The Return to Labor Market Mobility: An Evaluation of Relocation Assistance for the Unemployed

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Abstract

Supporting regional mobility among the unemployed might be an effective instrument to reduce unemployment in depressed regions and eliminate the shortage of labor in prosperity areas. Using German administrative data, we investigate the impact of a mobility program for unemployed individuals on labor market prospects of participants. The program —relocation assistance— provides a subsidy for unemployed job seekers that covers the costs associated with a permanent or temporary move within Germany in order to find a job. To take endogenous selection into account, we use an instrumental variable approach to estimate causal treatment effects. The estimates show very promising results with respect to subsequent job characteristics. Participants receive higher wages and end up more stable jobs.

Keywords: Evaluation, Active Labor Market Policy, Labor Market Mobility, Instrumental Variable Approach
JEL codes: J61, J68, D04, C26

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1 Introduction

Many European countries face high regional disparities in terms of unemployment rates. For instance, in 2012 the regional unemployment rate varied between 2.2% and 14.7% across Germany. Besides differences in real wages and labor productivity across regions, regional disparities in unemployment rates can be particularly attributed to regional labor market tightness and a mismatch of vacancies and skills on a regional level (Taylor and Bradley, 1997; Giannetti, 2002). In the previous literature labor mobility is often seen as one of the most efficient adjustment mechanisms to macroeconomic shocks (Blanchard, Katz, Hall, and Eichengreen, 1992; Borjas, 2006). Given existing regional disparities in terms of unemployment rates within many European countries, it is very surprising that labor market mobility among unemployed job seekers is very low compared to the US, Canada or Australia (e.g. Puhani, 2001; Decressin and Fatás, 1995). Supporting regional mobility among the unemployed might therefore be an effective instrument to reduce unemployment in depressed regions and eliminate the shortage of labor in prosperity areas. Marinescu and Rathelot (2013) estimates that the US unemployment rate could be reduced by up to 3% when reallocating job-seekers among regions. The main idea is to encourage unemployed job seekers who are not able to find a job locally to search/move in/to distant regions. One possible policy is to offer unemployed individuals a subsidy which would cover the costs associated with a permanent or temporary move of the place of residence.

Following the model by Rogers (1997) which extends the classical job search model by Mortensen (1986) with respect to the search radius of job seekers, such a subsidy is expected to impact both the job search behavior and subsequent job characteristics of unemployed individuals. First of all, the subsidy would directly reduce the costs of moving which is expected to decrease job seeker's reservation wage —for distant jobs— and also increase its search radius. The increase in the search radius will raise the job offer arrival rate which is expected to raise reservation wages. Job seekers become more picky as a result of increased job offers. Therefore, it remains ambiguous which effect dominates, so that the impact on the job finding probability of such a subsidy can not be determined theoretically. However, the expectations are much more clear with respect to subsequent job characteristics of subsidy recipients. Unemployed job seekers are expected to move —if at all—to regions which shows the highest returns to their skills in terms of wages (Borjas, Bronars, and Trejo, 1992) and employment probabilities (Arntz, Gregory, and Lehmer, 2011).[1] This will impact recipient's

[1] In practice, these are expected to be areas characterized by better overall economic conditions compared

labor market outcomes in terms of prospective employment stability and wage level positively. Beside that, searching nationwide for a new employment is generally expected to increase the quality of the job match.

However, to improve the effectiveness of such a program empirically evidence on the actual effect of the moving subsidy is necessary. We use German administrative data and consider a relocation assistance program for unemployed individuals. This program is part of the German active labor market policy (ALMP) and provides unemployed job seekers a monetary subsidy to cover the costs associated with a permanent or temporary move in order to find employment. Germany is a good example to study such a policy as its labor market is characterized by high regional disparities in terms of unemployment rates and wage levels (e.g. Lehmer and Ludsteck, 2011) while —until now— the inter-regional mobility among unemployed workers is rather low. For instance, 68.5% of the prime-age population in Germany still lived in the same federal state in 2008 as where they have grown up (Source: European Value Survey, own calculations). Moreover, Bonin, Eichhorst, Florman, Hansen, Skiöld, Stuhler, Tatsiramos, Thomasen, and Zimmermann (2008) report that the share of the population that has moved their place residence within Germany (compared to the year before) is relatively low and constant at about 1.3% within the period 1995-2006.

Considering a random inflow sample into unemployment in 2005 and 2006, descriptive statistics confirm the theoretical expectations. Recipients of the relocation assistance move predominately to regions characterized by lower unemployment and higher vacancy rates compared to their current place of residence. Moreover, they face slightly higher employment probabilities in the future, less job changes and higher wages than non-participants. However, these gaps are likely to be biased as participation in the program, and hence the moving decision, is likely to be correlated with observed and unobserved individual characteristics. In order to control for such differences between participants and non-participants and hence to estimate causal treatment effects, we adopt an instrumental variable approach. In fact, we use the treatment intensity of mobility programs within each local employment agency (LEA) district as an instrument for the treatment participation.[2] The local treatment intensity is defined as the ratio of total entries into mobility assistance programs and the stock of unemployed in each agency district. As each LEA receives a yearly fixed budget for ALMP programs (based on the local labor market conditions) and decides at the beginning of each year which share of this budget to spend on which ALMP program, i.e., each agency creates

to their current place of residence.

[2]During the investigated period, in Germany there exist 178 LEA districts in total.

an agency-specific policy mix, the instrument is expected to represent the preference of the LEA towards mobility assistance programs. The idea is that unemployed individuals living in a LEA district characterized by a high treatment intensity face a higher probability to 1) receive knowledge about the existence of the subsidy and 2) that the agency will approve an application for subsidy receipt. As the unemployed individual has no influence on the agency-specific policy mix, the instrument is expected to generate exogenous variation in the treatment participation.

The IV estimation results confirms our expectations that the treatment causes significantly higher wages and more stable jobs in the future, while local average treatment effects, on job-seekers who are affected by the LEA's policy, are even larger than the observed differences. Further analysis show that only a minor part of the treatment effects can be assigned to the migration into superior labor markets. The effect heterogeneity shows that participants with higher moving costs, i.e. with strong family obligations, claim larger wage premiums, whereas the causal treatment is lower than for single individuals without children.

The paper is structured as follows. The next section provides details on the program and summarizes results of related studies. Section 3 describes the data, the definition of treatment and control group, and presents descriptive statistics. Section 4 discusses the identification and estimation strategy. Finally, Section 5 presents the results and Section 6 concludes.

2 Institutional Settings and Related Literature

2.1 Mobility Assistance in Germany and the Program Under Scrutiny

Programs designed to encourage the inter-regional labor mobility among unemployed job seekers have been introduced in 1998 in Germany, whereby the use of these programs increased dramatically with the implementation of the major labor market reform in Germany between 2003 and 2005, the so-called "Hartz-Reform". In its current version, the mobility programs offer unemployed job seekers who are willing to move locally in order to find employment a wide range of support, starting from simple reimbursement of travel expenses for distant job interviews up to financial support of commuting costs or full coverage of transportation costs.

In this study, we focus on one particular mobility assistance program, i.e., the relocation assistance, as we are interested in the effect of taking up employment in a distant labor market on employment prospects of job seekers. The relocation assistance program provides

financial support for the costs associated with a permanent or temporary move in order to find employment. In general, all unemployed job seekers who are not able to find a job locally but in a distant region are eligible to the program. Thereby, it is required that the daily commuting time from the current location to the location of the new job would exceed 2.5 hours.[3]

The unemployed job seeker who found a job in a distant region faces two options. First, he/she can move permanently to the new location or second, leaves his/her current place of residence unchanged and just living during the working week at the new location. This second option is called double housekeeping as it requires the job seeker to rent a second accommodation at the new location. The program provides financial support for both options. The double housekeeping is supported by a payment of up to €260/month for a maximum of the first six months after the new job has been started. In case that job seekers decide to move permanently to the new location, the program provides full coverage of the transportation costs (with a maximum of €4,500).[4] The permanent relocation has to occur within a time window of two years after the new distant job has been started. The average costs for both types of relocation assistance in 2006 were about €1,177. Job seekers are not eligible to the subsidy when the employer provides accommodation. The application for the subsidy has to be submitted —together with the employment contract— to the LEA before the move takes place. The final decision about the permission of the relocation assistance is taken by the caseworker based on the individual labor market situation of the applicant and the available budget of the local employment agency for mobility assistance programs.

[Insert Table 1 about here]

Table 1 shows the number of entries into unemployment and different ALMP programs in Germany within the considered observation window in the empirical analysis. Besides the number of all entries into mobility assistance programs, we separately show the number of recipients for the program under scrutiny. It can be seen that the relocation assistance is a relatively small programm compared to other ALMP programs like vocational training or wage subsidies. Less than 1% of total entries into unemployment receive a relocation assistance at all.

[3] In case that the daily commuting time is less than 2.5 hours, the individuals might be eligible to another mobility assistance program. For instance, the commuting assistance pays a subsidy of 20 Eurocent per kilometer for the first six months in the new job.

[4] The applicant has to provide three cost estimates by professional removalists to the LEA. The most cost-efficient offer will be chosen. The subsidy is paid directly to the removalists. Alternatively, the agency can also reimburse the costs for a rental car.

2.2 Regional Mobility in Germany and Evidence on Similar Programs

Considering the German labor market, regional mobility became more important over the last 20 years, especially in the light of the German reunification in 1990. Given the large economic differences between East and West Germany, the German labor market provides remarkable adjustment potential (e.g von Hagen, 2000). Therefore, the majority of empirical work on regional mobility in Germany focuses on the transition between East and West Germany. For example, Burda (1993) investigates the determinants of East-West migration directly after the reunification. He shows that early migrants tend to be younger than those who stay and short-term wage increases in East Germany do not affect the migration decision. In contrast to this, in a more recent study Hunt (2006) finds that wage increases in the East within the first years after reunification, prohibited even higher migration rates from East to West Germany. Fuchs-Schündeln and Schündeln (2009) show that the East-West migration increases over time, which is likely to be explained by declining expectations about the convergence of Eastern and Western Germany. As expected, being younger, having no family commitments and a higher educational level increases the probability of migration. With respect to unobserved characteristics, Brücker and Trübswetter (2007) find that migrants from East to West are positively selected. Arntz, Gregory, and Lehmer (2011) models the migration decision based wages and employment prospects. Therefore, mean differentials in wages and employment are likely to increase the average skill level of migrants. Their empirical results suggest a lower skill level of East-West migrants relative to West-East migrants that may partially be attributed to poorer employment prospects of unskilled workers in Eastern Germany.

Beyond the East-West migration, some studies examine the regional mobility on a more detailed level. Peukert and Smolny (2011) show that migrants are in general younger and better educated, while high-skilled migrants are likely to select themselves into the prosperity areas in the South and avoid poorer regions in the North of Germany. Within a competing risk-framework, Arntz (2005) shows that unemployed job seekers in Germany put more effort towards job search in distant regions given an unfavorable labor demand situation in the local labor market. This effect seems to be more distinctive for men and high-skilled workers, and increases with the unemployment duration. Lehmer and Ludsteck (2011) show that positive returns to regional mobility are more pronounced for younger workers and workers who originally live in rural areas.

The empirical evidence on similar mobility programs are very scarce. However, existing

studies indicate positive support for the returns of mobility assistance on labor market outcomes. For instance, Briggs and Kuhn (2008) analyze the Relocation Assistance Program (RAP) in Kentucky (U.S.) as introduced in May 1998. The program pays a lump sum subsidy of up to $900 to households of welfare recipients given that they accept a full-time job offer that is at least 10 miles away from their current place of residence. Using IV estimation, the authors find a positive and significant effect on both employment and unconditional earnings. However, the results are mixed with respect to the earnings conditional on being employed. A second example in the U.S. would be the Moving to Opportunity (MTO) program as introduced in 1994 by the U.S. Department of Housing and Urban Development in five metropolitan areas, i.e., Baltimore, Boston, Chicago, Los Angeles and New York City. The program was implemented as a randomized experiment, where housing vouchers were offered to low-income families in order to move to better neighborhoods. The aim was to improve their health status, educational opportunities and labor market outcomes. Several studies (e.g. Katz, Kling, and Liebman, 2001; Kling, Liebman, and Katz, 2007; Ludwig and Kling, 2007) investigate the effectiveness of this program and find that the MTO program successfully relocated these families to better neighborhoods and partly improved their health status, while there is no significant effect with respect to educational or labor market outcomes. An earlier study by Mueller (1981) finds the U.S. Job Search and Relocation Assistance from 1976 to have a positive effect on the labor market performance of participants. Within this program, unemployed individuals who showed a high willingness to relocate were offered different types of job search assistance and financial support for the relocation. Participants end up with better employment prospects and higher wages.

With respect to Europe, Rodríguez-Planas and Benus (2010) investigate the effectiveness of employment and relocation services for unemployed individuals in Romania, which reimburses expenses associated with moving to another community. They find that the program has a positive and significant impact on the employment probability and earnings level of participants. Westerlund (1998) investigates the effect of mobility grants in Sweden on the internal migration without finding any significant effects of varying grants. However, the migratory behavior of the unemployed responds to changes in the regional labor market conditions.

3 Data, Treatment and Descriptive Statistics

3.1 Data

This study uses the IAB/IZA Evaluation Dataset which is based on the *Integrated Employment Biographies* (IEB) as provided by the Institute for Employment Research (IAB) and consists of a random sample of unemployment entries between 2001 and 2008.[5] As we can see in Table 2, the data contain 918,906 individuals in total. The IEB are administrative data and consist of different sources, e.g., employment history, benefit recipient history, training participant history and job search history and therefore contains detailed information on employment subject to social security contributions, unemployment and participation in active labor market policy including wages and transfer payments. The data additionally include a broad range of socio-economic characteristic including education, family status and health restrictions. The data do not contain information about the working hours and periods in self-employment, working as a civil servant, or spent in inactivity.

[Insert Table 2 about here]

To construct the estimation sample, we draw a random sample of entries into unemployment[6] in 2005 and 2006 out of this dataset whereby the selected individuals must have been employed for at least three months before entering unemployment and must have remained unemployed for at least two weeks. Table 2 shows that this applies to 178,555 individuals in total. We consider entries in 2005 and 2006 in order to have a sufficiently large observation window after entry into unemployment available in order to construct long-term outcomes. The data in its current version end in December 2010 so that we have a total observation window of 48 months. Finally, we focus on prime-age individuals only, i.e., aged between 25 and 55 years at entry into unemployment.

3.2 Definition of the Treatment Group

In our estimation setting, every individual starts as being unemployed at t_0 (see Figure 1). As the treatment requires a transition from unemployment to employment, we only consider

[5] This study is based on a weakly anonymized sample of the Integrated Employment Biographies by the IAB (V.901). The data can be accessed at the Research Data Center of the Federal Employment Agency at the Institute for Employment Research (FDZ). For a detailed description of this dataset see Caliendo, Falk, Kaiser, Schneider, Uhlendorff, van den Berg, and Zimmermann (2011).

[6] We define unemployment as being registered as unemployed at the Federal Employment Agency with or without benefit receipt including participation in ALMP.

individuals who find full-time non-subsidized employment within a period of 24 months after entry into unemployment, i.e., t_0 until t_{24}.[7] Excluding individuals who do not find employment within this time window reduces the impact of unobserved heterogeneity that might influence the selection into treatment and employment simultaneously. Full-time non-subsidized employment is defined as employment subject to social security contributions (excluding public employment schemes) with a monthly income of more than €600. The income condition is required to ensure full-time employment as we do not observe working time in our data. Finally, we also excluded job-seekers whose initial unemployment spell is interrupted by missing information lasting more than one month. In total, we observe 83,194 individuals who fulfill these restrictions (see Table 2).

[Insert Figure 1 about here]

Based on this sample, we need to identify treated individuals, i.e., those who received a relocation assistance related to the observed transition to employment. However, due to data restrictions we only observe the exact date at which an individual received the subsidy but we do not have an identifier available that would allow us to unambiguously merge the subsidy payment to a specific transition. Therefore, we have to make the following assumptions in order to define the treatment group: First, the subsidy payment has to take place within a time window of six months before and after the transition to employment (as indicated by the shadowed area around t_{ue} in Figure 1).[8] Second, as the subsidy payment requires the take up of a distant job, we only keep treated individuals with a change in their residential location, i.e., the place where they initially registered as unemployed must differ from the working location of the new job. As expected and visible in Table 2, this applies only to a few individuals. The control group contains all individuals with a transition to employment but without a receipt of relocation assistance. In addition, we excluded control individuals who participate in other mobility programs to avoid any influence arising from the similarity with the program under scrutiny. Moreover, the decision to participate in other mobility programs is also determined by our instrumental variable as described in the next section. The instrument drives the participation in relocation assistance and other mobility programs simultaneously. Therefore, the inclusion of recipients of other types of mobility assistance in the sample of non-participants, would violates the monotonicity assumption and reduces the

[7] The transition period is arbitrarily chosen. We decided to use 24 months as within this interval 98% of all transitions take place.

[8] We tested different time windows and six months appeared to be the most appropriate in terms of a trade-off between bias reduction and size of the treatment group.

power of the instrument to disentangle treated and non-treated individuals. Additionally, due the correlation between the participation in other programs and the labor market outcomes the inclusion would also harm the exogeneity assumption.

Finally, we randomly exclude one entry for individuals who entered unemployment in both years, 2005 and 2006. Table 2 shows that our estimation sample consists of 52,057 individuals in total, where 917 are defined as participants in relocation assistance and 51,140 are non-participants. The low participation rate in our estimation sample corresponds to the overall low participation rate in relocation assistance as shown in Table 1. Labor market mobility among the unemployed is low in Germany resulting in a very low participation rate in relocation assistance.

3.3 Labor Market Outcomes and Observed Characteristics by Treatment Status

To answer the research question whether participation in relocation assistance has an impact on the labor market performance, we consider four outcome variables (see also Figure 1): the initial wage in the first job after the transition to regular employment (measured at t_{ue+1}), the number of job quits and average monthly working income within the first 24 months after the initial transition to employment (t_{ue+1} until t_{ue+24}), and the long-term employment probability measured 24 months after the transition to regular employment (t_{ue+24}).

Table 3 shows the realization of the outcome variables in our estimation sample separated by treatment status. The descriptive statistics suggest that participants remain longer unemployed than non-participants (5.61 vs. 6.71 months). To illustrate the exact timing of the individual transitions, Figure 2 additionally shows the survival and hazard functions for the transition from unemployment to employment. It can be seen that non-participants face a higher probability to leave unemployment in particular in the beginning of the unemployment spell which explains the shorter average unemployment duration of non-participants. The longer unemployment duration among participants might be explained by higher reservation wages due to an increased job offer arrival rate and due to a time-intensive preparation period of the relocation (finding a new apartment etc.). With respect to subsequent job characteristics, it can be seen that participants receive higher daily wages in the new job (€ 76.42 vs. € 60.79) and also later on (€ 81.24 vs. € 63.16 within t_{ue+1} until t_{ue+24}), have more stable job (0.62 vs. 0.92 job quits) and have a higher long-term employment probability in t_{ue+24}

(79% vs. 74%).

In addition to the outcome variables, Table 3 shows selected individual and regional characteristics. With respect to regional characteristics, it can be seen that —as expected— individuals move predominately to areas characterized by better economic conditions, i.e., lower unemployment rates and higher vacancy rates, or from East to West Germany. Moreover, it can be seen that only a minority of non-participants takes up a distant job. The average distance to the new working place is in general about six times larger for participants. Furthermore, it can be clearly seen that individuals predominately move to urban areas.

[Insert Table 3 and Figure 2 about here]

With respect to the individual characteristics, Table 3 shows that participants are more likely to be female (36% vs. 33%), younger (36.56 years vs. 38.60 years) and better educated (e.g. 44% vs. 11% with upper secondary education, 30% vs. 9% with an university degree) than non-participants. Participants also tend to be more flexible as they are less likely to being married and having children which reduces the non-monetary costs of taking up a distant job. Moreover, higher shares of participants worked in service occupations before entering unemployment, received a substantially higher daily wage (€64.87 vs. €55.85) and have more employment experience in the past. Moreover, participants exhibit a higher regional mobility in the past, on average 43% of their previous jobs in the last 5 years were in different municipalities than their place of residence, (while this is only 27% for the non-participants), and are also more likely to already participate in mobility programs in the past (23% vs 5%).[9] In total, the descriptive statistics suggest that particularly individuals with rather positive labor market characteristics and performance in the past select into the program. Therefore, it is important to control for both observed and unobserved characteristics when estimating causal program effects. We will do this by implementing an instrumental variable approach which will be explained in the following section.

[9]This is of special interest since, as discussed later on, the knowledge about the treatment is the main channel to identify the treatment effect. Controlling for previous participation rules out (at least to some extend) that endogenous selection into the treatment in the past determines the actual participation and may bias our estimation results.

4 Estimation Strategy

4.1 Identification Using an Instrumental Variable Approach

We analyze the effect of relocation assistance using the Roy-Rubin model (Roy, 1951; Rubin, 1974) for two potential outcomes Y_{0i} and Y_{1i} (see Amemiya, 1985; Heckman, 2001). Let Y_{1i} denote the outcome in the treated and Y_{0i} in the untreated state, where the dummy variable D_i indicates the receipt of the treatment, in our case the relocation assistance. The observed outcome for each individual i is given by a linear combination of treated and non-treated outcomes: $Y_i = D_i Y_{1i} + (1 - D_i) Y_{0i}$. This linear equation illustrates the so-called fundamental evaluation problem, stating that the outcome is for the same individual either observable in a treated or non-treated state, but never both. Given that we are interested in the average treatment effect on the treated (ATT), which is defined as $E[Y_1 - Y_0|D = 1]$, we therefore have to estimate a counterfactual outcome for the treated individuals. However, using simply the average outcome of non-treated individuals as an estimate of the counterfactual outcome will in general not provide the causal treatment effect:

$$\begin{aligned} E[Y_1|D=1] - E[Y_0|D=0] &= E[Y_1|D=1] - E[Y_0|D=1] + E[Y_0|D=1] - E[Y_0|D=0] \\ &= E[Y_1 - Y_0|D=1] + E[Y_0|D=1] - E[Y_0|D=0] \\ &= \text{ATT} + E[Y_0|D=1] - E[Y_0|D=0]. \end{aligned} \tag{1}$$

In this case, the real ATT will be only identified given that $E[Y_0|D = 1] = E[Y_0|D = 0]$, which means that the non-treated outcome is independent of the treatment decision. This assumption is very unlikely to hold using non-experimental data as individuals usually self-select into the treatment based on observable and unobservable characteristics.

Given that the selection process into treatment would be based on observable characteristics only, the treatment effect could be estimated using ordinary least squares (OLS) and would yield consistent estimates of the ATT. However, the OLS estimates would be biased if the selection process is also based on unobservable characteristics that are correlated with the outcome variable. This is likely to be the case in our setting, as the decision to participate in relocation assistance and thus to move to a distant region is likely to be influenced by unobserved factors (e.g. personality or motivation by the unemployed, considerations by the caseworker). In order to estimate unbiased results, we therefore apply an instrumental variable approach which controls for observed and unobserved characteristics that influence the selection process into treatment. We assume that the vector Z_i contains only elements, i.e., the instrument, that effects the treatment decision D_i but not the outcome of interest Y_i. There is a variety of applied studies using the instrumental variable approach to identify

causal treatment effects (e.g. Heckman and Robb, 1985; Imbens and Angrist, 1994; Heckman and Vytlacil, 1999). Following Imbens and Angrist (1994) a valid instrument has to fulfill the following conditions:

(i). *Independence:* For all elements W in the support of Z, the triple $(Y_{0i}, Y_{1i}, P_i(W))$ is jointly independent of Z_i. The instrumental variable is not allowed to have any effect on the outcome variable Y_i other than trough the effect on the treatment probability $P_i(W)$.

(ii). *Relevance:* The treatment probability $P_i(W) = Pr(D_i = 1|Z_i = W)$ is a nontrivial function of W. So, the instrumental variable creates exogenous variation with respect to the probability of receiving the treatment.

(iii). *Monotonicity.* For all $Z_i, W_i \in \mathfrak{R}$, where $\mathfrak{R}$ denotes the support of Z, either $P_i(Z) \geq P_i(W)$ for all i, or $P_i(Z) \leq P_i(W)$ for all i. This ensures the no sign reversal property.

Assumption (i) guarantees that the instrument is independent of the outcomes, i.e., the error term V_i is uncorrelated with the instrumental variable. Assumption (ii) ensures that the instrument exogenously determines the treatment decision and assumption (iii) guarantees that the sign of the treatment effect is identified.

4.2 Treatment Intensity as an Instrumental Variable

Using an instrumental variable approach to estimate causal treatment effect, the researcher usually faces the difficulty to find a valid instrument that fulfills the three conditions (*i*) to (*iii*). In this study, we use the local treatment intensity for mobility assistance as an instrumental variable for the decision to participate in relocation assistance. The local treatment intensity is defined as the ratio of entries into mobility assistance programs[10] and the stock of unemployed in each LEA district j:

$$Z_j = \frac{N_j^{ma}}{N_j^{ue}} \times 100, \tag{2}$$

where N_j^{ma} denotes the number of recipients of mobility assistance and N_j^{ue} denotes the average stock of unemployed in the LEA district j.[11] Both numbers are measured in the year

[10]This includes relocation and commuting assistance, travel costs for distant job interviews, and equipment and transition assistance (e.g. for work clothes, financial aid to bridge time until receipt of first salary payment).

[11]Similar regional variations are used as instrumental variables for instance by Briggs and Kuhn (2008), Frölich and Lechner (2010) and Card and Krueger (1993).

before the considered entry window into unemployment. This ensures that our estimation sample will not contribute to the construction of the instrumental variable.

As discussed above, the instrument has to fulfill condition (i) to (iii) in order to estimate causal treatment effects. Condition (i) states that the instrument has to be uncorrelated with the error term V_i, i.e., to be independent of the individual outcome variable. This condition is not directly testable and has to be verbally verified. We therefore outline the idea behind our instrument in more detail.

At the beginning of each calender year, each LEA receives a fixed budget for ALMP programs from the Federal Employment Agency. While the set of programs are predetermined by the Federal Employment Agency, each LEA decides independently which share of the received budget to spend on which programs, i.e., each LEA determines their own policy mix (see Blien, 1998; Yankova, 2010). Therefore, our instrument should reflect the LEA's preference for mobility programs. The idea is that job seekers belonging to an employment agency with a relatively high treatment intensity, are more likely to receive knowledge about the existence of mobility programs and therefore to participate in relocation assistance. In addition, the final permission of the relocation assistance is at the caseworker's discretion so that program applicants living in districts where the LEA spends a relatively high share of their budget on mobility assistance, are more likely that the caseworker will approve their application.[12] However, as the individual himself has no influence on the policy mix of the LEA, the instrument can be assumed to be exogenous with respect to the individual labor market outcomes conditional on control variables. Besides individual characteristics, we include several macroeconomic variables on the district level in the regressions in order to control for heterogeneity of the treatment intensity which is caused by differences in the local labor market conditions.

Condition (ii) requires that the instrument is relevant, i.e., it determines the treatment decision. Within the IV literature, usually a F-statistic of larger than 10 is considered to suggest sufficiently strong instruments (Staiger and Stock, 1997). We provide evidence that we do not suffer problems from a weak instrument in Section 5.1. The monotonicity assumption (iii) states that the treatment probability is a positive monotonic function of the treatment intensity. This condition is very technical and usually assumed to be valid. We also assume

[12]For instance, job seekers in the Berlin-Brandenburg area have access to the same labor market but face large differences with respect to the local treatment intensities. While the LEA in Berlin-North supported only 1.6% of their unemployed by mobility assistance in 2005, this applied to 6.95% in the district of the LEA in Potsdam. Therefore, job-seekers in Potsdam have a higher probability to be informed and receive the relocation assistance, independent of individual characteristics.

that the monotonicity assumption is fulfilled as —in our case— a higher treatment intensity which illustrates the higher availability of the subsidy is likely to consistently increase the participation probability for all individuals. As mentioned before, we explicitly exclude participants in other mobility programs from the control group to ensure that the instruments affects only the probability of being a participant.

4.3 Unobserved Regional Heterogeneity

So far, we argued that each LEA decides independently about their individual policy mix. However, the treatment intensity might be determined by the local demand for mobility assistance. This would be problematic if there would exist unobserved regional differences that influence the local demand for mobility assistance and labor market outcomes simultaneously. For instance, assume that unemployed individuals in region A are generally higher motivated than in other regions and therefore more willing to move in order to find employment which will increase the demand for relocation assistance. Given that the LEA in region A would adjust their policy mix in subsequent years with respect to the increased demand for relocation assistance, our instrument —the treatment intensity in the year before the entry into unemployment— would be no longer independent of the labor market outcomes. As a consequence, our estimates would be biased.

In order to check whether this potential source of endogeneity affects our estimates, we additionally include regional fixed effects into the estimation procedure. The regional fixed effects will capture the time-invariant unobserved regional differences which might affect the local treatment intensity and the outcomes simultaneously. Therefore, the selection process into the treatment D_i can be characterized by:

$$D_i = \gamma Z_i + \beta_1 X_i + \eta_k + U_i, \tag{3}$$

where X_i and Z_i are vectors of observed, U_i of unobserved random variables and η_k denotes the regional fixed effects for each LEA district. The outcome variables of interest Y_i can be written as a function of the treatment dummy D_i, the observable characteristics X_i and the unobservable characteristics V_i and the regional fixed effects:

$$Y_i = \delta D_i + \beta_2 X_i + \eta_k + V_i, \tag{4}$$

The standard procedure to estimate the causal treatment effect using an instrumental variable approach is the two-stage least squares (2SLS) estimator, given as $\hat{\delta} = (Z'X)^{-1}Z'Y$ (see Angrist, 2004; Angrist and Imbens, 1995, for details on 2SLS estimation).

Summarizing our estimation strategy, we make use of several facts to ensure that the instrument is an exogenous measure for the LEA preferences and rule out that its influenced by the regional differences with respect to the preferences for mobility. First, we construct the treatment intensity for all types of mobility programs, which includes also some measures which are not related to regional mobility (see Section 2). Second, we use the treatment intensity in the year before the entry into unemployment. This rules out that the year-specific demand for relocation assistance in the year of entry affects our instrument. As depicted in Figure 3a the unconditional treatment intensity is highly imbalanced distributed among LEA districts. Unsurprisingly, the highest treatment intensities can be found in Eastern Germany, while the lowest treatment intensities exist in the prosperity areas in the south of Germany. However, our estimation strategies requires the treatment intensity is exogenous given the covariates. Therefore, we include a large set of control variables, comprising individual socio-demographic characteristics and labor market histories, but also a variety of regional characteristics, like unemployment and vacancy rates, the GDP per capita and the size of different sectors. Finally, we also include regional fixed effects, which ensures that time-invariant regional unobserved heterogeneity does not drives the demand for relocation assistance and the labor market performance of participants simultaneously. Figure 3b shows the rank differences with respect to local treatment intensities from 2004 to 2005, which is, conditioned on the covariates, the source of identification within the fixed effect approach. It can be seen that geographical distribution of the differences exhibit much more heterogeneity than the unconditional distribution of the treatment intensity.[13]

[Insert Figure 3 about here]

5 Results

5.1 Baseline Results

In order to ensure the relevance of our instrument for predicting the participation in relocation assistance we provide the first stage F-statistic to test the joint significance of all instruments (in our case only one). The baseline model, without fixed effects, shows a F-statistic of 48.34, while including LEA fixed effects the F-statistic decreases to 14.62. We see this as evidence that we do not suffer problems from a weak instrument (Staiger and

[13]The density distribution of the local treatment intensity, separated by year, overall and the ratio of 2004 and 2005 can be found in Figure A.1 in the Appendix.

Stock, 1997). Furthermore, we implemented a placebo test where we calculate the treatment intensity for other ALMP programs (e.g. job creation schemes and vocational training) and estimate its influence on the treatment participation in relocation assistance (first stage). The F-statistic for weak instruments is always below 1. This shows that our instrument is independent of the general allocation of ALMP programs within a LEA district and just proxies the preferences for mobility programs.[14]

Given that our instrument is valid, we present causal treatment effects for the participation in relocation assistance on individual labor market outcomes in Table 4. Thereby, we consider four outcome variables for the subsequent labor market performance as described in Section 3.3 and present, besides the IV, also the OLS estimates. All regressions include several control variables for socio-demographic characteristics, short- and long-term labor market history, characteristics of the current unemployment spell (e.g. benefit entitlement, duration, other ALMP participation) and local macroeconomic conditions at the time of entry into unemployment. Column 3 presents the estimation results including regional fixed effects as described in the previous section. Therefore, the identification of the treatment effects is based on the change of the instrument between the two years of entry. Naturally, this lowers the power of the instrumental variable. However, the F-statistic is still sufficient to not suffering problems from a weak instrument. Nevertheless, we present also IV estimates without fixed effects to allow for a sensitivity analysis for different subgroups later on.

[Insert Table 4 about here]

Without controlling for unobserved heterogeneity we find a positive effect of about 16% on the first wage after the transition, which very similar for average earnings in the observation period, a negative effect on job quits (all highly statistically significant), but no effect on the employment probability 24 months after the beginning of the new job. The IV estimates suggests even larger promising effects on all labor market outcomes, while the effect of unobserved regional heterogeneity (conditioned on the local labor market conditions) seems to be rather small, as indicated by the small differences between IV estimates with and without LEA fixed effects.[15] Focussing on the IV estimates including regional fixed effects we find a positive and significant effect on log wages about 0.50.[16] We consider two wage

[14]First stage estimation results and placebo tests can be found in Table A.3 the Appendix

[15]The relatively small differences between the estimates with and without fixed effects suggests that the included regional control variables for the local labor market conditions take into account a large part of the regional differences which may drive the demand for relocation assistance.

[16]Regarding the average daily wage of participants they would receive 39% lower wages if they would not move.

outcomes to test the hypothesis if firms pay a wage premium for mobile workers only at the beginning of the new job which disappears over time. Results show that both wage effects are positive and significant, indicating that the wage effect is persistent. Moreover, we find a reduction of the job quits about 0.68 and an increase of the employment probability 24 months after the transition of 23 percentage points. In summary, results on subsequent job characteristics suggest that program participation and therefore the decision to move to a distant labor market improved the employment prospects of participants substantially.

Comparing IV and OLS estimates (which solely controls for observed differences between participants and non-participants) it can be seen that the IV estimates tend to be more positive. This suggest a negative selection into the program based on unobserved characteristics. It seems that —conditional on observable characteristics— those who fail to find employment locally due to worse unobserved characteristics tend to participate in the program and leave towards distant labor markets.

However, regarding the discussion in Imbens and Angrist (1994), the IV estimates can be interpreted as the local average treatment effect (LATE), i.e. the causal effect on those individuals induced to change participation status by a change in the instrumental variable. In our case this is the effect on those job-seekers who chose (or receive) the treatment due to the higher treatment intensity in their LEA district. Therefore, we estimate a treatment effect on a subgroup which is highly policy relevant. Since the treatment intensity is a measure for the LEA's willingness to inform job-seekers about the subsidy and accept applications, this can be easily controlled by the policy-maker. Moreover, we argue that this is the relevant treatment effect on job-seekers whose decision to move is actually affected by the availability of the subsidy, i.e. the results are not driven by individuals who would also move without the receipt of the subsidy (windfall gains). Clearly, the treatment group contains also those job-seeker who do not require the subsidy in order to move and for those the potential gains from moving are sufficient to take up a distant job regardless whether they receive the subsidy or not. However, the comparison group contains the same type of individuals, with the only difference that the local treatment intensity is not sufficient in order to make them participants. Since both groups move, irrespective of the subsidy, the expected treatment effect for this individuals is zero and the previously estimated effect is just the LATE on those job-seekers who move due to the relatively high promotion of the subsidy in their LEA district.

5.2 Influence of Labor Market Conditions

The large positive effect of the moving subsidy on the labor market performance can be explained by three different channels. First, participants move to regions with better macroeconomic conditions. Second, job-seekers who know about the subsidy change their job search behavior, i.e. they increase their search radius, which increases the quality of the job match. Third, the relocation might has a positive effect on participants unobserved characteristics, especially the individual motivation.[17]

[Insert Table 5 about here]

In order to control for the effect of the first channel, we include also the labor market conditions of the location after the transition to regular employment in t_{ue+1} as additional control variables, to figure out to what extent the positive effects on the labor market outcomes can be explained by the better economic conditions in this new environment. To image the labor market conditions as detailed as possible we include the local unemployment rate, the real GDP per capita, the vacancy rate and the share of the working population employed in different sectors. However, to avoid that time trends affect our results we measure all variables for this new location also at the entry into unemployment in t_0, and not directly after the transition. Table 5 shows the estimation results for OLS and IV including also control variables for the labor market conditions at the new working place. The fixed effects IV estimates, suggests that about 19% of the log wage premium, 28% of the effect on the employment probability and about 37% of the estimated treatment effect on the job stability can be explained by the improvement of the labor market conditions.[18] However, the major part of all treatment effects remains even after controlling for changes in the labor market conditions, which suggests that the change of the job search behavior and the impact on the unobserved characteristics of individuals (e.g. motivation) are very meaningful explaining the positive effect on the labor market performance of the participants.

5.3 Heterogeneous Selection and Treatment Effects

The baseline results clearly suggest that the relocation assistance is an effective instrument to help former unemployed individuals to re-integrate into employment in the long-run and

[17] Note that the instrumental variable procedure only has the ability to control for differences with respect to unobserved heterogeneity that influences the selection into treatment, but not changes that are induced by it.

[18] Regarding the OLS estimates a smaller part of the treatment effects, between 13% and 21%, can be explained by the local labor market conditions, however the overall pattern looks very similar.

to increase their income. However, the flight of workers affects also the region of origin. The potential positive self-selection of high-skilled workers into migration can be seen as a negative externality for migrants region of origin (Bhagwati and Hamada, 1974). This 'brain drain' effect implies a loss of human capital in the region of origin that might has deleterious effects on economic growth (Miyagiwa, 1991; Haque and Kim, 1995). In order to test whether the LEA's promotion of the relocation assistance encourages this potential 'brain drain' effect, we interact the treatment intensity with several socio-economic characteristics of interest X_1 and separately include them into the first stage estimation of the participation probability:

$$D_i = \gamma Z_i + \mu(Z_i \times X_{1i}) + \beta_1 X_i + \eta_k + U_i. \tag{5}$$

Table 6 shows that the policy of the LEA has a stronger influence on singles, job-seekers without children and high-skilled workers, holding an A-level degree. This might raise concerns that a higher promotion of the moving subsidy encourage the better educated and more flexible job-seekers to leave depressed regions which would have further deleterious effects on these areas. However, considering the results in column (4) and (6) the treatment intensity has a significantly lower influence in East-Germany and in regions with higher unemployment rates in general which suggests that job-seekers living already in depressed areas are less affected by the policy of the employment agency. Given the fact the participants are more likely to live in East-Germany and regions with higher unemployment rates we assume that they are more likely to move even without the subsidy and to inform themselves about the availability of the relocation assistance. Therefore, the moving decision for those areas is less likely to be related to the LEA's policy and potential 'brain drain' effects are not caused by the higher treatment intensity.

[Insert Table 6 about here]

Given the large and positive effects on the labor market performance of participants, it is surprising that the relocation assistance faces —compared to other ALMP programs— such a low participation rate. A possible explanation might be the fact that a relocation does generate additional costs which are not covered by the subsidy. In particular, the costs and returns of relocation are highly related to the job-seekers socio-economic characteristics. On the one hand, individuals with strong family obligations are expected to face substantial non-monetary costs associated with the decision to move to a distant region, e.g.,

school change for children, selling own property, job change of partner, finding a new appartment/house, leaving behind social networks. In line with this, Brauninger and Tolciu (2011) argue that individual's mobility depend on their social environment and it is likely that economic incentives (disparities in unemployment rates or wages) and policies (subsidy) might be insufficient to affect individual's decision to move. On the other hand, following Borjas, Bronars, and Trejo (1992), persons whose skills are locally mismatched with the regional reward structure, receive the highest returns from moving and are consequently most likely to participate. Based on these considerations, we would expect that the marital status and the presence of children in the household should lower individual's willingness to move, so that a higher wage premium is required to induce those individuals to participate in relocation assistance, while a higher level of education and poor labor market conditions in initial place of residence would make a lower wage premium sufficient. To test this hypothesis, we re-estimate the initial wage equation, using OLS and IV without fixed effects, and include interaction terms between the treatment and certain socio-economic characteristics.[19] The outcome equation changes to

$$Y_i = \delta D_i + \lambda(D_i \times X_{1i}) + \beta_2 X_i + \eta_k + V_i, \tag{6}$$

where we use the treatment intensity and the interaction term of the treatment intensity and the variable X_1 as instruments in order to control for endogenous selection into the treatment within the IV framework.

[Insert Table 7 and Table 8 about here]

Table 7 shows the OLS estimates including interaction terms. We find positive effects on wages for job-seekers living in areas with higher unemployment rates and East-Germany, as well as for high-skilled workers holding an upper secondary school degree. These effects are likely to be caused by the fact that a relocation is associated with larger potential wage differences for those groups. However, this effect disappears within the IV setting in Table 8. We argue that these groups —receiving the largest wage gains from the relocation— would move even without the receipt of the subsidy and their behavior is not affected by the policy of the LEA. Regarding the marital status there are large negative interaction effects for job-seekers with children and a spouse using the IV estimator. As argued before a substantial part

[19] We do not make use the IV fixed effect estimation since this procedure reduces the power of the instrument. Additionally, including regional fixed effects might induce problems due to a weak instrument. Since IV estimates with and without fixed effects are relatively similar this should not lower the reliability of the results.

of the positive treatment effect might be associated to the change of the social environment of unemployed workers receiving the moving subsidy. However, this change is more likely to be relevant for singles, since for individuals with a partner or children the social environment is mainly determined by the family which does not change due to the relocation. The absence of this negative effect in the OLS estimates is likely to be induced by the wage premium which is claimed by job-seekers with a family in order to make the relocation attractive. The positive effect on women might be correlated to the fact that women who move are less likely to have family obligations.

OLS estimates on the job stability and the employment probability 24 months after the transition show stronger effects on women which disappear within the IV framework. This suggests that there is more positive selection into the treatment among women compared to men. Moreover, the IV estimates show that higher job stability is mainly driven by job-seekers from East-Germany due to the large differences between the East- and West-German labor market. In contrast to the wage effect, the interaction effect on the job stability is only significant in the IV framework which suggests that East-German job-seekers who are effected by the treatment intensity benefit more in terms of a higher job stability relative to their West-German counterparts, while they do not in terms of wages.

6 Conclusion

In this study, we use German administrative data on entries into unemployment in 2005 and 2006 to evaluate the effectiveness of relocation assistance on labor market outcomes. The relocation assistance is part of the German ALMP and provides job seekers a monetary subsidy to move to distant labor markets in order to find employment. The main aim of this program is to encourage labor market mobility among the unemployed. The decision to participate in relocation assistance and hence to move to a distant region is likely to be correlated with unobserved factors, like personality and motivation by the unemployed, or considerations by the caseworker. Therefore, we use IV estimation to estimate causal treatment effects. In fact, we use the local treatment intensity of mobility assistance programs as an instrumental variable as it is expected to represent the preference of the LEA towards mobility assistance programs and therefore affects the individual's probability of making use of the relocation assistance. The idea is that unemployed individuals living in a LEA district characterized by a high treatment intensity face a higher probability to 1) receive knowledge

about the existence of the subsidy and 2) that the caseworker will approve an application for subsidy receipt. As the unemployed individual has no influence on the preferences of the agency, the instrument is expected to generate exogenous variation in the treatment participation.

The IV estimation results confirm the theoretical expectations. The relocation assistance leads to significantly higher wages and more stable jobs in the future. The results turn out to be robust with respect to unobserved regional heterogeneity, which —if existing— would make our instrument endogenous and hence bias our estimation results. Controlling for the local labor market conditions at the workplace suggests that only between 19% to 37% of the treatment effects can be assigned to the improvement of labor market conditions. We expect that the major part of the treatment effects are associated with a better job match due the fact that job-seekers increase their search radius and an improvement of unobserved characteristics, like motivation.

The investigation of the effect heterogeneity reveals further interesting results. While the treatment itself seems to be more effective for people weaker family ties, job-seekers with children or a spouse claim higher wage premiums to compensate them for moving costs not covered by the subsidy, such as school change for children, selling own property, job change of partner, finding a new apartment/house, leaving social networks behind. Moreover, job-seekers from depressed benefit more from the relocation due to higher wage differences, however the moving subsidy seems to be not crucial for the moving decision.

This finding possibly explains the overall low participation rates in relocation assistance. In general, less than 1% of the individuals entering unemployment receive a relocation assistance and move to a distant region in order to find employment. If policy makers aim at increasing the labor market mobility among the unemployed to a larger extent, one possible channel would be to increase the subsidy payment by a "moving bonus" in addition to the pure transportation costs. The moving bonus might be a lump-sum payment or a temporary wage subsidy which is directly paid to the job seeker and expected to compensate for non-monetary or other costs caused by the move. To further increase the efficiency of such a moving bonus, one might vary the amount of the bonus based on individual characteristics, such as marital status or the presence of children. The extra payment in addition to the pure transportation costs would further reduce the job seeker's reservation wage for distant jobs and therefore increase their willingness to move to distant regions even for lower wages. This would help to fill available vacancies in prosperity areas by unemployed job seekers from

deprived areas to a larger extent. Such an improvement in the aggregate matching function will certainly reduce unemployment on a national level.

So far, our causal analysis focused on the labor market returns of the relocation assistance in terms of wages and the job stability. Further research should focus in more detail on the question how the subsidy affects the individual decision to move and what are the consequences for the chances that unemployed job-seekers can be reintegrated into the labor market. In this context the implications on reservation wages and search activities might be of special interest.

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Tables and Figures

Table 1: Entries in ALMP programs between 2005 and 2008 (in thousand)

	2005	2006	2007	2008
Entries into unemployment	8,427	8,129	8,155	8,302
Entries into ALMP programs				
Mobility assistance (total)	221	281	352	375
Relocation assistance	46	55	68	68
Vocational training	152	265	360	447
Job creation schemes	78	79	66	67
Wage subsidies	144	226	262	264
Start-up subsidies	91	76	126	119

Source: Statistic of the German Federal Employment Agency.

Table 2: Definition of the estimation sample

	Total	Non-Participants	Participants
Entries into unemployment 2001 - 2008	918,906	—	—
Entries into unemployment in 2005/2006	178,555	—	—
Age restriction (25-55 years)	128,169	—	—
Definition of the treatment group			
Transition to employment within 24 months	83,194	82,107	1,037
Subsidy related to transition (+/-6 months)	83,109	$\star$	1,002
Change of the working location	83,029	$\star$	922
Exclusion of participants in other mobility programs	65,169	64,247	$\star$
Exclusion of repeated entries	52,057	51,140	917
Estimation sample	52,057	51,140	917

Note: $\star$ denotes that the restriction does not apply for this group.

Table 3: Selected descriptive statistics of observed characteristics

	Non-participants	Participants	p-value
Number of observations	51,140	917	
Outcome variables			
Unemployment duration	5.61	6.71	0.00
First daily wage in € in t_{ue+1}	60.79	76.42	0.00
Average daily wage in € from t_{ue+1} to t_{ue+24}	63.16	81.24	0.00
Number of job quits from t_{ue+1} to t_{ue+24}	0.92	0.62	0.00
Employed in t_{ue+24}	0.74	0.79	0.00
Regional characteristics			
Living in East-Germany			
at entry in t_0	0.27	0.47	0.00
after the transition in t_{ue+1}	0.26	0.22	0.00
Distance to new working location in km	31.65	198.02	0.00
Move from non-urban to urban area[a)]	0.07	0.26	0.00
Move from urban to non-urban area[a)]	0.06	0.16	0.00
Local macroeconomic conditions[b)]			
Unemployment rate			
at entry in t_0	0.12	0.14	0.00
after the transition in t_{ue+1}	0.12	0.11	0.04
Vacancy rate			
at entry in t_0	0.06	0.05	0.00
after the transition in t_{ue+1}	0.06	0.08	0.00
Share of working population in industry sector			
at entry in t_0	0.22	0.19	0.00
after the transition in t_{ue+1}	0.22	0.21	0.09
Individual characteristics			
Socio-demographic characteristics			
Female	0.33	0.36	0.01
Age in years	38.60	36.56	0.00
(Spec.) Upper secondary school	0.17	0.44	0.00
University degree	0.09	0.30	0.00
Children $\leq$ 10 years	0.19	0.13	0.00
Married	0.56	0.41	0.00
Labor market history			
Last daily income in €	55.85	64.87	0.00
Time spend in unemployment in last 10 years in days	414	343	0.01
Occupational group of previous job			
Manufacturing	0.43	0.25	0.00
Technical occupation	0.03	0.07	0.00
Services	0.48	0.64	0.00
Share of distant jobs in last 5 years	0.27	0.43	0.00
Previous participation in mobility programs	0.05	0.23	0.00
Other ALMP participation during current UE spell	0.20	0.36	0.00

Note: All numbers are percentages unless otherwise indicated. Individual characteristics are measured at entry into unemployment (t_0). P-value is based on a t-test on equal means.
a) Cities with more than 100,000 inhabitants are defined as urban areas, all other regions are classified as non-urban.
b) Measured at the employment agency district level.

Table 4: Baseline estimation results

	OLS (1)	IV (2)	IV (3)
Log first daily wage in t_{ue+1}	0.152***	0.552***	0.496***
	(0.012)	(0.085)	(0.076)
Mean value non-participants	60.79	60.79	60.79
Log average daily wage from t_{ue+1} to t_{ue+24}	0.164***	0.543***	0.495***
	(0.012)	(0.097)	(0.077)
Mean value non-participants	63.16	63.16	63.16
No. of job quits from t_{ue+1} to t_{ue+24}	-0.153***	-0.699**	-0.683**
	(0.029)	(0.233)	(0.235)
Mean value non-participants	0.92	0.92	0.92
Employed in t_{ue+24}	0.020	0.318**	0.231**
	(0.014)	(0.096)	(0.083)
Mean value non-participants	0.74	0.74	0.74
No. of observations	52,057	52,057	52,057
F-statistic for weak identification		48.34	14.62
LEA fixed effects			✓

Note: Depicted are baseline estimation results from OLS and 2SLS estimations. All estimations include several control variables for socio-demographic characteristics, short- and long-term labor market history, benefit entitlement, local macroeconomic conditions at entry into unemployment and the initial unemployment duration. */**/*** indicate statistically significance at the 10%/5%/1%-level. Standard errors are in parenthesis and clustered at the LEA level.

Table 5: Influence of local labor market conditions

	OLS (1)	IV (2)	IV (3)
Log first daily wage in t_{ue+1}	0.130***	0.437***	0.403***
	(0.011)	(0.045)	(0.043)
Mean value non-participants	60.79	60.79	60.79
Log average daily wage from t_{ue+1} to t_{ue+24}	0.142***	0.419***	0.403***
	(0.011)	(0.051)	(0.049)
Mean value non-participants	63.16	63.16	63.16
No. of job quits from t_{ue+1} to t_{ue+24}	-0.121***	-0.476***	-0.445***
	(0.029)	(0.120)	(0.132)
Mean value non-participants	0.92	0.92	0.92
Employed in t_{ue+24}	0.017	0.209***	0.166**
	(0.014)	(0.049)	(0.052)
Mean value non-participants	0.74	0.74	0.74
No. of observations	52,057	52,057	52,057
F-statistic for weak identification		49.63	14.35
LEA fixed effects			✓

Note: Depicted are results from OLS and 2SLS estimations including control variables for the labor market conditions at the working place after the transition to employment. Additionally, all estimations include several control variables for socio-demographic characteristics, short- and long-term labor market history, benefit entitlement, local macroeconomic conditions at entry into unemployment and the initial unemployment duration. */**/*** indicate statistically significance at the 10%/5%/1%-level. Standard errors are in parenthesis and clustered at the LEA level.

Table 6: First stage estimation - Heterogenous selection into treatment

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Treatment intensity (TI)	0.103***	0.133***	0.136***	0.103***	0.281***	0.079***	0.284***
	(0.015)	(0.017)	(0.019)	(0.016)	(0.053)	(0.015)	(0.057)
TI × Children		-0.042***					
		(0.012)					
TI × Married			-0.052**				
			(0.019)				
TI × Women				0.000			
				(0.021)			
TI × East-Germany					-0.183***		
					(0.053)		
TI × Upper sec. degree						0.268***	
						(0.031)	
TI × Unemployment rate							-0.965***
							(0.291)
No. of observations	52,057	52,057	52,057	52,057	52,057	52,057	52,057
F-statistic for weak identification	48.34	30.51	27.86	24.17	30.22	61.91	29.66

Note: Depicted are linear first stage estimation results including interaction terms between several socio-economic characteristics and the local treatment intensity. Additionally, all estimations include several control variables for socio-demographic characteristics, short- and long-term labor market history, benefit entitlement, local macroeconomic conditions at entry into unemployment and the initial unemployment duration. */**/*** indicate statistically significance at the 10%/5%/1%-level. Standard errors are in parenthesis and clustered at the LEA level.

Table 7: OLS estimates - Heterogenous treatment effects

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Log first daily wage in t_{ue+1}							
Relocation assistance (RA)	0.152***	0.154***	0.155***	0.130***	0.112***	0.129***	0.073*
	(0.012)	(0.013)	(0.016)	(0.014)	(0.016)	(0.014)	(0.034)
RA × Children		-0.005					
		(0.014)					
RA × Married			-0.009				
			(0.021)				
RA × Women				0.059*			
				(0.023)			
RA × East-Germany					0.084***		
					(0.021)		
RA × Upper sec. degree						0.052*	
						(0.023)	
RA × Unemployment rate							0.564**
							(0.213)
Log average daily wage from t_{ue+1} to t_{ue+24}							
Relocation assistance (RA)	0.164***	0.165***	0.171***	0.137***	0.125***	0.152***	0.081*
	(0.012)	(0.013)	(0.016)	(0.014)	(0.015)	(0.014)	(0.032)
RA × Children		-0.003					
		(0.013)					
RA × Married			-0.017				
			(0.019)				
RA × Women				0.075***			
				(0.021)			
RA × East-Germany					0.085***		
					(0.021)		
RA × Upper sec. degree						0.029	
						(0.021)	
RA × Unemployment rate							0.596**
							(0.200)
No. of job quits from t_{ue+1} to t_{ue+24}							
Relocation assistance (RA)	-0.153***	-0.141***	-0.170***	-0.095*	-0.108**	-0.137***	-0.027
	(0.029)	(0.035)	(0.040)	(0.038)	(0.041)	(0.038)	(0.079)
RA × Children		-0.030					
		(0.045)					
RA × Married			0.041				
			(0.059)				
RA × Women				-0.161*			
				(0.065)			
RA × East-Germany					-0.096		
					(0.055)		
RA × Upper sec. degree						-0.037	
						(0.054)	
RA × Unemployment rate							-0.900
							(0.504)
Employed in t_{ue+24}							
Relocation assistance (RA)	0.020	0.013	0.021	-0.002	0.024	-0.009	-0.005
	(0.014)	(0.017)	(0.017)	(0.018)	(0.019)	(0.019)	(0.039)
RA × Children		0.017					
		(0.018)					
RA × Married			-0.003				
			(0.027)				
RA × Women				0.059*			
				(0.029)			
RA × East-Germany					-0.009		
					(0.027)		
RA × Upper sec. degree						0.067**	
						(0.025)	
RA × Unemployment rate							0.175
							(0.241)
No. of observations	52,057	52,057	52,057	52,057	52,057	52,057	52,057

Note: Depicted are OLS estimation results including interaction terms between several socio-economic characteristics and the treatment status. Additionally, all estimations include several control variables for socio-demographic characteristics, short- and long-term labor market history, benefit entitlement, local macroeconomic conditions at entry into unemployment and the initial unemployment duration. */**/*** indicate statistically significance at the 10%/5%/1%-level. Standard errors are in parenthesis and clustered at the LEA level.

Table 8: IV estimates - Heterogenous treatment effects

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Log first daily wage in t_{ue+1}							
Relocation assistance (RA)	0.552***	0.586***	0.620***	0.360***	0.659***	0.676***	0.945***
	(0.085)	(0.086)	(0.090)	(0.091)	(0.128)	(0.180)	(0.222)
RA × Children		-0.271***					
		(0.081)					
RA × Married			-0.423***				
			(0.114)				
RA × Women				0.435**			
				(0.138)			
RA × East-Germany					-0.132		
					(0.128)		
RA × Upper sec. degree						-0.149	
						(0.164)	
RA × Unemployment rate							-2.305
							(1.223)
Log average daily wage from t_{ue+1} to t_{ue+24}							
Relocation assistance (RA)	0.543***	0.583***	0.620***	0.309**	0.666***	0.535***	0.913***
	(0.097)	(0.096)	(0.100)	(0.097)	(0.139)	(0.156)	(0.251)
RA × Children		-0.314***					
		(0.076)					
RA × Married			-0.470***				
			(0.109)				
RA × Women				0.532***			
				(0.121)			
RA × East-Germany					-0.151		
					(0.152)		
RA × Upper sec. degree						0.009	
						(0.142)	
RA × Unemployment rate							-2.169
							(1.484)
No. of job quits from t_{ue+1} to t_{ue+24}							
Relocation assistance (RA)	-0.699**	-0.702**	-0.709**	-0.752**	-0.073	-0.936*	-0.180
	(0.233)	(0.232)	(0.241)	(0.255)	(0.292)	(0.417)	(0.442)
RA × Children		0.025					
		(0.234)					
RA × Married			0.065				
			(0.346)				
RA × Women				0.120			
				(0.277)			
RA × East-Germany					-0.769**		
					(0.271)		
RA × Upper sec. degree						0.286	
						(0.400)	
RA × Unemployment rate							-3.042
							(2.456)
Employed in t_{ue+24}							
Relocation assistance (RA)	0.318**	0.327**	0.314**	0.324**	0.140	0.149	0.150
	(0.096)	(0.098)	(0.105)	(0.109)	(0.120)	(0.176)	(0.212)
RA × Children		-0.072					
		(0.090)					
RA × Married			0.021				
			(0.146)				
RA × Women				-0.014			
				(0.112)			
RA × East-Germany					0.218		
					(0.136)		
RA × Upper sec. degree						0.203	
						(0.144)	
RA × Unemployment rate							0.983
							(1.351)
No. of observations	52,057	52,057	52,057	52,057	52,057	52,057	52,057
F-statistic for weak identification	48.34	30.51	27.86	24.17	30.22	61.91	29.66

Note: Depicted are 2SLS estimation results including interaction terms between several socio-economic characteristics and the treatment status. Additionally, all estimations include several control variables for socio-demographic characteristics, short- and long-term labor market history, benefit entitlement, local macroeconomic conditions at entry into unemployment and the initial unemployment duration. */**/*** indicate statistically significance at the 10%/5%/1%-level. Standard errors are in parenthesis and clustered at the LEA level.

Figure 1: The transition process and labor market outcomes

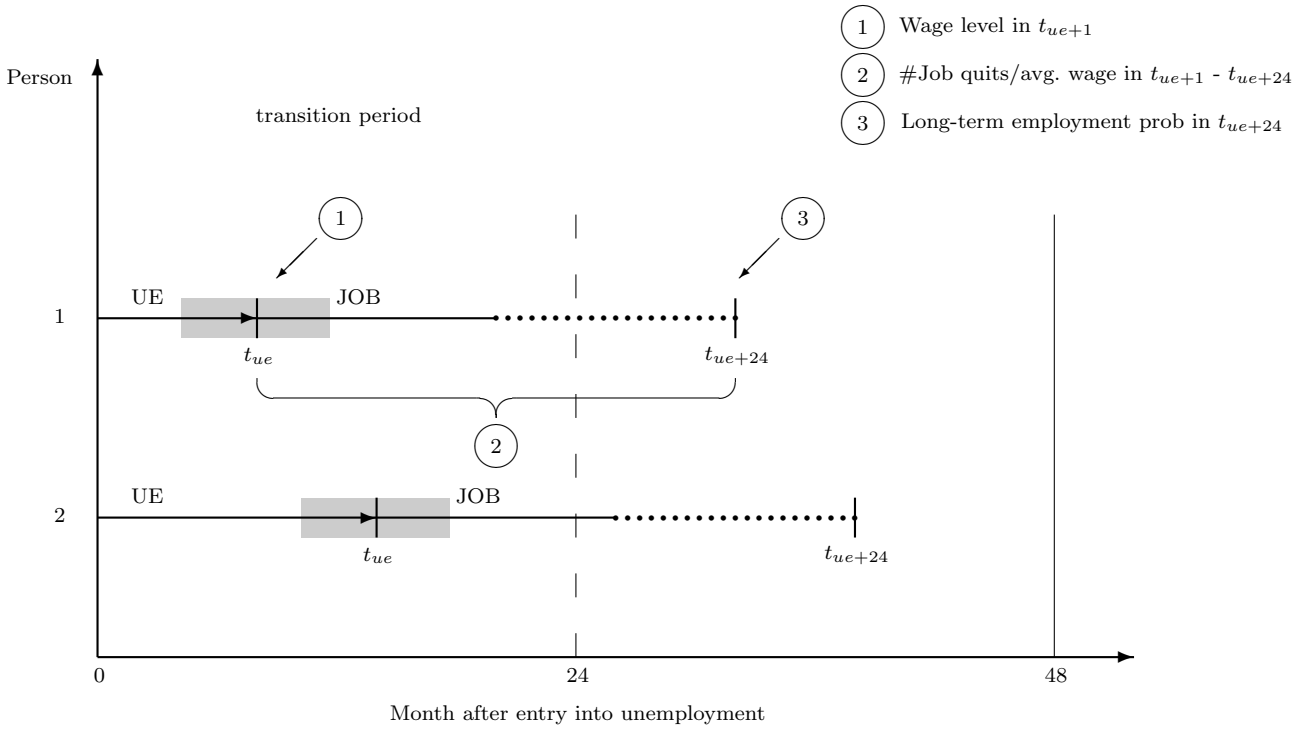
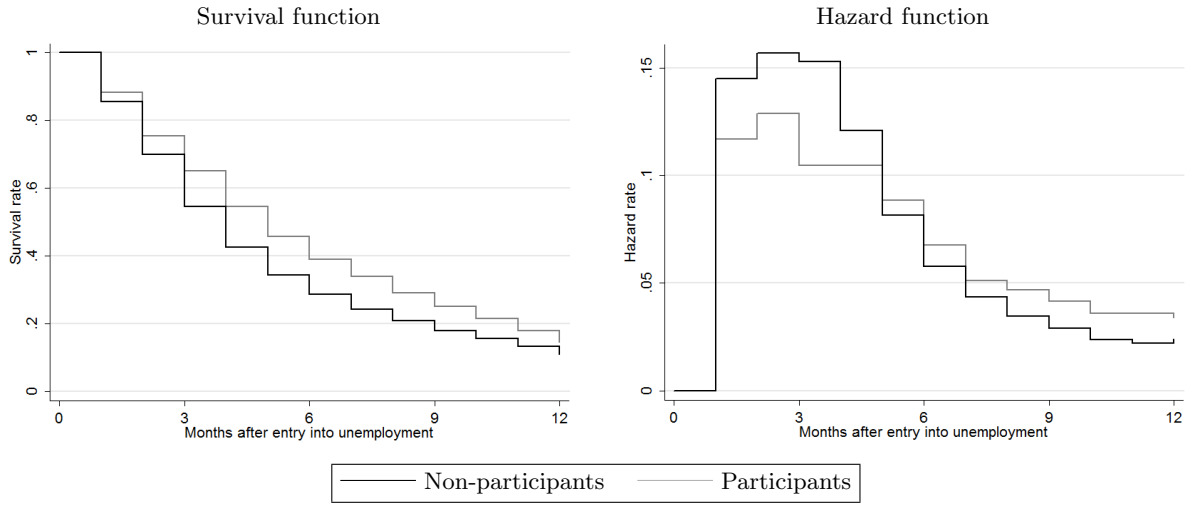
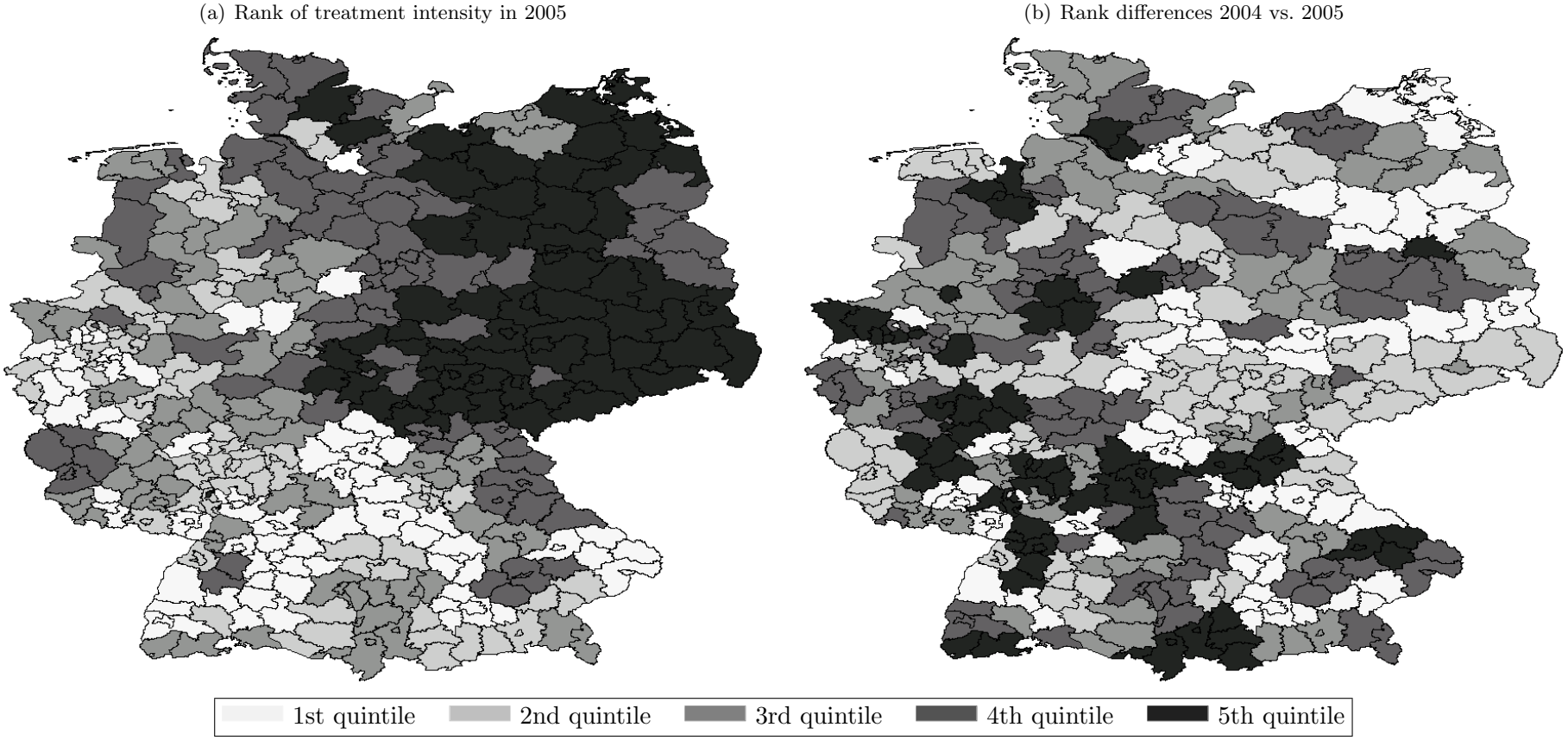


Figure 2: Transition from unemployment to employment



Note: Depicted are unconditional survival and transition probabilities separated for participants and non-participants for the first 12 months after the entry into unemployment.

Figure 3: Geographical distribution of local treatment intensities in Germany



Note: Depicted are the ranks of local treatment intensities in 2005 and the absolute differences in ranks between 2004 and 2005 among Local Employment Agencies in Germany. Source: Statistic of the Federal Employment Agency.

A Appendix: Supplementary Tables and Figures

Table A.1: OLS estimation: Baseline results

	Log first daily wage	Log average daily wage	No. of job quits	Employed in t_{ue+24}
	(1)	(2)	(3)	(4)
Relocation assistance	0.152***	0.164***	-0.153***	0.020
Socio-demographic characteristics				
Female	-0.139***	-0.153***	0.076***	-0.035***
Age in years	-0.007***	-0.007***	-0.007	0.012***
(Age in years)^2	0.000**	0.000*	0.000	-0.000***
School leaving degree				
None (ref.)				
Lower secondary degree	0.020***	0.024***	0.011	0.008
Middle secondary degree	0.027***	0.037***	-0.024	0.018*
(Spec.) Upper secondary degree	0.098***	0.120***	-0.063*	0.006
Vocational degree				
None (ref.)				
In-firm training	0.027***	0.033***	-0.085***	0.042***
External training	0.028***	0.039***	-0.112***	0.056***
Technical college education	0.023*	0.032**	-0.114***	0.054***
University degree	0.128***	0.146***	-0.105***	0.054***
Children	0.004	0.006**	-0.013	0.012***
Children $\leq$ 3 years	-0.004	-0.006	-0.005	-0.015
Children $\leq$ 10 years	-0.015**	-0.021***	0.027	-0.016**
Married	-0.004	-0.006	-0.016	0.013*
Lone parent	-0.018*	-0.011	-0.004	0.007
Health restriction or disability	-0.017***	-0.028***	-0.004	-0.041***
Migration background	-0.019***	-0.018***	0.066***	-0.041***
Professional qualification	0.061***	0.060***	-0.053***	0.008*
Any employment experience	-0.000	-0.007	0.088***	-0.020***
Labor market history				
Share of distant jobs in last 5 years	0.035***	0.042***	-0.098***	0.001
Previous participation in mobility programs	-0.024***	-0.019**	-0.080**	0.014
Last contact to employment agency				
more than 3 months ago (ref.)				
2-3 months ago	0.012	0.015	-0.045	0.012
1-2 months ago	0.005	0.003	-0.032	0.012
within last months	0.000	0.003	-0.005	0.001
No previous contact	0.042*	0.046**	-0.025	0.011
Occupational group of previous job				
Agriculture (ref.)				
Manufacturing	0.038***	0.047***	-0.288***	0.079***
Technical occupation	0.052***	0.074***	-0.304***	0.104***
Service	0.024***	0.036***	-0.293***	0.085***
Other	0.027	0.051**	-0.310***	0.092***
Last job was full-time employment	0.115***	0.113***	-0.035	0.004
Log last daily income	-0.004***	-0.003**	-0.062***	0.003
Reason for termination of last job: laid off by employer	-0.017*	-0.006	-0.118***	0.024**
Total income within last 24 months (in €10,000)	0.030***	0.029***	0.001	-0.002
Number of employers in last 24 months	-0.011***	-0.008***	0.044***	0.013***
Months in employment in year				
t-1	0.001	0.001	-0.050***	0.015***
t-2	-0.000	0.000	-0.011***	0.004***
t-3	0.000	0.000	-0.015***	0.005***
Months in program in years				
t-1	-0.001	0.002	-0.049***	0.008
t-2	0.004**	0.004**	-0.007	0.003
t-3	0.002	0.002	-0.009*	0.004*

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Months in unemployment in years				
t-1	-0.003	-0.001	-0.013	-0.002
t-2	0.001	0.000	-0.002	0.005*
t-3	0.001	0.000	-0.009	0.000
Log average daily wage in year				
t-1	0.069***	0.069***	0.057***	0.005
t-2	0.005***	0.004***	0.008**	-0.003*
t-3	0.007***	0.006***	0.014***	-0.000
Time spend in unemployment in last 4 years (in 100 days)	-0.006***	-0.006***	0.008**	-0.002
Time spend in employment in last 4 years (in 100 days)	-0.008***	-0.009***	0.004*	-0.003**
Number of programs in last 4 years	0.007	0.006	-0.000	-0.001
Months in program in last 4 years	-0.011	0.001	-0.057*	0.016
Employed 4 years ago	-0.125***	-0.127***	0.005	0.011
Daily income 4 years ago	0.003***	0.003***	-0.002***	0.000**
Total income within last 4 years (in €10,000)	0.010***	0.011***	-0.006	-0.000
Number of employers in last 10 years	-0.001	-0.001	0.008*	-0.002
Number of programs in last 10 years	-0.011***	-0.014***	-0.021	0.002
Months in program in last 10 years	-0.015**	-0.011	-0.013	0.014
Months in unemployment in last 10 years	-0.000	-0.000	-0.000	0.000
Time spend in employment in last 10 years (in 100 days)	-0.002**	-0.001**	0.001	0.001***
Number of unemployment spells in last 10 years	0.009***	0.005***	0.068***	-0.016***
Time spend with last employer in total	0.001	0.001	0.000	-0.000
Total income within last 10 years (in €10,000)	0.002*	0.002*	-0.001	-0.001
Duration of last employment spell (in 100 days)	-0.001***	-0.002***	-0.005***	0.000
Information on current unemployment spell				
Duration of initial unemployment spell				
1-3 months (ref.)				
4-6 months	-0.033***	-0.036***	0.170***	-0.013*
7-9 months	-0.073***	-0.071***	0.153***	-0.021**
10-12 months	-0.116***	-0.104***	0.134***	-0.043***
more than 12 months	-0.126***	-0.123***	0.188***	-0.096***
Remaining benefit entitlement				
0-3 months (ref.)				
4-6 months	-0.088***	-0.081***	0.132***	-0.021*
7-9 months	-0.081***	-0.079***	0.173***	-0.028**
10-12 months	-0.095***	-0.089***	0.158***	-0.018*
more than 12 months	-0.085***	-0.078***	0.226***	-0.035***
Any form of non-compliance with benefit conditions	-0.041***	-0.048***	0.432***	-0.121***
Amount of unemployment benefit (in €)	0.004***	0.004***	0.000	-0.000
Year of entry (=2006)	0.014	0.010	0.096***	-0.018**
Month of entry				
Jan.-Mar. (ref.)				
Apr.-Jun.	-0.028***	-0.010*	0.000	0.006
Jul.-Sep.	-0.032***	-0.020***	0.052**	-0.012
Oct.-Dec.	-0.018***	-0.011*	0.158***	-0.049***
Any vacancy referral	-0.026***	-0.015***	-0.035***	0.017***
Other ALMP participation	-0.009*	-0.002	-0.166***	0.026***
Regional information				
Living in East-Germany	-0.090***	-0.104***	0.102***	-0.002
Local unemployment rate	-0.090	-0.130	0.490	-0.111
GDP (real) per capita (in €1,000)	0.270	0.463*	0.017	0.472**
Local vacancy rate	0.225**	0.220**	-0.133	0.034
Share of working population				
in agriculture sector (ref.)				
in industry sector	0.000	0.001	-0.009***	0.000
in service sector	-0.000	0.001	-0.009***	-0.000
Number of observation	52,057	52,057	52,057	52,057

Note: Additionally, all estimations include LEA fixed effects. ***/**/* indicate statistically significance at the 1%/5%/10%-level. Standard errors are clustered ad LEA-level.

Table A.2: Baseline estimates: IV estimation with fixed effects

	Log first daily wage	Log average daily wage	No. of job quits	Employed in t_{ue+24}
	(1)	(2)	(3)	(4)
Relocation assistance	0.496***	0.495***	-0.683**	0.231**
Socio-demographic characteristics				
Female	-0.140***	-0.154***	0.074***	-0.035***
Age in years	-0.007***	-0.007***	-0.008	0.012***
(Age in years)^2	0.000**	0.000*	0.000	-0.000***
School leaving degree				
None (ref.)				
Lower secondary degree	0.019**	0.025***	0.007	0.007
Middle secondary degree	0.029***	0.040***	-0.031	0.017
(Spec.) Upper secondary degree	0.094***	0.115***	-0.057*	0.001
Vocational degree				
None (ref.)				
In-firm training	0.030***	0.036***	-0.094***	0.044***
External training	0.028***	0.040***	-0.114***	0.056***
Technical college education	0.023*	0.031**	-0.113***	0.053***
University degree	0.124***	0.142***	-0.102***	0.052***
Children	0.005*	0.007**	-0.014	0.012***
Children $\leq$ 3 years	-0.005	-0.008	-0.003	-0.016
Children $\leq$ 10 years	-0.014**	-0.020***	0.025	-0.015*
Married	-0.000	-0.003	-0.022	0.014**
Lone parent	-0.016	-0.008	-0.009	0.009
Health restriction or disability	-0.017***	-0.028***	-0.004	-0.041***
Migration background	-0.019***	-0.018***	0.059**	-0.038***
Professional qualification	0.060***	0.060***	-0.052***	0.008*
Any employment experience	0.000	-0.007	0.083***	-0.019***
Labor market history				
Share of distant jobs in last 5 years	0.028***	0.035***	-0.073***	-0.004
Previous participation in mobility programs	-0.042***	-0.035***	-0.069*	0.004
Last contact to employment agency				
more 3 months ago (ref.)				
2-3 months ago	0.012	0.014	-0.045	0.011
1-2 months ago	0.006	0.004	-0.040	0.014
within last month	0.003	0.006	-0.014	0.004
no previous contact	0.043*	0.047**	-0.035	0.013
Occupational group of previous job				
Agriculture (ref.)				
Manufacturing	0.039***	0.049***	-0.286***	0.080***
Technical occupation	0.053***	0.074***	-0.303***	0.105***
Service	0.022**	0.034***	-0.287***	0.085***
Other	0.028	0.054**	-0.307***	0.093***
Last job was full-time employment	0.114***	0.112***	-0.033	0.003
Log last daily income	-0.004***	-0.003**	-0.061***	0.003
Reason for termination of last job: laid off by employer	-0.016*	-0.006	-0.123***	0.025**
Total income within last 24 months (in €10,000)	0.020***	0.013***	0.005	-0.001
Number of employers in last 24 months	-0.012***	-0.008***	0.046***	0.012***
Months in employment in year				
t-1	0.001	0.001	-0.049***	0.015***
t-2	-0.000	0.000	-0.011***	0.004***
t-3	0.000	0.001	-0.015***	0.005***
Months in program in year				
t-1	-0.001	0.001	-0.048***	0.007
t-2	0.004**	0.004**	-0.007	0.003
t-3	0.002	0.003	-0.009*	0.004*

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Months in unemployment in year				
t-1	-0.002	-0.000	-0.014	-0.002
t-2	0.001	0.000	-0.002	0.005
t-3	0.001	0.000	-0.008	0.000
Log average daily wage in year				
t-1	0.068***	0.068***	0.058***	0.005
t-2	0.005***	0.004***	0.008*	-0.003*
t-3	0.007***	0.006***	0.014***	-0.000
Time spend in unemployment in last 4 years (in 100 days)	-0.006***	-0.006***	0.008**	-0.001
Time spend in employment in last 4 years (in 100 days)	-0.009***	-0.009***	0.009*	-0.003**
No. of programs in last 4 years	0.006	0.005	-0.001	-0.001
Months in program last 4 years	-0.011	0.000	-0.053*	0.015
Employed 4 years ago	-0.124***	-0.125***	0.001	0.012
Daily income 4 years ago	0.003***	0.003***	-0.001***	0.000**
Total income within last 4 years (in €10,000)	0.012***	0.013***	-0.005	-0.001
Number of employers in last 10 years	-0.001	-0.002	0.009*	-0.002
Number of programs in last 10 years	-0.010**	-0.013***	-0.023	0.003
Months in program in last 10 years	-0.015*	-0.011*	-0.011	0.013
Months in unemployment in last 10 years	-0.000	-0.000	-0.000	0.000
Time spend in employment in last 10 years (in 100 days)	-0.002**	-0.002**	0.000	0.000***
Number of unemployment spells in last 10 years	0.009***	0.006***	0.065***	-0.015***
Total time spend with last employer (in 100 days)	0.000	0.000	0.000	0.000
Total income within last 10 years (in €10,000)	0.002*	0.002*	-0.001	0.000
Duration of last employment spell (in 100 days)	-0.002***	-0.002**	-0.004***	0.000
Information on current unemployment spell				
Duration of initial unemployment spell				
1-3 months (ref.)				
4-6 months	-0.036***	-0.038***	0.170***	-0.013*
7-9 months	-0.077***	-0.076***	0.159***	-0.022**
10-12 months	-0.121***	-0.109***	0.141***	-0.045***
more than 12 months	-0.130***	-0.128***	0.197***	-0.097***
Remaining benefit entitlement				
0-3 months (ref.)				
4-6 months	-0.086***	-0.079***	0.127***	-0.020
7-9 months	-0.079***	-0.076***	0.168***	-0.028**
10-12 months	-0.091***	-0.085***	0.153***	-0.017*
more than 12 months	-0.080***	-0.074***	0.221***	-0.035***
Any form of non-compliance with benefit conditions	-0.043***	-0.050***	0.436***	-0.122***
Amount of unemployment benefit (in €)	0.004***	0.004***	0.000	-0.000
Year of entry (=2006)	0.025***	0.024***	0.063**	-0.005
Month of entry				
Jan.-Mar. (ref.)				
Apr.-Jun.	-0.027***	-0.010*	-0.012	0.014*
Jul.-Sep.	-0.030***	-0.018***	0.028	0.001
Oct.-Dec.	-0.014*	-0.007	0.118***	-0.030***
Any vacancy referral	-0.024***	-0.013***	-0.034**	0.016***
Other ALMP participation	-0.013**	-0.006	-0.159***	0.023***
Regional information				
Living in East-Germany	-0.089***	-0.081***	0.010	0.002
Local unemployment rate	-0.048	-0.038	-0.970	0.656**
GDP (real) per capita (in €1,000)	0.262	0.466**	-0.249	0.470*
Local vacancy rate	0.099	0.127	0.180	-0.077
Share of working population				
in agriculture sector (ref.)				
in industry sector	-0.001	-0.000	-0.008***	-0.000
in service sector	-0.002**	-0.001*	-0.007***	-0.001
Number of observation	52,057	52,057	52,057	52,057

Note: Additionally, all estimations include LEA fixed effects. ***/**/* indicate statistically significance at the 1%/5%/10%-level. Standard errors are clustered ad LEA-level.

Table A.3: First stage estimation results

	Baseline	Fixed effects	Placebo I	Placebo II
	(1)	(2)	(3)	(4)
Treatment intensity				
Mobility programs	0.103***	0.094***		
Vocational training			-0.001	
Job creation schemes				-0.003
Socio-demographic characteristics				
Female	0.001	0.001	0.001	0.001
Age in years	0.001	0.001	0.001	0.001
(Age in years)^2	-0.000	-0.000	-0.000	-0.000
School leaving degree				
None (ref.)				
Lower secondary degree	0.003	0.003	0.003	0.003
Middle secondary degree	0.004	0.004	0.005	0.005
(Spec.) Upper secondary degree	0.016***	0.016***	0.016***	0.016***
Vocational degree				
None (ref.)				
In-firm training	-0.001	-0.002	-0.001	-0.001
External training	0.005	0.004	0.005	0.005
Technical college education	0.002	0.001	0.002	0.002
University degree	0.016***	0.016***	0.016***	0.016***
Children	-0.001	-0.001	-0.001	-0.001
Children $\leq$ 3 years	0.005	0.005	0.005	0.005
Children $\leq$ 10 years	-0.005*	-0.005*	-0.005*	-0.005*
Married	-0.008***	-0.007***	-0.008***	-0.008***
Lone parent	-0.008**	-0.008*	-0.009**	-0.009**
Health restriction or disability	-0.000	-0.000	-0.000	-0.000
Migration background	0.003	0.002	0.003	0.003
Professional qualification	0.004***	0.004***	0.004***	0.004***
Any employment experience	-0.003*	-0.003	-0.004*	-0.004*
Labor market history				
Share of distant jobs in last 5 years	0.009***	0.011***	0.009***	0.009***
Previous participation in mobility programs	0.065***	0.065***	0.066***	0.066***
Last contact to employment agency				
more than 3 months ago (ref.)				
2-3 months ago	-0.002	-0.002	-0.002	-0.002
1-2 months ago	-0.006	-0.005	-0.006	-0.006
within last months	-0.006	-0.006	-0.006	-0.006
No previous contact	-0.005	-0.005	-0.005	-0.005
Occupational group of previous job				
Agriculture (ref.)				
Manufacturing	-0.000	-0.001	-0.000	-0.000
Technical occupation	0.005	0.004	0.005	0.005
Service	0.007*	0.006*	0.006*	0.006*
Other	-0.001	-0.001	-0.001	-0.001
Last job was full-time employment	0.004	0.004	0.004	0.004
Log last daily income	0.000	0.001	0.000	0.000
Reason for termination of last job: laid off by employer	-0.001	-0.001	-0.001	-0.001
Total income within last 24 months (in €10,000)	-0.001	-0.001	-0.001	-0.001
Number of employers in last 24 months	-0.001	-0.001	-0.001	-0.001
Months in employment in year				
t-1	0.000	0.000	0.000	0.000
t-2	0.000	0.000	0.000	0.000
t-3	-0.000	-0.000	-0.000	-0.000
Months in program in years				
t-1	0.001	0.001	0.001	0.001
t-2	-0.000	-0.000	-0.000	-0.000
t-3	-0.001*	-0.001*	-0.001*	-0.001*

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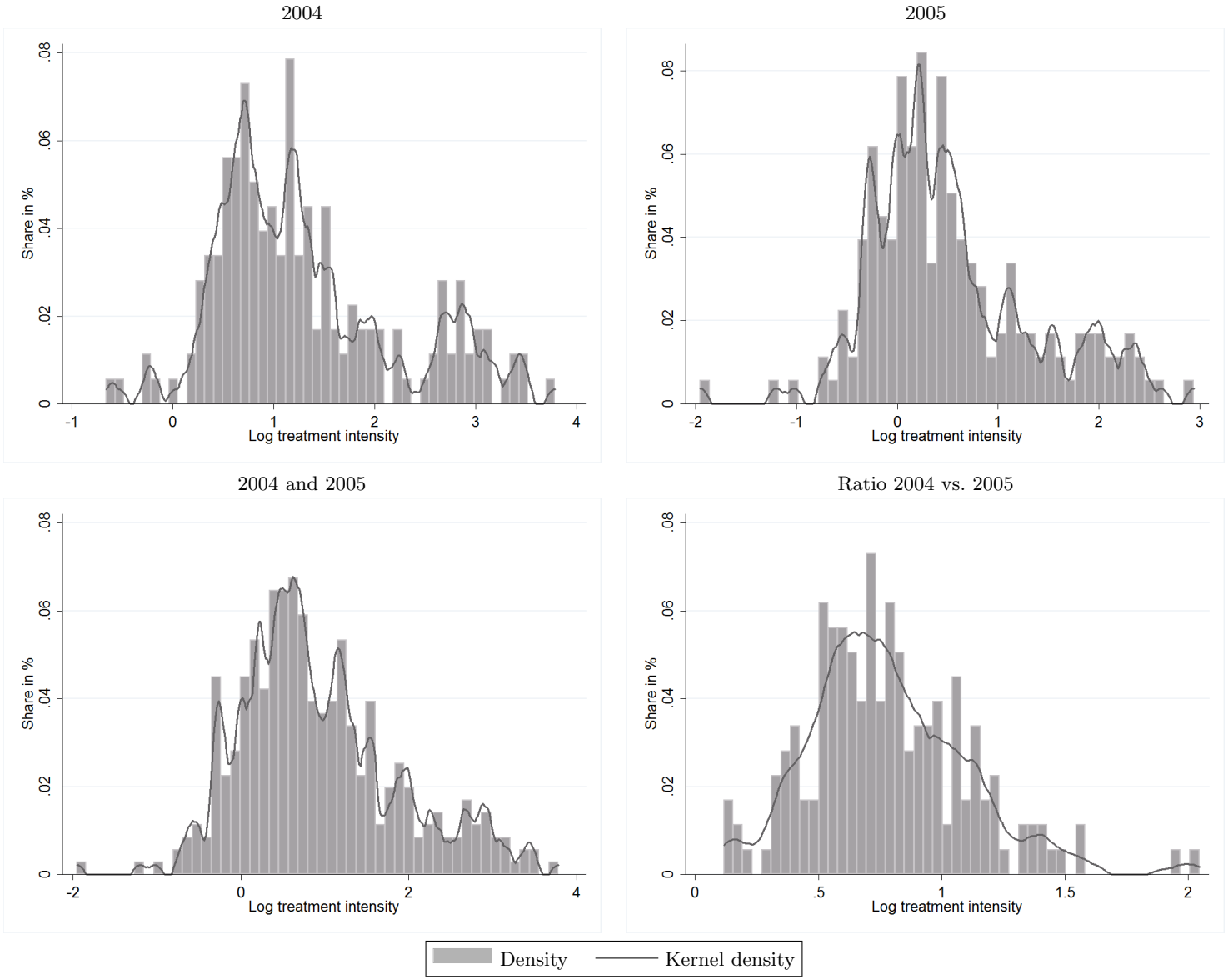
Months in unemployment in year				
t-1	0.001	0.001	0.001	0.001
t-2	-0.000	-0.000	-0.000	-0.000
t-3	-0.001	-0.000	-0.001	-0.001
Log average daily wage in year				
t-1	0.002	0.002	0.002	0.002
t-2	0.000	0.000	0.000	0.000
t-3	-0.000	-0.000	-0.000	-0.000
Time spend in unemployment in last 4 years (in 100 days)	0.000	0.000	0.000	0.000
Time spend in employment in last 4 years (in 100 days)	0.000	0.000	0.000	0.000
Number of programs in last 4 years	0.003	0.003	0.003	0.003
Months in program in last 4 years	-0.002	-0.002	-0.002	-0.002
Employed 4 years ago	-0.003	-0.003	-0.003	-0.003
Daily income 4 years ago	0.000	0.000	0.000	0.000
Total income within last 4 years (in €10,000)	0.003	0.003	0.003	0.003
Number of employers in last 10 years	0.000	0.000	0.000	0.000
Number of programs in last 10 years	-0.001	-0.001	-0.001	-0.001
Months in program in last 10 years	0.001	0.001	0.001	0.001
Months in unemployment in last 10 years	-0.000	-0.000	-0.000	-0.000
Time spend in employment in last 10 years (in 100 days)	0.000	0.000	0.000	0.000
Number of unemployment spells in last 10 years	-0.001**	-0.001***	-0.001**	-0.001**
Time spend with last employer in total	-0.000	-0.000	-0.000	-0.000
Total income within last 10 years (in €10,000)	-0.000	-0.000	-0.000	-0.000
Duration of last employment spell (in 100 days)	-0.000	-0.000	-0.000	-0.000
Information on current unemployment spell				
Duration of initial unemployment spell				
1-3 months (ref.)				
4-6 months	0.005***	0.005***	0.005***	0.005***
7-9 months	0.006**	0.007***	0.006**	0.006**
10-12 months	0.009***	0.009***	0.009***	0.009***
more than 12 months	0.005*	0.006*	0.005*	0.005*
Remaining benefit entitlement				
0-3 months (ref.)				
4-6 months	-0.002	-0.002	-0.001	-0.001
7-9 months	-0.004	-0.004	-0.004	-0.004
10-12 months	-0.005*	-0.006*	-0.005*	-0.005*
more than 12 months	-0.004	-0.005	-0.004	-0.004
Any form of non-compliance with benefit conditions	0.003	0.003	0.003	0.003
Amount of unemployment benefit (in €100)	0.035***	0.035***	0.035***	0.035***
Year of entry (=2006)	0.005*	0.003	0.004	0.004
Month of entry				
Jan.-Mar. (ref.)				
Apr.-Jun.	0.001	-0.001	0.001	0.001
Jul.-Sep.	0.002	0.000	0.002	0.002
Oct.-Dec.	-0.000	-0.003	0.000	0.000
Any vacancy referral	0.001	0.000	0.001	0.001
Other ALMP participation	0.013***	0.013***	0.013***	0.013***
Regional information				
Living in East-Germany	0.005*	0.049*	0.013***	0.014***
Local unemployment rate	-0.010	-0.100	0.002	0.003
GDP (real) per capita (in €1,000)	0.022	0.030	0.060	0.061
Local vacancy rate	-0.037	0.011	-0.038	-0.038
Share of working population				
in agriculture sector (ref.)				
in industry sector	-0.000	-0.000	-0.000*	-0.000*
in service sector	-0.000	0.000	-0.000	-0.000
No of observations	52,057	52,057	52,057	52,057
F-statistic for weak identification	48.34	14.62	0.033	0.046

Note: Additionally, all estimations include LEA fixed effects. Column (2) also include LEA fixed effects. ***/**/* indicate statistically significance at the 1%/5%/10%- level. Standard errors are clustered ad LEA-level.

Figure A.1: Distribution of the treatment intensity among local employment agencies



Note: Depicted are densities and epanechnikov kernel densities (with bandwith=0.05) of the log of treatment intensity among German local employment agencies.