The Cyclicality of the Stepping Stone Effect of Temporary Agency Employment

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Abstract: This paper investigates whether the stepping stone effect of temporary agency employment moves over the business cycle. Using German administrative data for the period 1985-2012 and an estimation framework based on the timing-events model, we construct a time series of in-treatment and post-treatment effects and estimate their relationship to the aggregate unemployment rate. We find evidence for a strong lock-in effect of temporary agency employment that is even more pronounced in tight labor markets. This suggests that firms do not use agency employment as a screening device when unemployment is low. Moreover, we find a noticeable countercyclical positive post-treatment effect indicating that workers might be able to activate networks established while being in treatment. We further document that the treatment effects are non-linear over the business cycle.

Key words: temporary agency employment, stepping stone, cyclicality, Germany

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1. Introduction

A quarter of a century ago most economists believed, that relaxing regulations for temporary agency employment increases labor market flexibility and thus overall employment. By lowering firing and hiring cost for flexible jobs, firms should have an incentive to create new jobs.[1] Moreover, temporary agency employment should act as a bridge into regular employment especially for individuals having difficulties finding a (new) job. Introducing two-tier labor markets may particularly beneficial in economies where it is politically difficult to reduce employment protection for workers with permanent contracts. Consequently, most economies have considerably relaxed regulations governing the temporary help service sector over the past decades. That said it comes not as a surprise that the temporary help service sector is paramount in increasing labor market flexibility almost all over the world (CIETT 2014). This holds particular for countries with strict employment protection (Boeri, 2011, Jahn et al., 2012).

Besides lowering firing and hiring costs, the literature has identified the need of the firms to adjust the size of the workforce to the volatility of the business cycle as the central motive why firms fall back to agency work. And indeed, it is well documented that the demand for agency work has a strong cyclical component (de Graaf-Zijl and Berkhout, 2007; Jahn and Bentzen 2012).

The high volatility of temporary agency employment combined with poor working conditions in this sector are the main reasons why recently temporary agency employment has become the heart of the debate on two-tier labor markets (Boeri, 2011; Jahn et al., 2012; OECD, 2013). Particularly, there are concerns whether agency work acts as a bridge into regular employment or whether it traps workers in poor-quality jobs. The question whether temporary agency employment is a bridge into regular employment has been investigated thoroughly during the past years (see below for a discussion of the current literature). Up to day, the empirical literature is not clear-cut. While some studies find evidence for a positive the stepping stone effect other studies provide evidence that agency employment is not

[1] To ease readability, the terms “temp job” and “agency work” are used as synonyms for “temporary agency employment,” and “temps” or “agency workers” are often used instead of “temporary agency workers.”

a springboard into regular employment. As the demand for agency employment is strong pro-cyclical, we expect that the transition from temp employment to regular employment might depend on the state of the economy as well. If the stepping stone effect moves indeed cyclical this could be an explanation why the evidence on the stepping stone effect is ambiguous, as the observation period of most studies only span a few years.

Whether the stepping stone effect depends on the business cycle has not been investigated yet. Using the timing-of events model it is the aim of this study to close this gap. As Germany has a long tradition with respect to agency employment and is one of the biggest markets for agency employment in the world, we are able to investigate the stepping stone effect for the time span 1985-2012, which covers more than three business cycles.

The theoretical impact of agency work on employment outcomes of the unemployed is not clear *a priori.* The acquisition of human capital is seen as the main channel through which agency employment offers a path into regular jobs (e.g. Abraham 1990). The argument is that agency work may improve workers' human capital through the variety of assignments (Autor 2001). Critics of this argument claim that human capital effects must be small given the short job duration (Segal & Sullivan 1997).

Due to frequent changes between user firms, agency work may also provide more useful labor market contacts compared to other flexible employment forms. Thus, agency work may facilitate rapid entry into regular employment. This holds the more if client firms use temporary staffing arrangements to screen workers to fill vacancies (e.g. Cockx & Picchio 2012b; Houseman et *al.* 2003).

The central idea of agency work is to provide a flexible buffer to the user firm "leasing" the worker. In countries with strict employment protection legislation firms might also use agency workers to circumvent high firing costs (e.g. Jahn *et al.* 2012). In both cases temp jobs can be dead-ends if firms do not plan to fill these jobs permanently (e.g. Booth *et al.* 2002; Boeri & Garibaldi 2009; Heinrich *et al.* 2005). Thus, temp work may crowd out direct job search, inhibiting longer-term labor market advancement.

To investigate these competing hypotheses, several studies estimate the effect of agency work on subsequent labor market outcomes. As mentioned previously, the empirical evidence is contradictory.

No evidence of agency work acting as a springboard into regular employment has been found so far for Germany (Kvasnicka 2009) or Spain (Amuedo-Dorantes *et al*. 2008). García-Pérez & Muñoz-Bullón (2005) and Malo & Muñoz-Bullón (2008) show that temp work serves only as a stepping stone for young, short-term unemployed workers and married women in Spain. In Italy, the effect on labor market outcomes depends on the region in question (Ichino *et al.* 2008). In general, it seems that rigid European labor market institutions do not facilitate successful transitions from temp work into regular jobs. The American evidence is not conclusive either.[2]

Our study contributes to this debate by, first, taking into account the different motivations for unemployed people to work as temps; escaping unemployment, to obtain or prolong eligibility for unemployment benefits, or to combine family responsibilities with labor market participation. Since the motivation to pursue agency work is not observed, it is important to separate the treatment effects from time-invariant unobserved variables affecting both the selection into agency employment and the transition out of unemployment. To do so, we employ the timing-of-events approach developed by Abbring and van den Berg (2003a). There are two related studies employing a similar approach, but not focusing exclusively on agency jobs. De Graaf-Zijl *et al.* (2011) studies temporary jobs in general, of which agency work makes up only a small fraction. Cockx & Picchio (2012a) investigate the impacts of 'short-lived' jobs observed to be so ex post and thus can be of any type. As our study exclusively focuses on agency jobs the interpretation of our results can lead more easily to policy advice.

Second, our approach differentiates between in-treatment and post-treatment effects of taking a temporary agency job during a phase of unemployment. This enables us to shed some light on whether temp workers are able to accumulate human capital, which may lead to a regular job, or whether agency employment stigmatizes workers and harms subsequent labor market careers. Third, the linked employer–employee data used provides us with daily information on the labour force status for the

[2] For example, see Lane *et al.* (2003), Andersson *et al.* (2005, 2009), Hamersma & Heinrich (2008), Heinrich *et al.* (2005, 2009), Autor & Houseman (2010) and Autor *et al*. (2012). The results of these studies are discussed thoroughly in Autor (2009).

period 1985-2012 which allows us to investigate the cyclicality of the stepping stone effect. This is a vast improvement over earlier work in this strand of literature.

We find that agency work does not serve as a bridge into regular employment while being in treatment. However, we did find a strong positive post-treatment effect. Moreover, we provide evidence that both, the in-treatment and post-treatment effect, are counter cyclical. It seems that having had at least some temp experience during unemployment might benefit workers in periods with slack employment demand. We provide also evidence that workers do not benefit from agency employment while being in treatment during a boom. The likely reason is a strong lock-in effect. Moreover, we find that the post-treatment effect is less volatile compared to the in-treatment effect. A possible explanation is that network effects are the reason for the positive post-treatment effects.

The paper is organized as follows. Section 2 discusses the temporary help sector and the unemployment insurance system in Germany. Section 3 presents the estimation strategy. Section 4 presents the data and main descriptive statistics. In Section 5, we discuss results; Section 6 draws conclusions and provides a brief policy discussion.

2. Institutional setting

In Germany all temporary agency workers are eligible for social benefits, have access to health insurance, holiday leave, and statutory pension plans. Agency workers who have been employed for more than six month with the agency are covered by the rather strict employment protection legislation. Nevertheless, agency jobs are spot-market jobs which tend to be rather short: The median duration of an agency job is about 12 weeks.

Temporary agency employment is regulated by national legal statutes since 1972 which governs the sector with specific regulations. Since the 1980s they have been amended several times while EPL for regular workers remained by and large the same. Most reforms in the 1980s and 1990s aimed to increase the flexibility of the user firms by prolonging the maximum period of assignment. The major purpose of the reforms after 2000 was to decrease the sizable wage gap between temporary agency

workers and workers employed outside the sector. However, the effect of these reforms were small. Although Antoni and Jahn (2009) find that the prolongation of the maximum period of assignment increased slightly the employment duration of temps, Jahn (2010) could not find any impact on the size of the pay gap. Moreover, it seems that the reforms had no significant effect on the growth of the temporary help service sector (Jahn and Bentzen, 2012).

[Figure 1 about here]

Figure 1 shows that during our observation period, which covers the time span from 1985 to 2012, Agency employment increased rapidly. Although agency employment still accounts for a relatively small share of paid employment (2.7 percent in 2012), agency employment has grown by nine per cent per year on average. The buffer function of agency employment can also be easily seen in Figure 1: During the recent economic crisis there has been a substantial drop in the number of temporary agency workers. The Federal Employment Agency estimates that around 70 percent of the total job loss during the Great Recession was due to the mass lay-offs in the sector (Federal Employment Agency, 2012). After the crisis agency employment played an important role in total job creation: in 2010 more than one out of two new jobs was created in this sector. By 2010 the temporary help service sector has again fully recovered and reached its historical peak.

The dynamic nature of agency work is also reflected by its volatility. The first differences of the log of the stock of agency workers and unemployed persons are shown in Figure 2.[3] A visual inspection of Figure 2, confirms a clear pro-cyclical pattern and seasonality appears to be present.

[Figure 2 about here]

Apart from the liberalization of the temporary help service sector likely reasons for the surge in Temporary agency employment was the improvement of it's reputation in the 1990s, the increasing matching efficiency of the temporary help service sector (Neugart and Storrie, 2006), and considerable productivity gains for firms complementing their permanent workforce with temporary agency employment (Hirsch and Müller 2012). These explanations are also in line with the perception that the

[3] As high-frequency data contain some short-run noise, a centered, 12-period moving-average filter has been applied to the time series before differencing the data.

extensive regulation of fixed-term contracts along with the strict employment protection legislation makes is attractive for user firms to adjust their workforce through temporary agency employment (Mitlacher 2007; Venn 2009). In contrast to countries like Spain or France (Bentolila et al. 2012) fixed-term contracts only play a minor role for the flexibility of the firms. The share of workers with fixed-term contracts has only slightly increased since 1985 (Destatis 2013) and about 56 percent of them were converted to permanent contracts in 2011 (IAB 2012). This is important to bear in mind when investigating the stepping stone effect of temp employment in Germany.

3. Econometric strategy

3.1. Timing-of-events model

As unemployed workers do not take up agency jobs at random, we have to distinguish the causal effects of agency employment from selection effects. If unobserved variables influence the selection process as well as the potential outcomes, an approach based on the CIA will result in biased estimates. We therefore employ the timing-of-events approach, formalized by Abbring & van den Berg (2003a), and analyze the time from inflow into unemployment until regular employment is obtained. This enables us to exploit random variation in the observed moment of transition from (full-time) unemployment to agency employment and thus to separate selection effects from causal effects.

We sample workers at the point in time when they enter unemployment and analyze how long it takes them to find regular work, and whether having worked for a temp agency while unemployed accelerates this process. The duration modeled is therefore the time from becoming unemployed to finding a regular job. The take-up of agency work during this period is considered the treatment, the effect of which we want to estimate.

Let T_u be a continuous random variable measuring the time from becoming unemployed to being hired into regular employment. Data on T_u are censored for those who remained unemployed until

the last week of the observation period and for those making transitions out of the labor force. The hazard rate into a regular job is assumed to be a Mixed Proportional Hazard (MPH):

$$\theta_u(t \mid x, d_1(t), d_2(t), \upsilon_u) = \lambda_u(t) \exp[x\beta_u + d_1(t)\gamma_1 + d_2(t)\gamma_2 + \upsilon_u] \quad (1)$$

The hazard function is the product of a baseline hazard, $\lambda_u(t)$, depending on the elapsed unemployment duration, and a scaling function depending on observed variables, *x*, an unobserved variable υ_u, and two time-varying indicators, one for being employed by a temp agency at time t, $d_1(t) = 1$, and one for having been a temp during the current unemployment spell before t but not a temp at t, $d_2(t) = 1$. The coefficients γ_1 and γ_2 thus capture the in-treatment and post-treatment effects of temp jobs on the hazard rate into regular employment, respectively. In case of repeated treatments the in-treatment indicator is again $d_1(t) = 1$ while the post-treatment effect is $d_2(t) = 1$. Hence, we estimate a weighted average treatment effect of the respective treatment spell.

When evaluating active labor market programs, one often observes that γ_1 is negative, i.e., that there is a lock-in effect. However, in the case of temporary agency employment, the sign of γ_1 is not obvious *a priori*. On the one hand, while on assignment, the temp worker has less time to search for a job outside the temp sector. On the other hand, it is well known that client firms also use agency employment as a screening device. In this case, agency workers may receive an offer for a regular job faster than comparable individuals conducting their job search from open unemployment.

If γ_2 is positive, it means that the skills or the network obtained during a temp job increases the subsequent chances of finding regular employment. A negative post-treatment effect would normally be interpreted as some type of stigma. If temporary agency employment is to act as a bridge into regular employment, then either γ_1 or γ_2 (or both) should be positive.

We model the baseline hazard using a flexible, piecewise-constant specification:

$$\lambda_u(t) = \exp\left[\sum_l \left(\lambda_{u,l} I_l(t)\right)\right]$$

where $l = 0, \ldots, 11$ is a subscript for the time intervals measured in weeks and $I_l(t)$ are time-varying indicator variables for elapsed duration *t*. We split the analysis period during the first 6 months into monthly intervals. From the 7th month on, we split the time axis into quarterly intervals up to 2 years, after which the exit rate is assumed to be constant.

In order to allow an interpretation of γ_1 and γ_2 as causal effects, we have to take into account the potential endogeneity of agency work, i.e. the decision to take up a temp job while being unemployed. Let T_p denote the time from becoming unemployed until the person finds an agency job. Note that we in a sense consider temp periods to be part of the unemployment spell, hence, if T_p is observed, it is shorter than T_u. Specifying once again a MPH function, the transition rate into temporary agency jobs is specified as:

$$\theta_p(t \mid x, \upsilon_p) = \lambda_p(t) \exp[x\beta_p + \upsilon_p] \tag{2}$$

The unobserved random variables, υ_u, υ_p, are allowed to be correlated, which implies a correction for the potential endogeneity of the treatment status. As we have multiple unemployment spells for some jobseekers, the values of each unobserved heterogeneity term is assumed to be specific to the individual.

Let C_i be a non-censoring indicator that takes the value of 1 if spell *i* was completed by a transition into a regular job before the end of the observation period, and zero otherwise. The likelihood function for individual *j* with *N* unemployment spells is specified as

$$L(\upsilon_u, \upsilon_p) = \prod_{i=1}^{N} L_i(\upsilon_u, \upsilon_p)$$

where

$$\begin{aligned} & L_i(\upsilon_u, \upsilon_p) \\ & = \theta_p[t_{pi} \mid x_i, \upsilon_p]^{I[t_{pi} < t_{ui}]}{}_u[t_{ui} \mid x_i, d_1(t_{ui}), d_2(t_{ui}), \upsilon_u]^{C_i} \\ & \times \exp\left\{ - \int_0^{t_{pi}} \theta_p[s \mid x_i, \upsilon_p] ds - \int_0^{t_{ui}} \theta_u[r \mid x_i, d_1(t), d_2(t), \upsilon_u] dr \right\} \end{aligned} \tag{4}$$

As we sample a 2% random sample of all temp job participants but only 0.5% of the nonparticipants, the econometric models are estimated using the weighted exogenous sampling maximum likelihood estimation method (Manski & Lerman 1977) precisely as in van den Berg & Vikström (2013). This sampling scheme is frequently used in economics; in case of maximum likelihood it provides a consistent but not fully efficient estimator.[4]

The distribution of unobserved variables is approximated non-parametrically by a bivariate discrete distribution with M mass points (Heckman & Singer 1984; Gaure *et al.* 2007).

In all estimations performed, we first estimate the model without unobserved heterogeneity, and then we proceed by adding an additional point of support to the distribution of unobservables (that is, we estimate values of υ_u, υ_p and an associated probability restricted to lie between 0 and 1 through logistic transformation). If the Akaike Information Criterion is satisfied, we proceed by adding another support point, and we continue to do so until the likelihood does not improve enough to satisfy the Akaike Information Criterion. This procedure allows for unrestricted correlation between the different unobserved variables and typically results in about six support points in the final estimation. Parameter estimates of treatment effects typically start to stabilize after the third or fourth support point has been added.

3.2. Identification of the causal effect of temp jobs

In this sub-section, we will deal with three issues; first, we will motivate treating a temp job as part of the unemployment spell rather than as a separate state. Second, we will discuss the MPH assumption and the assumption of random variation in the timing of treatment. Finally, we will briefly discuss general equilibrium effects.

We perceive the temp job as part of the unemployment spell, that is, our outcome of interest is the time from initiation of an unemployment spell until regular employment. The counterfactual situation

[4] Ideally, we should have used the sandwich estimator for the covariance matrix. However, due to problems in calculating the numerical Hessian matrix, we used the inverse of the cross-products of the score vector.

is one of continued unemployment until employment, so in this context and given its relatively short median duration, we believe that the most appropriate way of modeling the temp job is to perceive it as an activity undertaken during a spell of unemployment.

The Mixed Proportional Hazards assumption is fairly standard, but nevertheless crucial. We are not aware of any tests of its validity in the German context. Still, the presence of multiple spells - 3-4 on average per individual - implies that the distribution of unobserved variables is much better identified, and its identification relies less on the MPH assumption (e.g. Abbring & van den Berg 2003a, b; Brinch 2007; Gaure *et al.* 2007).

Under the assumption that unobserved characteristics are time-invariant and that there is no anticipation of treatment, random variation in the timing of the first temp job during the unemployment spell identifies its causal effect. Moreover, no additional exclusion restriction is necessary to identify the parameters of this model. In that sense, the random variation in the timing acts as an instrument or as an exclusion restriction in the class of models popularly known as Heckman selection models (e.g. Heckman *et al.* 1999).

The non-anticipation assumption implies that the individual is supposed not to know more about the moment when the agency job starts than is captured by the distribution of this duration. Anticipation in our model would occur if the jobseeker would know for too long in advance precisely when she will start a temp job. The non-anticipation assumption is crucial to rule out changes in behavior before the actual treatment takes place.

Next, we discuss the sources of this random variation. First of all, the unemployed worker should realize the possibility of signing up with a temp agency. Note that in Germany the information on the presence of temp agencies is not abundant. Hence, there will be a source of randomness in the arrival of information on the possibility of getting enlisted in a temp agency. Next, there may be some random variation in the time from approaching the agency until the jobseeker is actually listed in their pool of available workers. Subsequently, there may be some random variation, from the perspective of the individual in the arrival of temp job offers, that is, from the demand side. There is considerable variation between agencies in the amount of effort they put into this process and how time-consuming

it is. In general, when a worker decides to enlist with a temp agency, she simply contacts the relevant agency, which then evaluates her qualifications. This typically involves a face-to-face meeting with an employee at the agency. The agency may also reject an applicant on the grounds that it would be difficult to find temp employment for that person.

Once a worker is listed in the database of an agency, the time from enlisting until the first temp job depends on the qualifications of the applicant and on demand side factors, such as the event of employee sickness requiring a substitute in a firm, or a temporary increase in the demand for its goods or services. Most often, the time from an order is placed until the person has to begin the temp job is short, ranging from the next morning up to a couple of weeks. In cases where middle management positions have to be filled, the time span can be longer.[5]

This discussion implies that there is considerable variation in the timing of the first temp job, which can also be seen from the descriptives in Section 4. Moreover, quite a bit of this variation can be considered exogenous to the individual unemployed worker due to information frictions, search frictions, variation in hiring processes of agencies, and demand side random variation due to events (sickness etc.) in firms requiring temp workers. Finally, the violation of the non-anticipation assumption appears to be also minor, due to the typically very short time from notification until the actual temp job starts.

Our estimations are performed at the micro-level, and we implicitly assume that agency jobs do not affect the exit rate from non-treated unemployment to regular jobs. However, we cannot rule out the possibility of equilibrium effects on the demand and supply side of regular jobs. Still, the share of agency workers in Germany is rather small. Even in the biggest markets for temporary help services in Europe like the UK and Netherlands the share of agency workers is only about 3 to 4% (CIETT 2014). Consequently, we believe that general equilibrium effects are a minor concern in our case.

[5] This is one reason why we have excluded temp workers in management positions in the empirical part of the paper as in this case the non-anticipation condition might be violated, see Section 4.

3.3. Modeling the cyclicality

To estimate the cyclicality of agency employment, we augment the set of characteristics by including interaction terms between a the centered unemployment rate or unemployment rate dummies, *z*, and the two treatment indicators $d_1(t)$ and $d_2(t)$. Apart from a larger set of parameters, the estimation procedure is as before, and the hazard function out of unemployment to employment can be written as

$$\theta_u(t \mid x, d_1(t), d_2(t), \upsilon_u) = \lambda_u(t)\exp[x\beta_u + (1\ z)d_1(t)\gamma_1 + (1\ z)d_2(t)\gamma_2 + \upsilon_u] \quad (5)$$

Where $(1\ z)$ is a $(K+1)$ vector of unemployment rate dummies, and γ_1 is a $(K+1)$ parameter vector, and similarly for γ_2.

3.4 Calculating the expected remaining unemployment duration

The overall effect of having a temp job on the expected remaining unemployment duration gives an impression of the combined effects of in- and post-treatment effects. It obviously depends on the timing and duration of the treatment as well as on individual characteristics. We follow e.g. Kyyrä *et al.* (2013) and consider the following treatment effect:

$$\Delta(t_p, t_d) = E[T_u - t_p \mid T_p = t_p, t_d, T_u > t_p] - E[T_u - t_p \mid T_p = \infty, T_u > t_p] \quad (8)$$

where t_p denotes the elapsed unemployment duration at the time of entry into a temp job and t_d is the (intended) duration of the temp job. Hence, $\Delta(\cdot)$ measures the effect on the expected remaining unemployment duration of entering a temp job at t_p and holding it for (at most) t_d weeks.

4. Data sources and descriptive statistics

To put this approach into practice, we need detailed high-frequency data on unemployment durations and preceding and subsequent jobs over a long period of time, ideally encompassing several

business cycles. For our purpose, we combine two administrative data sets for the period 1980-2012: the Integrated Employment Biographies (IEB) and a quarterly version of the Establishment History Panel (BHP) provided by the Institute for Employment Research (IAB).

The IEB comprises all wage and salary employees as well as all registered unemployed with the German social security system (for details on the IEB, see Jacobebbinghaus 2007). Since the information contained is used to calculate social security contributions and unemployment benefits the data set is highly reliable and especially useful for analyses taking wages and unemployment durations into account.

Although our data contain observations for East German workers from 1992 onwards, restricting our analysis to the post-unification period would markedly reduce our period of observation and thus the scope of our investigation. Moreover, including East German data for the 1990s would mix up business cycle effects and those effects stemming from the transition of a socialist planned economy to a market economy. We will thus focus our analysis throughout on individuals working in West Germany (excluding Berlin) during the period 1985-2010 and further restrict it to males aged 20-55 years to circumvent selectivity issues regarding female employment and early retirement.

We identify employment spells in temporary help agencies by an industry classification code. For the analysis, we use a two percent random sample of all individuals who were employed by a temp agency at least once during an unemployment spell starting in the period 1985 to 2012, and a 0.5% random sample of all other individuals starting an unemployment spell during the same period. The information for the period 1980 to 1984 is used to construct the previous employment history of the job-seekers.

An unemployment spell is defined as a sequence of weeks during which a person receives either UI benefits or unemployment assistance or is employed at a temp agency. Note that jobseekers who are registered at temporary work agencies, but who are currently not assigned to an employer, do not receive wage income and are considered to be unemployed. Unemployment spells continuing until the end of the sample period are treated as independently right-censored observations (3% of all spells).

The dependent variable is the unemployment duration measured in days. The two explanatory variables of interest are the time-varying indicators of being employed as a temp worker, and having been employed as a temp worker at a previous time during the current unemployment spell. We define the destination "regular employment and apprenticeship" as non-temp employment.[6]

In order to concentrate on workers who accept an agency job because of a lack of alternatives outside the sector, the following selection decisions are made.

First, in order to insure that workers have at least some attachment to the labour market and to exclude students temping during education we require that the jobseeker must have been at least 90 days wage and salary employed during the past five years. Second, temp workers cannot be distinguished from the administrative staff of temporary employment agencies. However, we do not expect this to affect our estimations, since the absolute number of the staff members in the data set is likely to be small, and we concentrate our analysis on temp workers who were unemployed before accepting the temp job. Moreover, we exclude individuals who hold management positions, as it is likely that they belong to the staff of the agency.[7] For the same reason, we exclude temp workers with a temp spell lasting more than two years. After this sample selection, the sample consists of 88.091 individuals experiencing a total of 284.918 unemployment spells.

In addition, the following socio-demographic variables are used: age (4 categories), married or not, ethnic origin (4 groups), child in the household and education (3 categories). In addition, we have information on the last occupation (13 categories and one for occupation unknown) and whether the worker receives unemployment benefits or unemployment assistance. As a proxy for the human capital and employability of the worker, we use the employment history of the past five years: previously employed (in the temporary help sector, as apprentice, or regular employed), the latter of

[6] Our dataset does not provide information on other flexible contract types, so it might be possible that workers end up in direct-hire fixed-term contracts. However, direct-hire fixed-term contracts only play a minor role in Germany.

[7] Antoni and Jahn (2009) provide evidence for share of staff belonging to the agency among all workers working in the temporary help service sector Germany and show that agency staff members account for about 7% of the stock of all workers identified as temp workers via the industry classification code. In the inflow to temp jobs from unemployment, this ratio is likely to be considerably lower, since the staff of temp agencies obviously experiences fewer transitions into and out of jobs than the temp workers themselves.

which is the reference category), or out of the labor force. Moreover, we control for the total fraction of time spent in employment during the past five years, the number of temp and regular jobs held.

Finally, we include dummies for the year and quarter as well as the aggregate centered unemployment rate (for West Germany) and regional dummies (6 dummies)[8]. All controls, except for the two treatment indicators, the year and quarter dummies and the unemployment rate are measured at the beginning of the unemployment spell and will be treated as time-invariant regressors which are fixed for each single spell but can vary over different spells for the same person.

Table 1 presents an overview of events and outcomes for the treated and the untreated group. Of the 284.918 unemployment spells, 32,494 involve at least one agency work spell. Clearly, there are strong differences in the median duration of unemployment. Median search for a regular job lasts around 3.6 months for the untreated group and 12.5 months for individuals who experienced a temp spell during unemployment. The median (mean) time until first accepting an agency job is about 6.7 (3.6) months. The median (mean) duration of a temp spell is about 3 (5.1) months and the average number of separate temp spells (separated by unemployment) during an unemployment spell (given that there is at least one temp spell) is 1.3. [9] About 12.3 % of the unemployment spells of the treated group experienced more than one temp job during the unemployment spell. Table 1 also shows that 55% (59%) of the treated (control) group ultimately ended up in regular employment. The key descriptive statistics in Appendix Table A1 show, that there are only minor differences in terms of background characteristics between the treated and the untreated.

[8] Note using the regional unemployment rate would mix up cyclical movements of unemployment over time and structural differences in unemployment across regions which is the reason we use the aggregate unemployment rate.

[9] Some individuals held a temp job before becoming unemployed, that is, they went from regular employment or out of the labor force to temp employment and then into open unemployment. As the model does not allow for selection at time zero, in the estimations presented here unemployment begins with the open unemployment spell. However, as a robustness check, we also add these temp spells to the analysis by generating an artificial 0.1-week period of open unemployment to the beginning of such unemployment periods. In addition, we estimated the model excluding those unemployment spells. The results are robust to such changes.

5. Results

5.1 Selection into temporary employment

Figure 3 shows, first, the Kaplan-Meier estimates of the transition rate from unemployment to temporary agency employment as a function of elapsed unemployment duration; second, the hazard rate from unemployment to regular employment for unemployed who did not hold a temp job during unemployment (the untreated); and third, the hazard rate to regular employment for the treated individuals. All durations are measured from the time of unemployment entry in days.

[Figure 3 about here]

The hazard rate to temporary agency employment measures the probability of entering temporary agency employment at a given day for those who are unemployed at the beginning of the day. As stated in Section 3, a key identifying assumption is that we observe some exogenous variation in the time until being treated. Figure 3 shows that there is indeed a great deal of variation in these durations. The hazard rate to agency employment for men starts at about 0.08 percent per day and decreases over the first year of unemployment to a level of around 0.05 percent.

The hazard rates to regular employment for the untreated start at a level of 0.35 percent increases to 0.45 and gradually decrease thereafter. Interestingly, the hazard rate to employment jumps up after one year. One reason may be that after one year unemployment benefits run out for most workers.

Finally, Figure 1 displays the hazard rates to employment for the treated unemployed. The exit rate for the treated starts, by construction, very low (since they have a treatment period before leaving unemployment), peaks at about one year of job search and than stays constant. Moreover, after one year, the exit rate for the treated lies well above the hazard rate for the non-treated. This pattern suggests that the dynamics of the job search process are important, as conditioning on unemployment duration is obviously crucial when estimating treatment effects - the treated are found among those who did not find a regular job shortly after becoming unemployed. Moreover, it suggests that taking into account the dynamics of the selection process is important as well. It also implies that either there

is a fairly strong treatment effect, or that the treated and untreated differ considerably in observable or unobservable ways.

Results of the selection equation (time until a temp job) and the main equation (time until ordinary employment) are shown in appendix Table A2 for the model with homogenous treatment effects and six support points. For the sake of brevity, we will not report these in any detail, but we will briefly mention the main patterns in the selection equation.

First of all, duration dependence in the selection equation is decreasing with the time being unemployed. Young workers below the age of 25 have a much higher transition rate to temp jobs than older workers. Workers aged 45 have the lowest transition rate into temp jobs. Being married or having a child in the household is associated with a lower probability of receiving treatment.

The transition rate into temp jobs for Eastern European immigrants is considerably higher than for Germans or EU15 immigrants or non-western immigrants. Moreover, we find that the high skilled workers are less likely to take up temp jobs and median skilled unemployed are more likely than those with no educational degree. Finally, the transition rate into temporary agency work increases with the fraction of time the person was employed or temp employed during the past five years. Workers receiving unemployment assistance have a lower probability to enter into a temp job. The transition probability also decrease in a downturn.

5.2 Treatment effects

In order to estimate homogenous treatment effects across individuals, we proceed as follows. We first estimate a basic duration model with flexible baseline, no unobserved heterogeneity, no selection, and only the two main explanatory variables (in-treatment and post-treatment). Second, we estimate the same model but adding the covariates described in Section 4. The first model indicates that there are significant negative in-treatment effects and a strong positive post-treatment effect, see Table 2. The interaction term between the in-treatment effect, the post-treatment effect and the centered unemployment rate indicates at first that the stepping stone effect is not cyclical at all. After adding control variables, the in-treatment and the post-treatment effect increase considerably. Moreover,

the interaction terms with the centered unemployment rate become significant. It seems that the stepping stone effect is counter-cyclical. This might be an indication that lock-in effect during a boom might hamper fast re-integration into regular employment.

[Table 2 about here]

Third, we estimate the full timing-of-events model, starting from a two point distribution of unobservables. We proceed, by estimating the same model, allowing sequentially for extra mass points as described in section 3.1, freeing up the correlation structure of the unobservables. We add mass points as long as the Akaide Information Criterion improves (see e.g., Gaure *et al.* 2007). It turns out that the in-treatment and post-treatment coefficients barely change after adding the fourth mass point. The results after adding six support points, which is most often the optimal number, are presented in Model 3 in Table 2.

Table 2 shows that there is a significant and large negative in-treatment effect. This means that currently working for a temp agency does significantly affect negatively the transition rate to regular employment on average, when compared to a similar person in open unemployment. The results also show, that the in-treatment effect increases by about 7 percent (becomes less negative), if the unemployment rate increases one percent above the mean.

The negative in-treatment effect indicates that there might be a locking in effect at work. While temping workers might reduce their search intensity for a regular job. Consequently, unemployment duration increases compared to workers not taking up such a short-term job opportunity. Note, that also compared to international standards, temp jobs are with a median duration of 3 months quite long. In the downturn, the in-treatment effect is less negative which also might suggest, that the lock-in effect is a possible candidate for the negative in-treatment effect. In a downturn, when nobody finds a job, agency employment might less harm the unemployed.

Having worked for a temp agency at least once earlier in the same unemployment spell causes a high positive post-treatment effect. The hazard rate to regular employment increases by about 31 percent. As with the in-treatment we find a positive counter-cyclical pattern. If the economy slows down (e.g. an increase of about one percent above the mean unemployment rate) the hazard rate

increases by 4 percent. The volatility of the post-treatment effect is less pronounced compared to the in-treatment effect.

The positive post-treatment effects suggest that agency workers might be able to build up human capital during the temp spell or that they are able to build up a productive job-search network while being in temp employment. That the post-treatment increases in a slump, when nobody finds a job, might indicate that particularly the search network might be a candidate for explaining the post-treatment effect.

In a next step we construct a quarterly time series of the long-run in-treatment and post-treatment effect from the data by combining quarterly information on the centered unemployment rate, the treatment effects and the interaction terms between the in-treatment effects and the centered unemployment rate.

[Table 3 about here]

Table 3 summarizes our estimates for the period 1985-2012. First, the aggregate unemployment rate varies considerably from 5.8 to 11.8 percent. The long run treatment effects also varies markedly over our observation period with estimates for the in-treatment effect ranging from -35 percent to 3 percent. The post-treatment effect varies ranges depending on the state of the business cycle less pronounced between 21 percent and 42 percent and is always positive. A plot of the treatment and the unemployment rate time series (see Figure 4) suggests a substantial counter-cyclicality. Yet, the plot also reveals a strong seasonality in the elasticity series. Moreover, Figure 4 shows that the in-treatment effect becomes only positive during the period 2005-2006.

[Figure 4 about here]

5.3 Prevailing level of unemployment

Up to now, we have found evidence that both the in-treatment and post-treatment move counter-cyclical. So far, we have restricted the impact of the aggregate unemployment rate on the treatment effects to be independent of the current state of the labour market, i.e.

independent of the prevailing level of unemployment. It is tempting, though, to conjecture that deteriorating labor market prospects are felt more by workers when the labor market is tight than in a situation with already poor outside opportunities. In other words, the impact of the aggregate unemployment rate on the long-run treatment effects are less pronounced for low levels of unemployment.

To check this conjecture, we now redo our analysis adding dummy variables for the unemployment rate and their interaction with the treatment effects as covariates to the model. We thus allow the impact of the aggregate unemployment rate on the respective treatment effect to depend on the prevailing state of the labor market.

[Table 4 about here]

As is clear from Table 4, which presents the main results obtained from fitting in the modified timing-of-event-model the coefficients of the interaction of the unemployment rate and the in-treatment effect are statistically significant. The unemployment rate indeed has the worst adverse impact on the in-treatment effect if unemployment is low. While the changes of the treatment effect are moderate when the unemployment rate lies between 7% and 10 % once the unemployment rate reaches levels over 10 % the in-treatment effect is only slightly negative. It seems that if unemployment rate is above 10 % nobody finds a job neither the treatment nor the control group and the lock-in effect does not play a role any more. The strong negative in-treatment effect at low unemployment rates point again to a more pronounced adverse impact of the lock.in effect on the transition to regular employment.

Turning to the post-treatment effect we find no or slightly higher post-treatment effects for low unemployment rates ranging between 5.8% and 9%. The positive post-treatment effect becomes even more pronounced at high unemployment rates. This might be an indication, that network effects play a role.

Taken together, these results point at the robustness of our main finding that both the in-treatment and post-treatment effect move counter-cyclical. Even more, they make clear that the counter-

cyclicality is more pronounced in slack labor markets with high unemployment than in tight labor markets where lock-in effects deteriorate workers' search for regular jobs.

5.4 Expected remaining unemployment duration

To get an impression about the economic relevance of the treatment effect we compare in a next step the expected remaining unemployment durations for unemployed with and without treatment. To do so we follow the approach outlined in Section 3.4 and calculate the expected remaining unemployment duration of entering a temp job at a given unemployment duration and at a given treatment duration, compared to the counterfactual of no treatment, i.e the average treatment effect on the treated. For each combination of t_p and t_d, we calculate expected remaining durations and the effect of treatment for all individuals in the sample and then take the sample averages.

[Figure 5 about here]

In Figure 5, Panel A we vary the treatment duration in intervals of 15 days for the median and mean time until entry into the first temp job. The median time until the first temp job is 110 days and the mean time 205 days, respectively. Panel A makes clear that the overall effect is positive. Taking up a temp job during unemployment reduces remaining time in unemployment for the treatment group by 170 days if the temp jobs lasts two weeks (15 days). The remaining unemployment duration and thus the gain from treatment is less pronounced if the treatment duration increases. If worker enter the treatment after 205 days the treatment effect is even higher. The gain compared to the reference group is about 190 days.

Panel B in Figure 4 investigates whether the treatment effect varies with the time entered to the first temp job at constant treatment durations of 92 days (median) and 156 days (mean).

The gain from taking up a temp job with different durations does not vary greatly. The remaining unemployment duration is about 134 days for a treatment duration of 92 days and 128 days for a treatment duration of 156 days. It seems also that the gain in terms of remaining unemployed becomes bigger the later workers enter to the temp sector.

6. Conclusion

The question whether temporary agency employment is a bridge into regular employment has been investigated thoroughly. Up to day, the empirical literature is not clear-cut. While some studies find evidence for a positive stepping stone effect other studies provide evidence that agency employment is not a springboard into regular employment. However, the demand for agency employment is strongly cyclical and thus we would expect the stepping stone effect being cyclical as well. We argue that the cyclicality of the stepping stone effect of temporary agency employment could be an explanation why the evidence on the stepping stone effect is ambiguous so far.

We find that the stepping stone effect is indeed strongly counter-cyclical. Agency work does not serve directly as a bridge into regular employment when the labor market is tight. The likely reason for the strong counter-cyclicality of the in-treatment effect is a strong lock-in effect. However, in slack labor markets the in-treatment effect increases and becomes slightly positive when unemployment is high.

We also find a strong positive post-treatment effect over the entire business cycle, which is counter cyclical as well. It seems that having had at least some employment experience during unemployment might benefit workers particular in periods with slack employment demand. One possible explanation might be that workers are able to build up job-search networks while working as a temp. These networks might be useful in slack labor markets, when the unemployed have more difficulties finding a job.

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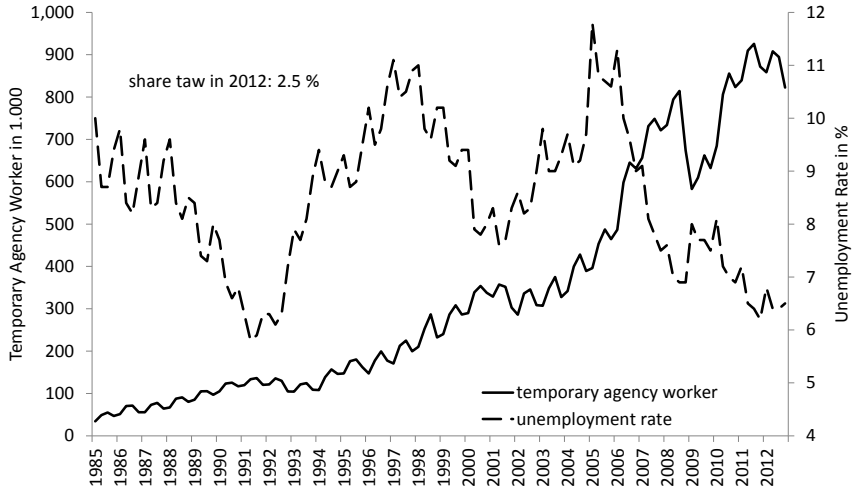
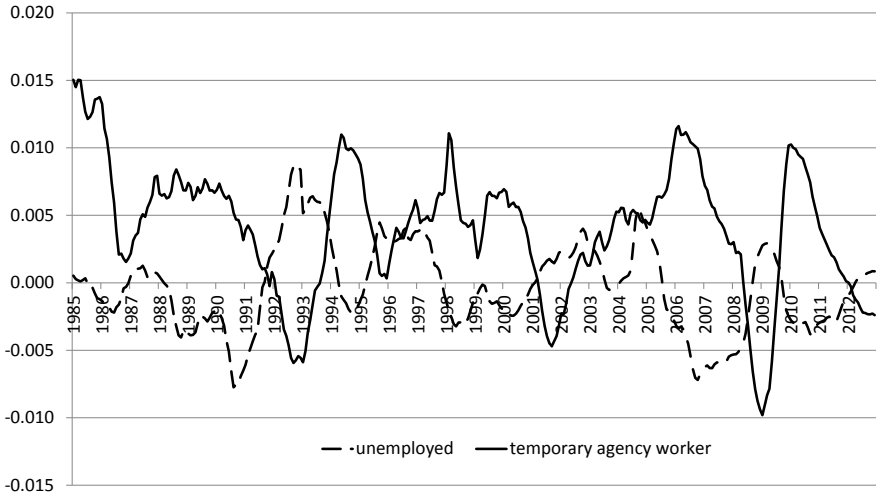
Tables and Figures

Figure 1: Temporary agency workers in Germany 1985-2012



Source: Labor Placement Statistics and Unemployment Statsistics, Federal Employment Service
Notes: Monthly stock of temorary agency workers

Figure 2: Cyclicality of temporary agency employment in Germany



Source: Labor Placement Statistics and Unemployment Statsistics, Federal Employment Service
Notes: The level values of the variables are smoothed by an 12-period centered moving average; first differences of log values are displayed at the vertcal axis.

Table 1: Overview of events and outcomes

	Treatment	Control
Number of unemployment spells	32,494	252,424
Number of persons	14,393	73,698
Share right-censored spells	2.8	9.6
Number of unemployment spells per person	3.2	
Median unemployment duration in months	12.5	3.6
Median (mean) duration of agency spell	3.0 (5.1)	
Median (mean) time until first accepting a temp job	3,6 (6,7)	
Share of workers with more than one treatment while unemployed	12.33	
Mean number of agency spells	1.3	
Percent of unemployment spells ending in regular employment	54.8	59.2

Source: IEB V11.0, 1985-2012, own calculations

Figure 3: Smoothed Kaplan Meier hazard rates out of unemployment to employment and temp jobs

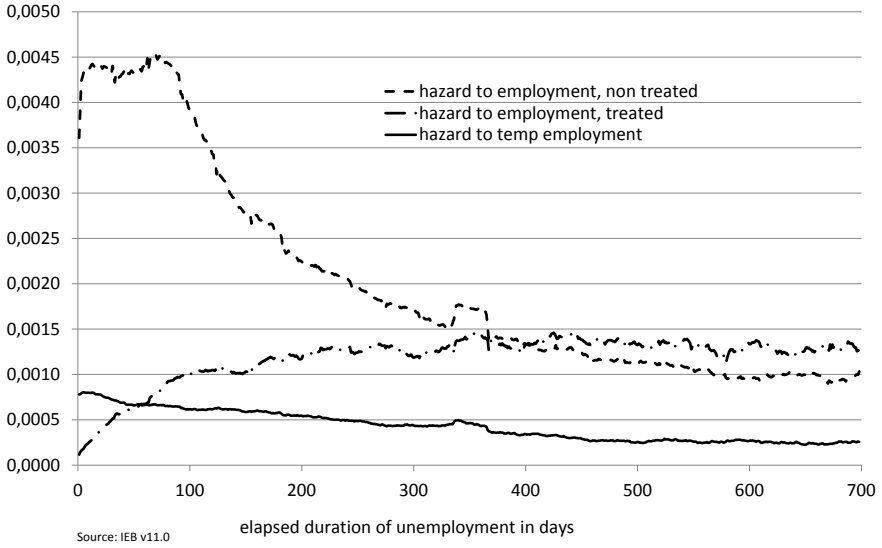


Table 2: In-treatment and post-treatment effects

	Model 1		Model 2		Model 3	
In-treatment	-0.073 **	(0.011)	-0.120 **	(0.011)	-0.178 **	(0.012)
In-treatment x centered unemployment rate	0.011	(0.007)	0.068 **	(0.007)	0.063 **	(0.008)
Post-treatment	0.291 **	(0.012)	0.355 **	(0.012)	0.306 **	(0.013)
Post-treatment x centered unemployment rate	-0.009	(0.008)	0.028 **	(0.008)	0.035 **	(0.008)
Control variables	no		yes		yes	
Unobserved heterogeneity	no		no		yes	

Source: IEB V11.0, 1985-2012, own calculations.

Notes: **/* denotes statistical significance at the 1/5 % level. The distribution of the unobservables is approximated non-parametrically by a bivariate discrete distribution with six mass points. The time varying centered quarterly unemployment rate for Western Germany is used as a business cycle indicator. In addition, the model includes 3 age dummies, 2 education dummies, a dummy for being married an having children, 3 migration background dummies, 13 dummies for the last occupation before entering unemployment, dummies for the number of temporary agency jobs (1, 2, 3-4, more than five), the number of regular jobs (1, 2, 3-4, more than five) during the past three years, dummy variables indicating whether the workers was previously a temp, an apprentice, or out of the labor force, 6 regional dummies, indicators for the year and the quarter, and parameters for the distribution of the unobserved characteristics.

Table 3: Unemployment rate and estimated treatment effects

	Mean	S.D.	Min	Max
Aggregate unemployment rate	8.472	1.377	5.800	11.800
In-treatment effect	0.178	0.086	- 0.346	0.030
Post-treatment effect	0.306	0.048	0.212	0.422
Observations (quarters)		112		

Source: IEB V11.0, 1985-2012, own calculations.

Notes: The in-treatment and post-treatment effects are estimated using the results from Table 2.

Figure 4: Cyclicality of the treatment effect

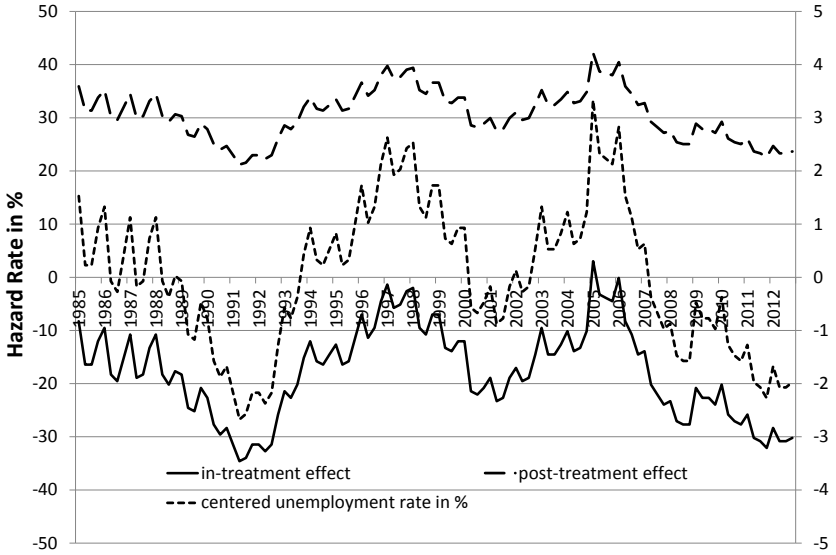


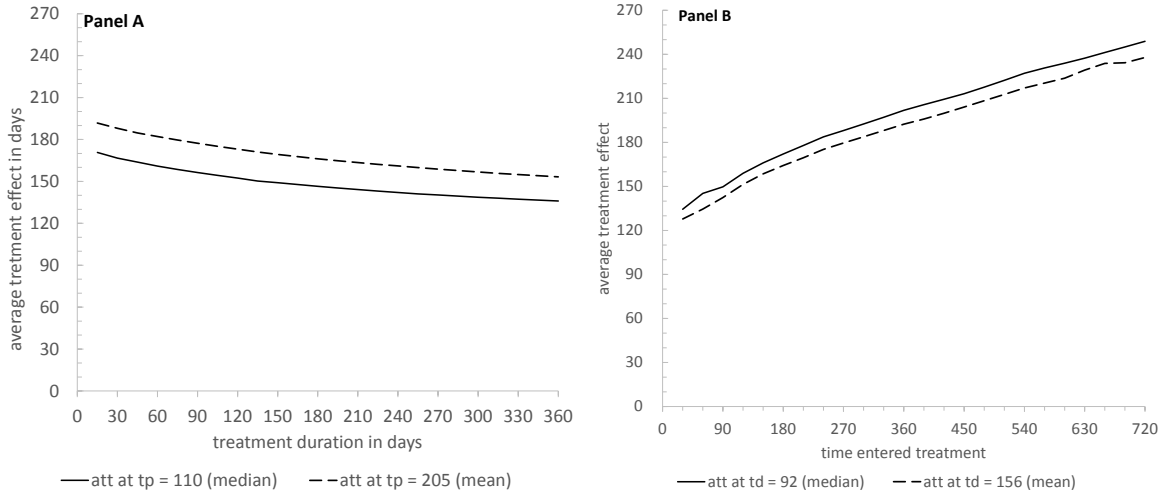
Table 4: Treatment effects and prevailing level of unemployment

In-treatment (ref: 5.8-7%)	-0.337	**	(0.022)
In-treatment x unemployment rate 7-8%	0.149	**	(0.030)
In-treatment x unemployment rate 8-9%	0.180	**	(0.035)
In-treatment x unemployment rate 9-10%	0.167	**	(0.031)
In-treatment x unemployment rate >10 %	0.322	**	(0.037)
Post-treatment (ref: 5.8-7%)	0.237	**	(0.024)
Post-treatment x unemployment rate 7-8%	0.061	*	(0.032)
Post-treatment x unemployment rate 8-9%	-0.012		(0.041)
Post-treatment x unemployment rate 9-10%	0.130	**	(0.034)
Post-treatment x unemployment rate >10 %	0.113	*	(0.040)

Source: IEB V11.0, 1985-2012, own calculations.

Notes: **/* denotes statistical significance at the 1/5 % level. Individual heterogeneity distribution, *M* = 6. In addition, the model includes the same controls as described in Table 2.

Figure 5: Expected remaining unemployment duration



Appendix

Table A1: Selected Sample Statistics

	Treatment	Control
Average age	31,983	34,923
Foreign	0,289	0,229
Low qualified	0,28	0,236
Medium qualified	0,693	0,719
High qualified	0,027	0,045
ALGII	0,308	0,272
Previous regular employed	0,495	0,548
Previous temp	0,073	0,019
Previous apprentice	0,064	0,034
Previous out of labor force	0,368	0,399

Source: IEB V11.0, 1985-2012, own calculations.

Table A2: Full estimation results

	Selection equation			Hazard to employment		
0-28	-9.246	***	(0.335)	-3.520	***	(0.047)
28-56	-9.208	***	(0.336)	-3.237	***	(0.048)
56-84	-9.286	***	(0.336)	-3.184	***	(0.048)
84-112	-9.313	***	(0.336)	-3.117	***	(0.048)
112-140	-9.369	***	(0.336)	-3.257	***	(0.049)
140-175	-9.351	***	(0.336)	-3.469	***	(0.049)
175-245	-9.397	***	(0.337)	-3.530	***	(0.049)
245-364	-9.525	***	(0.337)	-3.737	***	(0.049)
364-546	-9.781	***	(0.337)	-3.851	***	(0.049)
546-728	-10.035	***	(0.338)	-4.005	***	(0.050)
728-1092	-10.274	***	(0.338)	-4.088	***	(0.050)
-1092	-11.061	***	(0.339)	-4.713	***	(0.051)
Age25-34	-0.479	***	(0.015)	-0.179	***	(0.008)
Age35-44	-0.626	***	(0.018)	-0.338	***	(0.009)
Age45-55	-1.016	***	(0.022)	-0.688	***	(0.010)
Married	-0.044	***	(0.017)	0.136	***	(0.008)
Child	-0.140	***	(0.016)	-0.008		(0.007)
EU15-migrant	0.035		(0.035)	-0.099	***	(0.018)
Eastern European migrant	0.363	***	(0.025)	0.043	***	(0.014)
Non-Western migrant	0.065	***	(0.018)	-0.206	***	(0.011)
Median skilled	0.030	**	(0.015)	0.157	***	(0.008)
High skilled	-0.166	***	(0.041)	0.183	***	(0.018)
Prev. temp employed	0.482	***	(0.025)	-0.158	***	(0.019)
Prev. apprentice	0.302	***	(0.027)	-0.159	***	(0.014)
Prev. out of the labor force	-0.058	***	(0.014)	-0.311	***	(0.006)
Fraction regular employed	0.162	***	(0.027)	0.368	***	(0.012)
Fraction temp employed	0.934	***	(0.053)	0.098	**	(0.040)
Unemployment assistance	-0.256	***	(0.016)	-0.220	***	(0.008)
Centered unemployment rate	-0.091	***	(0.018)	-0.138	***	(0.008)
In_treatment effect				-0.178	***	(0.012)
Post-treatment effect				0.306	***	(0.013)
In-treatment*cen. urate				0.063	***	(0.008)
Po-treatment*cen. urate				0.035	***	(0.008)
Points of support						
$ln\ \upsilon_1$				-1.529	***	(0.227)
$ln\ \upsilon_2$				0.347		(0.271)
$ln\ \upsilon_3$				2.523	***	(0.203)
$ln\ \upsilon_4$				0.718	***	(0.274)
$ln\ \upsilon_5$				1.740	***	(0.185)
Probability masses (log transform)						
λ_1				2.026	***	(0.332)
λ_2				0.842	**	(0.327)
λ_3				-0.315		(0.350)
λ_4				0.845	**	(0.327)
λ_5				-0.221		(0.510)

Source: IEB V11.0, 1985-2012, own calculations.

Notes: **/* denotes statistical significance at the 1/5 % level, see footnote to Table 2 for further details.