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Do active labour market policies for welfare recipients in Germany raise their regional outflow into work?

A matching function approach

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Content

Abstract

While many studies estimated the effects of active labour market programmes (ALMPs) on the participants' labour market outcomes, much fewer studies are concerned with effects of these policies on the regional matching-process between job seekers and vacancies. An essential part of many reforms of the unemployment benefit system such as in Germany intended to activate unemployed job-seekers through an intense use of ALMPs. Therefore, it is crucial to understand whether such policies can improve the matching efficiency. We analyse quarterly panel data of German job centres in the period 2006 to 2011 and estimate the effects of the most important ALMPs on the regional exit rate from job-seeking into regular employment in a matching-function framework by applying the system generalized methods of moments estimator. Our results point to positive effects on the matching efficiency of a number of ALMPs, but the effects partly differ between high and low unemployment regions. Only for a few programmes does our evidence point to no or negative effects on the matching efficiency and this may be related to the implementation of these programmes on a very large scale.

Zusammenfassung

Viele empirische Studien haben die Effekte der Teilnahme an verschiedenen aktiven arbeitsmarktpolitischen Maßnahmen auf den Erfolg der Teilnehmenden am Arbeitsmarkt untersucht. Nur wenige empirische Studien haben sich mit Wirkungen dieser Maßnahmen auf den regionalen Matchingprozess zwischen Arbeitsuchenden und Vakanzen beschäftigt. Ein grundlegender Bestandteil vieler Reformen der Arbeitslosenunterstützung von Arbeitslosen, auch der Hartz-Reformen in Deutschland, war die Aktivierung von arbeitslosen Personen durch einen intensiven Einsatz aktiver arbeitsmarktpolitischer Maßnahmen. Folglich ist es von zentraler Bedeutung, die Wirkungen dieser Maßnahmen auf die Effizienz des Matchingprozesses zu verstehen. In dieser Studie werden Paneldaten der Jobcenter in Deutschland im Zeitraum 2006 bis 2011 auf Quartalsbasis verwendet, um mit einem Matchingfunktionsansatz die Effekte der quantitativ bedeutsamsten arbeitsmarktpolitischen Maßnahmen auf den Umfang der Abgänge aus Arbeitsuche in ungeförderte versicherungspflichtige Beschäftigung zu untersuchen. Die Schätzungen erfolgen mit der Generalisierten Momentenmethode. Die Befunde sprechen für einen positiven Einfluss einiger Maßnahmen auf die Matchingeffizienz. Nur für wenige Maßnahmen lassen sich keine oder negative Effekte auf die Effizienz des Matchingprozesses nachweisen, was damit zusammenhängen dürfte, dass die betreffenden Maßnahmen in sehr hohen Umfang eingesetzt wurden.

1 Introduction

Many studies on the effectiveness of active labour market programmes (ALMPs) are concerned with effects for programme participants. These studies are concerned with direct effects on the participants' performance in the labour market. They do not shed light on macro effects of ALMPs, as they do not take indirect effects of ALMPs on other job seekers into account. Parameters of an augmented matching function take such effects into account by quantifying an overall effect of ALMPs on the outflow of (all) job seekers into employment for a given number of vacancies and job seekers.

Whether ALMPs improve the matching efficiency was analysed by a limited number of studies using regional data for different countries, e.g. for Sweden (Calmfors/Skedinger 1995), for the Czech Republic (Boeri/Burda 1996), for Poland (Puhani 2003) and for Austria (Dauth/Hujer/Wolf 2016).

A few papers study the effects of ALMPs on the matching efficiency in Germany (e.g. Fertig/Kluve/Schmidt 2006; Hagen 2003; Hujer/Rodrigues/Wolf 2009 or Wapler/Werner/Wolf 2014). However, most of them were concerned with periods before the last of the Hartz reforms, the introduction of the basic income support for job seekers, which implemented a strict activation regime for welfare recipients from 2005 onwards. This reform emphasized the use of ALMPs to enable welfare recipients to subsequently successfully find jobs and reduce their dependence on the means-tested unemployment benefit II. Many programmes were available such as the assignment to private placement services, different wage subsidies and training programmes as well as public works; some of these programmes were implemented on a large scale (see Section 2). The programmes were implemented under a legal framework that put a high emphasis on integrating the welfare recipients into work and that implemented a strict benefit sanction regime including sanctions for refusing to participate in the ALMPs (van den Berg/Uhlendorff/Wolff 2014). While many studies presented evidence on the effects of these programmes on participants who receive the means-tested welfare benefits in Germany (see Section 3), no study quantified their effects on the matching efficiency.

We use quarterly regional data for German job centre districts during the years 2006 to 2011 applying system generalized methods of moments (SYSGMM) estimators (Arellano/Bover 1995; Blundell/Bond 1998) to a dynamic linear panel data model. In contrast to evaluation studies for individual participants in which "statistical twins" in a statistical matching approach are often used as controls, in our context, all other regions serve as a region's control group. The main focus of our analysis is to show whether more intense use of ALMPs for welfare recipients in a region improves the local matching efficiency. We model an augmented matching function (based on Pissarides 2000) that represents a relationship between the number of job seekers and vacancies on the one hand and the number of transitions into regular employment on the other hand. The matching efficiency in our model depends on the regional share of participants in different ALMPs among the job seekers.

By allowing for lagged values of the intensities of different ALMPs, we take important findings from micro studies into account – namely that programme effects for participants substantially differ between times during and after programme participation – and transfer them to our regional setting.

In a first specification in which we analyse all regions, the Sargan test results point to an invalid specification. A potential reason for the misspecified matching function in the analysis of all regions may be that low and high unemployment regions differ with respect to the effects of ALMPs and of control variables. E.g., employers might attempt to receive wage subsidies from job centres when hiring unemployed people. In high in contrast to low unemployment regions they might be in a stronger bargaining position so that job centres are more likely to grant such subsidies even in cases where firms would have hired the worker even without such a subsidy. This means that the impact of wage subsidies on the matching efficiency is likely to be lower in high as opposed to low unemployment regions. We separately analyse regions which were characterised by a below average (low) unemployment rate and an above average (high) unemployment rate in the year 2006.

The results of this analysis partly confirm differences of the ALMP effects between these two types of regions. Wage subsidies improve the efficiency of the matching function in low but not in high unemployment regions. The opposite holds for longer term training programmes. A more intense use of in-firm training (short internships) raises the matching efficiency in both types of regions, though the effects are stronger in high unemployment regions. A large scale public work programme, one-euro-jobs, affects the matching efficiency negatively in both low and high unemployment regions.

Our paper is structured as follows: In the next section we describe the ALMPs in our analysis in detail. Section 3 discusses the results of micro evaluation studies for the different ALMPs and what these results imply for our analysis. We present our theoretical consideration in Section 4 and describe the data in Section 5. We present the results in Section 6 first for Germany as a whole and then also potential differences between high- and low unemployment regions.

2 Institutional setting

Our analysis is concerned with the effects of different active labour market programmes in Germany that were implemented in the years 2006 to 2011. We study such effects for a certain type of job seeker – those who receive UB II. In Germany there are two types of unemployment benefits. The unemployment benefit (UB) I is based on previous contributions into the unemployment insurance (UI) scheme. Recipients of UI benefits receive a certain percentage of their last net wage (60 per cent for childless people and 67 per cent for parents) for a limited period of time. Receipt of this benefit requires that an unemployed person has paid contributions to the UI for at least one year in the two years prior to their UI benefit claim. In this paper we focus on the UB II recipients, as we study ALMP effects for this group of people. The UB II system and the principle of activating UB II recipients was introduced with the start of

the so-called Hartz IV reform in 2005. In the years 2006 to 2011, the unemployed UB II recipients accounted for 63 to 70 percent of the stock of registered unemployed in Germany. The UB II is a means-tested benefit that is available to any person (irrespective of the person's employment status) who is capable of working (at least three hours per day) and whose household's income is too low to achieve the legal minimum standard of living. Hence, even people who work or receive UB I, might still qualify for UB II.

UB II recipients are required to take actions to improve their employability and take up employment in order to reduce or end their dependence on welfare benefits. The public employment services should support them in their efforts through job search assistance and suitable ALMP placements. In our analysis, we are concerned with the quantitatively most important ALMPs. We discuss their main features and changes that were relevant in the period under review, i.e. 2006 to 2011. Not all programmes that we regard were implemented for the entire period.

The job centres responsible for UB II recipients could assign them temporarily to *private placement services*, which received some compensation by the job centre that partly depended on their success. Until 2008, the legal basis for the use of these services was Article 37 Social Code (SC) III (Beauftragung Dritter mit der Vermittlung) and Article 421i SC III (Beauftragung von Trägern mit Eingliederungsmaßnahmen).[1] The first of these two programmes aimed at placing unemployed people directly into work, while the second used private services to organize programme participations that should lead to the take up of jobs or training by the (former) participants.

Short-term training according to Articles 48–52 SC II (Maßnahmen der Eignungsfeststellung, Trainingsmaßnahmen). Participation in these programmes lasts between a few days up to no more than three months. Different training schemes existed with different goals, such as work tests, application training, testing the aptitude for an occupation, skill training (e.g., classes on computing, English language classes, occupational specific classes) or combinations of these trainings.[2] These courses were sometimes offered as classroom training. Aptitude tests, skill training and combined training may also take place in firms. Participants continue to receive their unemployment benefit. They are compensated by their job centre for costs related to the training including a limited amount of money to cover for additional childcare expenses.

The private placement services schemes and short-term training schemes in place prior to 2009 were replaced in January 2009 by the *schemes for activation and integration* (Maßnahmen zur Aktivierung und beruflichen Eingliederung) according to Ar-

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[1] New assignments to private placement services under Article 421i SC III were only possible until the end of 2007. For details on these private placement services rules see Bernhard/Wolff (2008).

[2] For more details see Kopf (2013) or Wolff/Jozwiak (2007).

ticle 46 of SC III (currently Article 45 SC III). In contrast to the schemes that were replaced, the new scheme instead specifies goals and not the exact content of the scheme. The goals are: 1) guiding into apprenticeships and into work, 2) determining, reducing and removing employment impediments, 3) placement into contributory employment[3], 4) preparing for self-employment, 5) stabilising an employment take-up. This new scheme is far more flexible than the ones it replaced and this should help the public employment services to design the measure so that it addresses the specific needs of a participant. The schemes can be operated by training providers and placement services providers (schemes by providers) or employers (in-firm training) (Harrer/Moczall/Wolff 2016). The cost of the programme can be financed by the job centre and participants continue to receive their unemployment benefit. The duration of participation depends on the specific content of the measure. For in-firm training though, the duration is limited to no more than four weeks and occupational skill training courses should not last longer than eight weeks.

Further vocational training according to Articles 77 to 86 SC III (Förderung der beruflichen Weiterbildung) represents different types of qualification programmes. They can be "broadly classified into short qualification programs that provide professional and practical skills and long retraining programs with a duration of up to two years that aim to provide a certified vocational training degree" (Bernhard/Kruppe 2012: 505). By enhancing human capital of the participants, their employment and wage prospects should be improved. The participants chose their training institution/course by using a training voucher that they receive from their job centre. The participants continue to receive their unemployment benefit. Costs related to training (including travel costs, childcare expenses) are (up to some limit for different types of cost) reimbursed by their job centre.

General employer wage subsidies are regulated in Articles 217 to 222 SC III (Eingliederungszuschuss). They are a temporary hiring subsidy that is granted to employers when they hire people with employment impediments or people who are severely disabled. The maximum amount of the subsidy is set to 50 per cent of the wage for people with employment impediments and 70 per cent of the wage for the severely disabled. The intention is to compensate the employer for a low productivity of the hired person. The duration of the hiring subsidy is limited to a maximum of 12 months, but can last longer for disabled people (up to 96 months if they are at least 55 years old). After the end of the hiring subsidy, employers are supposed to continue to employ the previously subsidised worker for at least the same amount of time as they received the subsidy. If the post-subsidy employment period is shorter than the number of months the hiring subsidy was received, then the job centres can ask the employers to partially pay back the hiring subsidy. In our analysis we will not regard the

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[3] We use the terms employment subject to social security contributions and contributory employment synonymously.

employer wage subsidies for severely disabled people as these are not contained in our data for privacy protection reasons.

One-euro-jobs (Arbeitsgelegenheiten in der Mehraufwandsvariante) regulated in Article 16 SC II until the year 2008, thereafter Article 16d SC II were one of the quantitatively most important programmes for UB II recipients in our observation window. They represent a programme of last resort. If no other active labour market programme is (yet) suitable to raise the employability of a UB II recipient, they should be placed into one-euro-jobs. They represent temporary jobs in the public interest. In our observation window, the SC II does not specify a maximum duration of participation. However, in practice about 85 to 90 per cent of participations were shorter than seven months.[4] The subsidised jobs should be additional in the sense that they do not compete with regular jobs or tasks. The organizers of the scheme receive a monthly lump-sum per participant as a compensation for programme costs. The participants receive their UB II and a compensation for costs of working of one to two euro per hour worked. In principle, participation should raise participants' employability and well-being through important latent functions associated with employment (Jahoda 1981; Warr 1987), such as having a daily routine, new contacts with people at work or externally generated goals that are related to the employment. This should help participants after completing their one-euro-job to work in other regular or subsidised jobs.

Contributory job creation schemes: In our observation window, job creation schemes were in place that aim at improving the employability of people with considerable employment impediments. Unlike one-euro-jobs, such hiring subsidies are available for employment subject to social security contributions (usually without contributions to the UI scheme). As is the case with one-euro-jobs, all job creation schemes are programmes of last resort: Unemployed persons should only be placed into such programmes when a placement into jobs or training is unlikely and a participation in other ALMPs is not suitable.

The oldest job creation scheme is the *traditional job creation scheme* (Arbeitsbeschaffungsmaßnahmen, Articles 260-271 SC III). Similar to one-euro-jobs, the subsidy is available for jobs in the public interest that do not compete with regular jobs. The subsidy was specified as different monthly lump sums depending on the qualificational requirements of the subsidised job ranging for full-time jobs from 900 euro (no requirements) up to 1,300 euro (university degree, technical university degree). The subsidy could be up to 300 euro higher if otherwise the participation cannot be financed or if, due to labour market policy considerations, there is a special interest in

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[4] Source: Datawarehouse of the Statistics Department of the Federal Employment Agency, only for job centres that are not entirely run by municipalities ("zugelassene kommunale Träger", Approved Local Providers - ALP), but instead by a cooperation between a municipality and the Federal Employment Agency.

a participation. Participation was limited to no more than 12 months. However, under certain conditions, a maximum duration of 24 or even 36 months was possible.

The traditional job creation scheme was completely abolished in April 2012. However, already in 2009, eligibility became limited solely to UB I recipients. This was not a major change as another type of job creation scheme so-called *work opportunities* was in place for UB II recipients since 2005. One type of work opportunities are the one-euro-jobs. The articles of the SC II on one-euro-jobs define additional rules for another type of work opportunities, *contributory work opportunities* (Arbeitsgelegenheiten in der Entgeltvariante).[5] They were available to subsidize contributory employment for people with employment impediments. They were regulated in the same articles of the SC II as one-euro-jobs. The contributory work opportunities subsidy could be granted for all types of jobs, not only for jobs that were in the public interest and did not compete with regular jobs. In the period under review here, the SC II did not specify any limits on the duration or on the subsidy level of contributory work opportunities. In 2005 the German Federal Employment Agency recommended that the job centres pay a lump-sum that takes into account all the expenses of the organiser of the scheme; the lump-sum should reflect the gap between the wage and the productivity of the subsidised worker and it should be in line with comparable subsidies (German Federal Employment Agency 2005). This most likely refers to the traditional job creation scheme. Once UB II recipients were no longer eligible for the traditional job creation scheme, the German Federal Employment Agency stated in its recommendations that work opportunities in which jobs of public interest are subsidised, the subsidy could be specified in the same way as for the traditional job creation scheme (German Federal Employment Agency 2009). The (planned) duration of participation in contributory work opportunities in the years of our observation window was shorter than 12 (7) months for 91 (72) per cent of the cases.[6]

Table 1 displays the inflow into the different ALMPs of interest in this study and the development of the unemployment stock for UB II recipients. We present these statistics for 2006 without data on job centres administered solely by municipalities. Their data on ALMPs was still regarded as incomplete at the start of our observation window (2006–2011). The unemployment stock of UB II recipients fell from 2.4 million to about 1.9 million people between 2006 and 2011. With regard to the two private placement services programmes, the one that aims at directly placing people into employment (Article 37 SC II) was the more important one in terms of scale. With a range of 346 to 704 thousand the inflow into one-euro-jobs was quite high. In the first year of our

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[5] Apart from the traditional job creation scheme and work opportunities and contributory work opportunities in our observation window other job creation schemes were temporarily in place. As they were implemented on a very small scale, we do not describe them in this section or include them in the analysis.

[6] Source: Datawarehouse of the Statistics Department of the Federal Employment Agency, only for job centres that are not entirely run by municipalities ("zugelassene kommunale Träger", Approved Local Providers - ALP), but instead by a cooperation between a municipality and the Federal Employment Agency.

observation window, it was the most important scheme in terms of inflow. By the end of the observation window, schemes for activation and integration became more important with 800 thousand cases in 2010 and 621 thousand in 2011. Short-term training represented the second largest programme from 2006 to 2008. The importance of further vocational training with an inflow ranging from 102 to 207 thousand in the years 2006 to 2011 was also considerable. General employer subsidies tend to be somewhat less quantitatively important. The inflow into the traditional job creation scheme and contributory work opportunities taken together range from 87 to 113 thousand during the years 2006 to 2009, and decreased considerably thereafter.

Table 1
Inflow into different ALMPs and unemployment stock of UB II recipients in our observation window (in 1,000)

Year	2006	2007	2008	2009	2010	2011
Private placement services						
Article 37 SC III	148.5	112.6	175.9	97.1	-	-
Article 421i SC III	12.7	18.3	1.7	-	-	-
Short-term training	446.5	480.2	495.3	212.4	-	-
Schemes for activation and integration	-	-	-	439.0	799.7	620.5
Further vocational training	102.4	139.4	187.1	206.9	196.5	140.2
Wage subsidy	104.6	124.9	120.1	102.6	113.5	90.3
One-euro-jobs	703.8	669.2	648.0	599.5	552.8	345.8
Traditional job creation scheme	62.4	50.1	60.4	5.5	-	-
Contributory work opportunities	37.3	36.6	52.1	85.4	74.9	33.8
Unemployment stock	2,402	2,444	2,182	1,960	1,944	1,891

Source: Datawarehouse of the Statistics Department of the Federal Employment Agency, only for job centres that are not entirely run by municipalities ("zugelassene kommunale Träger", Approved Local Providers - ALP), but instead by a cooperation between a municipality and the Federal Employment Agency.

3 Results of studies on effects for programme participants.

A number of studies analysed the effectiveness of participation of UB II recipients in different programmes using micro data. The studies applied propensity score matching methods to estimate net impacts by comparing participants with matched controls of people who were eligible for participation but did not participate in the programme in the time window, in which the participants started their programme participation. They investigated participation effects on different outcomes like receipt of UB II or being registered as unemployed. We limit our discussion to the results on the employment outcome as this is the most relevant for us: The studies estimated effects on the outcome working in unsubsidized contributory (regular) jobs at different points in time after entering the programme, as most of the programmes aim at raising the employment prospects of the participants (at least in the medium term).

Most of the studies analysed large administrative data sets to study effects for a whole population of participants. However, a few studies also used survey data and small

participant samples. A large number of the studies investigated the effects for programme participations that started in some time window during the years 2005 to 2007.

The results of the studies were often presented for men and women in East and in West Germany separately. As our analysis is based on regional outcomes where we treat the labour market as a whole and not one divided into several subgroups for example for people of different age, we do not present results regarding further demographic subgroups. Further, we do not discuss studies on participation in sequences of ALMPs.

3.1 Studies on programme participation of UB II recipients soon after the introduction of the UB II

A number of studies regarded an early period after the introduction of the Social Code II in January 2005. They analysed a stock sample of people who were both unemployed and received the UB II at the end of January 2005. All of the studies estimated the effects of participation in different programmes for people who met the sampling criterion and entered the programme studied in the period of February to April 2005. The effects were estimated by propensity score matching (PSM). The matched controls were selected from people who met the sampling criterion, but did not enter the programme from February to April 2005.

Bernhard/Wolff (2008) investigated the effects of the assignment of UB II recipients to private placement services according to Article 37 SC III. The results of their PSM analyses for the four main groups of men and women in East and West Germany showed the following: In the first month after the assignment to private placement services, negative effects on the probability of working in unsubsidized contributory employment of up to -5 percentage points (lock-in effects) were found. However, already after five to six months after the assignment to the scheme, the effect estimates became positive. However, the positive effects were mostly insignificant for East Germany, while they were statistically significant for participants in West Germany. For East German participants and male participants in West Germany, they implied an effect of more than 2 percentage points on the probability of working in unsubsidized contributory jobs 20 months after programme start (the end of the observation window). For West German women it was close to 4 percentage points.

Wolff/Jozwiak (2007) analysed the effectiveness of short training programmes. The results for men and women in East and West Germany showed that classroom training had slight negative effects of up to -2.5 percentage points on the probability of working in regular jobs for the first few months after programme start. The estimated effects became positive after 4 to 8 months after entering the scheme and reached levels of up to 3 percentage points in the observation window of up to 20 months after programme start. The effect estimates for in-firm training were far higher. They showed almost no lock-in effects and three months after programme start effects of an order of magnitude of more than 10 percentage points on the probability of working

in a regular job. Afterwards the effects became even higher reaching levels of up to 20 percentage points (for East German women).

The studies of Bernhard/Kruppe (2012) and Bernhard (2016) investigated the effects of participation in further vocational training. In contrast to private placement services or short training programmes, further vocational training participation tends to last longer and should not raise the probability of working in regular jobs early after programme start. Bernhard/Kruppe (2012) found that six months after programme start, the participants' likelihood of working in a regular job tended to be negatively affected by the treatment. However, this is only the case when the planned duration of the programme exceeded one year.

Bernhard (2016) provided more detailed results on the development of the effects of participating in further vocational training on participants over time and for an observation window of 104 and not only 28 months after programme start as in Bernhard/Kruppe (2012). These results showed that participations of a duration of up to one year started to positively affect the regular employment probability of participants by the end of the first year after programme start and reached an order of magnitude of up to 12 percentage points. However, most of the time and in the long-run, the effect estimates were in general lower than 10 percentage points. For further vocational training participation that lasted for more than one year, Bernhard (2016) found positive employment effects only more than two years after programme start. As soon as positive effects emerged, the effect estimates in the different months after programme start usually ranged from about 15 to 20 percentage points which was considerably higher than for the shorter further vocational training participations.

The effects of the general hiring subsidy were analysed by Bernhard/Gartner/Stephan (2008). The study distinguished between the effects of a short-term subsidy of a duration of up to three months and a medium-term subsidy lasting for four to six months. In both cases, the results showed considerable lock-in effects in the first months after receiving the subsidy: When the results for men and women in East and West Germany are regarded, the participants' probability of working in unsubsidized contributory job initially was usually reduced by more than 5 up to 15 percentage points. These negative effects lasted for up to four months for the short-term subsidy and up to eight months for the medium-term subsidy. Thereafter, the effects estimates quickly became positive reaching levels of 45 percentage points or more, though in the longer run, after 36 months, they declined to an order of magnitude that in most of the cases ranged from 35 to 40 percentage points. Hence, the hiring subsidy lead to fairly high effects.

Hohmeyer/Wolff (2012) and Hohmeyer (2012) were concerned with the effectiveness of one-euro-job participation. As one-euro-jobs are rather a programme of last resort for people with relatively low job finding prospects, the programme was unlikely to generate large effects on the probability of working in a regular job. The studies find for men and women in East and in West Germany initially lock-in effects up to nearly

-4 percentage points on this employment outcome. In the course of the second year after programme start, the effect estimates turned positive except for East German male participants. For the other three groups they reached an order of magnitude of 0.6 to 3 percentage points up to 28 months after programme start.

Among the studies that investigated programme participations early after the introduction of the Social Code II, one study regarded a sample that was not drawn at the end of January 2005. Hohmeyer/Wolff (2010) analysed people who were unemployment and on welfare receipt at the end of April 2005. They studied the effects of one-euro-jobs, contributory work opportunities and the traditional job creation scheme. The programme participants were people that met the general sampling criterion and entered the programmes in the period May to July 2005. The estimation results on one-euro-jobs hardly differ from those that we already discussed for the earlier participation cohort of February to April 2005.

With regard to regular employment effect estimates in Hohmeyer/Wolff (2010) for contributory work opportunities and job creation schemes, the results differ considerably from those on one-euro-jobs. The lock-in-effects were a few percentage points higher than for one-euro-jobs. However, over time for both programmes, the effects turned positive more quickly than for one-euro-jobs. In particular for contributory work opportunities, the findings implied positive participation effects on the regular employment probability after 6 to 11 months though for East German men the positive effects were not well determined. The positive effects of participation in contributory work opportunities up to the 36th month after programme start mostly ranged from 4 up to 12 percentage points. For the job creation schemes, these effects were lower. They were usually below 4 percentage points with the exception of West German women: for them in the third year after programme start the order of magnitude was 8 to 12 percentage points.

3.2 Studies on programme participation of UB II recipients regarding later periods

Fewer studies analysed effects of participating in ALMPs for UB II recipients in periods after the year 2005. Huber et al. (2011) estimated participation effects of one-euro-jobs, short training and further vocational training using a combination of survey, administrative and regional data. They analysed a stock sample of welfare recipients in October 2006 and estimated with PSM the effects of one-euro-jobs for participations that started between the sampling date and April 2007. At the time the study was conducted, the administrative data did not yet record employment outcomes in 2007. Therefore, the employment outcomes came from survey data and were collected at the end of 2007. Hence, for one-euro-jobs and further vocational training, some participants still had to overcome initial lock-in effects at the end of their course or just after having completed it. The coefficients for the employment rate after the respective ALMP were found to be positive but statistically insignificant. The same holds for effect estimates for the outcomes minor employment and employment or self-employment. For short training (including both classroom and in-firm training) though, the effect on

the probability of working in insured employment was found to be around 9 percentage points.

Dengler (2016) studied the participation effects for welfare recipients and regarded a large number of programmes. She analysed employment effects of participation and placed particular attention on the effects on the probability of working in jobs of a (relatively) high quality. She used administrative data and applied PSM to estimate the participation effects. Her sample consisted of people who entered UB-II-receipt without any contributory employment in the period of October 2005 to September 2006. A participant sample represented all people of this sample that entered a specific programme during the first six months after the start of the UB-II-receipt without being employed. She analysed participation effects of short classroom training, short in-firm training, further vocational training and one-euro-jobs at different points in time for up to 42 months after programme start.

For short classroom training, the effects estimated by Dengler (2016) tend to be slightly higher than in Wolff/Jozwiak (2007) reaching temporarily a level of close to 5 percentage points for East German participants and West German female participants. Even after 42 months, the effects were still found to be positive at 2 to 3 percentage points for males and more than 4 percentage points for women. For in-firm training, she found employment effects that were considerably higher than those reported by Wolff/Jozwiak (2007) for an earlier period. Similarly, the effects of further vocational training tend to be higher than in the study on participations in the months February to April 2005 of Bernhard/Kruppe (2012) and of Bernhard (2016). For one-euro-jobs, the picture is not that clear: For women but not for men the effects were positive and somewhat higher than in the study of Hohmeyer/Wolff (2012). One important reason for the difference to studies on participations in the first months of the year 2005 might be a business cycle effect. The labour market was strongly affected by an upturn when the programme participations that Dengler (2016) studied came to an end, while this was not the case for the studies on participations starting in the first months of the year 2005.

Harrer/Moczall/Wolff (2016) analysed the effects of participating in schemes for activation and integration. As described above, the programme replaced the former short training programmes and private placement schemes at the start of 2009. The reform aimed at allowing a flexible design of such services, in order to meet the needs of unemployed people, in particular long-term unemployed people. This would imply that the new scheme should tend to be more effective than the previous ones. Harrer/Moczall/Wolff (2016) answered the question whether this is the case. They used administrative data of welfare recipients who were unemployed at the end of 2009 and using PSM analyse the effectiveness of scheme. Participants were people who entered the scheme from January to March 2010, while potential controls where the individuals who did not start such a participation in this time period. The authors analysed these effects separately for participants in schemes by providers and the in-

firm training scheme. By comparing them with the results from studies on the programmes that were replaced, the authors found the following: Their effect estimates for the outcome working in unsubsidised jobs do not differ considerably from those of the studies on the short term training (both in classrooms or in firms) of Wolff/Jozwiak (2007) and from those on private placement services of Bernhard/Wolff (2008).

3.3 Key lessons for our study

The results from the different studies imply first of all that most of the programmes help to increase the employment probability of participants. Particularly high effects emerged for in-firm training (up to more than 20 percentage points) and hiring subsidies (up to more than 40 percentage points) quickly after the programme participations end. Positive employment effects were also recorded for contributory work opportunities participation quickly after participations end and reached substantial levels of up to more than 10 percentage points. A large part of the positive effects of these programmes apparently emerges (almost) directly after ending the participation. These high effects might suggest substantial improvements in the matching function. However, they also might reflect that participants from the target group of the programmes took up regular jobs that they or other members of the target group would have taken up even if the programme participations had never have taken place. Hence, a substantial deadweight loss is possible.

For further vocational training, the magnitude of the effects is similar to that of contributory work opportunities when the long-run is regarded (up to more than 10 percentage points). They are lower for short term classroom training (usually below 5 percentage points) and one-euro-jobs (usually below 3 percentage points). For vocational or short term classroom training and one-euro-jobs, the results suggest that the effects did not necessarily emerge immediately after the end of the programme. This is not surprising because the participants are usually not in contact with a potential employer who retains them as employees after the end of programme participation. Participants in these three programmes hence often have to go through an additional period of job search and probably further ALMP participation to reap the benefits of their treatment. Hence, there might be some non-negligible lag between ending the participation and gaining from participation by a higher probability of working. The results for the job creation scheme are somewhere in between those for one-euro-jobs and contributory work opportunities. Given that these programmes all aim at improving skills and in the case of one-euro-jobs and job creation schemes very basic skills such as punctuality or becoming accustomed to regular work schedules, they are unlikely to create deadweight losses.

Some of the programmes like classroom or in-firm training usually last a few weeks whereas participation in others last for longer periods, e.g., participation in one-euro-jobs frequently last for six months. This taken together with the possibility that the effects on the matching process might not necessarily emerge immediately after participations in such programme ends, imply that one should allow for lags of ALMP

intensity effects on the number of matches of at least three to four quarters in an analysis like ours.

4 The matching function approach and some considerations for our application

The theoretical concept that defines the framework of our analysis is the matching function (see Pissarides 2000). In its simplest version, it represents the relationship between the number of transitions from unemployment into regular employment in a given (small) time window that depends on the number of unemployed people and the number of vacancies that are available at the beginning of the time window. In our application, an exit into regular employment is defined as an exit into unsubsidised employment (subject to social security contributions) provided that the employment lasts for at least a week.

The simple matching function makes the assumption that unemployed job seekers are homogenous. Therefore, they all have the same probability of getting job offers and the same willingness to take up a job. In other words, they are characterized by the same search intensity and effectiveness of their job search. To analyse the effects of ALMPs, we allow for heterogeneous job seekers who can differ with respect to their search intensity and effectiveness of their job search. Hence, we will use augmented matching functions that allow for different effects for different types of job seekers on the number of matches. We split the stock of job seekers into different groups: We differentiate between job seekers who are participating in different ALMPs and those who are unemployed and not participating in one of the ALMPs we focus on.

The starting point for our analysis is an augmented matching function that has the form (for a derivation of this function see Wapler/Werner/Wolf 2014):

$$\ln M_{rt} = \ln A + \alpha \ln S_{rt-1} + \beta \ln V_{rt-1} + \sum_{j=1}^{J} \gamma_j \left(\frac{P_{jrt-1}}{S_{jrt-1}} \right) \qquad (1)$$

In this function, M_{rt} represent the number of exits of job seekers into regular employment in region r in the period t and A is a constant. S_{rt-1} is the total number of job seekers, V_{rt-1} the number of vacancies and P_{jrt-1} the number of job seekers who participate in the *j*th programme that we consider. Each of these variables is measured at the end of the previous quarter before the matches are realised (in quarter *t*). The effect of the *j*th ALMP is represented by the parameter γ_j. ALMPs in this specification affect the matching efficiency. If the share of participants in programme *j* were to increase by 0,01 or one percentage point for a given number of job seeker and vacancies, the number of exits of job seekers into regular employment would change by γ_j percent for small values of γ_j. γ_j represents the net effect of the share of job seekers participating in programme *j* in the stock of job seekers. This parameter may be the result of different possible effects of programme participation: For example, an ALMP might imply a rise of the employment prospects of participants. But at the same

time it might negatively affect other job seekers who do not participate in this programme e.g. due to substitution effects or by the fact that job centres increased spending on participants implies that less resources are allocated for general placement services.

It is well-known that it takes time until the overall effect of a programme participation is visible, so that we do not only control for ALMP variables at the end of the previous quarter but for additional time lags of these variables. During programme participation, participants are likely to reduce their search activities at least initially. However, in the longer run, ideally participation improves the (former) participants' search effectiveness. Hence, a high share of participants in the past may imply a high share of current job seekers who completed an ALMP participation in the (recent) past and who search more effectively for a job than other job seekers with no such past participation. For this reason, we will estimate the parameters of a specification that takes into account lagged values of the share of participants in the stock of job seekers with L lags. To control for a partial adjustment processes as well, we use a dynamic specification by including the lagged dependent variable $\ln M_{rt-l}$ as an additional explanatory variable:

$$\ln M_{rt} = \ln A + \alpha \ln S_{rt-1} + \beta \ln V_{rt-1} + \sum_{l=1}^{L_1} \sum_{j=1}^{J} \gamma_{jl} \left(\frac{P_{jr(t-l)}}{S_{jr(t-l)}} \right) + \sum_{l=1}^{L_2} \delta_l \left(\ln M_{r(t-l)} \right) + \underline{\theta}' \, \underline{x}_{rt-1} \ (2)$$

Hence, in such a model we estimate parameters for different lags of a share of the programme and for lags of the dependent variable. The (marginal) long-run effect of an increase in the share which is for programme j is then defined by (see Greene 2008: 684):

$$\left. \sum_{l=1}^{L_1} \gamma_{jl} \middle/ \left[1 - \sum_{l=1}^{L_2} \delta_l \right] \right.$$

The basis for the identification of these effects is provided by the temporal and regional variation in ALMP intensities. However, to enable a causal interpretation of our findings, we have to account for possible selection problems. At the regional level, such problems arise as job centres are not only characterised by different programme intensities, but vary in their regional characteristics which also determine the regional outcome variable. Therefore, it is necessary to control for observed confounding factors $\underline{x}_{rt}$ which may be correlated with the intensity of ALMPs as well as with the number of matches. As Angrist/Pischke (2009: 221) state: "the key to causal inference is control for observed confounding factors." Following Wapler/Werner/Wolf (2014), we group these variables into three categories: job seekers' characteristics, regional economic structure and seasonal effects.

With regard to job seekers' characteristics, we include the share of male job seekers, the average age of job seekers, the share of severely disabled people, single parents, and the share of job seekers with a German nationality as well as the average age of

the job seekers. The regional qualificational structure of the job seekers is taken into account by adding the shares of job seekers with lower, middle and upper secondary school certificates. The shares with vocational or academic degrees are also included. In addition, we include the share of job seekers which receive both welfare payments as well as payments from the unemployment insurance scheme. As only those unemployed which had a job for a minimum of twelve months in the two years before they became unemployed are eligible to receive insurance-based payments, it is likely that this group is "closer" to the labour market than those welfare recipients who do not fulfil this qualifying period.

To control for the regional economic structure, we include the share of female employees, the share of (high-)qualified employees and the share of employees working in the primary or secondary sector. The regional occupational structure is accounted for by including shares in technical, service and farming occupations, respectively.

The recession in 2008/2009 occurred during our observation period. The German government reacted to this recession by making short-time work compensation (*Kurzarbeitergeld*) more attractive to employers. As the usage of short-time work varies by economic activity and hence also by region, we use the share of employees covered by this specific measure relative to all employees in a region as an additional regional explanatory variable. Thus, we account for the fact that regions in Germany were affected quite differently by the recession. Moreover, because the job-finding possibilities during the great recession were much lower than in the remaining observation window (see Section 5.2), we interact the number of job seekers and vacancies with a dummy as of the second quarter in 2008 until (and including) the second quarter in 2009.

The third category of control variables concerns seasonal effects as we have pronounced seasonal fluctuations. As not all job centres exhibit the same seasonal pattern for which the time fixed effects would control, we further include an interaction effect of seasonal dummies and region type. Following a classification of job centres developed by Blien et al. (2011), we differentiate between 12 different types of job centres based on their labour market conditions in 2010. Finally, we include the regional employment growth rate and the deviation of actual employment from its seasonally adjusted level.

Apart from these time-varying observed covariates, there might also be unobserved regional factors that are time-invariant. As we use panel data, we are able to account for such characteristics by including regional fixed effects. Furthermore, to control for the fact that regional matches themselves depend on their lagged values, we adopt a dynamic specification.

Finally, the existence of a political reaction function whereby job centres react to changing economic conditions could hamper a causal interpretation of our results (see Calmfors/Skedinger 1995). For example, an economic shock which affects the

number of matches in a region also has a direct consequence on the regional intensity of ALMPs in the job centre. In this case, the regional and temporal variation of ALMPs is not strictly exogenous. Ignoring such a reverse causality would lead to a simultaneity bias. Given our model, which is estimated in first differences, such a simultaneity problem will only be present if job centres are able to react to an economic shock instantaneously (i.e. within one quarter). Considering the institutional setting in Germany, this is not very likely. The budget-planning process normally takes place in the last quarter of the previous year and is then fix for the following year. Thus, it would be hard for job centres to instantaneously increase or decrease the number of inflows in ALMPs. In addition, most of the programmes are not conducted by the job centres themselves, but are carried out by external providers which first have to go through a selection procedure before they are entitled to obtain the funds to carry out the course. This also hampers the job centres capability of reacting very quickly to changing labour market conditions. A reaction afterwards does not lead to a simultaneity problem.

5 Data and some descriptive statistics

5.1 Classification of individuals as programme participants

Our analyses regards job seekers who are welfare recipients and who are either registered as unemployed or participate in one of the main ALMPs. The data base for our analysis are the "Integrated Employment Biographies" (IEB).[7] These data are administrative individual spell data. The data set combines information from labour agencies and job centres on unemployment, different types of unemployment benefit receipt and ALMP participation with information from employers on dependent employment (except for the employment of civil servants). Apart from the vacancies and the control variables regarding the regional economic structure and seasonal effects which stem from the Statistics of the Federal Employment Agency, all other variables are generated using these administrative spell data. When computing the relevant variables of our matching function, we have to take some decisions related to these data. Short interruptions of a given type of programme participation of up to a week are classified as a continued programme participation of this type of programme. Moreover, the legal ruling of general wage subsidy programme states that the employer must continue to employ the previously subsidised worker for at least the same number of months the subsidy was paid. Otherwise the employer may be forced to pay back part of the subsidy. For this reason, we classify participants in this programme not only as participants of the wage subsidy while the wage subsidy is paid, but also during the post subsidy mandatory employment period.

When regarding programmes of a very short duration of two weeks or even less, defining participants by the stock at the end of a quarter will most likely underrepresent the intensity of the programme compared with measures where participations lasts

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[7] For a detailed description of a sample of these data see vom Berge/König/Seth (2013). For our purposes, we use the total population data set.

for longer than a month. Therefore, for very short programmes, in our case the classroom and in-firm training programmes, we define the participants at the end of a quarter as all individuals who participated in the programme for at least one day between the 15th and the last day of the last month in the quarter.

To achieve reliable estimates of the ALMP effects on a regional level, it is crucial to analyse programmes that are at least of some quantitative importance. For this reason, we only regard the programmes that in our observation window were characterized by a considerable annual inflow. These programmes were already discussed in Section 2. In our specification, very similar programmes are regarded as one programme group. More precisely, we specify the following programmes as single ones: The general employer wage subsidy (WS), classroom short term training (CT), schemes for activation and integration that do not (entirely) take place in firms and are run by (private) training providers and placement services (schemes by providers, SP), one-euro-jobs (1EJ), and further vocational training (FVT). For other programmes there are good reasons to treat them as one group: The two private placement services programmes will be regarded as one group (PPS). The in-firm short-term training programme available until the end of 2009 will be regarded together with in-firm training under the new schemes for activation and integration that were implemented as of 2009 (IFT). The two public works programmes, contributory work opportunities and the traditional job creation scheme, target similar job seekers and both last for participation periods of less than one year. Therefore, they will be regarded as one programme group (JCS).

5.2 Definition of regional units and choice of the observation window

With the regional keys available in the IEB, it is possible to compute the variables of interest described in Sections 4 and 5.1 for job centre districts for every quarter (or end of the quarter depending on the definition of the variable). We analyse the time period of 2006 to 2011. We exclude the year 2005, the year, in which the SC II was introduced as it was a period in which job centres had to be built from scratch and first experiences of operating ALMPs for unemployed welfare recipients had to be made. As we include lags of up to four quarters for the ALMP variables, we count our matches starting in 2007.

An important issue in our time window is the fact that job centres can operate under two different institutional frameworks. Some job centres (in our time window 67) are run entirely by municipalities ("zugelassene kommunale Träger", Approved Local Providers – ALP). Depending on the year, between 12.6 and 13.7 per cent of the pool of unemployed welfare recipients were registered as unemployed at an ALP job centre according to data of the Statistics Department of the German Federal Employment Agency. All other job centres are run jointly by municipalities and the Federal Employment Agency ("gemeinsame Einrichtungen", Joint Local Agencies - JLA). Until 2007, (individual) ALMP data provided by the ALPs to the Statistics Department of the Ger-

man Federal Employment Agency was not always complete. For this reason, we exclude these job centres from our analysis. The alternative would have been to choose a time window that starts in 2008 when the ALMP data of the ALPs was more or less complete. As however in January 2012 a large number of job centres changed their status from JLA to ALP and moreover two reforms (in January 2009 and April 2012) took place that changed the composition of ALMPs and the way they are designed, we decided to analyse the observation window 2006 to 2011.

5.3 Some descriptive statistics on our sample

In order to estimate causal effects of the variables of interest as described in Section 4, it is important to take into account that job centre districts not only differ with respect to the share of participants in different ALMPs in the stock of job seekers. Other covariates that could be correlated with these shares may determine the (log of) the exits from unemployment and ALMP into regular employment in our matching functions. We therefore include a number of additional control variables in our specifications. Table 2 displays some descriptive statistics on all our covariates.[8]

Table 2
Descriptive statistics on the variables used in our analysis; values for job centres in Germany, 2007 QII to 2011 QIV

Variable	Average per Job centre[)]	Minimum	Maximum	Standard-deviation
Matches	442	35	16.865	805
Number of job seekers	6,590	370	250,534	14,114
Vacancies	933	19	23,186	1,412
No. ALMP	1,545	65	70,366	3,522
Wage subsidies	185	2	5,471	297
Contributory work opportunities, traditional job creation scheme	81	0	13,151	446
One-euro-jobs	648	0	33,201	1,559
Private placement services	88	0	9,978	333
Further vocational training	222	0	12,375	628
In-firm training	32	0	1,530	59
Classroom training	152	0	7,638	425
Schemes by providers	49	0	3,673	126
Employment growth relative to moving yearly average	1.01	0.96	1.05	0.01
Employment growth relative to same quarter in previous year (in %)	1.54	-7.73	11.35	2.06

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[8] In Table A1 and Table A2 we present the same statistics for the low and high unemployment regions respectively.

Variable	Average per Job centre[a]	Minimum	Maximum	Standard-deviation
Share of job seekers receiving unemployment insurance	0.03	0.01	0.08	0.01
Age of the job seekers	40.87	38.16	45.39	1.03
Share of single parents amongst job seekers	0.11	0.05	0.21	0.02
Share of males amongst job seekers	0.53	0.41	0.61	0.03
Share of severely disabled amongst job seekers	0.05	0.02	0.13	0.01
Share of Germans amongst job seekers	0.85	0.51	0.99	0.10
Share with vocational training degree amongst job seekers	0.48	0.18	0.88	0.15
Share with tertiary education degree amongst job seekers	0.03	0.01	0.12	0.02
Share with lower secondary education degree amongst job seekers	0.49	0.25	0.72	0.10
Share with higher secondary education degree amongst job seekers	0.22	0.07	0.54	0.13
Share with university-entrance diploma amongst job seekers	0.08	0.02	0.27	0.04
Share of females amongst all employees	0.45	0.28	0.58	0.05
Share of skilled and high-skilled amongst all employees	0.69	0.47	0.83	0.06
Share of employees in primary sector	0.01	0.00	0.07	0.01
Share of employees in secondary sector	0.35	0.07	0.71	0.11
Share of employees in technical occupations	0.06	0.02	0.16	0.02
Share of employees in service sector	0.61	0.30	0.81	0.08
Share of employees in primary occupations	0.02	0.00	0.09	0.01
Share of employees in short-time work (Kurzarbeit)	0.01	0.00	0.21	0.02

[a] not weighted

Source: IEB V12.00.00; own calculations

To highlight that the different programmes were applied with changing intensities over time, Figure 1 shows the average shares over all job centres in our analysis for all the quarters analysed.

Figure 1
Share of participants in different ALMPs in the stock of job seekers on welfare receipt – development over time
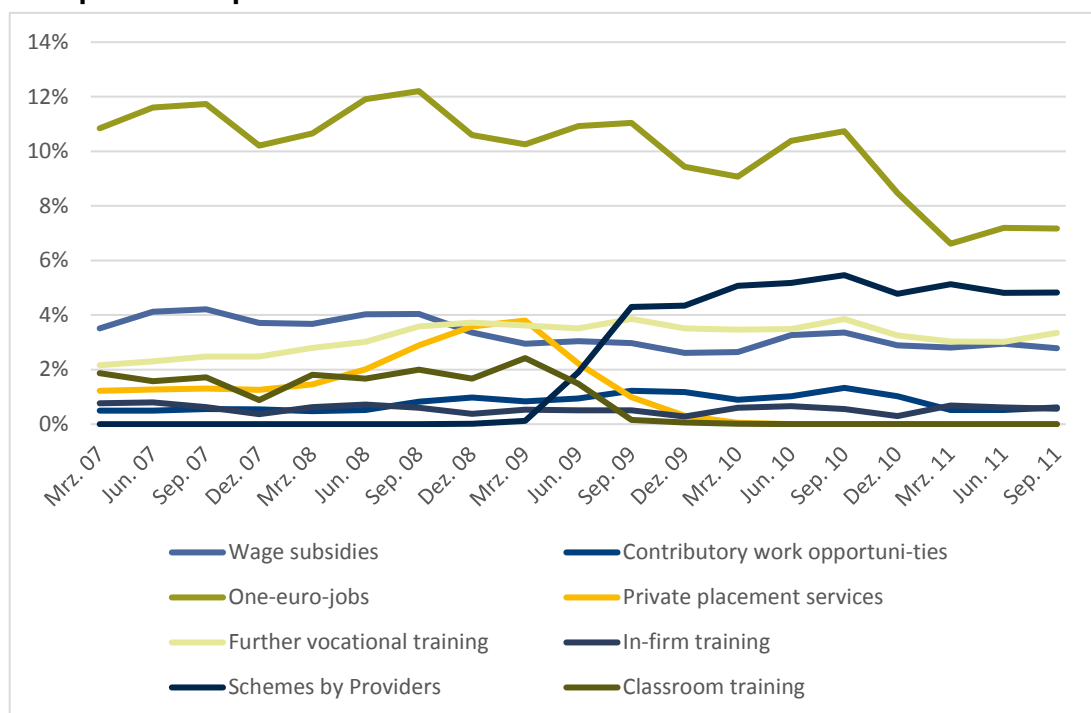
Source : IEB V12.00.00; own calculations, averages over the job centres for each quarter in our observations period.

It can be seen that there is some variation of the shares of the programme participant stock in the stock of job seekers receiving welfare payments. From the beginning of the period until the end of 2010, the average of the one-euro-jobs-share over the job centres is usually between 10 and 12 per cent. In 2011 it declined considerably to about seven per cent in the final quarter of 2011. Until the end of 2008, wage subsidies have the second highest share of around four per cent. Thereafter, two other programmes become more important: Further vocational and schemes by providers. The remaining programmes mostly have average share of less than two and sometimes even less than one per cent.

6 Results

6.1 Estimation issues

We estimate equation (2) by applying the first-step heteroscedasticity-robust version of the system generalized methods of moments (SYSGMM) estimator (Arellano/Bover 1995; Blundell/Bond 1998). This estimator takes into account the correlation between the residuals and the lagged endogenous variable by using internal instruments, i.e. lagged levels and lagged differences of the dependent variable. For the consistency of this estimator it is necessary to assume that the first-differenced error terms show no second order correlation. We test this assumption by the standard Arellano and Bond test for serial correlation. The results presented for Germany are derived by using maximum 18 lags as instruments. When estimating for regions with an unemployment rate above (below) the average the maximum number of lags that are used as instruments are 4 (7). This proceeding ensures that the ratio between the number

of overidentifying restrictions and the number of cross-sectional units is in all three estimations the same (around 0.7). When we reduce the number of instruments, the results are qualitatively and quantitatively almost the same.[9]

Including contemporaneous as well as lagged values of these shares in our equation is important. This allows us to take into account that while ALMP participation is still ongoing, lock-in effects might dominate, whereas after participation improvements of the former participants' search effectiveness might influence our outcome.

The determination of the number of lags for each programme is conducted by sequential F-tests. The maximum number of lags that is allowed is four, i.e. one year. The inclusion of lagged variables (dependent and independent) means that the long-term effects will differ from the short-term ones. The calculation formula for the long-term effects is analogous to the autoregressive distributed lag models (see Greene 2008: 684). The respective standard errors are calculated by the delta method. As we think the long-term effects are of more political relevance, we only present these effects (see Table 3).

6.2 Results

Table 3 shows the estimation results for Germany as a whole as well as for high and low unemployment regions.[10] For Germany as a whole (column 1), significant effects are found for one-euro-jobs, wage subsidies, in-firm training as well as further vocational training. In the case of one-euro-jobs these are negative. Hence, an increase in the regional shares of participants in this programme reduces the number of matches in the region. An increase in the share of welfare recipients allocated to one-euro-jobs of 0.01 or one percentage point with respect to all job seekers (receiving welfare benefits) in the region, leads to a reduction of (unsubsidised) matches by welfare recipients of 1.2 per cent. This does not imply that an increase of 100 people in the one-euro-job stock leads to a reduction of the number of matches by more than 100. In a job centre there are on average roughly 650 people in one-euro-jobs and 440 matches every quarter. In this case, an increase of 68 participants leads to roughly 5 fewer matches. As micro-evaluation studies for one-euro-jobs show that this programme first leads to lock-in-effects but in the medium-term to positive integration effects (see Hohmeyer/Wolff 2012), it is likely that negative deadweight and substitution effects also play a role on a regional level. The fact that the number of participants in this programme is very high reinforces this presumption.

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[9] Results are available upon request from the authors.

[10] The job centre Ruegen (an island in the Baltic Sea) is excluded from the regression as it is identified as an influential observation. This job centre has a highly disproportionate influence on the regression results. Results when including Ruegen are available upon request from the authors.

Unfortunately, the result of the Sargan test implies that this model is misspecified. A potential reason for this could be that the results so far are based on regression analysis for all job centres in our sample. However, the regional labour market performance in Germany is very heterogeneous. Hence, the matching process and therefore the effects of the different ALMPs could differ across regions. In this case, forcing the coefficients to be identical for all regions leads to a misspecified model and therefore to a rejection of the null hypothesis of the Sargan test. Therefore, the results for Germany as a whole are not reliable.

Table 3
Long-term effect of the share of selected ALMPs on the regional number of matches

Share of Active Labour Market Programme amongst Job Seekers	All job centres	Unemployment rate … in 2006	
		above average	below average
Scale effects	1.05***	1.23***	1.10***
Wage subsidies	1.26*	1.27	2.55***
Private placement services	-0.22	-0.15	-0.40
Contributory work opportunities, traditional job creation scheme	0.78	-0.13	2.67**
One-euro-jobs	-1.21***	-0.90***	-0.57**
Further vocational training	1.02**	1.16**	0.40
In-firm training	6.41***	14.62***	5.52***
Classroom training	-0.31	0.04	0.32
Schemes by providers	-0.17	0.41	-0.53
Sargan test (p-value)	0.01	0.66	0.46
AR1 test (p-value)	0.00	0.01	0.00
AR2 test (p-value)	0.57	0.82	0.15
Number of regions	340	142	198

* Significant at the 10 %-level; ** Significant at the 5 %-level; *** Significant at the 1 %-level

Table 3 provides selected results. The parameter estimates for all regressors are displayed in the Appendix Table A- 3.

Results are robust one-step System GMM estimates. All models include time and regional fixed effects as well as further exogenous variables. T = 19

Source: IEB v12.00.

In order to take this adequately into account, we perform separate regressions for different groups of regions. The analytical methods we use require at least roughly 100 job centres in order to obtain robust results. For this reason, we cannot, for example, run a regression only for job centres located in East Germany. Instead we differentiate between regions with a below or above average unemployment rate in 2006, respectively. Hence, we choose the year nearest to when we start counting the regional matches. This division leads to 142 job centres in the category with an above

average unemployment rate[11] and the remaining 198 job centres with an unemployment rate which was below average in 2006.

Comparing the results for Germany as a whole with those derived for the two groups of regions we see that both the returns to scale of the matching function and the estimated effects of some programmes indeed differ between regions with unemployment rates above and below the German average. For regions with an unemployment rate below average the null hypothesis of constant returns to scale could not be rejected. Analysing the two types of regions separately also changes the results of the Sargan test. The null hypothesis is no longer rejected.

Regardless of the regional labour market situation, effects of private placement services, schemes by providers as well as classroom training were found to be insignificant. In contrast, with regard to contributory work opportunities, we find pronounced regional differences. They are associated with a negative effect in regions with relatively high unemployment rates (in 2006) but with positive effects in regions with a much better labour market performance. This is an indication that in regions with a relatively poor labour market performance, the total number of jobs declines perhaps because subsidised employers perform tasks that would otherwise have been performed in (additional) unsubsidised jobs. In regions with relatively low unemployment rates, it seems more likely that firms screen employees whilst they are in contributory work opportunities and then (at least partially) hire them after programme completion and – due to high product demand and hence good labour market conditions – also hire further unsubsidised employees to perform regular tasks.[12] Another reason for this result is that these programmes are designed to raise the employability of people with considerable employment impediments; for other job seekers this type of programme is unlikely to improve their performance in the labour market and a participation may even prolong their unemployment period. In regions with an above average unemployment rate, the participant pool is less likely to be dominated by people with considerable employment impediments so that we can expect to find no or negative effects in our analysis. The opposite holds for low unemployment regions.

The reasoning that explains the results on work opportunities might also apply to general wage subsidies and explain why we find a higher positive effect of wage subsidies on the matching efficiency in low unemployment regions than in high unemployment regions, where the effect is also statistically insignificant. The result for high unemployment regions confirms that the large effects of in-firm measures like wage subsidies found in micro studies have to be interpreted with caution: They could reflect large deadweight losses and substitution effects and not genuine integration effects.

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[11] All job centres located in East Germany plus 123 in West Germany are in this category.

[12] In the regression with all West German job centres, this means including West German job centres with an unemployment rate above the German average we find no significant effect for contributory work opportunities.

With regard to one-euro-jobs, we find negative effects on the matching efficiency in low and high unemployment regions. However, the negative effects are slightly stronger in regions with a poorer labour market performance again indicating that firms may reduce the total number of jobs in the area if they can rely on subsidised employees to a larger extent. Overall these results imply that even if there are indirect positive substitution effects, these are not strong enough to compensate for the lower search intensity of the participants. The effects of one-euro-jobs could also be a sign that the implementation of the programme in the job centres is associated with substitution and crowding-out effects. If in firms, for example, some tasks are performed (at least some of the time) by programme participants which otherwise would have been performed by unsubsidised employees, then one consequence could be that regular vacancies are filled less quickly or even that fewer are posted. As this programme was used on a large scale, it was probably difficult to implement it without being accompanied by considerable substitution and crowding-out effects. Hence, the positive effects found in micro studies seem to be outweighed by negative indirect effects of non-participants.

For further vocational and in-firm training we find positive coefficients in high and low unemployment regions. The magnitude of the coefficients is larger in the high unemployment regions indicating that the labour market here benefits more from the ALMPs and are more effective in training participants for the current needs of the labour market. For further vocational training in low unemployment regions the effects are though not well determined.

The significant positive effects of further vocational training in above but not below average unemployment regions is plausible, because a relatively high unemployment rate may at least partly be the result of a relatively high skill mismatch in these regions. An increase in the share of further vocational training should increase the outflow into employment more strongly the higher the skill mismatch. For similar reasons, the need to screen applicants by in-firm training programmes may be more important in high unemployment regions if the relatively high level of unemployment is associated with more skill mismatch. The in-firm training helps companies to screen the skills and competences of the applicants. Even if the applicants do not possess the skills required for a vacancy, this screening process helps to identify whether they have the competencies to quickly acquire these skills. Micro studies come to the conclusion that both programmes help the participants to find jobs (see, for example, Wolff/Jozwiak 2007; Harrer/Moczall/Wolff 2016; Bernhard 2016). However, the positive results for the total effect in for vocational training in one region type and in-firm training in both types of regions does not imply that the number of people in these programmes should be considerably increased. It is not certain that these effects also hold for a far higher number of participants.

7   Conclusion

There is a large literature which studies the effectiveness of active labour market programmes for participants. The standard approach is to find statistical twins and then

compare the labour market performance of participants with that of "their" twins. In contrast to these studies, we are interested in whether ALMPs can improve the performance of the regional labour market as a whole. Hence, we also take indirect effects of participants on the job finding chances of other job seekers into account. The regional labour markets which we analyse are the German job centre districts from 2006 until 2011. The parameters of our matching function are estimated by a SYSGMM estimator. Our results refer to means-tested benefit recipients and hence a group of job seekers who live in a household with insufficient means to achieve the legal minimum standard of living for their members.

We estimate parameters of a matching function that models ALMPs by the share of ALMP participants among job seekers. According to the Sargan test statistic, the results for all job centres are not valid, but our results on job centres in low and high unemployment regions are. In both region types we find no well-determined effects for private placement services, schemes by providers and short term training. The insignificant effects of some programmes partly reflect that an increased employment probability of participants that were found in studies for private placement services and short classroom training as discussed in Section 3, go at the expense of other job seekers.

Negative and well-determined effects are found for one-euro-jobs. Our results for low and high unemployment regions also demonstrate that the ALMP effects can differ considerably across regions. This is plausible as for instance in low unemployment regions in contrast to high unemployment regions, the share of hard-to-place individuals among the job seekers is relatively high. In low unemployment regions, many job seekers find jobs without the support of ALMPs. Hence, in low unemployment regions, it is more likely that general wage subsidies can be concentrated on relatively disadvantaged unemployed who without this support would have considerable difficulties of finding a job. Further, in low unemployment regions, programmes for hard-to-place job seekers such as contributory work opportunities can be implemented more successfully than in regions with a high unemployment rate. That these programmes can improve the matching efficiency is confirmed by our results. At the same time, in above average unemployment regions in contrast to below average ones, we find higher effects for further vocational training and in-firm training. This is also plausible as high unemployment regions are likely to be characterised by more skill mismatch than low unemployment ones. Consequently, programmes that lead to a considerable improvement in skills of the unemployed and more opportunities to screen applicants are more important for the matching efficiency in high than in low unemployment regions. However, for wage subsidies we do not find a well determined effects in high unemployment regions. One reason for this may be that the employers bargaining position with regard to the job centres is stronger. These may be inclined to grant such subsidies sooner as they have fewer other means of placing the unemployed than job centres in low unemployment regions have. We consider these regional differences in the effectiveness of various ALMPs as important facts which policy makers should consider when planning their regional mix of their ALMPs.

Summing up, our results clearly show that ALMPs can have a positive influence on the regional labour market performance of job seekers receiving welfare recipients. This means that – at least for some ALMP – potential negative indirect effects are more than outweighed by positive direct effects. The size of such effects, however, also depends on the local labour market conditions. Contributory work opportunities seem to be more effective in low unemployment regions whilst in-firm training improves the matching efficiency in regions with relatively high unemployment rates more.

Future research could shed additional light on the issue of regional variation of the effects of ALMPs on the matching efficiency. Regions can differ considerably with respect to skill mismatch or occupational mismatch. It is plausible that ALMPs that address problems of mismatch such as further vocational training lead to higher positive effects on the matching efficiency in regions with an above rather than a below average skill or occupational mismatch. Hence, future work could address this question by computing the relevant mismatch indicators for job centre districts and estimating the effects for job centre districts that are low and high mismatch districts.

Appendix

Table A1
Descriptive statistics on the variables used in our analysis; values for job centres in Germany, 2007 QII to 2011 QIV, Low Unemployment Regions

Variable	Average per Job centre)	Minimum	Maximum	Standard-deviation
Matches	282	35	2.930	251
Number of job seekers	3,351	370	28,544	3,245
Vacancies	794	19	11,262	788
No. ALMP	721	65	6,756	687
Wage subsidies	102	2	901	89
Contributory work opportunities, traditional job creation scheme	16	0	437	32
One-euro-jobs	293	0	2,346	288
Private placement services	52	0	3,822	196
Further vocational training	96	0	1,416	115
In-firm training	18	0	123	17
Classroom training	86	0	3,583	210
Schemes by providers	30	0	441	51
Employment growth relative to moving yearly average	1.01	0.97	1.05	0.01
Employment growth relative to same quarter in previous year (in %)	1.74	-5.83	11.35	2.04
Share of job seekers receiving unemployment insurance	0.03	0.01	0.08	0.01
Age of the job seekers	40.95	38.16	45.39	1.01
Share of single parents amongst job seekers	0.12	0.07	0.21	0.02
Share of males amongst job seekers	0.52	0.41	0.59	0.03
Share of severely disabled amongst job seekers	0.05	0.03	0.13	0.02
Share of Germans amongst job seekers	0.82	0.58	0.97	0.08
Share with vocational training degree amongst job seekers	0.42	0.24	0.63	0.06
Share with tertiary education degree amongst job seekers	0.03	0.01	0.12	0.02
Share with lower secondary education degree amongst job seekers	0.54	0.35	0.72	0.07
Share with higher secondary education degree amongst job seekers	0.15	0.08	0.26	0.03
Share with university-entrance diploma amongst job seekers	0.08	0.02	0.27	0.04
Share of females amongst all employees	0.44	0.29	0.57	0.04

Variable	Average per Job centre[a]	Minimum	Maximum	Standard-deviation
Share of skilled and high-skilled amongst all employees	0.68	0.47	0.82	0.05
Share of employees in primary sector	0.01	0.00	0.04	0.01
Share of employees in secondary sector	0.39	0.09	0.71	0.11
Share of employees in technical occupations	0.07	0.02	0.16	0.02
Share of employees in service sector	0.59	0.30	0.80	0.07
Share of employees in primary occupations	0.01	0.00	0.04	0.01
Share of employees in short-time work (Kurzarbeit)	0.02	0.00	0.21	0.03

a) not weighted

Source: IEB V12.00.00; own calculations

Table A2

Descriptive statistics on the variables used in our analysis; values for job centres in Germany, 2007 QII to 2011 QIV, High Unemployment Regions

Variable	Average per Job centre⁾	Minimum	Maximum	Standard-deviation
Matches	665	54	16,865	1,174
Number of job seekers	11,107	976	250,534	20,673
Vacancies	1,127	61	23,186	1,961
No. ALMP	2,694	141	70,366	5,175
Wage subsidies	300	11	5,471	421
Contributory work opportunities, traditional job creation scheme	173	0	13,151	678
One-euro-jobs	1,142	22	33,201	2,299
Private placement services	138	0	9,978	455
Further vocational training	396	2	12,375	934
In-firm training	51	0	1,530	85
Classroom training	245	0	7,638	596
Schemes by providers	75	0	3,673	182
Employment growth relative to moving yearly average	1.01	0.96	1.05	0.01
Employment growth relative to same quarter in previous year (in %)	1.25	-7.73	7.98	2.05
Share of job seekers receiving unemployment insurance	0.03	0.01	0.08	0.01
Age of the job seekers	40.75	38.50	44.13	1.04
Share of single parents amongst job seekers	0.09	0.05	0.16	0.01
Share of males amongst job seekers	0.54	0.47	0.61	0.02
Share of severely disabled amongst job seekers	0.04	0.02	0.10	0.01
Share of Germans amongst job seekers	0.89	0.51	0.99	0.11
Share with vocational training degree amongst job seekers	0.56	0.18	0.88	0.19
Share with tertiary education degree amongst job seekers	0.03	0.01	0.09	0.02
Share with lower secondary education degree amongst job seekers	0.42	0.25	0.62	0.08
Share with higher secondary education degree amongst job seekers	0.32	0.07	0.54	0.15
Share with university-entrance diploma amongst job seekers	0.07	0.02	0.18	0.04
Share of females amongst all employees	0.47	0.28	0.58	0.04
Share of skilled and high-skilled amongst all employees	0.71	0.47	0.83	0.07
Share of employees in primary sector	0.02	0.00	0.07	0.02

Variable	Average per Job centre[a]	Minimum	Maximum	Standard-deviation
Share of employees in secondary sector	0.30	0.07	0.61	0.09
Share of employees in technical occupations	0.06	0.02	0.15	0.02
Share of employees in service sector	0.63	0.42	0.81	0.07
Share of employees in primary occupations	0.02	0.00	0.09	0.02
Share of employees in short-time work (Kurzarbeit)	0.01	0.00	0.14	0.02

a) not weighted

Source: IEB V12.00.00; own calculations

Table A3
Full Estimation Results

Variable	All job centres	Unemployment rate … in 2006	
		above average	below average
Lagged no. of log matches	0.143*** (0.020)	0.122*** (0.033)	0.085*** (0.029)
Log no. of job-seekers	0.771*** (0.039)	0.958*** (0.077)	0.902*** (0.055)
Log no. of vacancies	0.132*** (0.016)	0.123*** (0.024)	0.100*** (0.020)
Log no. of job-seekers x recession dummy	0.035*** (0.009)	0.027* (0.016)	0.036** (0.015)
Log no. of vacancies x recession dummy	-0.014 (0.010)	0.000 (0.013)	-0.008 (0.015)
Wage subsidies			
Lag 0	0.497 (0.431)	0.213 (0.773)	0.609 (0.501)
Lag 1	1.007** (0.473)	0.0812 (0.895)	1.322*** (0.499)
Lag 2	-0.354 (0.470)	-0.935 (1.017)	-0.032 (0.516)
Lag 3	2.364*** (0.507)	6.828*** (1.128)	1.511*** (0.523)
Lag 4	-2.435*** (0.515)	-5.073*** (0.930)	-1.081** (0.549)
Contributory work opportunities, traditional job creation scheme			
Lag 0	0.380 (0.328)	0.459 (0.345)	0.958 (0.987)
Lag 1	-0.437 (0.271)	-0.575** (0.283)	0.111 (0.744)
Lag 2	0.723** (0.310)		1.372* (0.816)
Lag 3			
One-euro-jobs			
Lag 0	-0.462*** (0.127)	-0.382** (0.148)	-0.524*** (0.190)
Lag 1	-0.232** (0.118)	-0.207 (0.146)	
Lag 2	-0.075 (0.109)	-0.201 (0.127)	
Lag 3	-0.271** (0.118)		
Private placement services			
Lag 0	0.240 (0.189)	0.258 (0.253)	0.250 (0.234)
Lag 1	-0.190 (0.193)	-0.391* (0.217)	-0.193 (0.251)
Lag 2	0.070 (0.197)		0.006 (0.227)
Lag 3	0.019 (0.146)		0.089 (0.195)
Lag 4	-0.328*** (0.104)		-0.522*** (0.1286)
Further vocational training			
Lag 0	0.101 (0.231)	0.196 (0.402)	-0.117 (0.250)
Lag 1	0.551**	0.089	0.610**

Variable	All job centres	Unemployment rate … in 2006	
		above average	below average
Lag 2	(0.216)	(0.353)	(0.244)
	-0.389*	0.730**	-0.723***
Lag 3	(0.221)	(0.344)	(0.260)
	0.609***		0.598**
	(0.237)		(0.286)
In-firm training			
Lag 0	5.500***	6.507***	5.050***
	(1.050)	(1.883)	(1.300)
Lag 1		1.268	
		(1.771)	
Lag 2		0.714	
		(1.458)	
Lag 3		4.347***	
		(1.563)	
Classroom training			
Lag 0	-0.270	0.033	-0.260
	(0.295)	(0.454)	(0.341)
Lag 1			0.096
			(0.274)
Lag 2			0.458*
			(0.260)
Schemes by providers			
Lag 0	0.159	0.359	0.023
	(0.158)	(0.259)	(0.189)
Lag 1	-0.304**		-0.509**
	(0.149)		(0.222)
Employment growth relative to moving yearly average	-4.199***	-3.553***	-4.162***
	(0.609)	(0.763)	(1.044)
Employment growth relative to same quarter in previous year (in %)	0.007***	-0.004	0.012***
	(0.002)	(0.003)	(0.003)
Share of job seekers receiving unemployment insurance	3.440***	6.814***	3.414***
	(0.732)	(1.393)	(0.802)
Age of the job seekers	-0.075***	-0.101***	-0.065***
	(0.011)	(0.018)	(0.012)
Share of single parents amongst job seekers	-0.652	-1.696**	-0.652
	(0.424)	(0.767)	(0.477)
Share of males amongst job seekers	1.117***	0.279	1.216***
	(0.361)	(0.761)	(0.404)
Share of severely disabled amongst job seekers	-1.473*	-1.078	-1.532*
	(0.765)	(1.795)	(0.799)
Share of Germans amongst job seekers	-1.007***	1.170	-1.390***
	(0.381)	(0.993)	(0.411)
Share with vocational training degree amongst job seekers	2.089***	1.320**	2.344***
	(0.297)	(0.597)	(0.383)
Share with tertiary education degree amongst job seekers	0.990	4.434**	3.202**
	(1.200)	(1.990)	(1.274)
Share with lower secondary education degree amongst job seekers	1.257***	2.585***	1.001**
	(0.455)	(0.876)	(0.482)
Share with higher secondary education degree amongst job seekers	-0.884*	-0.534	0.404
	(0.516)	(0.944)	(0.693)
Share with university-entrance diploma amongst job seekers	-0.616	-3.266**	-0.975
	(0.863)	(1.473)	(0.943)
Share of females amongst all employees	-4.013***	-1.530	0.349
	(1.152)	(1.611)	(1.526)

Variable	All job centres	Unemployment rate … in 2006	
		above average	below average
Share of skilled and high-skilled amongst all employees	0.102 (0.270)	-0.182 (0.450)	0.749* (0.454)
Share of employees in primary sector	0.036 (3.714)	-2.510 (4.600)	-0.555 (5.690)
Share of employees in second-ary sector	0.605 (0.534)	1.181* (0.700)	0.701 (0.742)
Share of employees in tech-nical occupations	-2.185** (1.116)	-1.871 (1.551)	-3.058** (1.338)
Share of employees in service sector	0.969 (0.620)	2.025*** (0.732)	0.452 (0.893)
Share of employees in primary occupations	0.205 (3.568)	-0.953 (4.343)	2.308 (5.176)
Share of employees in short-time work (Kurzarbeit)	-1.554*** (0.284)	-1.449** (0.568)	-0.749*** (0.270)

Note: Results are robust, one-step system GMM estimates. The standard errors are in parentheses. *** Significant at the 1%-level; ** Significant at the 5%-level; * Significant at the 10%-level. All models also include time and reginal fixed effects as well as 33 interaction effect of seasonal dummies and region type.

Source: IEB v12.00.

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