Does Temporary Help Work
Provide a Stepping Stone to Regular Employment?

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Abstract

Based on administrative data from the federal employment services in Germany, this paper applies statistical matching techniques to estimate the stepping-stone function to regular employment of temporary help work for unemployed job seekers. Our results show that workers who enter temporary help work from registered unemployment do not enjoy subsequent greater chances of employment outside temporary help work over a four-year period. Neither, however, do they suffer from future greater risks of unemployment. While our results, therefore, do not lend empirical support to a stepping-stone function of temporary help employment for the unemployed, they do neither confirm the existence of adverse effects on the future regular employment and unemployment chances of unemployed job seekers. If anything, temporary help work seems to provide an access-to-work function for the unemployed.

Keywords: Temporary help agencies, stepping stone, statistical matching.
JEL Classification: J40, J62, J64, C31.

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1   Introduction

Temporary help work has expanded rapidly across Europe over the last decade. While concerns have been raised about this trend expansion, because of the perceived inferior quality of jobs created on this submarket, growing attention is being paid to the potential longer-term effects of temporary help agency (THA) employment on the labor market prospects of workers. For labor turnover in this industry is exceedingly high, and THA employment spells generally constitute but a short transitory period in the labor market histories of workers. Policy makers throughout Europe in fact have taken an increasingly active stance over the last years in further promoting THA work by dismantling existing national regulations on temporary help work that circumscribed the operation of temporary help agencies and the use of THA workers by client firms.

The German case constitutes a prime example for this trend. Because of the strong employment record of the THA industry in Germany and the acclaimed stepping-stone function of THA work to regular employment for the jobless, restrictive provisions of the Law on Placement Activity (LoPA) that governs the operation of the German THA submarket were increasingly relaxed during the 1990s, a process that culminated in the large-scale labor market reform legislated in late 2002. Among other measures, the latter initiated a near complete dismantling of hitherto existing regulations imposed on temporary help work in Germany (for details, see Burda and Kvasnicka, 2006). With stubbornly high rates of unemployment putting a drain on public resources and the efficiency of the federal employment service increasingly being questioned, policy makers in Germany saw THA work as a cost-effective and complementary means to get the unemployed back into work. Apart from the deregulation of the LoPA, this is evinced by the large-scale creation following the 2002 reform of subsidized temporary help agencies, or personnel-service-agencies (PSA), in all of Germany's 181 employment office districts. These PSA operate as ordinary THAs for the sole purpose of providing unemployed workers ports of entry to the labor market and above all subsequent springboards to social-security employment ('temp-to-perm') by way of temporary work assignments with different firms. What is surprising about these initiatives is that solid empirical evidence for the existence of such a stepping-stone function of THA work for unemployed job seekers was in fact lacking for Germany, and internationally sparse at best.

Using statistical matching techniques, this paper investigates the validity of the stepping-stone hypothesis of THA work in Germany. We confine the empirical analysis to an investigation of the stepping-stone function of THA employment for unemployed job-seekers only. This restriction in focus is inspired by the fact that the most recent reform of the law on placement activity in Germany has been enacted largely for the acclaimed bridging function of THA work for this particular group of workers. With about every second worker entering THA work in Germany

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from unemployment, the population of interest chosen does, however, represent a significant share of all inflows into THA work. Conditioning the analysis on prior unemployment experience has the additional advantage of providing some sort of initial condition among the sample chosen, excluding, for instance, students and pupils who only perform vacation work in a THA, without seeking any steady employment. In the remainder of this paper, we will, as is commonly done, refer to social-security employment outside the THA industry as 'regular employment'. This is understood as but a terminological convention. For apart from the irregular triangular setup of the THA submarket, workers in the German THA industry do in fact enjoy the same employment protection and worker rights as other workers under the provisions of general labor and social security law (Klös, 2000). Focusing on the first unemployment spell of individuals who register as unemployed in 1994 to 1996, we are able to follow these workers for up to a minimum of 5 years and hence are in a position to study both the short-term and long-term effects of THA work experience on their subsequent employment trajectories. The matching approach employed in this study is based on the methodology applied by Barbara Sianesi in her studies on the short- and long-term effects of worker participation in Swedish labor market programmes (Sianesi, 2001/2004).

Our results show that unemployed workers who enter THA employment within twelve months of unemployment registration benefit from both higher monthly employment (THA or regular) and THA employment chances, as well as from significantly reduced monthly risks of unemployment throughout the four year period these workers are followed post entry compared to similar workers that did not join THA work at the same elapsed unemployment duration. THA workers, however, do not appear to enjoy greater chances of future regular employment. While our results, therefore, do not lend empirical support to the stepping-stone hypothesis of THA work for unemployed job-seekers, they do neither confirm the existence of adverse effects of agency work on the future regular employment and unemployment probabilities of workers. If anything, THA work seems to provide an access-to-work function for unemployed workers that leaves them with a higher probability of employment and a lower probability of unemployment for the entire four years their subsequent labor market states are followed.

The paper is structured as follows. Section 2 surveys arguments for and against the existence of a stepping-stone function of THA work, Section 3 reviews the existing literature on the subject, and Section 4 describes the data. Section 5 addresses the evaluation problem encountered in estimating the stepping-stone function of THA work and proposes an appropriate framework for empirical evaluation. Section 6 contains the empirical results, and Section 7 concludes.

2 Preliminary Considerations

A number of reasons have been cited in the literature, why THA work may provide a bridge to regular employment for the unemployed. First, THA workers are frequently recruited among the un- or nonemployed and are hence given access to paid work or entry-level jobs (see, for example, Mangum, Mayall, and Nelson, 1985), otherwise potentially denied to them on the general labor market. Surveys of THA workers show that one of the main reasons for taking up a job in the THA industry is the inability to find a regular job (see, for example, CIETT (2000) for Europe, Cohany (1998) for the US, or IWG (1995) for Germany). Second, unemployed workers may acquire skills and gain work experience in THA jobs that increase their productivity and hence improve their future labor market prospects (Autor, Levy, and Murnane, 1999; Paoli and Merrlié, 2001; Kvasnicka and Werwatz, 2003), which puts to a halt the depreciation of human capital that would take place in continued unemployment. Third, the search for regular employment may be more effective on a THA job than in unemployment, as work assignments with client firms provide opportunities for workers to get to know different potential employers (Storrie, 2002), and to signal their ability (Ichino, Mealli, and Nannicini, 2005). Fourth, employers may, in turn, deliberately utilize temporary help work as a riskless screening device to prospect and recruit workers for permanent positions (Segal and Sullivan, 1997a; Houseman, 1997; Abraham and Taylor, 1996; Autor, 2001). As client firms are in no way contractually bound to THA workers during a work assignment, on-the job screening is possible without subjecting oneself to any firing restrictions or direct monetary firing costs. Finally, THA workers are pre-screened by the agency, both in terms of general marketable skills when recruiting the worker, and in terms of the specific requirements of client firms for a particular work assignment (Autor, 2001; Burda and Kvasnicka, 2006). Increased screening may in turn also lead to better and therefore more stable employment relationships, as match quality is improved by prior extensive on-the-job screening (Katz and Krueger, 1999).

However, there have also been dissenting voices, pointing out that THA workers often cycle between short employment spells in the industry and extended periods of unemployment (Bronstein, 1991), leading to potential labor market segmentation into low wage, less stable THA jobs with little opportunities for career advancement and highly paid permanent jobs (Mangum, Mayall, and Nelson, 1985; Segal and Sullivan, 1997a). In particular, THAs are likely to provide less formal training on the job (Ferber and Waldfogel, 1998), as investment in general and therefore marketable skills, by definition the only skills traded on this submarket, increase the risk of the worker being poached before the agency can recoup its outlays through temporary work assignments. Finally, THA employment may also stigmatize workers in the eyes of potential employers under incomplete information, as their inability to obtain regular work may be perceived by the

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latter as a signal of low productivity.

3   Previous Research

Lack of adequate longitudinal data in the past on the individual employment histories of temporary help workers has tended to circumscribe empirical research on the stepping-stone function of THA work. Existing studies for Europe are mostly descriptive (see Storrie (2002) for a recent survey), whereas for Germany, they are exclusively so (see, for example, Rudolph and Schröder (1997), or Brose, Schulze-Böing, and Meyer (1990)), and as such do not permit any causal interpretation. Other studies fail to control for potential self-selection of workers into THA employment by restricting the analysis to posterior transitions of an initial stock sample of workers already employed in the THA industry (e.g. Finegold, Levenson, and van Buren (2003) and Segal and Sullivan (1997b) for the US, or García-Pérez and Muñoz-Bullón (2005) for Spain), or suffer from data defects, in particular the ability to identify THA workers across time (e.g. Segal and Sullivan (1997a) for the US). Case studies based on data collected at a single THA or specific geographic regions sometimes do find positive effects of THA work (e.g. Almus, Engeln, Lechner, Pfeiffer, and Spengler (1999) for non-profit THAs in a federal state of Germany, or Ichino, Mealli, and Nannicini (2005) for Italy), and sometimes don't (e.g. Autor and Houseman (2005) for the US), which makes it hard to draw any generalizable conclusions.

For lack of alternative data, different types of flexible employment forms, such as fixed-term contract, casual, THA or part-time employment, have also been frequently subsumed under the ambiguous catch-all term "temporary employment" to then estimate their impact on the future labor market prospects of those holding these jobs (see, for example, Booth, Francesconi, and Frank (2002) for the UK, or Zijl, Heyma, and van den Berg (2004) for the Netherlands). Differences in the respective contractual arrangements, employment compositions, and economic roles performed by these flexible work arrangements, however, make it all but clear, in how far results obtained in this vein do in fact apply to each single heterogeneous employment form. As this literature review illustrates, there is still a lack of ample evidence on whether or not temporary help work provides a gateway to regular employment. With this study, we want to contribute to this insufficiently researched area.

4   The Data

The analysis is based on an extended version of the public-use IAB Employment Sample (IABS) of the Institute for Employment Research (IAB) at the German Federal Employment Agency, a 2% random sample of all employees registered in the period 1975 to 2001 by the social security

system in Germany (data on East German workers is included from 1992 onwards). Employment information in the IABS is based on statutory notifications of employers on their workforces to the institutions of the social security system. Containing a host of worker, firm, and job-specific attributes, and with information on unemployment periods involving benefit payments added from the federal unemployment register, the IABS provides exact daily information on the employment and unemployment trajectories of more than one million individuals in the 27 years sampled. Large sample sizes and detailed flow information are indispensable for analyses of the THA industry, as the latter still accounts for only a small employment share in the German economy and is characterized by very high rates of labor turnover. As administrative data, typical problems besetting longitudinal survey data, such as panel mortality due to non-responses, or memory gaps in restrospective questions, are not encountered in the IABS (Bender, Haas, and Klose, 2000).

However, the IABS also has a number of potential shortcomings for the present analysis. First, as THA employment is identified by the industry affiliation of an employer in the IABS, THA workers cannot be differentiated from the administrative staffing personnel of THA firms in the dataset. This shortcoming, encountered also in other datasets that have been used for analyses of THA employment, such as the US Current Population Survey, is however unlikely to be of major practical importance for our analysis, as the workforce share of staffing personnel is generally very small. Second, as the THA firm alone issues the statutory employment notifications, the IABS neither contains information on client firms, nor work assignments of THA workers (this shortcoming is also shared with all public-use administrative data sources, who by design are tailored to the standard bilateral employment relatinship). However, as will be argued in Section 5.1.2, this data deficiency is immaterial for our analysis of the stepping-stone function of temporary help work. Nevertheless, lack of information on client firms implies that we are unable to tell whether a successful transition to regular employment occurred to a former client firm or not. As a consequence, we may not directly test the relative importance of the screening hypothesis for the stepping-stone function of THA work. However, the object of the present analysis is deliberately chosen to be both more general and more fundamental, in that we test for the existence and the quantitative importance of the overall bridging function of THA work, leaving an assessment of the relative importance of different explanations put forward for its alleged existence for future research. Given the relative paucity of empirical evidence on the stepping-stone function of THA work, this is a natural starting point to take. Finally, covering only employment relationships that are subject to social security contributions, civil servants, the self-employed, and those in marginal dependent employment (until 1999) are not included in the IABS. We may therefore only investigate the employment trajectories of workers in such dependent employment.

In the next Section, we discuss in detail the peculiar features of the present evaluation problem of the stepping stone function of THA employment for the unemployed in comparison to an archetypical administered social experiment. In doing so, we define key terms, such as treatment (THA employment) and non-treatment status (the counterfactual for the treated), as well as various outcome measures that describe workers' future employment prospects, so as to formulate testable causal questions about the stepping-stone function of THA work, subject to the restrictions imposed by the nature of the phenomenon under investigation and the data available. Sample selection issues will be addressed in the course of this discussion, so that a presentation of summary statistics on major variables recorded in the data is deferred until then.

5   The Evaluation Problem

5.1   Evaluating the Stepping-Stone Function of THA Work

The archetypical administered social experiment is conducted only once, with a specific starting and ending date, clearly circumscribed in the nature and scope of the treatment provided therein (e.g. a particular one-time training programme), and linked to specific formal eligibility requirements for participation (e.g. a certain skill level of workers, or a minimum elapsed unemployment duration). None of these features, however, applies to the present evaluation problem of the stepping stone function of THA employment for the unemployed. As an on-going programme, unemployed workers may join THA work both at different calendar dates and at different individual elapsed unemployment durations. In addition, employment spells in the THA industry vary endogenously in length. THA workers may also be assigned to different numbers of client firms for different durations and for different tasks, rendering THA employment heterogeneous across workers in several respects that are endogenously determined but post entry. An unemployed worker may furthermore hold a THA job more than once, and thus be subject to multiple treatments with interspersed repeated spells of unemployment or regular employment. One and the same worker may therefore be counted as treated at one point in time (when in THA work) and as non-treated at another. Finally, formal requirements for participation are absent. General 'profitable employability', a function of both individual characteristics of the unemployed job-seeker and general labor market conditions encountered, is alone decisive for temporary help agencies in the recruitment process. Likewise, unemployed workers decide on whether or not to seek employment in THA work based on factors that determine job search behavior in general, such as the likelihood of finding alternative employment opportunities, reservation wages, and the like.

The definition of outcomes is equally beset with difficulties. Above all, the question to be addressed is when one should start to measure outcomes, both for those treated and for those not

treated. For the former, the more obvious choice is between the start of a THA employment spell and its end, depending on how THA employment is valued relative to regular employment or the specific causal question asked. For those workers not treated, the case is even more ambiguous, as neither entry date to nor exit date from THA work are observed. These specific features inevitably require choices to be made with respect to the timing, as well as the definition of potential treatment and control groups. This we do in the remainder of this section, beginning with the units (workers) to be analyzed, i.e. the sample selected.

5.1.1 Sample Selection

For the ensuing analysis, we select all individuals who in 1994 to 1996 register as unemployed and consider only their first unemployment spell in this period.[1] This allows us to observe the subsequent employment histories of those workers for an extended period of time in the IABS (up to a minimum total of 5 years). Entries into unemployment are sampled over a three year period to increase the absolute number of subsequent transitions to THA work observed in the data. The years of entry chosen have the advantage to sufficiently predate the 1997 reform of the LoPA, which, among other things, introduced a one-time exemption to the general recall ban in the THA industry. We further restrict this inflow sample to individuals who are between 18 and 55 years of age at the time of unemployment registration. The upper age limit is imposed to reduce the likelihood of sampling older workers who may be entitled to some form of early retirement scheme that permits them to exit unemployment straight into inactivity without having to search for a job or accept job offers by the public employment service while drawing benefits. Furthermore, we exclude workers that lack some prior employment experience. This measure is imperative given the data collection process, for important worker attributes, in particular the educational-vocational qualifications obtained, are recorded in employment notifications issued by employers, but not in the information collected in and contributed to the IABS from the federal unemployment register.

These restrictions leave us with a raw total of 106,383 workers in the sample selected that enter unemployment between 1994 and 1996. Summary statistics on major variables for this sample recorded at the time of inflow into unemployment are provided in Table 8 in the appendix. As documented in Table 1 below, 0.4% of these unemployment spells are right-censored at the end of 2001, and 7.1% end with no subsequent transition recorded within the sampling period 1994 to 2001. 68.1% of all unemployed workers enter a regular job (non-THA employment), almost eight out of ten within one month of deregistering from unemployment. Another 2.3% of the unemployed leave for a THA job, the great majority (80.8%) again within one month.

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[1] An unemployment spell is defined as consecutive unemployment notifications for an individual in which the time between these notifications does not exceed one week.

Table 1: Subsequent transitions to THA and regular employment of unemployment inflows in 1994 - 1996

Group of workers	Absolute number	Share (%)
Total entries into unemployment:	106,383	100
with right-censored unemployment spells in 2001	429	0.4
with no subsequent record in sampling period	7,531	7.1
... who enter THA work:		
within < 1 month of exiting unemployment	2,006	1.9
after ≥ 1 month of exiting unemployment	477	0.4
at some point within sampling period	8,529	8.0
... who enter regular work:		
within < 1 month of exiting unemployment	59,070	55.5
after ≥ 1 month of exiting unemployment	13,441	12.6

Source: IABS.

It is noteworthy that a much larger fraction, or 8.0% of all entries into unemployment at some point until December 2001 do in fact take up a job in the THA sector. With close to one in ten unemployed workers joining THA work over this period, THA employment appears to be more dispersed in the working population than its still small employment share in the economy suggests. In addition, but not shown in the Table 1, 85.5% of all direct entries into THA work (those who enter within one month of exiting from unemployment), do eventually find regular employment within the sampling period. The latter statistic is especially important in the present context, for a high "frequency of transitions from temporary to permanent employment suggests that the size of any permanent "underclass" of temporary workers must be small" (Segal and Sullivan, 1997a, p. 123). No subsequent transitions out of THA work are observed for only 2.2% of direct entries into THA employment. Moreover, only four out of ten of these 2.2% are accounted for by right-censored THA employment spells at the end of the sampling period. The median duration of THA job spells is four months (124 days). 60% of them last less than half a year, 79% less than one year, and 92% end within two years.

However, past work experience in the THA sector seems to affect the probability of renewed entry into THA work. As Table 2 shows, 13.2% of workers with some prior THA work experience exit unemployment for a THA job, compared to only 1.7% of workers who never worked in the THA sector. An even larger fraction (24.0%) of workers that enter unemployment directly from THA work again take up a THA job, but only one in eight of these return to their previous THA. Thus a sizeable fraction of THA workers, at least in the short to medium run, indeed appears to cycle between unemployment and temporary help work spells before eventually finding regular

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employment. The vast majority of THA workers, however, does not. Additional explorations, not shown in Table 2, underscore the importance of the THA submarket for labor market flows, and of past THA work experience for the likelihood of unemployed workers to enter THA employment. Workers with prior THA work experience and workers who enter unemployment directly from a THA respectively account for 5.1% and 1.5% of all entries into unemployment and for 29.0% and 11.5% of all observed subsequent transitions from unemployment to temporary help work. Recalls within the THA industry, however, occur far less frequently than on the general labor market. 6.0% of all workers last employed at a THA in fact return to the same agency when leaving unemployment. In contrast, 11.8% of workers entering unemployment from a regular job again return to the same employer when deregistering from unemployment. The recall ban imposed by the LoPA at the time is likely to be in the main accountable for this discrepancy, for a significant share of former THA workers, as we have seen, does in fact return to THA work, albeit not to the same employer. An additional reason is that THA workers are likely to accumulate less firm-specific human capital when in temporary help work, which reduces their attachment to former THA employers.

Table 2: Subsequent transitions to THA and regular employment of unemployment inflows in 1994 - 1996 by prior TWA work experience

THA work experience prior to entry into unemployment	Subsequent transition to:			No subsequent transition observed
	Regular work	THA		
		any agency	same as before	
Anytime in the past	56.2%	13.2%	–	4.9%
Entered unemployment from THA work	47.6%	24.0%	3.2%	4.4%
None	68.8%	1.7%	–	7.6%

Source: IABS.

In the following, we restrict the analysis to transitions of individual workers to other labor market states (regular or non-THA employment, and THA work) that occur within one month of deregistering from unemployment. Apart from workers with some prior unemployment experience, we also retain workers in the analysis that have been employed in the THA sector, i.e. "treated", before entering unemployment in 1994 to 1996, because of the scale of reentry into THA work documented above. Exclusion of either of these two groups of workers from the analysis would likely result in above-average productivity individuals being sampled. It would also restrict the treatment effect investigated to a significantly reduced subsample of THA inflows from unemployment, which, at least from a policy perspective, does not represent the group of unemployed workers mostly

concerned with in the context of the stepping-stone function of THA work. For completeness, however, we consider the case of unemployed workers with no prior work experience in THA employment in Section 6.2, where we investigate potential heterogeneities in the treatment effects of THS work on the future regular employment chances of individuals for different subgroups of workers.

5.1.2 Treatment and Non-Treatment Status

With respect to the definition and the timing of the treatment, we consider the first entry of workers into THA employment after having registered as unemployed in 1994 to 1996. Any subsequent treatments are therefore viewed as outcomes of the initial treatment. More specifically, we define treatment as entry into THA employment, also called the intent of treatment. Assuming the causal effects of THA work to set in upon entry into the sector, we disregard differences in THA employment experience across workers (e.g. in terms of employment duration, number of work assignments, etc.), and focus on the overall or average effects of joining THA work on the subsequent labor market prospects of workers. As noted, practical restrictions imposed by the data, in particular the complete lack of information on client assignments, in part dictate this approach. However, one may argue for the definition of treatment adopted also on purely methodological grounds. For, in contrast to the archetypical programme discussed above, virtually all aspects of individual THA employment relationships formed are ultimately determined endogenously, depending on the post-entry decisions of both the temporary help agency and the THA worker. Moreover, the available, albeit limited evidence for Germany on the distribution of client assignments across THA workers and on the transitions of THA workers to regular employment suggests that the ability of THA workers to sample many potential employers during temporary work assignments and the ability of client firms to screen THA workers during such work assignments for permanent positions may not in fact be of primary importance for the acclaimed stepping-stone function of THA work. As the case study by Kvasnicka (2003) has shown, most THA workers have but a singular client assignment, while first evidence on the recently created PSA in Germany reveals that in fact less than a fourth of all transitions out of THA work into regular employment occurred to a former client firm (Jahn and Windsheimer, 2004).

Outcomes, yet to be defined, are consequently measured from the month of entry into THA work for those actually receiving treatment. This raises the question, as to when one should start to measure outcomes for those not observed to enter THA work. Theory suggests that unemployed workers conduct their job search sequentially, accepting or declining a particular job offer depending on the respective net payoffs associated with either decision. There is in addition ample evidence that THA workers in the majority prefer regular employment to holding a job in

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the THA industry,[2] largely because of the higher pay and superior working conditions expected to accrue in the former. Moreover, surveys reveal that unemployed workers frequently enter THA work after a period of unsuccessful search for a regular job, and because they hope to thereby improve their chances to find regular employment (see, for example, IWG, 1995; CIETT, 2000; Cohany, 1998). In other words, unemployed workers are likely to decide sequentially, whether or not to enter THA work in a given month of unemployment. This implies that for the construction of an adequate control group for those actually observed to enter THA work in a given month of elapsed unemployment duration (u^1), only those unemployed workers should be chosen as potential controls that have been unemployed for at least u^0 and are not treated in u^0, where $u^0 \geq u^1$. Note that these workers may well enter THA work and therefore be treated at a later month of elapsed unemployment duration. Thus while potential controls can be treated themselves at a later stage, treated workers may never subsequently become controls for workers that enter THA work at longer unemployment durations.

As individual months of entry into THA work (treatment) differ across workers, we adopt a relative time scale in measuring subsequent outcomes (the effects of the treatment) for the treated. For a matched control person, outcomes are measured from the observed u^1 of the treated worker. However, as u^1, i.e. elapsed unemployment duration before entry into THA work, is an unobserved counterfactual for non-treated unemployed workers, it cannot be included as a regressor in the estimation of the propensity score. We nevertheless condition the construction of matches on elapsed unemployment duration, by estimating separate propensity scores for every month (u), where each estimation is based on those treated in a particular u and those not treated in the same u. This approach is equivalent to estimating a discrete hazard rate model, where all estimated parameters are allowed to be duration-specific (Sianesi, 2004, p.140).

Choosing potential controls from such a duration-based flow sample has an inherent advantage in the present context over the primary alternative comparison group design employed in the evaluation literature, i.e. the exclusive selection of potential controls from among those workers never observed to enter the particular programme investigated. For in the latter case, the construction of a comparison group is in fact conditioning on the future and hence the outcome when programme starts are not restricted to a particular period (see on this point, for example, Fredriksson and Johansson, 2003). In the current application, such as restriction would in all likelihood introduce a downward bias in the estimated treatment effects of THA work on the future regular employment probabilities of individuals, as unemployed workers that act as controls are likely to be never observed to enter THA work simply because they have instead made a successful transition to regular

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[2]See, for example, Storrie (2002) for the European evidence, Finegold, Levenson, and van Buren (2003) for the US, Hegewish (2002) for the UK, or IWG (1995) for Germany.

employment.

We next formalize these ideas in the form of the average treatment effect on the treated (ATT) to be estimated in the present context, deferring a discussion of the different outcome measures employed in this study to the subsequent subsection.

5.1.3 Formal Specification of the Evaluation Problem

We formalize the evaluation problem based on Sianesi's (2001/2004) exposition in her application of statistical matching techniques to the evaluation of the effectiveness of active labor market programmes in Sweden. The outcomes of interest are various labor market states of individuals over time, i.e. $\left\{Y_{jt}^{(u)}\right\}_{t=u+1}^{T}$, where j denotes the type of outcome, i.e. the particular labor market status considered, and $t = u+1, .., T$ are the months these outcomes are measured post elapsed unemployment duration of at least u months. At time u, the population of interest comprises workers with elapsed unemployment duration of at least u months. Treatment assignment is denoted by $D^u = \{1, 0\}$, with $D^u = 1$ for unemployed workers who join THA work in u, and $D^u = 0$ for those unemployed job seekers who have elapsed unemployment duration of at least u and do not join THA work in u. We further denote the potential labor market states of an individual at time t, where $t > u$, that joins THA work in her $u'th$ month of unemployment with $Y_{jt}^{1(u)}$, and with $Y_{jt}^{0(u)}$ if an individual has not joined THA work up to that month, respectively.

The average treatment effects on the treated (ATTs), Δ_{jt}^u, in the present application then correspond to the average effects of joining THA work in month u of elapsed unemployment duration $\left(Y_{jt}^{1(u)}\right)$ compared to not joining THA work in that month $\left(Y_{jt}^{0(u)}\right)$ for those unemployed workers who actually take up a THA job in that same month ($D^u = 1$), i.e.:

$$
\begin{aligned}
\Delta_{jt}^u &\equiv E\left(Y_{jt}^{1(u)} - Y_{jt}^{0(u)}\middle| D^u = 1\right) \\
&= E\left(Y_{jt}^{1(u)}\middle| D^u = 1\right) - E\left(Y_{jt}^{0(u)}\middle| D^u = 1\right) \quad for \; t = u+1, ..., T.
\end{aligned}
\tag{1}
$$

To identify the second term in equation (1), i.e. the unobserved counterfactual, we have to assume stable unit treatment value and conditional independence. The conditional independence assumpton (CIA), in formal terms requires that:

$$
Y_{jt}^{0(u)} \perp D^u \middle| X = x \quad for \; t = u+1, ..., T,
\tag{2}
$$

i.e. for observably similar individuals ($X = x$) having reached the same elapsed unemployment duration (u), the distribution of potential non-participation outcomes ($Y_{jt}^{0(u)}$) is the same for unemployed workers entering THA work ($D^u = 1$) and unemployed workers not entering THA work ($D^{(u)} = 0$) in month u. Common support in the present context amounts to the condition that:

$$
0 < \Pr(D^u = 1|X) < 1.
\tag{3}
$$

In other words, conditional on elapsed unemployment duration and individual worker characteristics of interest, a potential control has to exist for each treated individual. In the empirical analysis, we set $U = 12$, i.e. we investigate the effect of taking up a THA job within one year of registering as unemployed in the period 1994 to 1996. The period workers are followed while still in unemployment is restricted for two reasons. First, to have a sufficiently long period at one's disposal in which the subsequent labor market outcomes of these workers can be studied in the IABS: with data until December 2001, this restriction provides us with at least 48 months for each individual worker, irrespective of the particular calendar months she entered and exited her unemployment spell. Second, as shown in Figure 1, the total number of transitions from unemployment to THA work declines rapidly with elapsed months of unemployment duration. More than eight out of ten (82.1%), or 1647 out of the 2006 transitions to THA employment recorded in the sampling period 1994 to 2001 take place within the first year of unemployment.

Figure 1: Treated unemployed workers by month of entry into THA work
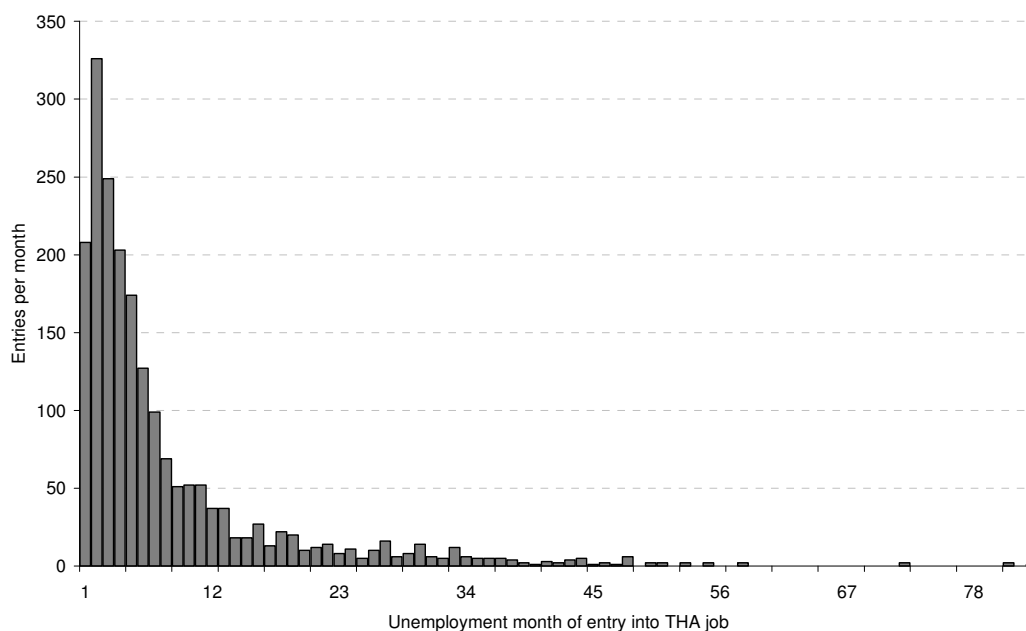
Source: IABS. Sample: Inflows to unemployment in 1994-1996.

5.1.4 Outcomes

To gain a comprehensive view of how the future labor market prospects of unemployed workers in Germany are affected by taking up a job in the THA industry, we employ a set of four different outcomes measures $\left(Y_{jt}^{(u)}\right)$, described in Table 3 below. These respectively forty-eight monthly

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post-treatment probabilities of regular employment (non-THA employment), THA employment, any type of employment (regular or THA), and unemployment allow us to study the dynamics of the effects that taking up THA employment exerts on the individual likelihoods of observing these states over time.

Table 3: Definition of outcome measures used in the empirical analysis

Outcomes for each month up to 4 years post treatment:	
Outcome 1	Monthly probability of regular employment
Outcome 2	Monthly probability of THA employment
Outcome 3	Monthly probability of employment (regular or THA)
Outcome 4	Monthly probability of unemployment

It is important to note that these monthly outcome measures refer to the respective probabilities of observing workers in a particular labor market state at any point in time during a particular month. As workers may naturally spend time in more than one of these labor market states in a given month, Outcomes 1, 2, and 4 are not mutually exclusive, and therefore do not necessarily add up to one for a particular group of workers. Moreover, workers that return to education, or general inactivity, i.e. states which are not recorded in the IABS, are retained in the respective monthly base groups from which the four outcome measures are calculated. For by virtue of the data generation process, we have complete information on the employment (regular and THA) and unemployment trajectories of workers over time that comprise our individual outcome measures of interest, i.e. employment subject to social security contributions and unemployment periods that involve some kind of entitlement to financial support from the public authorities.

While Outcome 1 is of primary interest for the empirical assessment of the stepping-stone function of THA work, the remainder does provide important supportive evidence in this context. Outcome 2 provides information on the degree to which workers remain or tend to get stuck in the THA sector over time, whereas Outcome 3 conveys information on overall employment probabilities. The latter is of interest in its own right, for even if treated workers turn out not to benefit in their likelihood of obtaining regular work, or to suffer from increased risk of future unemployment (Outcome 4), they might still prove to enjoy relatively higher chances of employment in general.

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5.2 Implementation of Propensity Score Matching

5.2.1 Nearest-Neighbor Matching

We apply nearest-neighbor propensity score matching without replacement, but within caliper (Cochran and Rubin, 1973).[3] In other words, conditional on elapsed unemployment duration u, each treated individual i in month u is matched to that non-treated individual z with the closest estimated propensity score $p(X)$ and used as a control C_i for individual i, subject to the condition that the absolute difference in the two estimated propensity scores, i.e. the degree of residual mismatch, does not exceed a certain maximum Ψ, or caliper (see, for example, Heckman, LaLonde, and Smith, 1999, p. 1954):

$$C_i = z| \Psi > \min_{z \epsilon \{1,...,N^0\}} \|p_i(X) - p_z(X)\|. \tag{4}$$

In the empirical analysis, we set the caliper to $\Psi = 0.03$. From these pairs of treated and control individuals, the nearest-neighbor matching estimator estimates the j times t ATTs (Δ_{jt}^u) for each entry month into THA work, i.e. u, as the difference in mean outcomes between between the treated and their matched controls:

$$\Delta_{jt}^u = \frac{1}{N^{u1}} \sum_{i=1}^{N^{u1}} \left(y_{jt}^{1(u)} - y_{jt}^{0(u)} \right), \tag{5}$$

where N^{u1} is the number of matched treated workers with completed unemployment duration u. Assuming independent observations, homoskedasticity of the outcome variables within the treatment and control groups, and non-dependence of the variance of the outcome on the propensity score (Lechner, 2001), the variances of the ATTs, Δ_{jt}^u can then be calculated as (see Sianesi, 2001, p. 28):[4]

$$Var\left(\Delta_{jt}^u\right) = \frac{1}{N^{u1}} Var\left(Y_{jt}^{1(u)} \middle| D^u = 1 \right) + \frac{\sum_{z=1}^{N^{u0}} \omega_z^2}{(N^{u1})^2} Var\left(Y_{jt}^{0(u)} \middle| D^u = 0 \right), \tag{6}$$

where $D^u = 1$ and $D^u = 0$ denote matched treated and non-treated workers at time u, respectively, and ω_z is the number of times individual z is being used as a control, with $\sum_{z=1}^{N^{u0}} \omega_z = N^{u1}$. As matching is conducted without replacement to reduce the standard errors of the estimated effects, however, $\omega_z = 1$ for all controls, so that $\sum_{z=1}^{N^{u0}} \omega_z^2 = N^{u1}$, too. As the true propensity score is

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[3]The matching estimator 'psmatch2' by Leuven and Sianesi (2003) for STATA is used and adapted to the specific features of the present evaluation problem.

[4]Note, however, that unlike Sianesi (2001), we do not have to condition on treated workers being observed at individual outcome months, as we do not have any measurement error in the labor market states of interest that underylie our outcome measures (see Section 5.1.4).

unknown, its estimate has to be used, which leads to reduced estimated variances of the ATTs. Standard errors may be obtained by bootstrapping, which, however, is not pursued here for the amount of computing time required.

5.2.2 Estimating the Propensity Score

The plausibility of the CIA in equation (2) depends on the richness of the available data with respect to the underlying mechanism that determines treatment assignment and future outcomes, i.e. the ability to control for all factors that both determine selection into THA work and affect potential outcomes in the two participation states. We discuss these factors in relation to the two principal actors involved, i.e. the THA and the unemployed job-seeker, the potential restrictions imposed on their conduct by the LoPA, as well as the general labour market conditions they are confronted with.

The Temporary help agency: As pointed out before, few formal requirements besides general 'profitable employability', a function of both individual characteristics of the unemployed job-seeker and general labor market conditions, are relevant for temporary help agencies in the recruitment process. Deferring a discussion of the latter for the time being, the former necessitates the consideration of attributes related to the productivity of individuals in the estimation of the propensity score. Besides personal characteristics, i.e. age, sex, foreign nationality, marital status, presence of children, as well as the highest educational and vocational attainment recorded for the worker, we control for the previous (recent and more distant) labor market history of individuals in the estimation of the propensity score. With respect to the last employment relationship, we control for employment tenure, real earnings, real average earnings in the last establishment, type of occupation held, part-time status, industrial sector, and whether the last job was a THA job. The latter in particular appeared quite significant in the descriptive explorations of observed transitions from unemployment to THA work in Section 5.1.1. Information on the last sector the worker was employed, in turn, is likely to capture human capital and work experience that might be of use in the mainly manual, industrial tasks THA workers are usually assigned to at client firms. In addition, and by virtue of the dataset, key summary statistics with respect to individuals' more distant labor market history are constructed. Attributes that are controlled for include whether the individual has ever worked in the THA sector before and whether the worker has ever been unemployed before. The latter acts as a proxy for past instability of employment, and possibly for the degree of labor market attachment of the worker, which itself may be related to unobserved individual characteristics related to worker productivity. Furthermore, a dummy for unemployment registration in the new German Lander is included, where THAs have only been able to operate

from 1990 onwards, and annual as well as seasonal indicators are used to capture cyclical and seasonal variations in the demand of THAs for manpower. By virtue of conditioning on elapsed unemployment durations in the estimation of the propensity score, we also implicitly control for unobservables correlated with the duration of unemployment, such as average time-invariant and time-variant differences in individual worker productivity not captured by our other covariates measured only at entry into unemployment.

The unemployed job-seeker: The aforementioned factors are also likely to affect the participation decision and future labor market outcomes of unemployed job-seekers at a given time. Elapsed unemployment duration is of primary importance in this context. First, surveys, as noted, regularly find unsuccessful search for a regular job to be one of the most important motives for taking up work in the THA sector, thereby lending support to the notion of sequential decision taking on the part of unemployed job-seekers of whether or not to join THA work. Second, benefit entitlement levels, and thus the reservation wage, decline with elapsed unemployed duration. As remuneration in the THA sector generally falls short of levels attainable in other industries, workers with prolonged unemployment spells, and hence a lower reservation wage, should be more likely to take up a THA job than workers who have just entered unemployment. Third, elapsed unemployment duration provides an upper bound on individual unobserved ability, as more productive workers are on average more likely to exit unemployment quickly. And finally, job search activity and more generally 'drive' are likely to decline with prolonged unemployment, as workers become discouraged. The latter raises the attractiveness of turning to THAs who each manage a whole portfolio of potential job opportunities. Registering in the new German Lander and the local unemployment rate at entry are likely to have an effect on the employment opportunities of individual job-seekers, both in the THA sector and in other industries. We also control for the real gross daily earnings workers received at their last employer before entering into unemployment. These proxy individual worker productivity, and affect benefit entitlement levels as well as potential aspiration wages when searching for a new job in unemployment. As Kvasnicka and Werwatz (2002) have shown, relative earnings of workers that enter THA employment in Germany on average fall short of those of otherwise comparable workers even two to three years before actually entering temporary work. We in addition control for the type of entitlements received by a worker in a particular month of elapsed unemployment duration, i.e. unemployment benefits, unemployment assistance, or unemployment support. The first is limited in duration and generally exceeds the latter two in financial terms. Eligibility for benefit entitlements is conditional on past employment, and its level depends on the last income earned.

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Restrictions imposed by the Law on Placement Activity (LoPA): The only restriction imposed by the LoPA during the observation period on the conduct of THAs in the recruitment process was the recall ban, which prohibited an agency to rehire a laid-off worker within three months of prior employment termination.[5] This ban was not eased until April 1997, when a one time exemption was introduced (see, for example, Jahn and Rudolph, 2002). By virtue of sampling only inflows into unemployment between 1994 and 1996, however, this reform is immaterial for subsequent transitions of workers out of their spell of unemployment. In our empirical analysis, we may not directly account for this regulatory constraint on the recruitment behavior of THAs in the estimation of the propensity scores by way of a dummy variable that takes the value one if less than three months have elapsed since a worker has been laid off by a THA, and zero otherwise. For we run separate probit regressions for each elapsed month of unemployment. As a consequence, in months of unemployment greater than three, this indicator will always take the value zero, i.e. we will have no variation in the data, as the recall ban ceases to be binding for all workers still unemployed after three months. In the context of our matching algorithm, however, we would expect immediately preceding employment in the THA sector to have less of a positive effect on the probability to reenter THA work in the first three months of unemployment than in the fourth, if the recall ban does indeed exert a material influence. We do, in fact, find such evidence (see Table 9 in the appendix).

General Labor Market Conditions: General labor market conditions influence both the search behavior and potential employment chances of unemployed job-seekers, as well as the recruitment decisions of THA agencies. Labor demand of THA firms is known to be both highly procyclical and subject to strong seasonal variations. We control for general labor market conditions along three dimensions: cyclical, seasonal, and regional. Cyclical and seasonal factors are controlled for by annual and quarterly indicator variables, measured at entry into unemployment. These indicator variables also account for differences in the inflow composition of workers into unemployment. The average annual unemployment rate in the employment office district where the worker registers as unemployed, in turn, is used to capture differences in local labor market imbalances. Finally, recorded unemployment registration in the new German Lander proxies for persistent structural differences between East and West Germany.

A note is in order on a problem, which is commonly encountered in evaluation studies, i.e. the presence of anticipatory effects of future treatment on the pre-treatment behavior of workers

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[5] As we have seen in Section 5.1.1, recalls among our unemployment inflow sample in 1994-1996 indeed occured much less frequently in the THA sector than in the economy at large.

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and its likely pervasiveness in the current application. Anticipatory effects of unemployed job-seekers, leading to reduced job search prior to entry into THA work (akin to Ashenfelter's dip), are unlikely to be a major problem in the present evaluation problem of the stepping-stone function of THA work. For THAs in Germany tend to hire workers predominantly on-call in line with current realizations of client demand (see Kvasnicka, 2003), which is unlikely to be predictable with certainty even one or two weeks in advance. In addition, as already discussed, worker recalls on the THA submarket at the time were prohibited within three months of prior employment termination, which effectively circumscribes.the problem of anticipatory effects related to potential recall among workers who entered unemployment from THA work.

5.2.3 Matching Quality

The regression output of the probit estimations of the propensity scores for a number of treatment months are provided in Table 9 in the appendix. All covariates except current entitlement status are measured at entry into unemployment. In particular, previous THA work experience and direct entry into unemployment from a THA job have a sizeable and statistically significant positive effect on the probability of transition to a THA job. Previous real earnings and the local unemployment rate, in contrast, surprisingly never exert any statistically significant effect on the likelihood of treatment assignment. The latter finding may be the product of two countervailing effects of local labor market conditions on the probability of treatment. While unemployed job-seekers may be more willing to accept a THA job, when other employment opportunities are scarce, THAs may only be inclined to recruit more workers when client demand for their services is high, i.e. local labor market conditions are tight. Workers who spent less than one year in their last job, which proxies for past instability of employment, turn out to be at times more likely to enter THA work, potentially for the otherwise reduced chances to find employment and lack of sufficient occupation-specific skills acquired in their last job. Workers entering unemployment from training also appear to be more inclined to take up a THA job in the first months of their unemployment spells. THA work thus indeed appears to provide an access-to-work function for recent labor market entrants. It is important to keep in mind that all estimated probit regressions are conditional on treated and non-treated workers in the respective subsamples to have reached the same elapsed duration of unemployment. As the latter is likely to be correlated both with observable and unobservable worker characteristics, the respective monthly subsamples should already be more homogeneous than the full groups of treated and non-treated workers sampled for the entire first twelve months of elapsed unemployment duration. As a consequence, the estimated coefficients of the observable attributes controlled for in the individual probit regressions measure only the impact of these covariates on the probability of treatment assignment conditional on elapsed unemployment

duration.

Table 4: Statistics by month on covariate balancing, before and after matching

Month (u) (1)	Treated workers before (2)	Nontreated workers before (3)	Probit ps.-R^2 before (4)	Probit ps.-R^2 after (5)	Pr>χ^2 before (6)	Pr>χ^2 after (7)	Median bias before (8)	Median bias after (9)	Treated workers lost to CS after (10)
1	208	95,265	0.113	0.029	0.000	0.991	14.3	3.9	0
2	326	80,905	0.138	0.015	0.000	0.999	16.5	3.7	0
3	249	69,270	0.124	0.017	0.000	1.000	16.3	3.6	1
4	203	59,768	0.166	0.030	0.000	0.995	18.8	2.9	0
5	174	52,997	0.159	0.023	0.000	1.000	16.4	4.5	0
6	127	47,184	0.125	0.055	0.000	0.973	14.4	6.5	0
7	99	42,280	0.153	0.065	0.000	0.986	21.7	6.5	0
8	69	38,302	0.127	0.093	0.000	0.973	21.0	6.5	0
9	51	35,008	0.149	0.177	0.000	0.805	16.6	8.1	0
10	52	31,897	0.171	0.138	0.000	0.957	16.8	8.7	0
11	52	29,250	0.152	0.123	0.000	0.975	27.1	7.2	0
12	37	25,674	0.193	0.192	0.000	0.943	28.1	11.6	0

Note: before = before matching, after = after matching.

(4), (5): Pseudo-R^2 from probit regressions for the monthly conditional treatment probability.

(6), (7): P-value of likelihood ratio tests for the joint significance of regressors.

(8), (9): Median absolute standardized biases taken over all regressors.

Source: IABS.

Following Sianesi (2004), Table 4 provides various summary statistics on covariate balancing and hence matching quality for all 12 probit regressions. Given the very large groups of potential controls available for each unemployment month (column 3), finding a suitable match partner for treated individual is not a problem. Only 1 out of the 1647 workers leaving unemployment for a THA job, as shown in column 10, are excluded for lack of common support. The pseudo-R^2 from the individual probit regressions before matching (column 4) indicate the extent to which the covariates explain the probability of treatment in a particular month of unemployment. The respective pseudo-R^2 from monthly probit regressions after matching (column 5) show that on average over the twelve probits run, the covariates continue to explain only 8% of the variance in treatment assignment across the matched subsamples, and thus only about half the average respective figure obtained from the original samples of treated and non-treated workers. Associated probability values of likelihood ratio tests before and after matching are reported in columns 6 and 7. Whereas before matching, the joint significance of the covariates is never rejected for any of our twelve probit regressions, it is always rejected after matching. Matching on the estimated propensity scores leads to significant improvements in the balancing of attributes between treated and (potential) control workers in the matched subsamples for each unemployment month u, as shown by the respective median absolute standardized biases before and after matching (columns

8 and 9).[6]

6 Empirical Findings

6.1 Summarizing Outcomes Over Time

We begin with a graphical summary of the average time pattern of the different treatment effects, before presenting the results for the respective Δ_{jt}^u by month of entry into THA work in Section 6.2, i.e. the causal effects identified under the CIA in equation (2). Following Sianesi (2004, p. 140), an average effect on each outcome measure j in outcome month t may be derived for the entire group of workers treated in their first twelve months of unemployment as:

$$E_U\left(\Delta_{jt}^u\middle| D=1\right) = \sum_{u=1}^{U=12}\left[E\left(Y_{jt}^{1(u)} - Y_{jt}^{0(u)}\middle| D^u=1\right)P\left(D^u=1\middle| D=1\right)\right], \qquad (7)$$

where $E\left(Y_{jt}^{1(u)} - Y_{jt}^{0(u)}\middle| D^u=1\right) = \Delta_{jt}^u$, which are weighted in the summation by the monthly entry distribution into THA work for those actually leaving unemployment for THA work, i.e. $P\left(D^u=1\middle| D=1\right)$. The following subsections graph estimates of these average monthly effects on our four outcome measures together with 95% confidence intervals calculated on the basis of equation (6) for the entire population of individuals treated in their first twelve months of unemployment. These graphs summarize how unemployed job-seekers who take up THA work on average fared in their subsequent employment and unemployment trajectories by joining THA work relative to the counterfactual situation in which they would have continued their job search in registered unemployment. Estimates of these treatment effects on our four outcome measures are reported in Table 10 in the appendix for selected months post treatment.

6.1.1 Outcome 1: Probability of Regular Employment

Figure 2 shows that entering a THA job has no statistically significant effect for most of our four-year period that outcomes are measured on the monthly probabilities of regular employment. In other words, for the majority of months post treatment, neither a stepping-stone effect of THA employment, nor an adverse effect on the future probabilities of regular employment is discernable. In the first months, however, THA work appears to reduce the relative chances of being in a regular job, a differential effect that subsequently turns slightly positive, and then seems to increase in

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[6]The median is taken over all regressors and calculated for each unemployment month u following Rosenbaum and Rubin (1985) as: $Bias_{Before}(X) = \frac{\bar{X}_1 - \bar{X}_0}{\sqrt{[(V_1(X)+V_1(X))/2]}} \times 100$ before matching and as $Bias_{After}(X) = \frac{\bar{X}_1^M - \bar{X}_0^M}{\sqrt{[(V_1(X)+V_1(X))/2]}} \times 100$ after matching, where $\bar{X}_1$ and $\bar{X}_0$ are the respective sample means in the entire subsamples of treated and nontreated workers, $V_1(X)$ and $V_1(X)$ their associated variances, and $\bar{X}_1^M$ and $\bar{X}_0^M$ the respective sample means in the group of matched treated individuals within the common support and nontreated individuals, i.e. controls (see Sianesi, 2004, p. 154).

the fourth year post treatment. The estimated reduced probabilities of regular employment are in all likelihood the result of a lock-in-effect of programme participation, as THA employment spells of treated workers have a median duration of fourth months (and a mean duration of eight and a half months), as pointed out before. The positive differentials observable in the fourth year post treatment, in turn, suggest that the potential advantages in terms of regular employment chances of taking up a THA job from unemployment tend to materialize rather late than early. It remains to be seen, whether or not these positive differentials in our descriptive graphical analysis for all workers who enter within their first twelve months of unemployment registration remain when we explore the causal effects of THA work for each entry month into unemployment, i.e. the treatment effects identifed under the conditional independence assumption (equation 2).

Figure 2: Treatment effects over time on the probability of regular employment
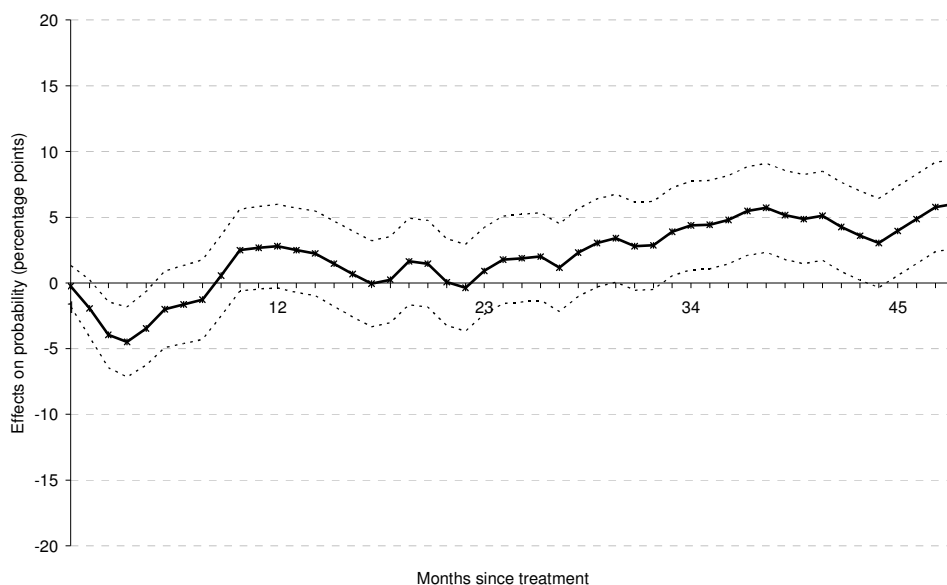
Source: IABS. - - - denote 95% confidence intervals.

Some unemployed workers entering THA work might still be employed in their job at later outcome months, while others may also cycle between different THA jobs. While inspection of Figure 2 provides little support for a stepping stone function of THA work for most of the four-year post-treatment period, it does not give an answer as to whether, and if so, to what extent, unemployed workers benefit in their overall future probability of employment, be it regular or temporary help work employment, from entering a THA job from unemployment. Having explored the former constituent part of this outcome measure in Figure 2, we next turn to the latter component (Outcome 2), before considering both parts in combination, i.e. Outcome 3.

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6.1.2 Outcome 2: Probability of THA Employment

As is evident from Figure 3, individuals that leave unemployment for THA work are significantly more likely throughout the four year period after entering agency work to be employed in the THA sector. While the positive probability differential declines rapidly over the first eight to nine months, its declines become subsequently less marked and the differential roughly stabilizes at around 11% towards the end of the observation period.

Figure 3: Treatment effects over time on the probability of THA employment
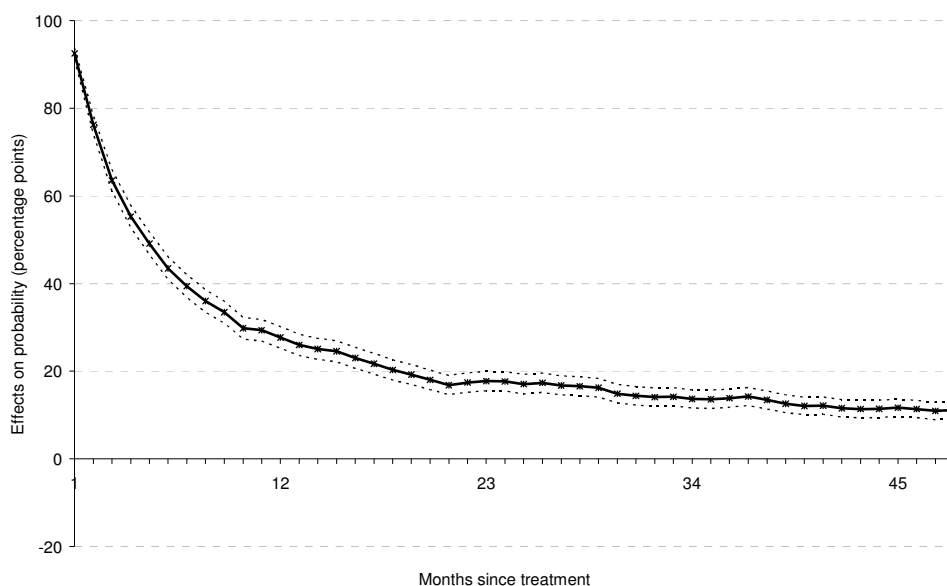
Source: IABS. - - - denote 95% confidence intervals.

While prolonged program duration and repeated program participation may in general be a matter of concern if it keeps workers from obtaining regular work, this does not seem to be the case in the present context. For as we have seen in Figure 2, unemployed workers entering THA work on average do not exhibit statistically significant lower monthly probabilities of regular employment than unemployed workers who chose not to join THA work as yet.

6.1.3 Outcome 3: Overall Probability of Employment

With respect to any social-security employment (THA or regular), Figure 4 reveals that unemployed workers who take up a THA job exhibit a higher employment probability than those unemployed workers who do not join THA work in the same month of elapsed individual unemployment duration in each month following entry into the THA sector for the entire 4 year period under investigation.

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Figure 4: Treatment effects over time on the probability of employment
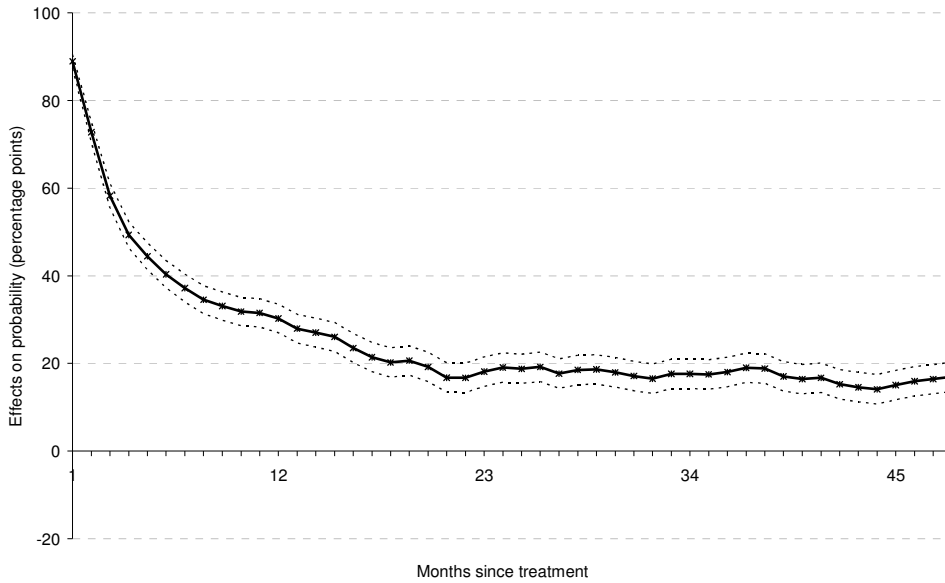
With Outcome 3 being a composite of Outcomes 1 and 2, and the general time pattern of treatment effects discernable in Figures 3 and 4, it is clear that the overall monthly employment probabilities quite closely resemble the levels and the trend of the increased likelihoods of THA employment for workers treated upon exit from unemployment. It remains to be seen, how entry into THA work affects the risks of future unemployment over time. As noted, our outcome measures are neither mutually exclusive nor all inclusive (e.g. inactivity is not considered as an outcome), so that we cannot infer the treatment effects of THA work on a particular outcome from the treatment effects estimated for the other outcomes.

6.1.4 Outcome 4: Probability of Unemployment

Figure 5 documents that monthly probabilities of unemployment are significantly reduced for treated workers throughout the four observation period post entry into THA work, but tend to converge to those experienced by workers that were not treated as of yet towards the end of the four-year observation period. Summarizing the four figures considered, it appears that unemployed worker seem to substantially improve (reduce) their overall future employment chances (risks of unemployment), while only benefitting potentially in terms of their future regular employment probabilities from their engagement in THA work towards the latter quarter of the four year period that their subsequent labor market states are followed.

Figure 5: Treatment effects over time on the probability of unemployment

Source: IABS. - - - denote 95% confidence intervals.

6.2 Treatment Effects by Month of Entry into THA Work

Having so far explored the average dynamics of the different treatment effects, Table 5 reports the respective causal effects averaged over the forty-eight outcome months for different entry months into THA work, as well as for the entire population of workers entering THA work within their first twelve months of unemployment. The former only correspond to the causal effects identified under the CIA, equation (2), whereas the latter summarize Figures 2 to 5, i.e. relates to the entire group of workers treated within their first year of unemployment and thus represent a benchmark against which to discuss the variations in ATTs by month of entry into THA work. Estimated baseline outcome probabilities for the respective control groups corresponding to the different groups of treated workers in Table 5 are provided in Table 11 in the appendix. As is evident, the averaged ATTs for the probability of regular employment are never significantly different from zero, whereas those for the probabilities to be employed in the THA sector, or in either THA or regular work (any employment) are always strong positively and statistically significantly affected if unemployment is left for a THA job. Future risks of unemployment, in turn, are in general significantly reduced for workers who take up a job in the THA sector. Although a marked systematic pattern by entry month into THA work is not observable for our four outcome measures, it appears that unemployed workers who join THA work very late in their unemployment spells (in the twelve month) tend to fare worse on average than those workers who join earlier, with respect to both THA employment, any employment, and unemployment.

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Table 5: Average treatment effects over the four year outcome period post treatment by unemployment month of entry into THA work

Outcomes:	Effect (percentage points):					
	u = 1-12	u = 1	u = 3	u = 6	u = 9	u = 12
Reg. Empl.	2.0 (−1.3;5.3)	5.3 (−4.1;14.7)	3.2 (−5.3;11.8)	0.7 (−7.8;9.2)	7.4 (−11.0;25.7)	3.2 (−19.0;25.4)
THA Empl.	24.0 (21.6;26.3)	24.7 (18.1;31.4)	25.1 (19.0;31.1)	26.6 (18.4;34.8)	27.8 (13.9;41.6)	20.1 (5.9;34.4)
Any Empl.	25.4 (22.1;28.7)	29.3 (20.2;38.4)	28.0 (19.6;36.4)	26.8 (14.9;38.6)	33.6 (15.3;51.9)	22.9 (0.7;45.0)
Unemployment	−17.0 (−20.1;−14.0)	−20.6 (−28.7;−12.5)	−20.4 (−27.9;−12.8)	−12.5 (−23.9;−1.2)	−20.3 (−38.1;−2.5)	−12.6 (−33.4;8.2)

Source: IABS. 95% confidence intervals are reported in parentheses.

Overall, we may summarize the findings in Table 5 to suggest that unemployed workers benefit in their overall future employment chances in the four-year observation period from entering THA work, because of the increased likelihood of future THA employment, but are neither on average more likely to obtain regular employment, nor to suffer from increased risks of future unemployment in the outcome period. Quite to the contrary, they appear to benefit substantially from reduced risks unemployment over the four-year post treatment period considered. Sample sizes, however, are fairly small, which leads to large standard errors in the estimates of our ATTs obtained, as is evident from Table 5. This is particularly a problem for our outcome measure of regular employment, for which all tabulated ATTs are insignificant, yet throughout positive. The estimated treatment effects on regular employment are, however, quite small for entries into THA work at the various months of unemployment duration considered in Table 5 when compared to the baseline probabilities of regular employment for the respective matched control groups (see Table 11 in the appendix).

The effects of THA employment on the future regular employment chances of unemployed workers, i.e. our outcome of primary interest, may differ between subgroups of workers. In the following, a number of such groups are considered. Given the small sample size of unemployed workers that leave for a THA job, and their rapidly declining numbers at longer elapsed unemployment durations, however, we have to restrict the analysis to transitions to THA work that occur within the first six months of unemployment registration. Table 7 tabulates the causal effects for each subgroup on the probability of regular employment averaged over the forty-eight outcome months for different entry months into THA work, as well as, as a benchmark, for the entire group of workers entering THA work within their first six months of unemployment together with the estimated baseline probability of regular employment of their matched controls. As is evident,

average treatment effects over the four-year outcome period are in the majority positive, though at several instances also negative, never statistically significant for all entries months into THA work, and mostly modest in absolute value if compared to the baseline probabilities of matched controls for the entire entry period considered. It is noticeable that the reduction in the upper age limit of workers considered to 40 years, and the sample restriction to workers without some prior THA experience do not result for each entry month into THA work in generally higher average treatment effects for regular employment probabilities than for all workers who enter THA work within the first six months of their unemployment spell. Furthermore, it appears that later entries into THA work ($u = 6$) once again appear to benefit less in their overall future regular employment chances than workers who enter THA earlier in their unemployment spell.

Table 6: Average treatment effects on probability of regular employment over the four year outcome period post treatment by unemployment month of entry into THA work for different subgroups of workers

Groups of workers:	Baseline Probablity	Effect (percentage points):			
		u = 1-6	u = 1	u = 3	u = 6
All workers (N=1286)	35.8	1.3 (−2.5;5.0)	5.3 (−4.1;14.7)	3.2 (−5.3;11.8)	0.7 (−7.8;9.2)
Aged 18-40 at entry into u. (N=1059)	36.9	2.0 (−2.1;6.2)	3.7 (−7.0;14.3)	4.1 (−5.3;13.4)	1.5 (−11.6;14.6)
No prior THA experience (N=864)	38.9	2.3 (−2.3;6.9)	6.3 (−5.6;18.1)	1.1 (−9.1;11.4)	1.7 (−12.1;15.4)
Unempl. in W. Germany (N=874)	34.9	3.7 (−0.8;8.2)	2.8 (−9.0;14.6)	−3.0 (−13.5;7.5)	5.2 (−8.8;19.3)
Men (N=1038)	37.8	−2.4 (−6.6;1.7)	1.2 (−9.5;11.9)	−4.0 (−13.5;5.5)	−1.7 (−14.1;10.8)

Source: IABS. 95% confidence intervals are reported in parentheses. N = No. of treated in u=1-6.

Finally, we want to look at the average treatment effects on the probability of regular employment for only the fourth year post entry into THA work. For as we have seen in Figure 2, for the entire group of workers entering THA work within twelve months of unemployment registration, a positive differential in their monthly regular employment probabilities was discernable only in this fourth year of our observation period that outcomes are measured. Plotting the outcomes averaged over all entries into THA work within twelve months of their unemployment registration, this figure (like the other figures) did not have a causal interpretation, for the CIA, as noted, pertains only to treated workers and their matched controls who have identical elapsed unemployment durations at entry of the former into THA work. Considering only the averaged monthly regular employment differentials between treated and controls in the fourth year of our observation

period, Table 7 shows that neither for all workers that enter THA work within six months of their unemployment registration, nor for any of the four subgroups already considered, are estimates statistically different from zero. Standard errors are, of course, once more very large due to the small sample sizes. Nevertheless, in the majority of cases, positive estimates are again small in magnitude, and in a quarter even negative, suggesting that workers do not benefit significantly in quantitative terms from generally higher chances of regular employment four years post entry in THA work. Summing up the various analyses in this section, there is little evidence that suggests the existence of a general and significant stepping stone function of THA work to regular employment for unemployed job seekers in Germany in the time period considered.

Table 7: Average treatment effects on probability of regular employment in the fourth year post treatment by unemployment month of entry into THA work for different subgroups of workers

Groups of workers:	Effect (percentage points):		
	u = 1	u = 3	u = 6
All workers (N=1286)	6.6 (−3.0;16,2)	6.8 (−2.0;15.5)	0.09 (−11.0;12.9)
Aged 18-40 at entry into u. (N=1059)	7.9 (−2.8;18.6)	8.3 (−1.2;17.9)	−5.2 (−18.9;8.5)
No prior THA experience (N=864)	7.2 (−4.7;19.0)	2.2 (−8.2;12.5)	6.3 (−7.9;20.5)
Unempl. in W. Germany (N=874)	4.3 (−7.6;16.2)	−2.3 (−13.0;8.4)	−2.0 (−16.6;12.7)
Men (N=1038)	3.2 (−7.6;14.1)	0.9 (−8.8;10.6)	−1.8 (−14.9;11.4)

Source: IABS. 95% confidence intervals are reported in parentheses. N = No. of treated in u=1-6.

7 Conclusion

Applying statistical matching techniques, this paper has investigated the average effects of entering THA work on the future labor market outcomes over a four-year period of workers who registered as unemployed in 1994 to 1996 relative to the counterfactual in which these workers would have continued their job-search in registered unemployment.

Unemployed workers who entered THA employment within twelve months of unemployment registration turned out to benefit from both higher monthly chances of THA and overall employment (THA or regular employment) throughout the four year period these workers were followed post treatment. Workers who took up a job in the THA sector also appeared to enjoy significantly reduced future risks of unemployment. They did not, however, seem to enjoy generally greater chances of future regular employment. While our results, therefore, do not lend empirical

support to the stepping-stone hypothesis of THA work for unemployed job-seekers in Germany, they do neither confirm concerns about potential adverse effects on the future regular employment and unemployment probabilities of THA workers. If anything, THA work appears to provide an access-to-work function for unemployed workers that leaves them with a higher probability of (THA) employment for the entire four years their subsequent labor market states have been analyzed than workers who did not join THA work as of yet in their unemployment spell.

References

[1] Abraham, K. G, and Taylor, S. K. (1996), "Firms' Use of Outside Contractors: Theory and Evidence", *Journal of Labor Economics*, 14 (3), 394 - 424.

[2] Almus, M., Engeln, J., Lechner, M., Pfeiffer, F., and Spengler, H. (1999), "Wirkungen gemeinnütziger Arbeitnehmerüberlassung in Rheinland-Pfalz", *Beiträge zur Arbeitsmarkt- und Berufsforschung*, No. 225.

[3] Autor, D. H. (2001), "Why do temporary help firms provide free general skills training?", *Quarterly Journal of Economics*, 116, 1409 - 1448.

[4] Autor, D. H., and Houseman, S. N. (2005), "Do Temporary Help Jobs Improve Labor Market Outcomes for Low-Skilled Workers? Evidence from Random Assignments", MIT, October 2005, *mimeo*.

[5] Autor, D. H., Levy, F., and Murnane, R. J. (1999), *Skills Training in the Temporary Help Sector: Employer Motivations and Worker Impacts*, Report to the U.S. Department of Labor Employment and Training Administration, Massachusetts Institute of Technology, Cambridge Massachusetts.

[6] Bender, S., Haas, A., and Klose, C. (2000), "IAB Employment Subsample 1975-1995. Opportunities For Analysis Provided by the Anonymised Subsample", *IZA Discussion Paper,* No. 117.

[7] Booth, A. L., Francesconi, M., and Frank, J. (2002), "Temporary Jobs: Stepping Stones or Dead Ends?", *The Economic Journal*, 112(127), 189 - 213.

[8] Bronstein, A. S. (1991), "Temporary Work in Western Europe - Threat or Complement to Permanent Employment?", *International Labour Review*, 130(3), 29 - 35.

[9] Brose, H. G., Schulze-Böing, M., and Meyer, W. (1990), *Arbeit auf Zeit – Zur Karriere eines "neuen" Beschäftigungsverhältnisses*, Leske & Budrich, Opladen.

[10] Burda, M. C., and Kvasnicka, M. (2006), "Zeitarbeit in Deutschland: Trends und Perspektiven", *Perspektiven der Wirtschaftspolitik*, 7(2), 195 - 225.

[11] CIETT (2000), *Orchestrating the evolution of Private Employment Agencies towards a stronger society*, International Confederation of Private Employment Agencies, Brussels.

[12] Cochran, W., and Rubin, D. B. (1973), "Controlling Bias in Observational Studies: A Review", *Sankyha*, No. 35, 417 - 446.

[13] Cohany, S. R. (1998) "Workers in alternative employment arrangements: a second look", *Monthly Labor Review*, 121(11), 3 - 21.

[14] Ferber, M. A., and Waldfogel, J. (1998), "The long-term consequences of non-traditional employment", *Monthly Labor Review*, 121(5), 3 - 12.

[15] Finegold, D., Levenson, A., and van Buren, M. (2003), "A Temporary Route to Advancement? The Career Opportunities for Low-Skilled Workers in Temporary Employment", in Appelbaum, E., Bernhardt, A. D., and Murnane, R. J. (eds.), *Low-wage America: how employers are reshaping opportunity in the workplace*, Russel Sage, New York, 317 - 367.

[16] Fredriksson, P., and Johansson, P. (2003), "Program Evaluation and Random Program Starts", *IFAU Working Paper*, 2003:1, Institute for Labour Market Policy Evaluation, Uppsala.

[17] García-Pérez, J. I., and Muñoz-Bullón, F. (2005), "Temporary Help Agencies and Occupational Mobility", *Oxford Bulletin of Economics and Statistics*, 67(2), 163 - 180..

[18] Heckman, J. J., Lalonde, R., and Smith, J. (1999), "The Economics and Econometrics of Active Labor Market Programs", in Ashenfelter, O., and Card, D. (eds.), *Handbook of Labor Economics*, vol. III, Elsevier, Amsterdam.

[19] Hegewish, A. (2002), *Temporary agency work: national reports. United Kingdom*, European Foundation for the Improvement of Living and Working Conditions, Dublin.

[20] Houseman, S. N. (1997), *Temporary, Part-Time and Contract Employment in the United States: New Evidence from an Employer Survey*, W.E. Upjohn Institute for Employment Research, Kalamazoo, Michigan.

[21] Ichino, A., Mealli, F., and Nannicini, T. (2005), "Temporary Work Agencies in Italy: A Springboard Toward Permanent Employment?", *Giornale degli Economisti*, 64(1), 1-27.

[22] IWG (1995), *Die wirtschafts- und arbeitsmarktpolitische Bedeutung der Zeitarbeit in Deutschland*, Eppa, Bonn.

[23] Jahn, E. J., and Rudolph, H. (2002), "Zeitarbeit – Teil I. Auch für Arbeitslose ein Weg mit Perspektive", *IAB Kurzbericht*, No. 20/28.8.2002.

[24] Jahn, E. J., and Windsheimer, A. (2004), "Personal-Service-Agenturen - Teil II. Erste Erfolge zeichnen sich ab", *IAB Kurzbericht*, No. 2/15.1.2004.

[25] Katz, L., and Krueger, A. (1999), "The High-Pressure U.S. Labor Market of the 1990s", *Brookings Papers on Economics Activity*, 1999/1, 1 - 87.

[26] Klös, H.-P. (2000), "Zeitarbeit - Entwicklungstrends und arbeitsmarktpolitische Bedeutung", *iw-trends*, 1/2000, 5 - 20.

[27] Kvasnicka, M. (2003), "Inside the Black Box of Temporary Help Agencies", *SFB373 Discussion Paper* 43/2003, Humboldt University Berlin.

[28] Kvasnicka, M., and Werwatz, A. (2002), "On the Wages of Temporary Help Service Workers in Germany", *SFB 373 Discussion Paper*, 70/2002, Humboldt University Berlin.

[29] Kvasnicka, M., and Werwatz, A. (2003), "Arbeitsbedingungen und Perspektiven von Zeitarbeitern", *DIW Wochenbericht*, No.. 46/2003, 717 - 725.

[30] Lechner, M. (2001), "Identification and Estimation of Causal Effects of Multiple Treatments under the Conditional Independence Assumption", in Lechner, M., and Pfeiffer, F. (eds.), *Econometric Evaluation of Labour Market Policies*, Physica/Springer, Heidelberg, 43 - 58.

[31] Leuven, E., and Sianesi, B. (2003), "PSMATCH2: Stata module to perform full Mahalanobis and propensity score matching, common support graphing, and covariate imbalance testing", at: http://ideas.repec.org/c/boc/bocode/s432001.html. Version 3.0.0.

[32] Mangum, G., Mayall, D., and Nelson, K. (1985), "The Temporary Help Industry:A Reponse to the Dual Internal Labor Market", *Industrial and Labor Relations Review*, 38(4), 599 - 611.

[33] Paoli, P., and Merllié, D. (2001), *Third European survey on working conditions 2000*, European Foundation for the Improvement of Living and Working Conditions, Dublin.

[34] Rosenbaum, P.R., and Rubin, D.B. (1985), "Constructing a Control Group Using Multivariate Matched Sampling Methods that Incorporate the Propensity Score", *The American Statistician*, 39(1), 33 - 38.

[35] Rudolph, H., and Schröder, E. (1997), "Arbeitnehmerüberlassung: Trends und Einsatzlogik," *Mitteilungen aus der Arbeitsmarkt und Berufsforschung*, 1/97, 102 - 126.

[36] Segal, L. M., and Sullivan, D. G. (1997a), "The Growth of Temporary Services Work", *Journal of Economic Perspectives*, 11(2), 117 - 136.

[37] Segal, L. M., and Sullivan, D. G. (1997b), "Temporary Services Employment Durations: Evidence from Administrative Data", *Federal Reserve Bank of Chicago Working Paper*, WP-97-23.

[38] Sianesi, B. (2001), "An evaluation of active labour market programmes in Sweden", *IFAU working paper*, 2001:5, Institute for Labour Market Policy Evaluation, Uppsala.

[39] Sianesi, B. (2004), "An Evaluation of the Swedish System of Active Labor Market Programs in the 1990s", *The Review of Economics and Statistics*, 86(1), 133 - 155.

[40] Storrie, D. (2002), "*Temporary agency work in the European Union*", European Foundation for the Improvement of Living and Working Conditions, Dublin.

[41] Zijl, M., Heyma, A., and van den Berg, G. (2004), "Stepping Stones for the Unemployed? The Effect of Temporary Jobs on the Duration until Regular Work", *IZA Discussion Paper*, No. 1241.

Appendix

Table 8: Summary statistics of the sample at entry into unemployment

Worker Characteristics:		Previous real daily gross wage (€)	49.5
Female	43.2	∅ real daily gross wage at employer (€)	54.9
Foreign	9.4	Duration of last job less than 1 year	48.7
Age (years)	34.5	Ever before in THA work	5.1
Married	48.6	Immediately before in THA work	1.5
Kids	38.2	Unemployment Spell:	
Educational/vocational degree:		First time unemployed	50.4
secondary	28.9	Registered in new German Lander	32.5
secondary with vocational	66.3	Local unemployment rate	11.7
polytechnic or university	4.8	Registration in:	
Previous Employment History:		1994	38.7
Sector:		1995	31.5
Farming and energy	2.7	1996	29.9
Manufacturing	26.8	1st quarter	32.1
Construction	15.9	2nd quarter	20.4
Trade	13.8	3rd quarter	24.2
Transport	5.0	4th quarter	23.2
Services	28.9	Entitlements:	
State	6.0	Unemployment benefits	90.3
Other	0.8	Unemployment assistance	7.6
Type of last occupation:		Unemployment support	2.1
In training	9.9		
Unskilled blue-collar	24.3		
Skilled blue-collar	28.6		
White-collar	26.7		
Part-time	10.6		

Note: Number of workers = 106,383. All entries are in percent, unless stated otherwise.
Source: IABS.

Table 9: Estimation of propensity scores by month of entry into TWA work

	Months 1	4	8	12
Personal characteristics:				
Female	-.2582 (.0658)***	-.2038 (.0680)***	-.3076 (.1121)***	-.1689 (.1542)
Foreign	.0544 (.0762)	.0477 (.0778)	.0518 (.1151)	.2354 (.1656)
Age	.0084 (.0222)	-.0369 (.0241)	-.0183 (.0374)	-.0901 (.0546)*
Age^2	-.0003 (.0003)	.0002 (.0003)	-.0000 (.0005)	.0008 (.0007)
Married	-.0218 (.0647)	.0296 (.0735)	-.0244 (.1108)	-.1095 (.1675)
Kids	-.0249 (.0660)	-.0961 (0.752)	-.1194 (.1136)	.0090 (.1665)
Education:				
(ref.: secondary degree)				
Vocational degree	.2328 (.0776)***	.0690 (.0801)	-.0128 (.1237)	.2611 (.1810)
University	-.2668 (.2410)	-.4419 (.2972)	—	.6767 (.3159)**
Last employment spell:				
Job tenure less than 1 year	.0896 (.0524)*	.0721 (.0588)	.2423 (.0949)**	.0987 (.1274)
Occupation:				
(ref.: unskilled blue collar)				
Training	.2229 (.1051)**	.3906 (.1024)***	.2356 (.1811)	.2981 (.2314)
Skilled blue collar	.0156 (.0737)	.0521 (.0833)	.2479 (.1283)*	.0602 (.1802)
White collar	.0664 (.0879)	.0668 (.0976)	.0752 (.1556)	-.3035 (.2312)
Part time	.0495 (.1223)	-.2019 (.1632)	-.0161 (.2066)	-.0566 (.2817)
Real gross daily income				
Of worker	-.0016 (.0010)	-.0006 (.0010)	-.0012 (.0016)	.0015 (.0018)
Average at employer	.0026 (.0015)*	.0031 (0.73)*	.0020 (.0026)	.0019 (.0034)
Sector:				
(ref.: manufacturing)				
Agriculture / Energy	.0854 (.1369)	.2471 (.1420)*	—	—
Construction	-.0463 (.0738)	.0645 (.0833)	.1128 (.1289)	.1517 (.1764)
Trade	-.1020 (.0881)	-.0270 (.0953)	-.0429 (.1622)	-.0189 (.2084)
Transport	-.0595 (.1159)	-.1660 (.1510)	.1829 (.1775)	-.2767 (.3723)
Services	-.1413 (.0776)*	-.0984 (.0863)	.1042 (.1281)	-.0351 (.1794)
State	-.4917 (.2116)**	-.1126 (.1481)	-.3059 (.2996)	—
Other	-.1465 (.3168)	.2503 (.2638)	.3850 (.3773)	—
Previous THA work:				
At some point in past	.6053 (.0776)***	.5850 (.0903)***	.4674 (.1306)***	.4801 (.1907)**
Last job was in THA sector	.6075 (.1134)***	.7466 (.1263)***	.2443 (.2019)	.3823 (.3015)
Unemployment characteristics:				
First-time unemployed	.0657 (.0555)	.0055 (.0621)	-.0555 (.0973)	.0481 (.1405)
Registered in new Lander	.1188 (.0862)	.0742 (.0921)	.0479 (.1513)	-.4497 (.2256)**
Local unemployment rate	.0041 (.0099)	.0132 (.0106)	-.0107 (.0171)	.0244 (.0234)
Entitlements (ref.: benefits):				
Assistance payments	-.2045 (.0978)*	-.0884 (.0903)	-.0811 (.1125)	-.0027 (.1482)
Living supports	—	-.4684 (.1665)***	-.3018 (.1548)**	-.1329 (.1699)
Registration:				
(ref.: 1994, 1st quarter)				
1995	.0625 (.0594)	-.0629 (.0648)	.0013 (.0982)	-.3129 (.1956)
1996	.1008 (.0591)*	-.0311 (.0634)	-.0916 (.1060)	.2421 (.1360)*
2nd quarter	.2172 (.0676)***	-.0896 (.0670)	-.1184 (.1330)	.4184 (.1806)**
3rd quarter	.2460 (.0656)***	-.2669 (.0735)***	-.0651 (.1214)	.3729 (.1798)**
4th quarter	.0658 (.0178)	-.4032 (.0796)***	.1751 (.1069)	.1331 (.2085)

Note: ***, **, * indicate statistical significance at the 1%, 5%, and 10% level. Standard errors in parantheses.
Source: IABS.

Table 10: Average effects on the probabilities of being in different labor market states for various outcome months

Outcomes:	Effect (percentage points):					
	t = 3	t = 6	t = 12	t = 24	t = 36	t = 48
Regular Empl.	−3.9 (−6.5;−1.4)	−2.0 (−4.9;0.9)	2.8 (−0,4;6.0)	1.8 (−1.6;5.1)	4.8 (1.4;8.2)	6.0 (2.6;9.4)
THA Empl.	63.5 (61.1;66.0)	43.5 (40.9;46.1)	27.7 (25.2;30.2)	17.7 (15.5;19.9)	13.9 (11.8;15.9)	11.1 (9.1;13.1)
Any Empl.	58.3 (55.5;61.0)	40.3 (37.2;43.5)	30.3 (27.0;33.5)	19.1 (15.7;22.4)	18.0 (14.7;21.4)	17.0 (13.6;20.3)
Unemployment	−59.7 (−62.4;−56.9)	−34.8 (−37.9;−31.6)	−20.0 (−23.1;−16.9)	−9.9 (−12.9;−6.9)	−6.9 (−9.8;−4.0)	−7.2 (−10.0;−4.3)

Note: 95% confidence intervals are reported in parantheses.

Source: IABS.

Table 11: Estimated probabilities for different outcomes and control groups by elapsed unemployment duration

Outcomes:	Average probability (percent):					
	u = 1-12	u = 1	u = 3	u = 6	u = 9	u = 12
Regular Employment	34.8 (32.6;37.0)	37.7 (31.1;44.3)	36.2 (30.3;42.1)	31.6 (24.0;39.3)	30.6 (19.1;42.0)	37.3 (24.3;50.3)
THA Employment	3.9 (3.0;4.8)	3.8 (1.2;6.4)	3.5 (1.2;5.7)	2.0 (−0.3;4.4)	4.0 (−0.9;9.0)	2.2 (−1.7;6.1)
Any Employment	38.6 (36.4;40.9)	41.5 (34.8;48.2)	39.5 (33.5;45.5)	33.6 (25.8;41.4)	34.5 (22.7;46.4)	39.4 (26.3;52.6)
Unemployment	37.6 (35.4;39.9)	35.6 (29.1;42.1)	36.9 (30.1;42.8)	37.9 (29.9;45.9)	43.1 (30.7;55.4)	36.8 (23.8;49.8)

Note: 95% confidence intervals are reported in parantheses.

Source: IABS.