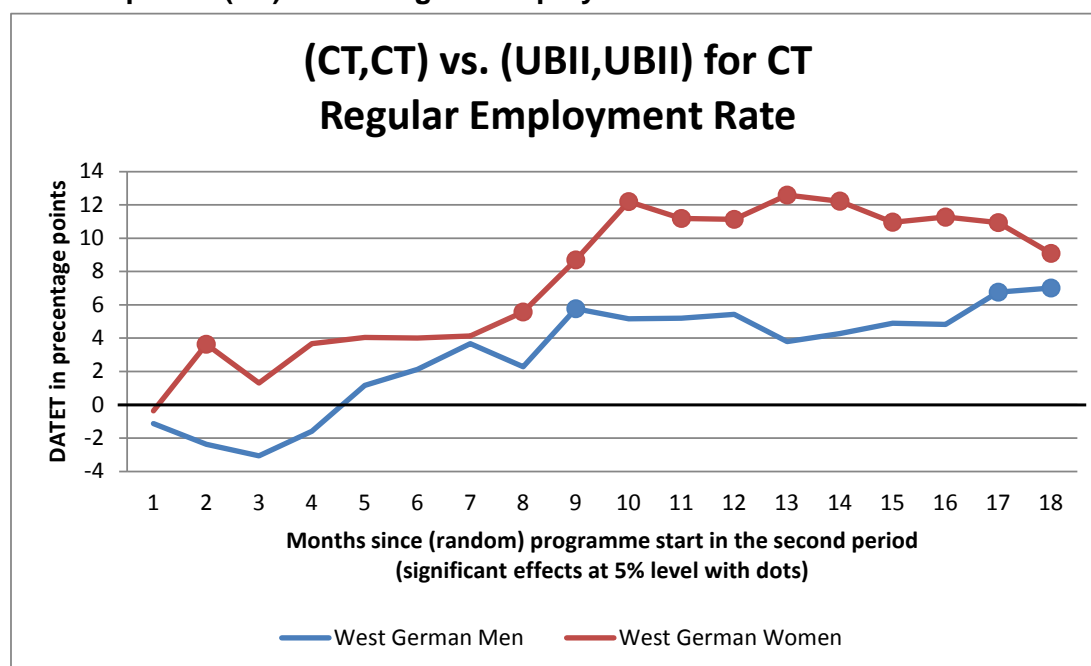
Source: Own Illustration.

**Figure 3**  
Dynamic window approach



Source: Own Illustration.

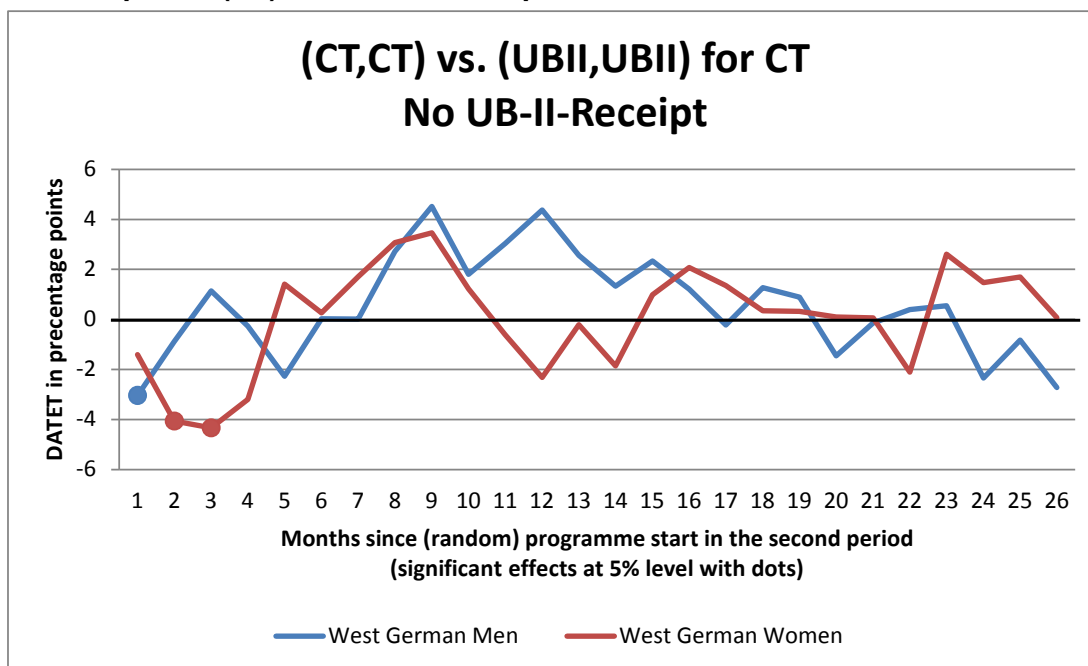
**Figure 4**  
DATET for (CT,CT) versus (UBII,UBII) for participants in classroom training in the first period (CT) on the regular employment rate



Source: Own Calculations.

**Figure 5**

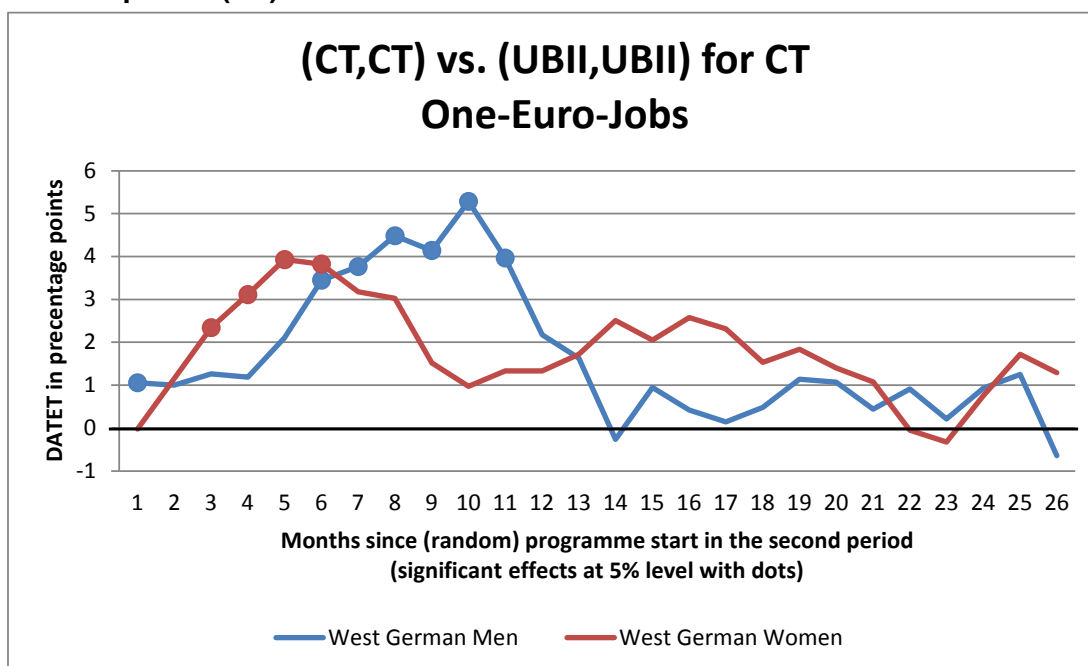
**DATET for (CT,CT) versus (UBII,UBII) for participants in classroom training in the first period (CT) on no UB-II-receipt**



Source: Own Calculations.

**Figure 6**

**DATET for (CT,CT) versus (UBII,UBII) for participants in classroom training in the first period (CT) on One-Euro-Jobs**

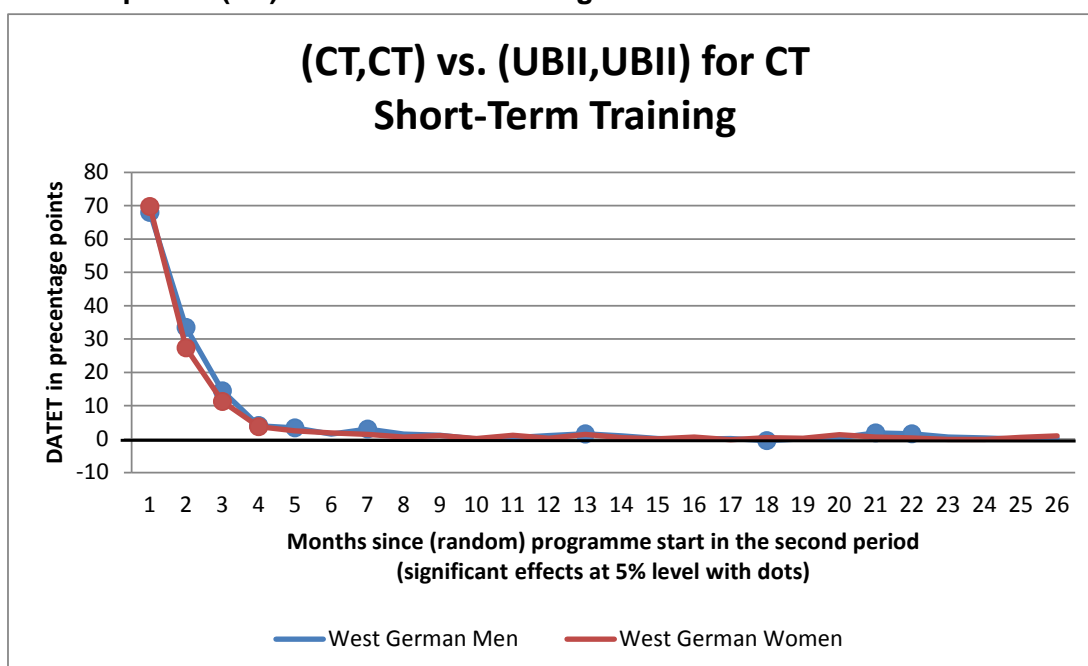


Source: Own Calculations.



**Figure 7**

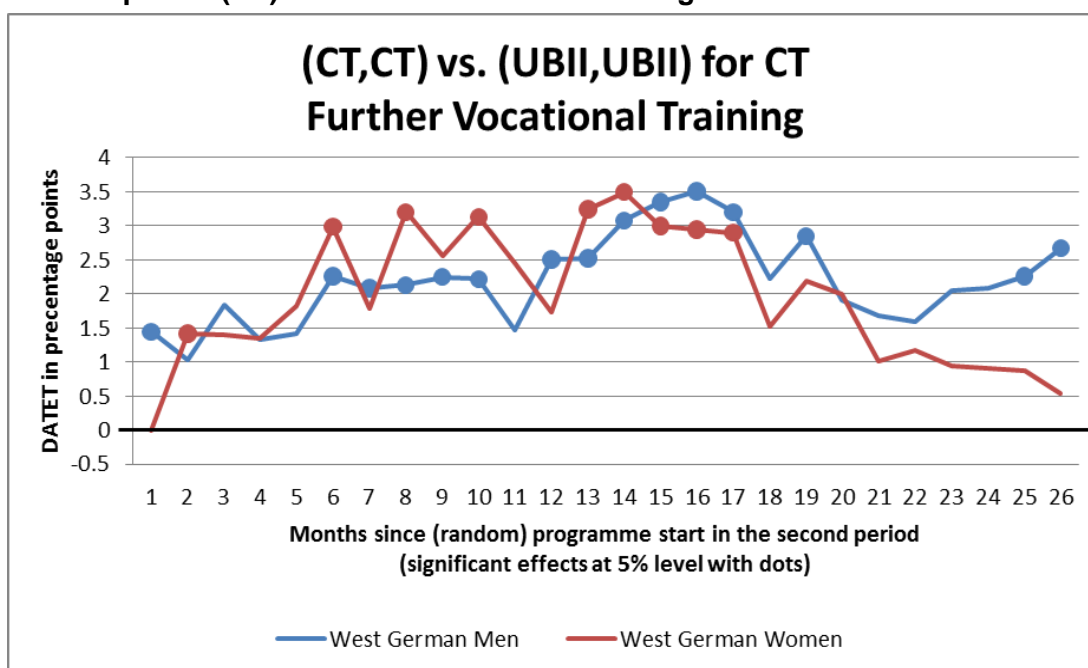
**DATET for (CT,CT) versus (UBII,UBII) for participants in classroom training in the first period (CT) on short-term training**



Source: Own Calculations.

**Figure 8**

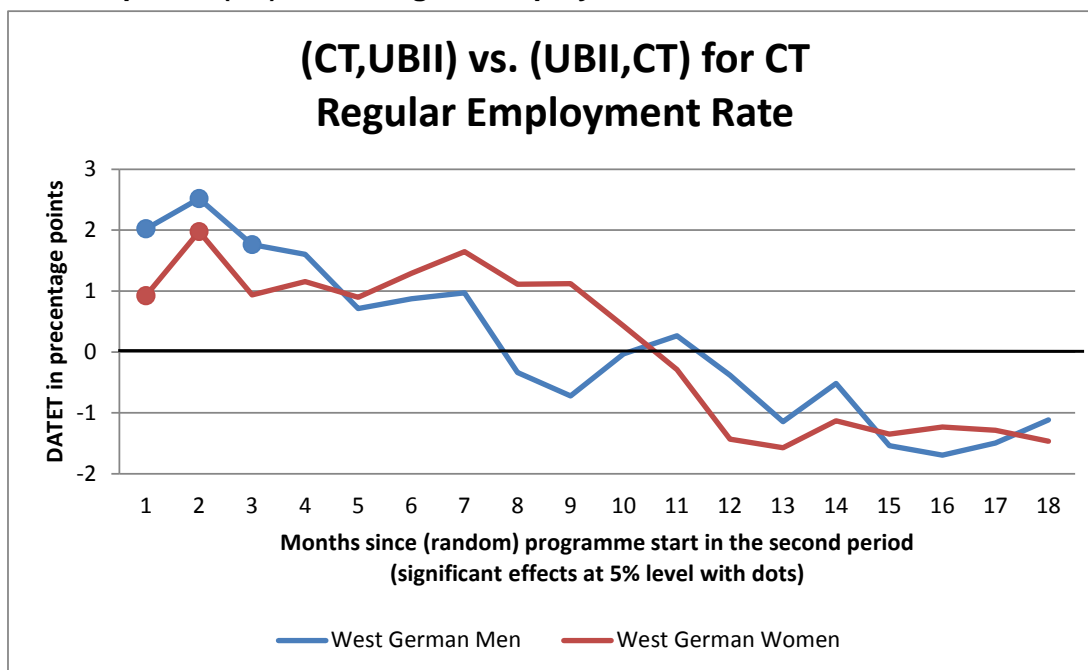
**DATET for (CT,CT) versus (UBII,UBII) for participants in classroom training in the first period (CT) on further vocational training**



Source: Own Calculations.

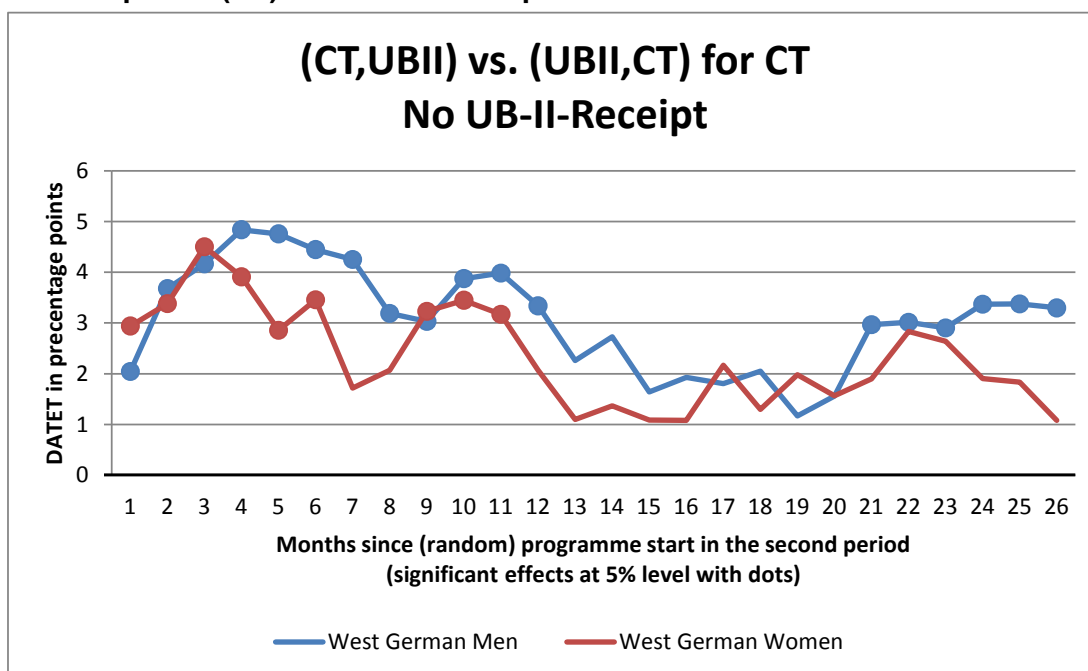
**Figure 9**

**DATET for (CT,UBII) versus (UBII,CT) for participants in classroom training in the first period (CT) on the regular employment rate**



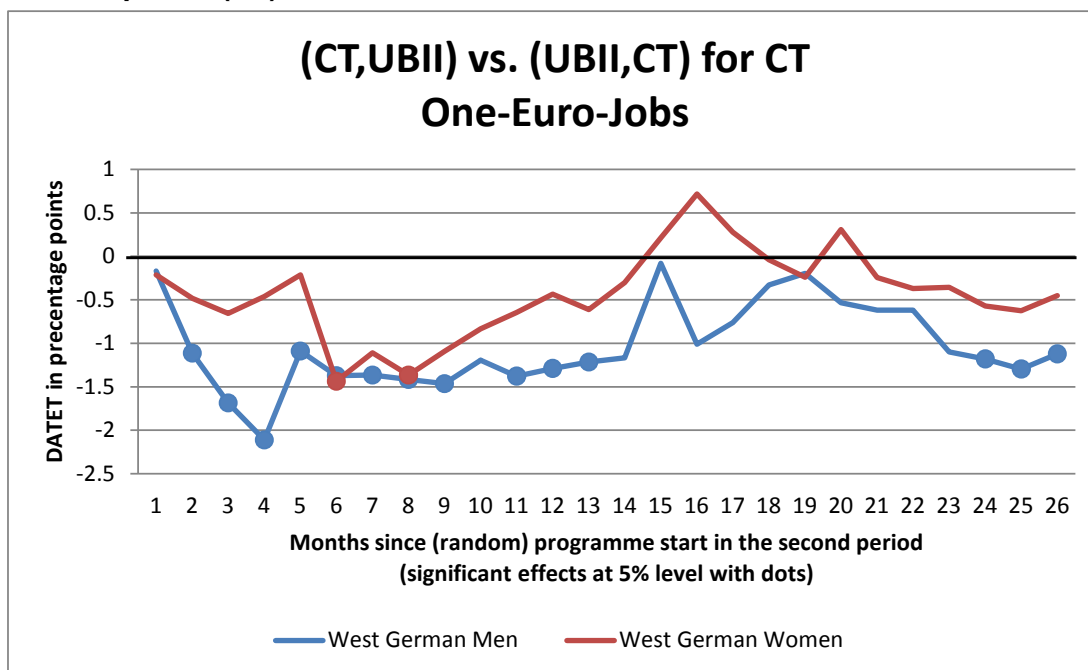
**Figure 10**

**DATET for (CT,UBII) versus (UBII,CT) for participants in classroom training in the first period (CT) on no UB-II-receipt**



**Figure 11**

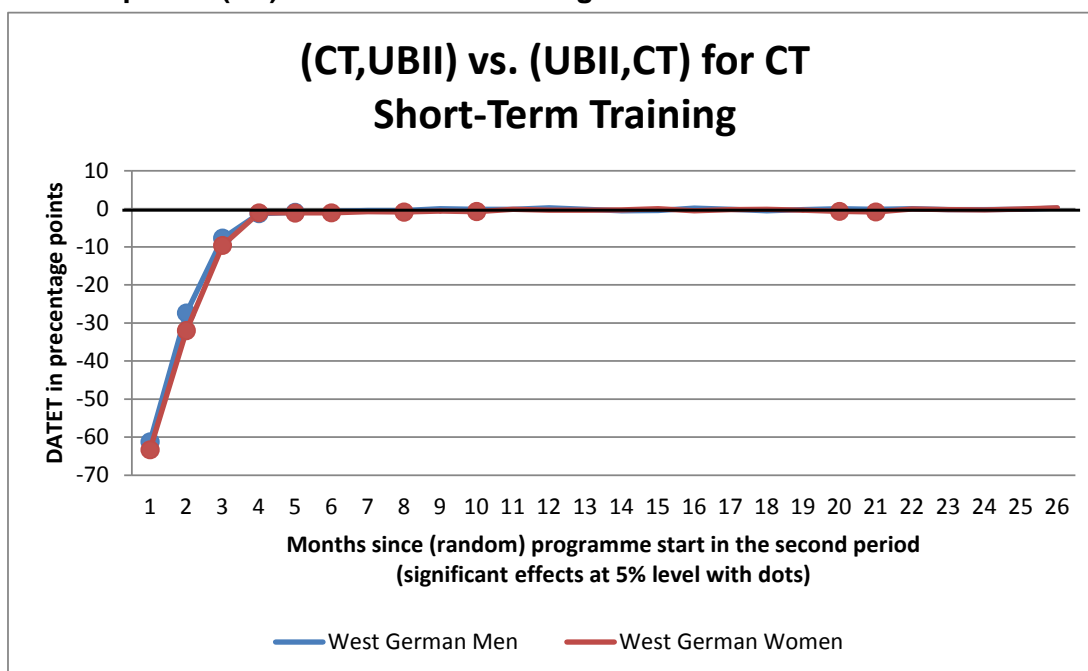
**DATET for (CT,UBII) versus (UBII,CT) for participants in classroom training in the first period (CT) on One-Euro-Jobs**



Source: Own Calculations.

**Figure 12**

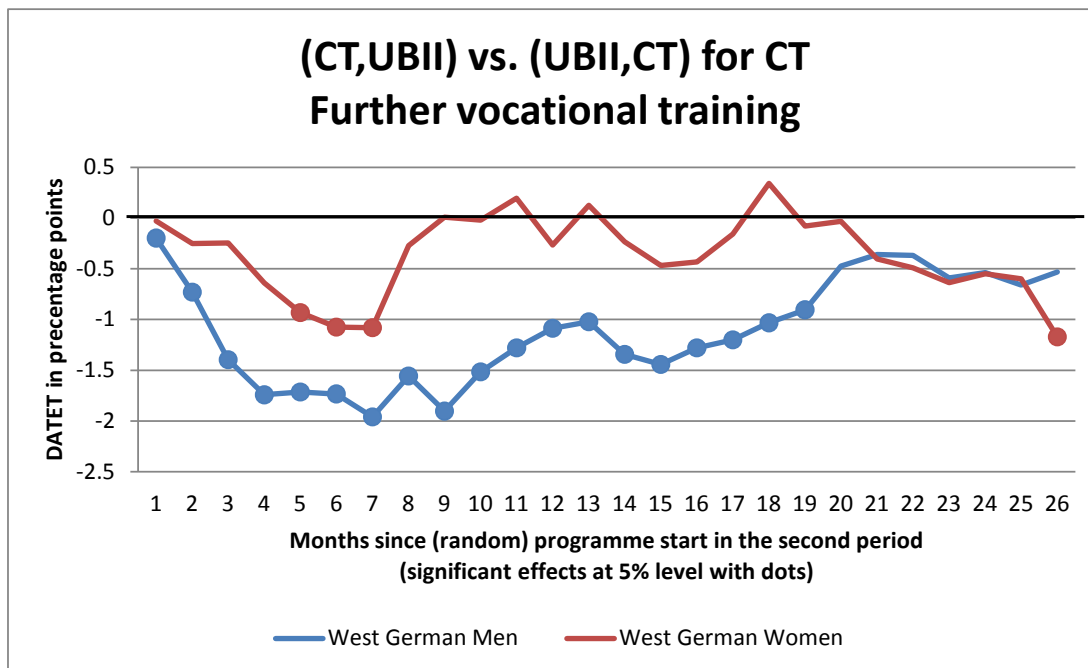
**DATET for (CT,UBII) versus (UBII,CT) for participants in classroom training in the first period (CT) on short-term training**



Source: Own Calculations.

**Figure 13**

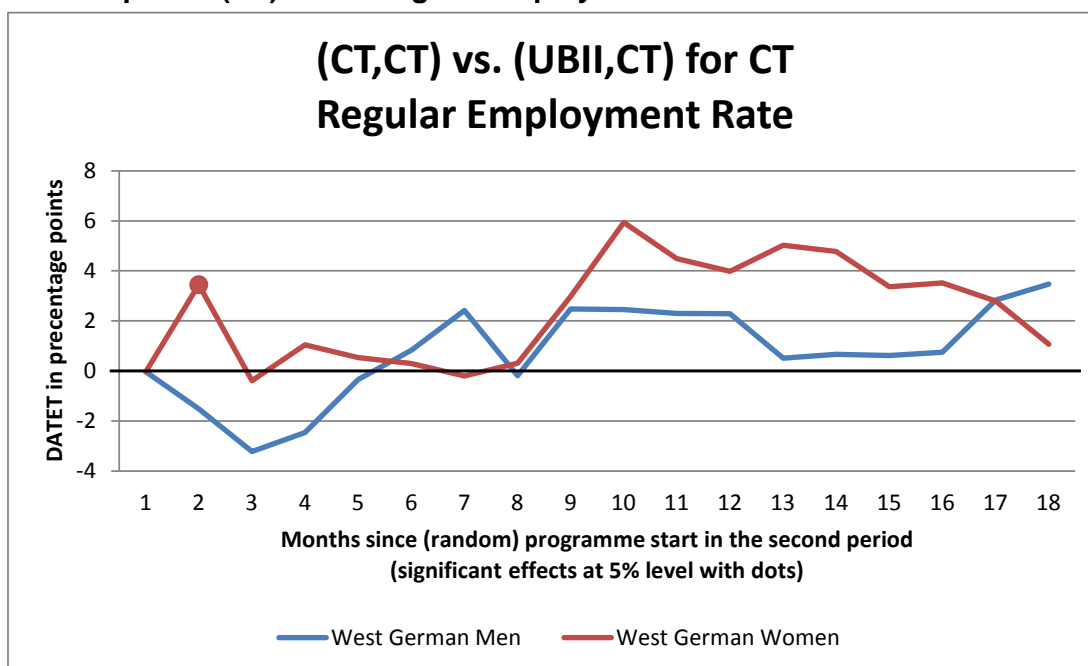
**DATET for (CT,UBII) versus (UBII,CT) for participants in classroom training in the first period (CT) on further vocational training**



Source: Own Calculations.

**Figure 14**

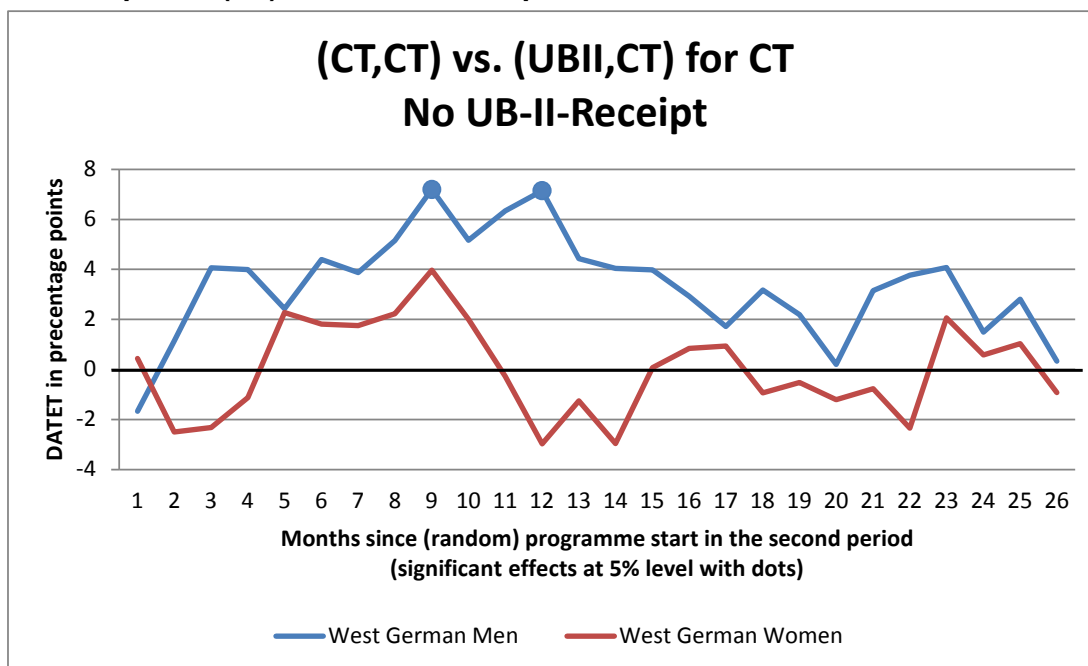
**DATET for (CT,CT) versus (UBII,CT) for participants in classroom training in the first period (CT) on the regular employment rate**



Source: Own Calculations.

**Figure 15**

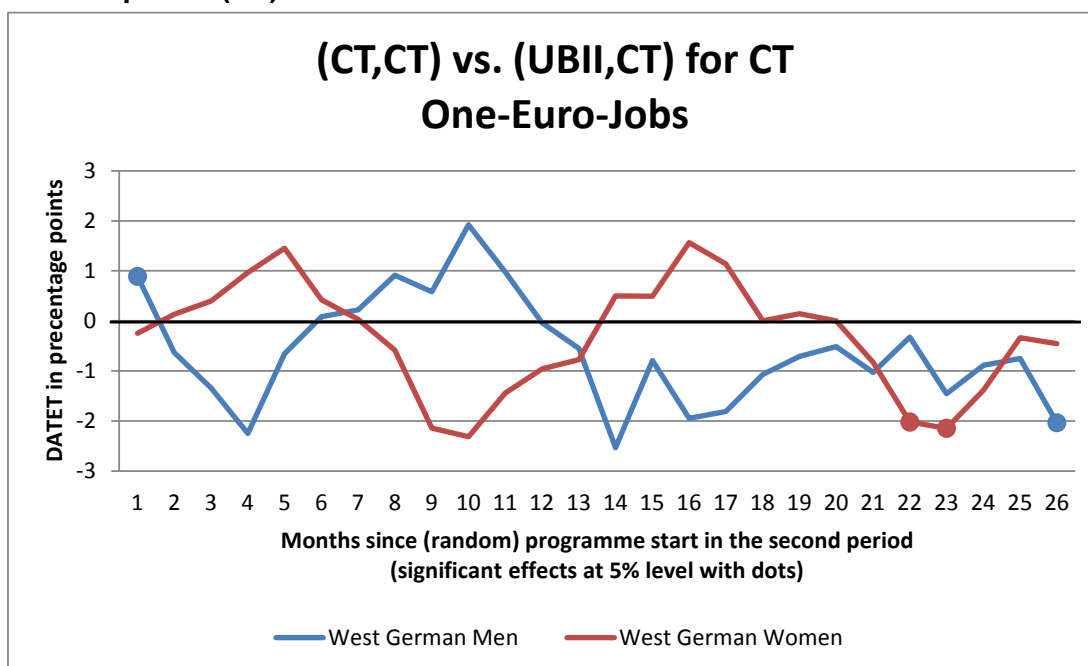
**DATET for (CT,CT) versus (UBII,CT) for participants in classroom training in the first period (CT) on no UB-II-receipt**



Source: Own Calculations.

**Figure 16**

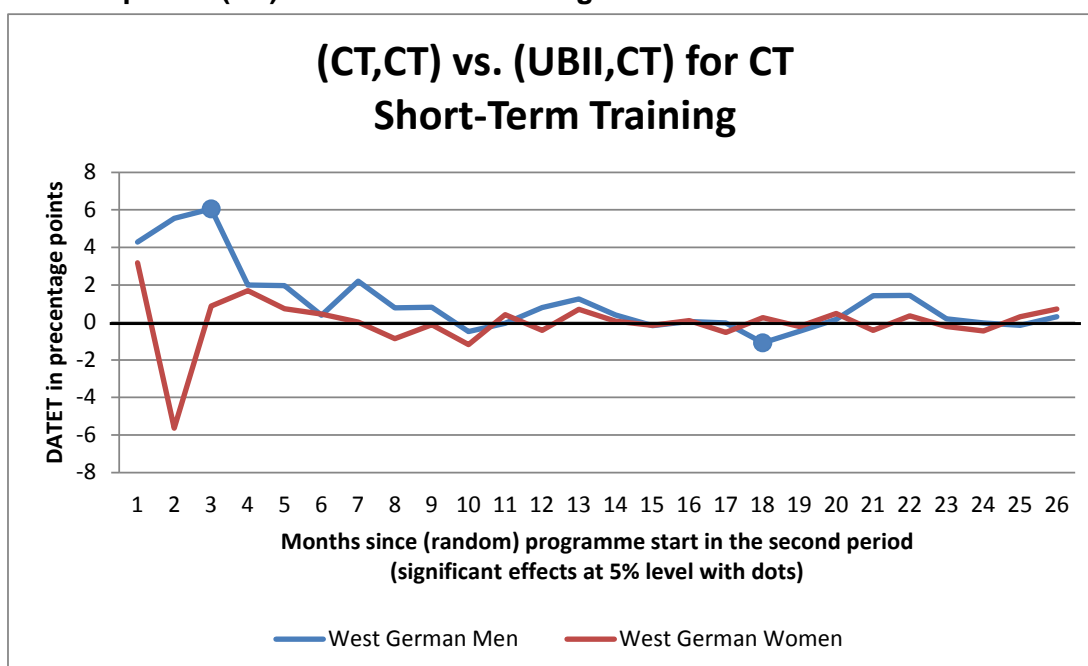
**DATET for (CT,CT) versus (UBII,CT) for participants in classroom training in the first period (CT) on One-Euro-Jobs**



Source: Own Calculations.

**Figure 17**

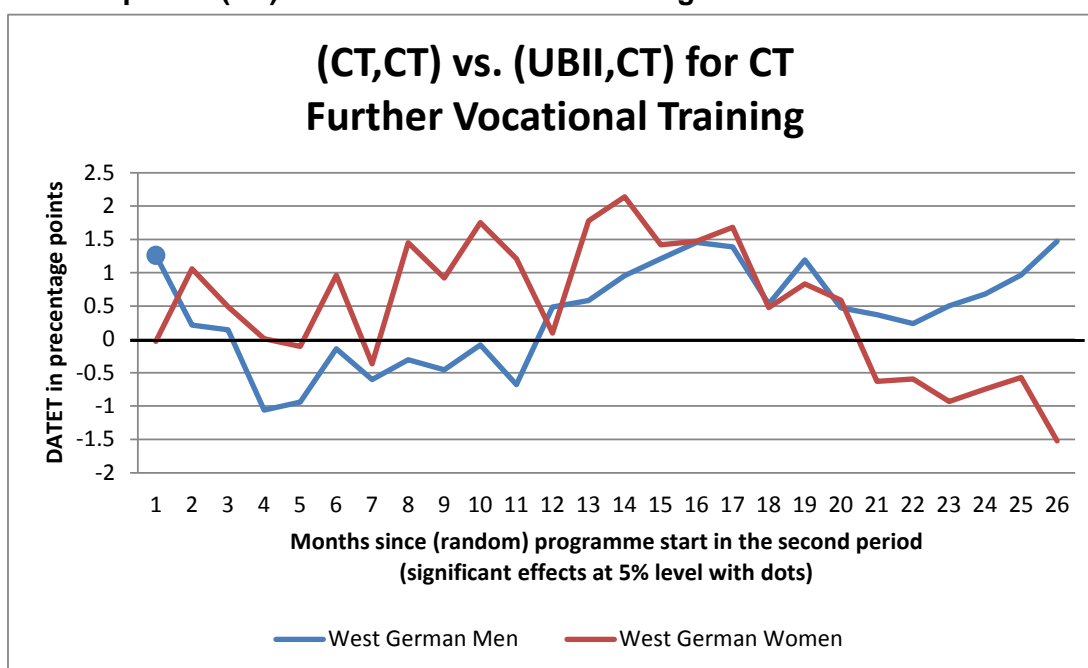
**DATET for (CT,CT) versus (UBII,CT) for participants in classroom training in the first period (CT) on short-term training**



Source: Own Calculations.

**Figure 18**

**DATET for (CT,CT) versus (UBII,CT) for participants in classroom training in the first period (CT) on further vocational training**

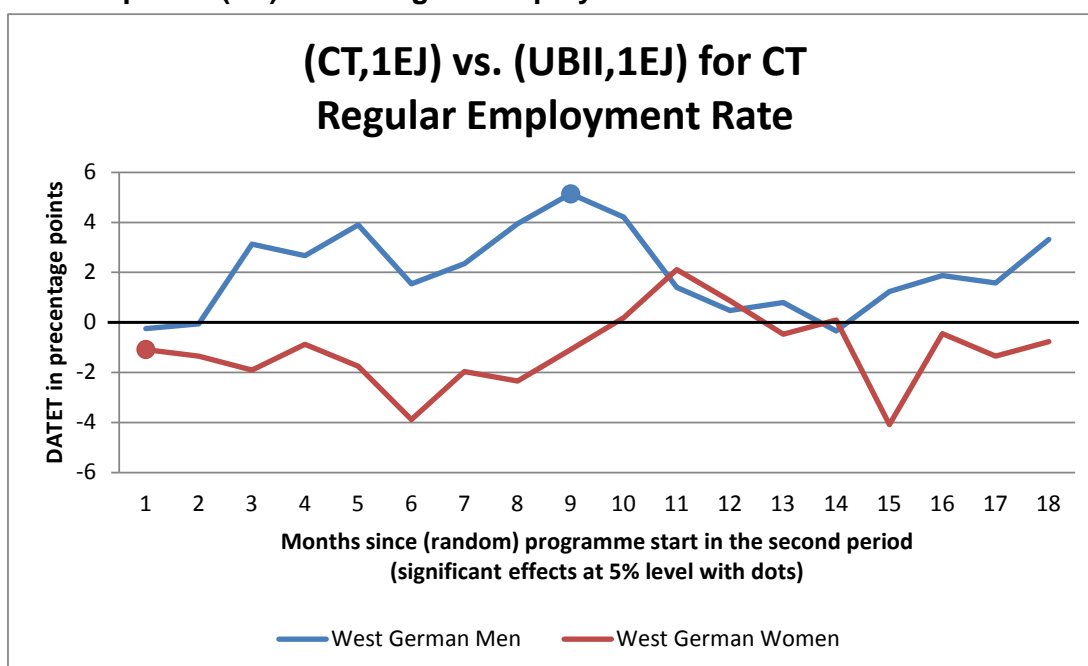


Source: Own Calculations.



**Figure 19**

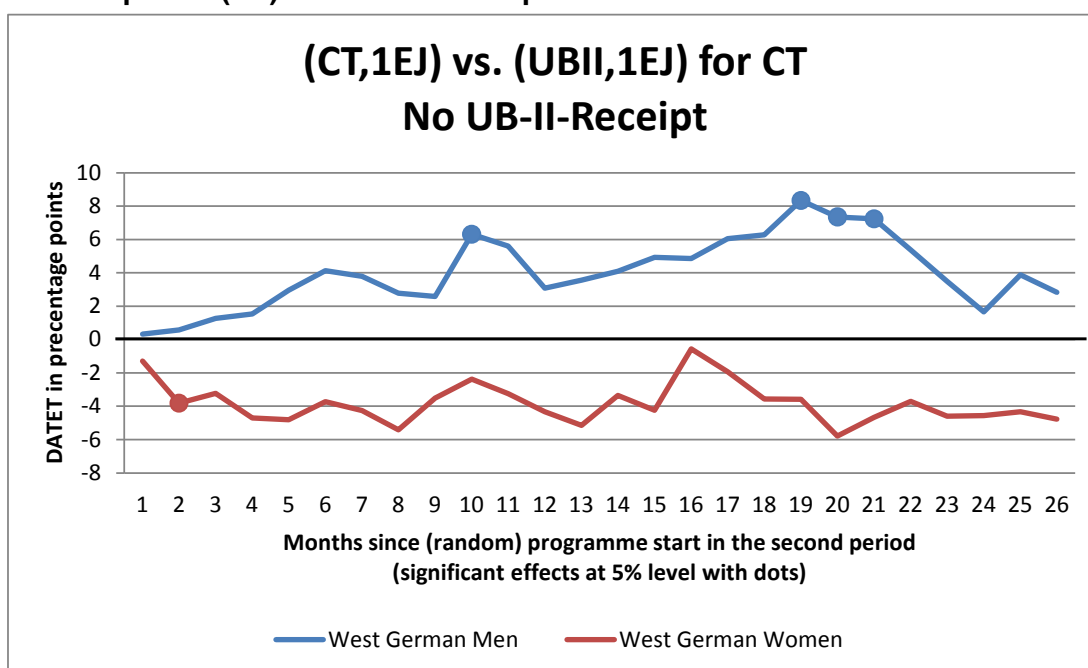
**DATET for (CT,1EJ) versus (UBII,1EJ) for participants in classroom training in the first period (CT) on the regular employment rate**



Source: Own Calculations.

**Figure 20**

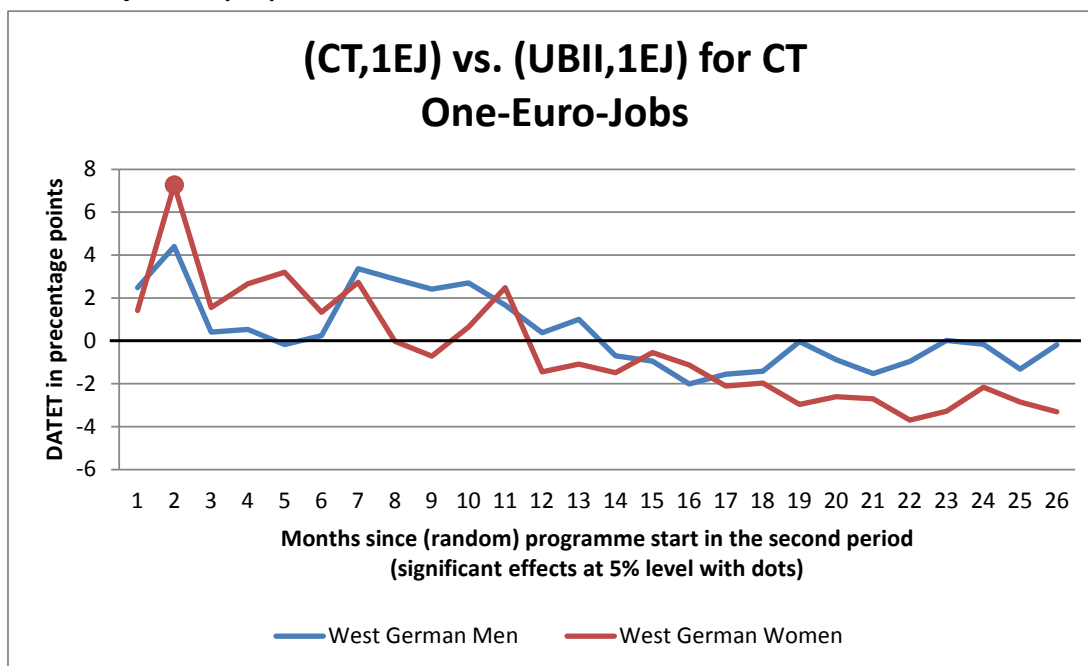
**DATET for (CT,1EJ) versus (UBII,1EJ) for participants in classroom training in the first period (CT) on no UB-II-receipt**



Source: Own Calculations.

**Figure 21**

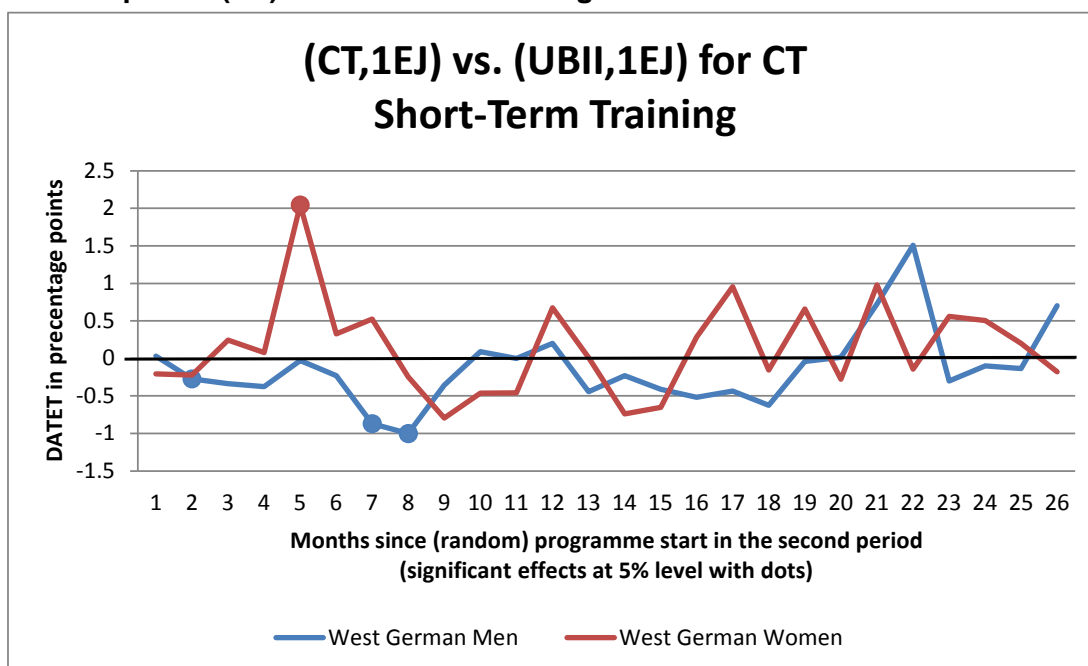
**DATET for (CT,1EJ) versus (UBII,1EJ) for participants in classroom training in the first period (CT) on One-Euro-Jobs**



Source: Own Calculations.

**Figure 22**

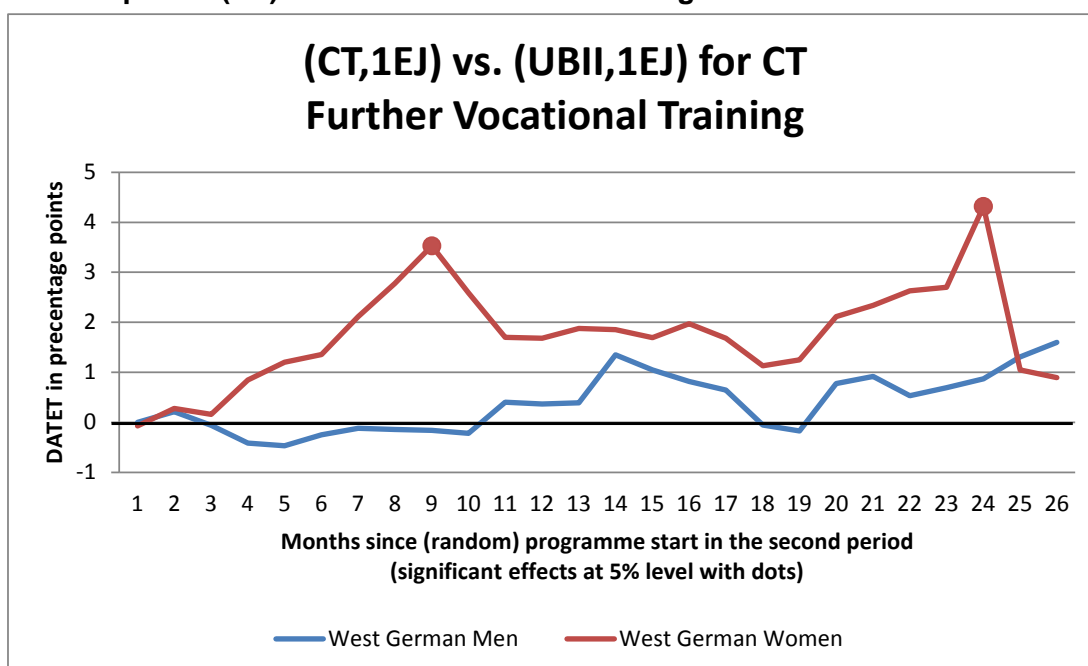
**DATET for (CT,1EJ) versus (UBII,1EJ) for participants in classroom training in the first period (CT) on short-term training**



Source: Own Calculations.

**Figure 23**

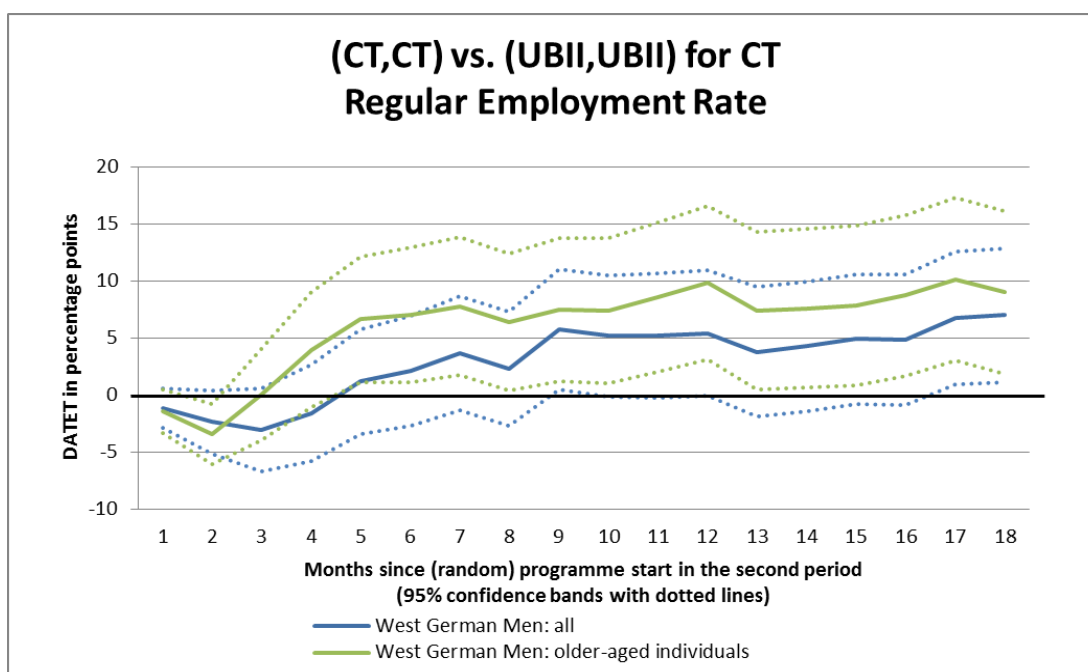
**DATET for (CT,1EJ) versus (UBII,1EJ) for participants in classroom training in the first period (CT) on further vocational training**



Source: Own Calculations.

**Figure 24**

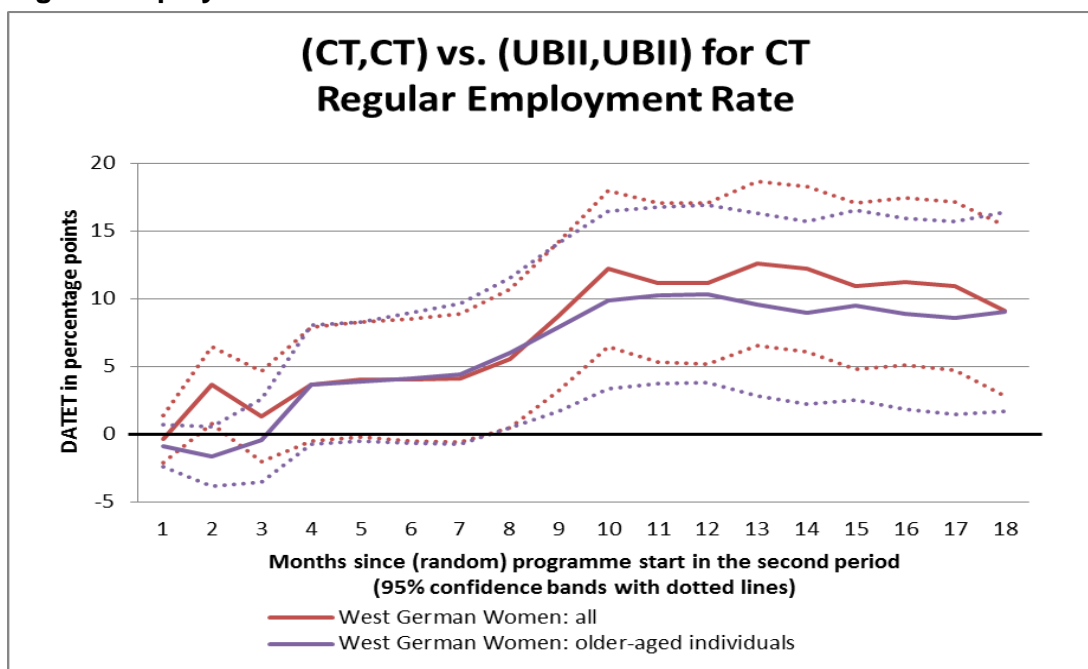
**All vs. older-aged West German men – DATET for (CT,CT) versus (UBII,UBII) for participants in classroom training in the first period (CT) on the regular employment rate**



Source: Own Calculations.

**Figure 25**

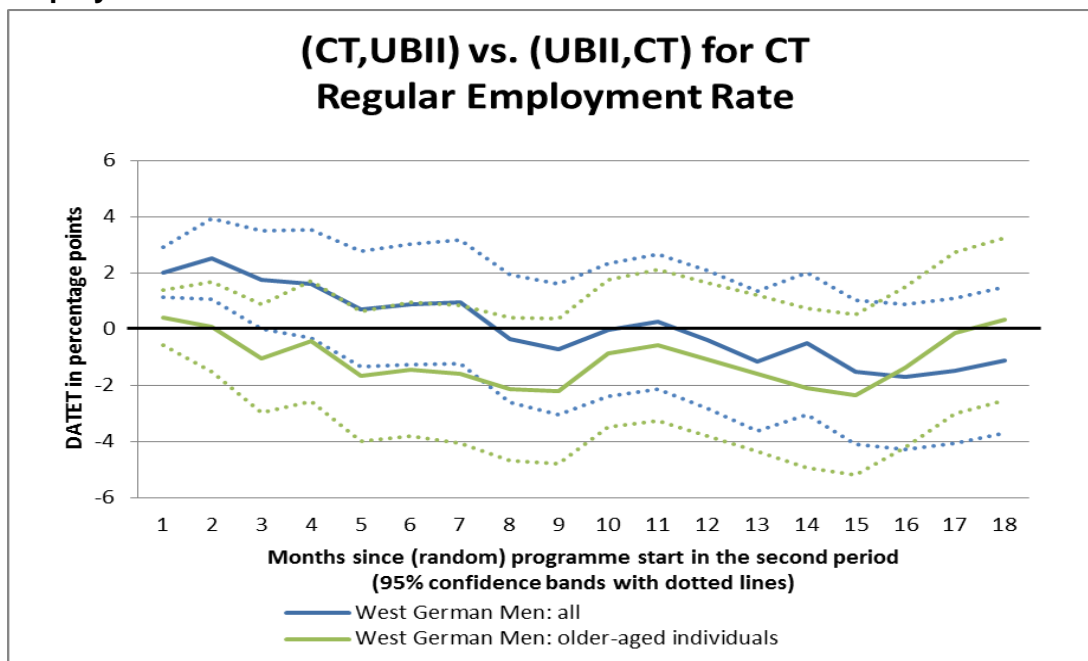
**All vs. older-aged West German women – DATET for (CT,CT) versus (UBII,UBII) for participants in classroom training in the first period (CT) on the regular employment rate**



Source: Own Calculations.

**Figure 26**

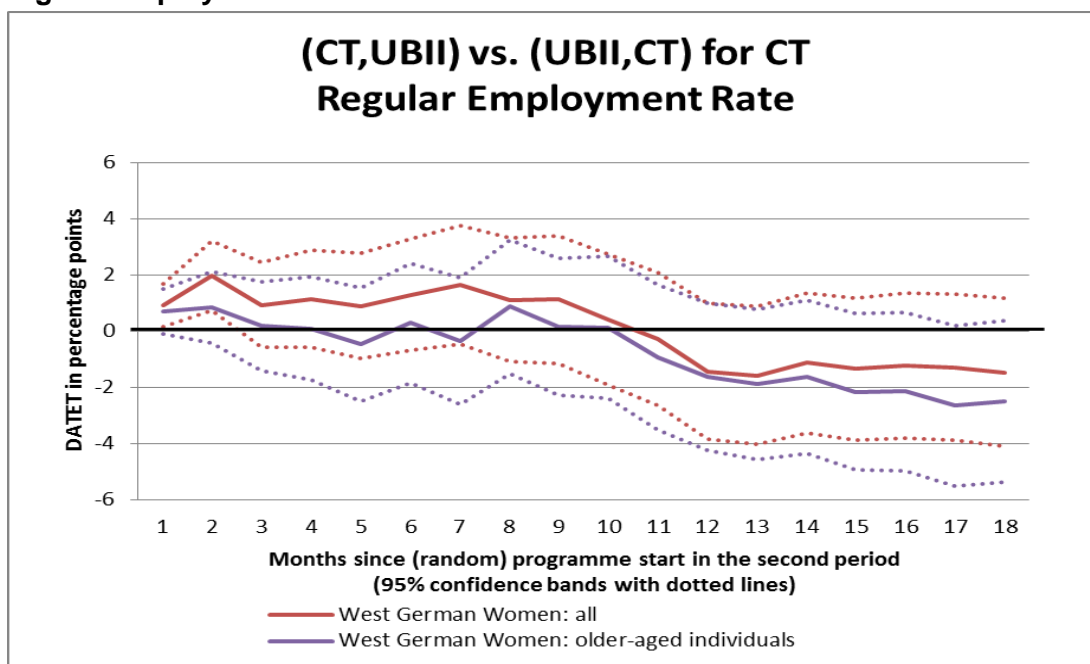
**All vs. older-aged West German men – DATET for (CT,UBII) versus (UBII,CT) for participants in classroom training in the first period (CT) on the regular employment rate**



Source: Own Calculations.

**Figure 27**

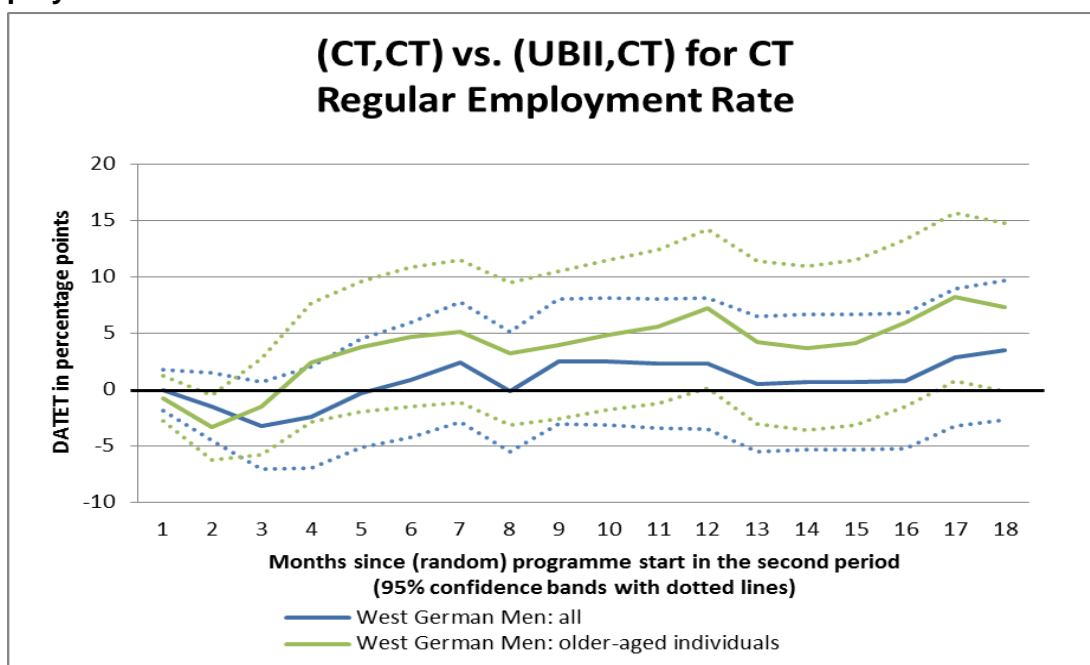
**All vs. older-aged West German women – DATET for (CT,UBII) versus (UBII,CT) for participants in classroom training in the first period (CT) on the regular employment rate**



Source: Own Calculations.

**Figure 28**

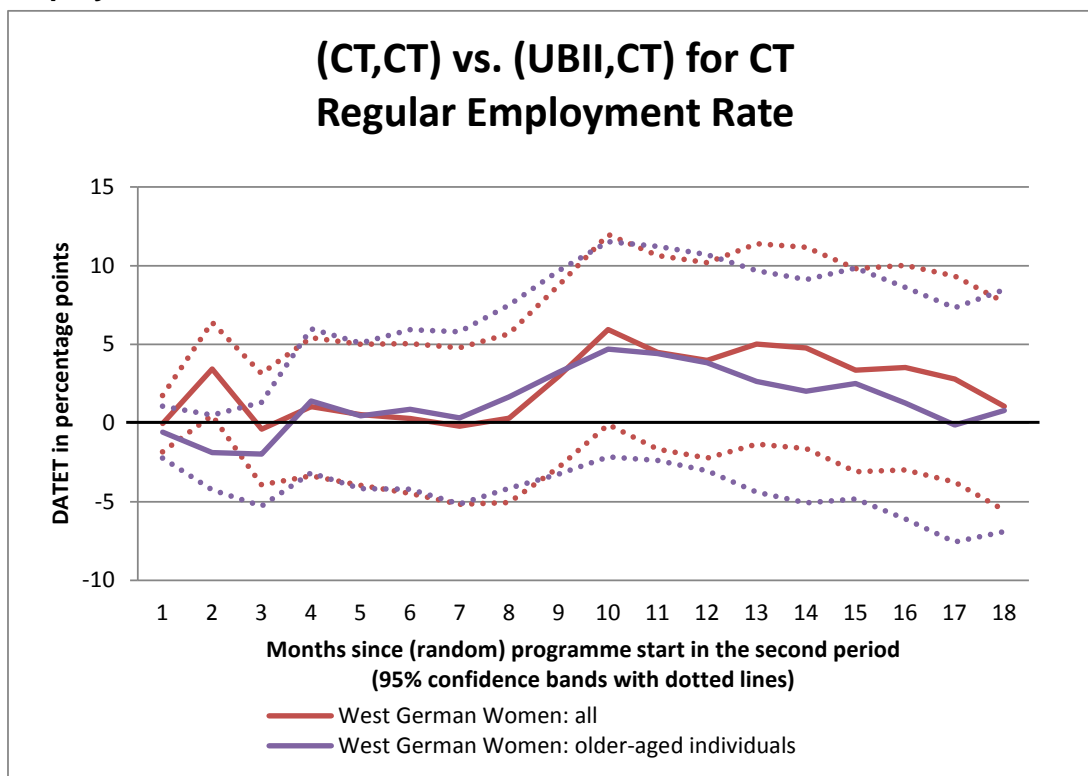
**All vs. older-aged West German men – DATET for (CT,CT) versus (UBII,CT) for participants in classroom training in the first period (CT) on the regular employment rate**



Source: Own Calculations.

**Figure 29**

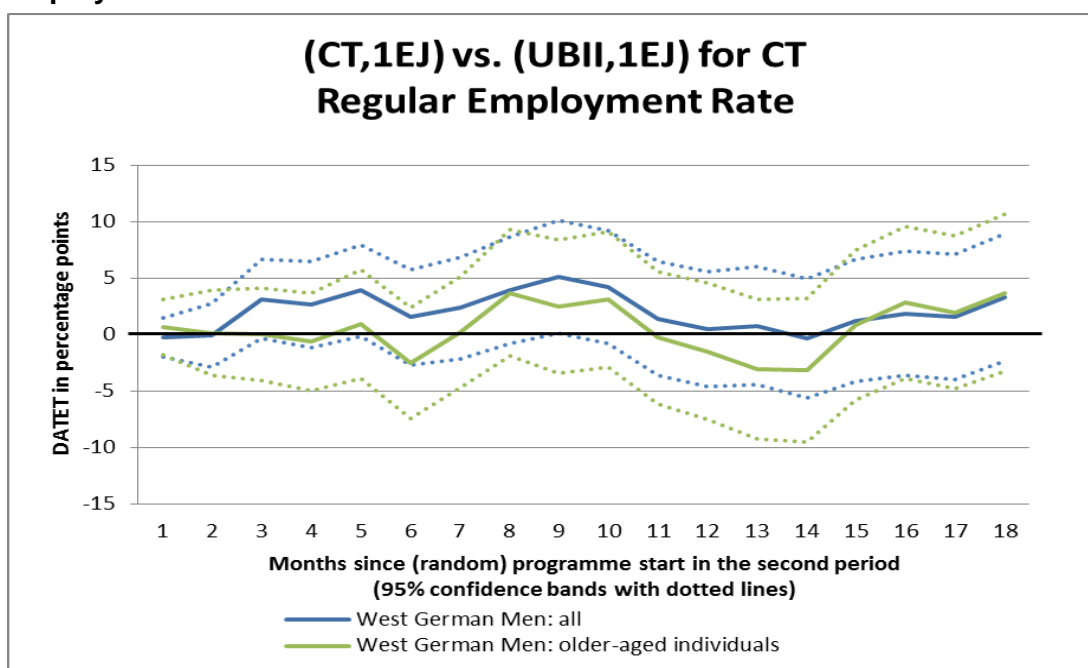
**All vs. older-aged West German women – DATET for (CT,CT) versus (UBII,CT) for participants in classroom training in the first period (CT) on the regular employment rate**



Source: Own Calculations.

**Figure 30**

**All vs. older-aged West German men – DATET for (CT,1EJ) versus (UBII,1EJ) for participants in classroom training in the first period (CT) on the regular employment rate**

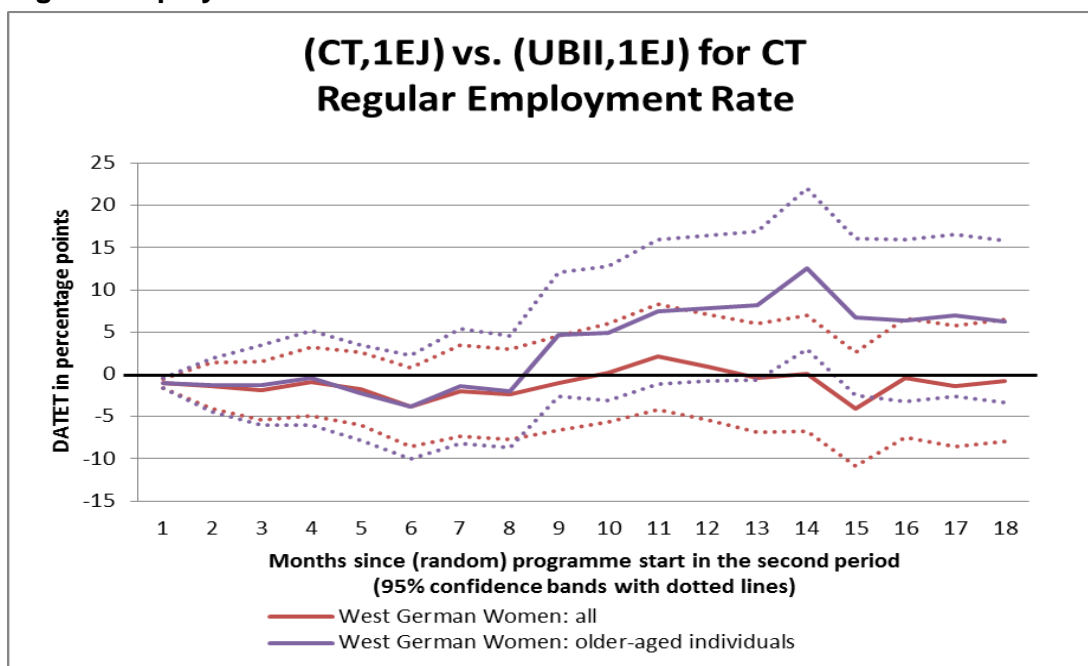


Source: Own Calculations.



**Figure 31**

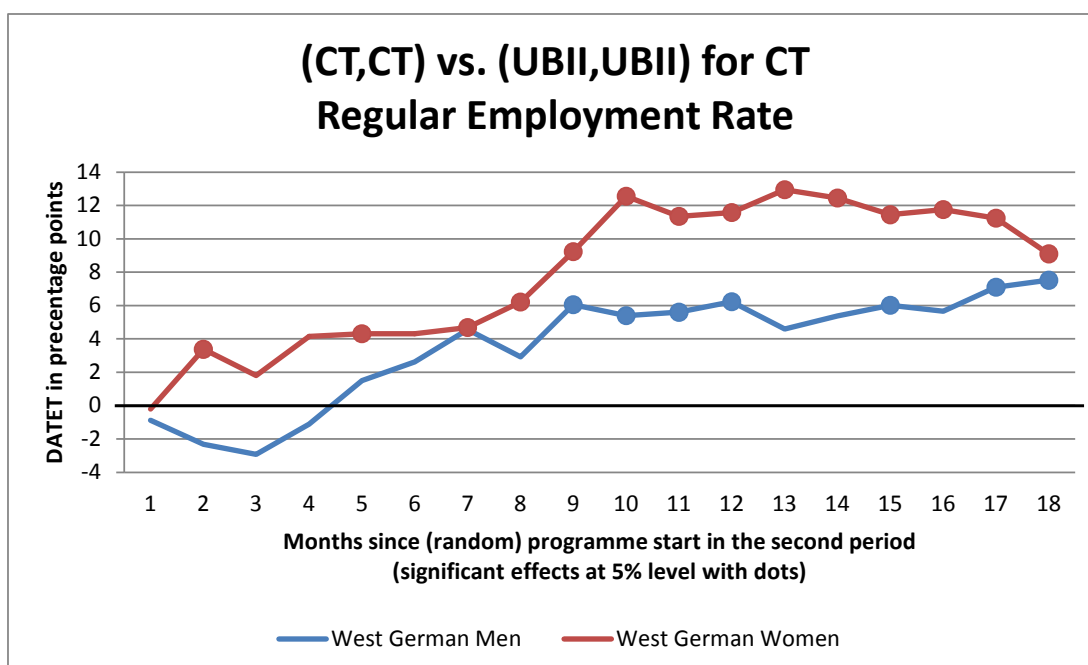
All vs. older-aged West German women – DATET for (CT,1EJ) versus (UBII,1EJ) for participants in classroom training in the first period (CT) on the regular employment rate



Source: Own Calculations.

**Figure 32**

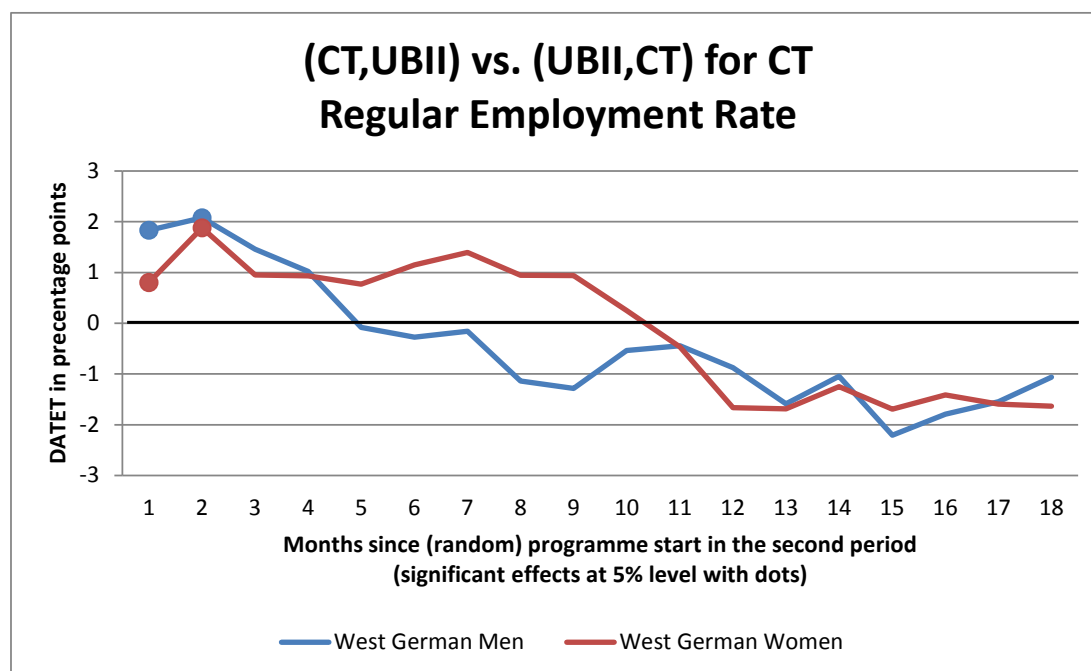
Robustness check (caliper) – DATET for (CT,CT) versus (UBII,UBII) for participants in classroom training in the first period (CT) on the regular employment rate



Source: Own Calculations.

**Figure 33**

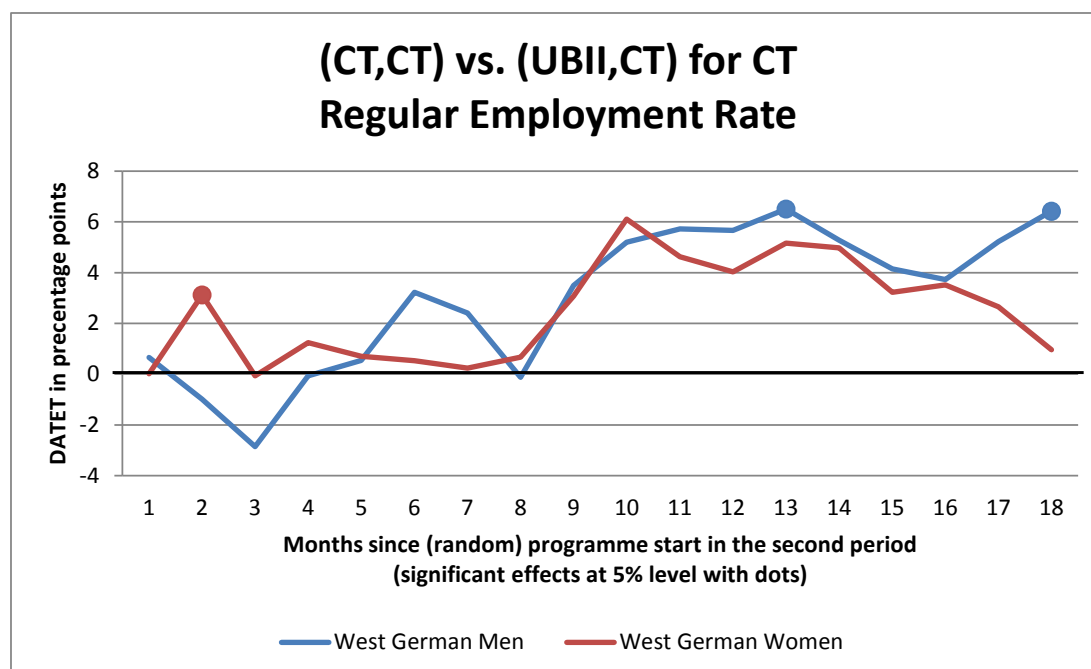
**Robustness check (caliper) – DATET for (CT,UBII) versus (UBII,CT) for participants in classroom training in the first period (CT) on the regular employment rate**



Source: Own Calculations.

**Figure 34**

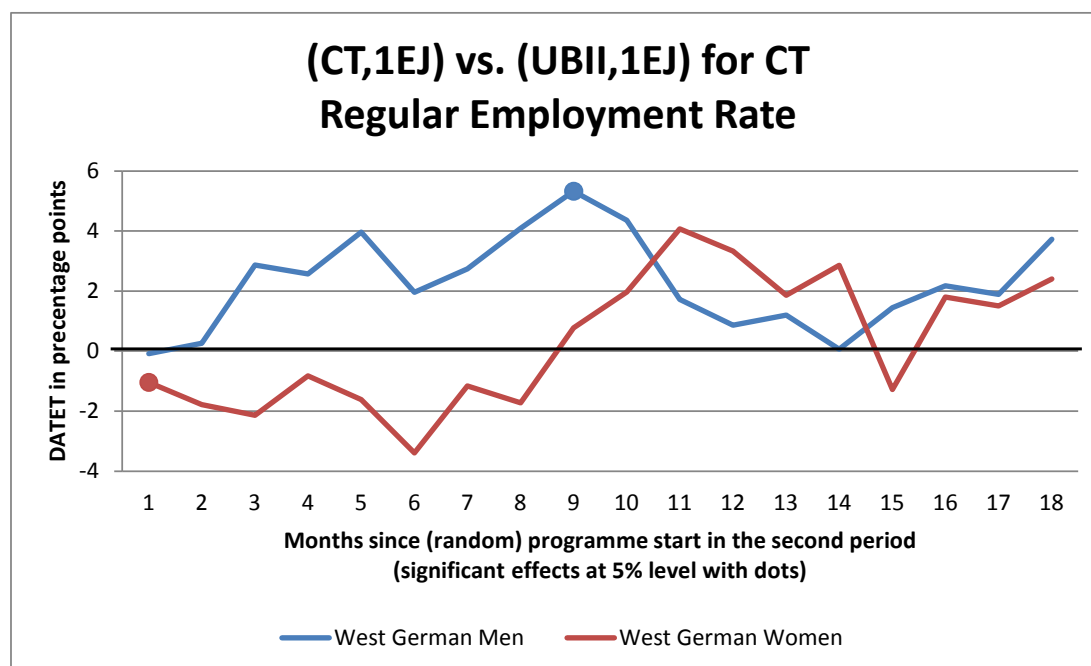
**Robustness check (caliper) – DATET for (CT,CT) versus (UBII,CT) for participants in classroom training in the first period (CT) on the regular employment rate**



Source: Own Calculations.

**Figure 35**

**Robustness check (caliper) – DATET for (CT,1EJ) versus (UBII,1EJ) for participants in classroom training in the first period (CT) on the regular employment rate**



Source: Own Calculations.

## Tables

**Table 1**

**Average stock of unemployed UB-II-recipients and inflow into major ALMPs between 2005 and 2008 for West German men and women (in 1,000)**

	2005		2006		2007		2008	
	Men	Women	Men	Women	Men	Women	Men	Women
Average stock of unemployed UB-II-recipients	882	686	872	725	737	666	651	614
Classroom training	103	72	103	77	105	85	115	93
In-firm training	55	23	74	32	80	37	73	37
Further vocational training	24	15	41	25	52	33	66	45
One-Euro-Jobs	207	108	264	142	255	148	236	147
Work opportunity as contributory employment	6	3	12	6	13	6	19	11
Wage subsidy for employers	26	9	50	17	58	22	51	23
Wage subsidy for employees	0.4	0.3	4	2	7	4	8	4
Start-up subsidy	8	3	14	6	11	5	7	4

Note: Data without information from local authorities.

Source: Department for Statistics of the German Federal Employment Agency (2014).

**Table 2**  
**Sample sizes and selected descriptive statistics**

	Sample		CT		UBII		(CT,CT)		(CT,UBII)		(UBII,CT)		(UBII,UBII)		(CT,1EJ)		(UBII,1EJ)	
	West Germany Men	West Germany Women	West Germany Men	West Germany Women	West Germany Men	West Germany Women	West Germany Men	West Germany Women	West Germany Men	West Germany Women	West Germany Men	West Germany Women	West Germany Men	West Germany Women	West Germany Men	West Germany Women	West Germany Men	West Germany Women
Observations	350,786	364,294	11,588	7,754	269,930	306,307	554	420	6,157	4,609	3,267	2,753	201,631	250,052	710	380	5,494	3,242
<b>Variables at/before entry</b>																		
Average age at entry	32.9	32.3	31.5	32.4	33.3	32.4	30.5	31.7	32.6	33.5	32.3	33.3	33.7	32.5	28.9	30.6	32.5	32.1
Children at entry (in %)																		
no	77.6	51.1	82.2	68.9	77.0	48.9	86.8	70.5	81.1	65.6	80.5	59.9	76.2	47.1	88.0	77.9	85.0	68.2
yes	22.4	48.9	17.8	31.1	23.0	51.1	13.2	29.5	18.9	34.4	19.5	40.1	23.8	52.9	12.0	22.1	15.0	31.8
Average cum. duration of minor employment 5 years before entry (in days)	113.3	244.0	111.7	226.7	112.8	243.7	123.3	203.0	101.6	231.4	110.7	247.2	110.1	238.7	95.6	167.1	82.9	178.4
Average cum. duration of UB II 1 year before entry (in days)	34.9	24.6	33.9	25.5	33.7	23.9	34.2	25.0	31.3	23.9	34.0	25.8	31.6	22.7	36.7	27.7	40.5	28.7
Any last contributory employment before entry (in %)																		
yes	77.5	64.0	79.5	69.5	76.1	62.6	76.2	69.8	78.3	66.7	81.3	71.8	74.2	60.9	73.0	68.9	78.2	65.3
no	22.5	36.0	20.5	30.5	23.9	37.4	23.8	30.2	21.7	33.3	18.7	28.2	25.8	39.1	27.0	31.1	21.8	34.7
Average equivalent household income from welfare in the month at entry (in Euros)	381.3	301.1	394.3	351.3	381.7	297.0	397.9	343.4	397.8	346.3	404.9	338.8	382.3	296.7	392.3	398.4	421.8	377.5
<b>Intermediate variables (before period 2)</b>																		
Intermediate: Average cum. duration of minor employment 1 month before period 2 (in days)							1.7	2.9	2.1	3.8	2.7	4.3	3.3	4.9	1.2	2.2	1.6	2.8
Intermediate: Average cum. duration of UB II 1 month before period 2 (in days)							30.3	30.4	30.3	30.3	30.4	30.4	30.3	30.4	30.3	30.3	30.3	30.4
Intermediate: Minor employment at period 2 (in %)																		
no							94.4	89.8	92.6	86.9	90.9	85.4	88.9	83.9	96.2	93.4	94.6	91.1
yes							5.6	10.2	7.4	13.1	9.1	14.6	11.1	16.1	3.8	6.6	5.4	8.9
Intermediate: Children at period 2 (in %)																		
no							86.5	70.0	80.6	65.7	79.6	59.8	75.5	45.4	86.8	77.6	84.2	68.0
yes							13.5	30.0	19.4	34.3	20.4	40.2	24.5	54.6	13.2	22.4	15.8	32.0
Intermediate: Average equivalent household income from welfare in the month before period 2 (in Euros)							579.6	504.1	586.8	495.9	568.0	482.4	533.1	401.2	570.3	523.9	592.9	516.2

Source: Own Calculations.

**Table 3**  
**Outcomes 12 months after programme start in the second period**

	Men - West Germany				Women - West Germany			
Outcomes 12 months after programme start in the second period (in %) for sequence k (treated) vs. sequence h (controls)	All controls	All treated	Matched controls	Matched treated	All controls	All treated	Matched controls	Matched treated
<b>(CT,CT) vs. (UBII,UBII)</b>								
Regular employment rate	19.4	26.7	22.1	26.9	11.4	22.4	13.1	24.2
Short-term training	0.6	0.9	0.5	1.0	0.4	0.7	0.4	0.3
Further vocational training	0.9	3.8	0.8	3.4	0.5	2.9	0.6	2.8
One-Euro-Jobs	3.0	5.6	3.2	5.5	1.8	5.7	1.9	5.6
No UB-II-receipt	36.6	42.4	40.0	44.4	29.1	30.7	30.6	31.4
<b>(CT,UBII) vs. (UBII,CT)</b>								
Regular employment rate	25.3	22.2	25.6	22.7	19.1	16.8	19.7	17.6
Short-term training	0.9	0.8	0.8	0.8	1.1	0.8	1.0	0.9
Further vocational training	2.6	1.6	2.9	1.7	2.3	1.9	2.3	2.0
One-Euro-Jobs	5.0	4.4	4.8	4.0	4.8	4.3	4.6	4.1
No UB-II-receipt	35.7	37.9	37.0	39.0	30.6	31.1	31.2	32.3
<b>(CT,CT) vs. (UBII,CT)</b>								
Regular employment rate	25.3	26.7	25.6	26.9	19.1	22.4	19.7	24.2
Short-term training	0.9	0.9	0.8	1.0	1.1	0.7	1.0	0.3
Further vocational training	2.6	3.8	2.9	3.4	2.3	2.9	2.3	2.8
One-Euro-Jobs	5.0	5.6	4.8	5.5	4.8	5.7	4.6	5.6
No UB-II-receipt	35.7	42.4	37.0	44.4	30.6	30.7	31.2	31.4
<b>(CT,1EJ) vs. (UBII,1EJ)</b>								
Regular employment rate	17.9	19.6	18.5	20.1	14.8	15.0	15.4	16.1
Short-term training	0.5	0.7	0.4	1.0	0.9	0.8	0.8	1.1
Further vocational training	1.3	2.3	1.3	2.3	1.3	3.2	1.5	3.6
One-Euro-Jobs	13.3	12.1	13.4	11.4	12.8	15.5	13.4	15.4
No UB-II-receipt	30.6	34.4	31.5	36.6	26.0	25.8	26.3	25.7

Source: Own Calculations.

**Table 4**  
**Mean standardised absolute bias**

	Men - West Germany		Women - West Germany	
Mean standardised absolute bias (MSB)	Before matching	After matching	Before matching	After matching
<b>(CT,CT) vs. (UBII,UBII) for CT</b>				
Dynamic matching 1: UBII to CT	8.29	0.76	13.36	1.39
Dynamic matching 2: (UBII,UBII) to CT	10.20	0.97	16.06	1.04
Dynamic matching 3: (CT,CT) to CT	7.58	2.88	4.33	2.04
Final matching: (CT,CT) to (UBII,UBII)	12.21	5.77	19.39	11.90
<b>(CT,UBII) vs. (UBII,CT) for CT</b>				
Dynamic matching 1: UBII to CT	8.29	0.76	13.36	1.39
Dynamic matching 2: (UBII,CT) to CT	5.58	1.05	7.44	1.03
Dynamic matching 3: (CT,UBII) to CT	8.00	1.76	9.71	2.03
Final matching: (CT,UBII) to (UBII,CT)	5.33	1.92	4.85	4.25
<b>(CT,CT) vs. (UBII,CT) for CT</b>				
Dynamic matching 1: UBII to CT	8.29	0.76	13.36	1.39
Dynamic matching 2: (UBII,CT) to CT	5.58	1.05	7.44	1.03
Dynamic matching 3: (CT,CT) to CT	7.58	2.88	4.33	2.04
Final matching: (CT,CT) vs. (UBII,CT)	8.05	4.37	9.27	5.08
<b>(CT,1EJ) vs. (UBII,1EJ) for CT</b>				
Dynamic matching 1: UBII to CT	8.29	0.76	13.36	1.39
Dynamic matching 2: (UBII,1EJ) to CT	8.33	1.60	6.85	2.05
Dynamic matching 3: (CT,1EJ) to CT	11.21	2.94	10.79	4.54
Final matching: (CT,1EJ) to (UBII,1EJ)	10.31	4.79	8.57	6.01

Source: Own Calculations.

**Table 5**  
**Individuals aged at least 25 years – mean standardised absolute bias**

	Men - West Germany		Women - West Germany	
Mean standardised absolute bias (MSB)	Before matching	After matching	Before matching	After matching
<b>(CT,CT) vs. (UBII,UBII) for CT</b>				
Dynamic matching 1: UBII to CT	6.94	0.93	14.72	1.17
Dynamic matching 2: (UBII,UBII) to CT	9.23	0.87	16.05	1.35
Dynamic matching 3: (CT,CT) to CT	6.50	2.87	4.42	4.19
Final matching: (CT,CT) to (UBII,UBII)	9.39	5.79	19.88	13.06
<b>(CT,UBII) vs. (UBII,CT) for CT</b>				
Dynamic matching 1: UBII to CT	6.94	0.93	14.72	1.17
Dynamic matching 2: (UBII,CT) to CT	4.93	1.30	5.17	1.80
Dynamic matching 3: (CT,UBII) to CT	7.92	2.19	10.72	2.17
Final matching: (CT,UBII) to (UBII,CT)	6.86	1.76	5.15	3.01
<b>(CT,CT) vs. (UBII,CT) for CT</b>				
Dynamic matching 1: UBII to CT	6.94	0.93	14.72	1.17
Dynamic matching 2: (UBII,CT) to CT	4.93	1.30	5.17	1.80
Dynamic matching 3: (CT,CT) to CT	6.50	2.87	4.42	4.19
Final matching: (CT,CT) vs. (UBII,CT)	7.03	4.53	7.04	6.22
<b>(CT,1EJ) vs. (UBII,1EJ) for CT</b>				
Dynamic matching 1: UBII to CT	6.94	0.93	14.72	1.17
Dynamic matching 2: (UBII,1EJ) to CT	11.74	1.97	8.73	2.41
Dynamic matching 3: (CT,1EJ) to CT	11.84	4.88	11.49	7.00
Final matching: (CT,1EJ) to (UBII,1EJ)	7.48	5.78	7.87	8.11

Source: Own Calculations.



**Table 6****Robustness Check (Caliper Matching) – mean standardised absolute bias**

	Men - West Germany		Women - West Germany	
Mean standardised absolute bias (MSB)	Before matching	After matching	Before matching	After matching
<b>(CT,CT) vs. (UBII,UBII) for CT</b>				
Dynamic matching 1: UBII to CT	8.29	0.86	13.36	1.44
Dynamic matching 2: (UBII,UBII) to CT	8.86	0.97	14.72	1.27
Dynamic matching 3: (CT,CT) to CT	7.58	2.61	4.33	1.94
Final matching: (CT,CT) to (UBII,UBII)	12.21	7.38	19.39	13.24
<b>(CT,UBII) vs. (UBII,CT) for CT</b>				
Dynamic matching 1: UBII to CT	8.29	0.86	13.36	1.44
Dynamic matching 2: (UBII,CT) to CT	4.68	0.95	6.42	1.05
Dynamic matching 3: (CT,UBII) to CT	7.99	1.55	9.71	2.18
Final matching: (CT,UBII) to (UBII,CT)	5.33	2.91	4.85	4.65
<b>(CT,CT) vs. (UBII,CT) for CT</b>				
Dynamic matching 1: UBII to CT	8.29	0.86	13.36	1.44
Dynamic matching 2: (UBII,CT) to CT	4.68	0.95	6.42	1.05
Dynamic matching 3: (CT,CT) to CT	7.49	3.09	4.33	1.94
Final matching: (CT,CT) vs. (UBII,CT)	8.05	5.13	9.27	5.86
<b>(CT,1EJ) vs. (UBII,1EJ) for CT</b>				
Dynamic matching 1: UBII to CT	8.29	0.86	13.36	1.44
Dynamic matching 2: (UBII,1EJ) to CT	8.08	1.70	6.71	1.75
Dynamic matching 3: (CT,1EJ) to CT	11.21	2.94	10.79	4.38
Final matching: (CT,1EJ) to (UBII,1EJ)	10.31	5.41	8.57	6.09

Source: Own Calculations.

## Appendix

**Table A-1**

**Short matching protocol according to Lechner (2004):**

**A. Definition of the sequences  $(\underline{s}_2^h$  and  $\underline{s}_2^k$ ) and the population  $s_1^k$**

**B. Matching of  $\underline{s}_2^h = (s_1^h, s_2^h)$  to  $s_1^k$**

1. Definition of weight  $w_i^{\underline{s}_2^h} = 0$  for units of  $\underline{s}_2^h$
2. Estimation of probit  $P(S_1 = s_1^h | \underline{X}_0 = \underline{x}_0) = p^{s_1^h}$
3. Common Support
4. Matching of  $s_1^k$  to  $s_1^h$  that is closest in terms of  $p^{s_1^h}$  using nearest neighbour matching (one-to-one) with replacement
5. Estimation of probit  $P(S_2 = s_2^h | S_1 = s_1^h, \underline{X}_1 = \underline{x}_1) = p^{s_2^h | s_1^h}$
6. Common Support
7. Matching of  $s_1^k$  to  $\underline{s}_2^h$  that is closest in terms of  $p^{s_1^h}$  and  $p^{s_2^h | s_1^h}$  using the Mahalanobis metric
8. Increase of weight  $w_i^{\underline{s}_2^h}$  by 1 every time an observation in  $\underline{s}_2^h$  is matched

**C. Matching of  $\underline{s}_2^k = (s_1^k, s_2^k)$  to  $s_1^k$**

1. Definition of weight  $w_i^{\underline{s}_2^k} = 0$  for units of  $\underline{s}_2^k$
2. Estimation of probit  $P(S_2 = s_2^k | S_1 = s_1^k, \underline{X}_1 = \underline{x}_1) = p^{s_2^k | s_1^k}$
3. Common Support
4. Matching of  $s_1^k$  to  $\underline{s}_2^k$  that is closest in term of  $p^{s_2^k | s_1^k}$  using nearest neighbour matching (one-to-one) with replacement
5. Increase of weight  $w_i^{\underline{s}_2^k}$  by 1 every time an observation in  $\underline{s}_2^k$  is matched

**D. Joint Common Support**

1. Reduction of  $w_i^{\underline{s}_2^k}$  by 1 for every observation  $i$  matched to  $s_1^k$ , but deleted in B.3 or B.6
2. Reduction of  $w_i^{\underline{s}_2^h}$  by 1 for every observation  $i$  matched to  $s_1^k$ , but deleted in C.3

## E. Estimation of DATET and variance

1. Estimation of DATET:

$$\hat{\theta}_2^{s_2^k, s_2^h}(s_1^k) = \frac{1}{\sum_{i \in s_2^k} w_i^{s_2^k}} \sum_{i \in s_2^k} w_i^{s_2^k} y_i - \frac{1}{\sum_{i \in s_2^h} w_i^{s_2^h}} \sum_{i \in s_2^h} w_i^{s_2^h} y_i$$

2. Estimation of variance:

$$\widehat{Var}\left(\hat{\theta}_2^{s_2^k, s_2^h}(s_1^k)\right) = \frac{\sum_{i \in s_2^k} (w_i^{s_2^k})^2 \widehat{Var}(Y_2|S = s_2^k)}{(\sum_{i \in s_2^k} w_i^{s_2^k})^2} + \frac{\sum_{i \in s_2^h} (w_i^{s_2^h})^2 \widehat{Var}(Y_2|S = s_2^h)}{(\sum_{i \in s_2^h} w_i^{s_2^h})^2}$$

with

$$\widehat{Var}(Y_2|S = s_2) = \frac{1}{N^{s_2}} \sum_{i \in s_2} (y_i - \bar{y}_2^{s_2})^2, \quad \bar{y}_2^{s_2} = \frac{1}{N^{s_2}} \sum_{i \in s_2} y_{2,i}, \quad N^{s_2} = \sum_i \mathbb{1}(s_{2,i} = s_2)$$

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