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Active Job-search Programs a Promising Tool?: A Microeconometric Evaluation for Austria

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Founded in 1963 by two prominent Austrians living in exile – the sociologist Paul F. Lazarsfeld and the economist Oskar Morgenstern – with the financial support from the Ford Foundation, the Austrian Federal Ministry of Education and the City of Vienna, the Institute for Advanced Studies (IHS) is the first institution for postgraduate education and research in economics and the social sciences in Austria. The **Economics Series** presents research done at the Department of Economics and Finance and aims to share "work in progress" in a timely way before formal publication. As usual, authors bear full responsibility for the content of their contributions.

Das Institut für Höhere Studien (IHS) wurde im Jahr 1963 von zwei prominenten Exilösterreichern – dem Soziologen Paul F. Lazarsfeld und dem Ökonomen Oskar Morgenstern – mit Hilfe der Ford-Stiftung, des Österreichischen Bundesministeriums für Unterricht und der Stadt Wien gegründet und ist somit die erste nachuniversitäre Lehr- und Forschungsstätte für die Sozial- und Wirtschafts-wissenschaften in Österreich. Die **Reihe Ökonomie** bietet Einblick in die Forschungsarbeit der Abteilung für Ökonomie und Finanzwirtschaft und verfolgt das Ziel, abteilungsinterne Diskussionsbeiträge einer breiteren fachinternen Öffentlichkeit zugänglich zu machen. Die inhaltliche Verantwortung für die veröffentlichten Beiträge liegt bei den Autoren und Autorinnen.

Abstract

In Austria active job-search programs were introduced on a large scale in 1999. These programs aim at activating unemployed at an early stage and bringing them back to work by training job-search related skills. We evaluate the impact of active labour market programs in Austria on individual unemployment durations, and allow program effects to vary between active job-search programs and formal training programs. We use the timing-of-events method which estimates the program effect as a shift in the transition rate from unemployment to jobs at the moment of program entry. We find that participation in active job-search programs significantly reduces unemployment durations, whereas formal training programs have a negative effect on unemployment durations. For women all programs have positive effects.

Keywords

Active labour market policy, treatment effect, multivariate duration model

JEL Classifications

C14, C41, J64, J68

Comments
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Contents

1 Introduction

Active labour market policies (ALMP) have the aim to bring unemployed back to work and to improve the functioning of the labour market in various ways. Political guidelines by the OECD and the European Commission recommend that governments should shift the balance of public spending on labour market policies from passive income support towards active measures (OECD, 1994). However, in most countries only a small switch in resources could be detected over the past decade (Martin and Grubb, 2001). This is related to doubts about the effectiveness of ALMP spending. Recent studies view the benefits of many programs rather pessimistic (Calmfors et al., 2001; Heckman et al., 1999; Kluve and Schmidt, 2002). An important drawback of many public programs is that they stimulate workers to reduce their search efforts during participation instead of increasing it. This is the so-called lock-in effect, as opposed to the desired skill-enhancement effect.

In their overview on ALMP Martin and Grubb (2001) assess principles in order to maximise the effectiveness of ALMP in the OECD countries (see also Martin and Grubb, 2000). First, a high priority should be given to in-depth counselling, job-finding incentives, and job-search assistance programs. Second, public training programs should be kept on small scale and be well targeted to specific needs of both job seekers and employers.

In Austria ALMP is traditionally focused on training programs. Their aim is to improve individual skills and chances in the labour market with a long term perspective[1]. In 1999 and 2000, following the recommendations towards job-search assistance programs, a new type of programs were introduced on a large scale. The main goal of these active job-search programs was to activate and encourage unemployed individuals to move quickly out of unemployment by increasing the effectiveness of job-search. Due to the low cost, in comparison to formal training programs, active job-search programs could be made available to a much wider target group. It was planned to send every new entrant into unemployment to a course before the fourth month of the spell had elapsed. The question is now whether these programs with a short-term perspective succeed in stirring up the unemployed and moving them back to employment, and how they fare in comparison to formal training programs[2].

[1] Zweimüller and Winter-Ebmer (1996) evaluated public training programs in the 1980's and found positive treatment effects on employment stability.

[2] This is especially interesting as empirical evidence on the effects of active job-search programs is rare in comparison with evaluation studies on the effect of training programs or employment programs (Blundell et al., 2001; Hotz et al., 2002; Winter-Ebmer, 2000).

The question how participation in ALMP programs affects labour market outcomes of participants has been subject to substantial debate in the econometric literature (Heckman et al., 1999). The main problem can be regarded as one of missing data: at any point in time an individual is either a participant of the program or not, but not both. Labour market outcomes for participants may be systematically different from non-participants for reasons that are unobservable to the researcher, this is called the selection problem. The ideal setup for evaluation would be a social experiment, where individuals are randomly assigned to participate in a program. Social experiments are a standard tool in the US[3]. However, they are expensive and difficult to implement and therefore relatively uncommon in Europe (for examples see Rosholm and Skipper, 2003; van den Berg and van der Klaauw, 2001).

Several econometric methods have been developed to deal with the evaluation problem in non-experimental data (for overviews see Blundell and Costa-Dias, 2000; Heckman et al., 1999). They deal with the construction of an appropriate counterfactual or comparison group. One method is to find explanatory variables which only affect program participation but not the outcome variable directly, and to use this exclusion restrictions for instrumental variables estimation (Heckman, 1997). A second alternative is to construct a comparison group on basis of all observable information. This is the so-called method of matching (Heckman et al., 1997a); it is based on the assumption that observed variables explain all differences between program participants and non-participants (conditional independence assumption CIA).

Introducing a new method based on the exact timing of the program during an unemployment spell Abbring and van den Berg (2003) show that the program effect is identified by the variation in the time of program entry. This method does not rely on any exclusion restrictions or conditional independence assumption but the selection into the program is allowed to depend on unobservable individual characteristics as well. A further advantage of this method is that it allows inference on how the causal program effect varies with the time since program start. The timing-of-events method has been recently applied in a number of papers, including Abbring et al. (1999); Bolvig et al. (2002); Lalive et al. (2002); Lubova and van Ours (1999); Richardson and van den Berg (2001).

In this paper we choose to apply the timing-of-events methods for the following reasons. First, we use data from administrative sources, which contain precise

[3]Experimental data may also provide useful information on the adequacy of non-experimental methods by assessing their reliability (see Heckman et al., 1997a,b; Lalonde, 1996)

information on the timing of unemployment and program participation, along with the individual's labour market history. Second, in the Austrian system decisions on program participation are subject to discretionary power of the advisors in the employment office to a large extent. As we do not have all the information underlying their decisions, CIA or exclusion restrictions might be hard to justify. Further, the programs we consider are designed for all groups of unemployed, hence no natural comparison groups arise. The explicit aim of ALMP in Austria is to reduce unemployment and prevent long-term unemployment. Therefore we focus on the employment effects of ALMP programs.

We estimate a basic model where the program effect is measured as a constant shift in the transition rate from unemployment to work from the entry into the program onwards. The program effect is allowed to be different for training programs and active job-search programs. Then we contrast the results to a number of different specifications allowing for further heterogeneity in the program effect, and investigating the variation of program effects over time. We find substantial heterogeneity in the program effect according to the program type. Participation in active job-search programs significantly reduces unemployment durations, whereas training programs have a negative effect on unemployment durations. Allowing for time-varying program effects shows that all programs have the lowest effects during the first 30 days after program start. For active job-search programs the effect is always positive and reaches its full extent after the first 30 days. Training programs have a positive effect only after 60 days from program start, which is a strong evidence for a lock-in effect. Allowing for heterogeneous program effects for several population groups shows that women benefit from participation in all programs, even from training programs.

2 Labour market policy in Austria

The Austrian labour market policy has two components: a benefit system that supports individuals while unemployed and various active labour market programs offered in order to facilitate the re-employment of unemployed jobseekers. Austrian expenditures on active and passive labour market policies amounted to 1.57% of GDP in 2000. The amount allocated to active labour market policies was 0.51% of GDP. These figures are small in international comparison; spending on active labour market policy in the OECD average was 0.76% of GDP (OECD, 2002).

Unemployment insurance is provided in the form of unemployment benefits (Arbeitslosengeld, UB) and unemployment assistance (Notstandshilfe, UA). El-

igibility for UB depends on work experience and age. The minimum duration of benefits is 12 weeks, but if the unemployed person has worked at least 486 weeks in the last 15 years and is above the age of 50, the period of benefits can be as long as 52 weeks. The monthly amount received is 55% of the net monthly earnings plus allowances for dependent children. There is an upper limit for the amount of UB, which flattens the replacement ratio considerably for high-income earners. Benefits are not taxed. Those who have exhausted unemployment benefits may be granted unemployment assistance. In principle, the amount of UA is about 92% of UB and it is means tested. The resulting amount is ultimately 78% of the UB amount on average. The duration of UA is six months, but can be extended after further examination. Voluntary quitters and workers discharged for misconduct are subject to a waiting period of 4 weeks before they can claim any benefits.

Active labour market policy includes counselling, placement and a broad range of active labour market programs. The main strategy of ALMP in Austria consists of programs which aim at improving individual skills. Of all persons treated by ALMP programs in 2000, 84% attended training programs (formal training or active job-search). Employment subsidies were granted to about 8% of treated persons[4]. Finally a share of 8% received other kinds of treatment in the form of child care assistance, support for unemployed to start an enterprise or special counselling (Arbeitsmarktservice Österreich, 2001).

Training programs focus on education and on qualification enhancement of participants. Courses offered are either vocational training courses which result in a certified education equivalent to an apprenticeship degree. Other courses train specific skills like languages or computer abilities. Course durations vary from 4 weeks to one year according to the course type. Training courses are rather expensive per trainee. Therefore they can only be provided for a small fraction of the unemployed and the targeting of participants is complicated. For the participants training courses are time intensive and participation may reduce their search effort and attachment to the labour market.

Following the guidelines of the European Employment Strategy a second group of programs has been implemented. These are so-called active job-search programs aiming at the activation of unemployed individuals at an early stage. These programs are not focused on specific target groups but should be available for the majority of the unemployed. Active job-search programs are designed to increase search effort and search efficiency by motivating and encouraging par-

[4]Expenditures for ALMP were distributed by 59% for training programs, 32% for employment subsidies, and 9 for the other measures

ticipants. The programs should lead to immediate transitions into employment either during the course or shortly afterwards. Consequently unemployment durations should be reduced and transitions into long-term unemployment should be prevented. Active job-search programs were first introduced on a large scale in 1999 and 2000 under the project name "job-coaching" (Schernhammer and Adam, 2002). The ambitious aim was that every new entrant into unemployment should be enrolled into a course before completing the first four months of unemployment. During the course job application practices (writing application letters, behaviour in job talks) were trained. Course durations were 6 weeks (7 weeks in 2000), but not full time: three course days during the first week and one day during each of the following weeks. The short time between installment and begin of this large scale program led, however, to a number of administrative difficulties. In some locations also unemployed with longer spell durations had to be admitted to fill up existing courses, in others slots for short-time unemployed were missing.

To be eligible for ALMP program participation in Austria a person must be unemployed, or face the risk of becoming unemployed. Since the Austrian Ministry of Social Affairs does not specify the eligibility criteria more narrowly, this leaves a great deal of discretion to the program administrators. The guidelines instruct the employment office advisors actively to offer training to the unemployed who lack specific skills, and in particular to individuals with placement disadvantages (school dropouts, long-term unemployed, disabled, women with long work interruptions). During training participation, individuals receive compensation which amounts to the level of unemployment benefits. If necessary, the administration supports additional costs accruing from participation. Noncompliance with the program regulations or nonparticipation leads to benefit sanctions.

3 Model and estimation method

The timing-of-events method uses a multivariate duration model specification. In this framework it is necessary to give an adequate description of the processes unemployment, program participation and employment. In the literature several approaches have been used. Bonnal et al. (1997) model each as a separate state and compare transitions between the states.

We assume two states, unemployment and employment. When an unemployment spell begins an other process also starts, measuring the time until program

participation. If an individual finds a job before entering into a program, the time until participation is treated as right censored. In this way selection into the program is explicitly modelled. When the person enters the program, he is still unemployed but the hazard rate out of unemployment is allowed to change. This is the program effect we want to measure. The method also takes into account that program participation and the decision to take a job are affected by unobserved factors, which may be correlated. This allows to distinguish between selection effects and the causal program effect.

3.1 Timing-of-events method

Let the random variable T_u denote the duration of unemployment, and T_p the duration from the start of unemployment until participation in an ALMP program. We assume that the individual distribution of T_u can vary with observed and unobserved explanatory variables x and v_u, respectively. To construct a model, it is useful to focus on the hazard rates of T_u and T_p of that individual. The hazard rate of a duration variable is the rate at which the spell is completed at time t given that it has not been completed before, as a function of t. It provides a full characterisation of the duration distribution (Lancaster, 1990; van den Berg, 2001).

Let t_p denote the realisation of T_p. For an unemployed individual the transition rate from unemployment to employment at t conditional on x, v_u and t_p is denoted by $\theta_u(t|x, t_p, v_u)$ and is assumed to have a Mixed Proportional Hazard (MPH) specification,

$$\theta_u(t|x, t_p, v_u) = \lambda_u(t) \exp(x'\beta_u + \delta I(t > t_p) + v_u) \tag{1}$$

in which $\lambda_u(t)$ represents the individual duration dependence of the hazard. Program entry at t_p is expressed by the indicator $I(t > t_p)$ which takes the value one for program participants; δ measures the program effect. The effect of the explanatory variables is given by β. This specification summarises a number of important assumptions. First, we assume that x is not time-varying. Second, we assume that program participation does not affect the transition rate from unemployment to employment before the moment of the program start. Third, we do expect that the program, once it has started has a constant and permanent effect on the hazard rate out of unemployment. Fourth, we assume that the multiplicative effect of program participation is the same for every type of individual. Later on we check the sensitivity of this specification

by estimating models with alternative assumptions on the behaviour of the hazard. We test whether the hazard varies over time and for different population groups. Let t_u denote the realised unemployment duration. The conditional unemployment duration density function $f_u(t_u|x, t_p, v_u)$ can be written as

$$f_u(t_u|x, t_p, v_u) = \theta_u(t_u|x, t_p, v_u) \exp\left(-\int_0^{t_u} \theta_u(s|x, t_p, v_u)ds\right) \tag{2}$$

Next, we incorporate the duration until the start of an ALMP program into the model. Consider the rate at which the individual enters the first ALMP program, from the moment she enters the current spell of unemployment. We assume the hazard into the program varies with observed and unobserved characteristics x and v_p. This rate is denoted by $\theta_p(t|x, v_p)$ and it is assumed to have a MPH specification

$$\theta_p(t|x, v_p) = \lambda_p(t) \exp(x'\beta_p + v_p) \tag{3}$$

in which $\lambda_p(t)$ represents the individual duration dependence of the hazard. The density of $T_p|x, v_p$ associated with the distribution defined by (3) can be expressed analogously to equation (2)

$$f_p(t_p|x, v_p) = \theta_p(t_p|x, v_p) \exp\left(-\int_0^{t_p} \theta_p(s|x, v_p)ds\right). \tag{4}$$

The joint distribution of $T_u, T_p|x, v_u, v_p$ is fully determined by (2) and (4). Conditional on x, v_u, v_p the only possible relation between the variables T_u and T_p is by way of the direct program effect on the transition rate from unemployment to employment. This means that if $\delta = 0$ then, conditional on x, the variables t_u and t_p are only dependent if v_u and v_p are dependent.

In the case of independence of v_u and v_p we have a duration model for t_u with a time-varying regressor $I(t > t_p)$ which is orthogonal to v_u. In this case no selection into the program occurs. Now assume, for example, that v_u is positively related to v_p. Individuals who get into a program early have on average a larger v_u than individuals who get into a program later during their unemployment spell. The correlation in turn implies that they also have on average a larger transition rate from unemployment to employment. This can be interpreted that individuals with favourable employment prospects are selected into the program. Now, if getting into a program were assumed to be independent from x and v_u, the estimate of δ will be affected by this relation

that works by way of the unobserved heterogeneity determinants. Specifically, δ will be overestimated. For negative correlation, or negative selection into programs, the reverse is possible.

Let G denote the joint distribution of v_u, v_p, in the inflow into unemployment. A specification of G together with the specification of the distribution of $T_u, T_p|x, v_u, v_p$ fully determines the distribution of $T_u, T_p|x$. Abbring and van den Berg (2003) show that the model in (2) and (4) is non-parametrically identified. They also show that we can identify models in which δ is allowed to vary with x or with elapsed duration after program entry. Thus, the restriction of a constant and permanent effect of program participation is indeed testable. Intuitively, the timing-of-events method uses variation in the unemployment duration and in the duration until the start of the first program, conditional on observed covariates, to identify the unobserved heterogeneity distribution.

3.2 Compatibility between the Austrian ALMP system and model assumptions

Identification for the timing-of-events method relies on the individual variation in entry dates into programs. This variation is given in our data. Although several programs are targeted at unemployed of specific elapsed durations, it proves difficult to generate homogeneous groups of participants in practice. For example, active job-search programs aimed at short term unemployed between the third and fourth months of their spell. In practice unemployed with spell durations from 1 to 6 months were admitted.

In order to guarantee that the job hazard rate is shifted only at the entry date into the program, it is necessary to assume that the unemployed have no advance notice of program participation. They may well be aware of the probability that they will be enrolled into a program, but they may not be informed about the exact date. This information would influence their strategy, either not to search for jobs and wait for the program start or to increase search effort in order to avoid program participation. Enrolment into training programs is based on discussions between the unemployed and the employment office advisor. In many cases a formal application or even an entrance exam are required. This means that notification of program participation can only be given a short time before the program start. At least this time span should be short compared to the unemployment duration. For active job search programs the plan was to notify participants within one months before program start. In practice this was not always possible. Many participants were notified by mail a very short time

before the program started in order to fill up courses. In other cases unemployed were assigned to the courses a long time in advance (Schernhammer and Adam, 2002). In these cases the assumption of no anticipation might be violated, but unfortunately data on the dates of notification are not available. In order to eliminate any effects of temporary layoff we removed from the sample all individuals who returned to their previous employer after unemployment.

3.3 Empirical implementation

In order to avoid substitution effects between different program types, we specify a model that evaluates the effects of all kinds of programs. We want to distinguish between the effects of three different program types: training programs, active job-search programs, and a residual group of other programs. The program effect, the effect of the type of the first program the individual enters, in (1) is measured with three different parameters by

$$\begin{aligned}\delta I(t_u > t_p) = \quad & \delta_1 I(t_u > t_{p1}, t_{p2} > t_{p1}, t_{p3} > t_{p1}) + \\ & \delta_2 I(t_u > t_{p2}, t_{p1} > t_{p2}, t_{p3} > t_{p2}) + \\ & \delta_3 I(t_u > t_{p3}, t_{p1} > t_{p3}, t_{p2} > t_{p3}).\end{aligned}$$

where the index $p1$ stands for training program, $p2$ stands for active job-search program, and $p3$ for other program. The realisation of the random variable T_{p1}, duration until entry into training program, is denoted by t_{p1}. Additionally we model separate hazards into each program type $\theta_{p1}, \theta_{p2}, \theta_{p3}$, analogous to (3).

We specify piecewise constant baseline hazards as

$$\lambda_k(t) = \exp(\sum_{i=1}^{m} \lambda_{ki} I_i(t)) \quad k = u, p1, p2, p3 \tag{5}$$

where $i = 1, \ldots, m$ are subscripts for time intervals and $I_i(t)$ are time-varying dummy variables, for the intervals: 0-1 months, 1-2 months, 2-5 months, 5-12 months, over 12 months. Because we also estimate a constant term, we normalise $\lambda_{k1} = 1$.

The joint distribution of unobserved characteristics $G(v_u, v_{p1}, v_{p2}, v_{p3})$ is assumed to take on a multivariate discrete distribution. We assume that each transition rate has two points of support (v_{ua}, v_{ub}) for the transitions from unemployment into employment, $(v_{p_i a}, v_{p_i b})$ for the transitions into the programs $i = 1, 2, 3$. This implies that the joint distribution has 16 mass points. The

associated probabilities are denoted as

$$\begin{aligned} P(v_u = v_{ua}, v_{p1} = v_{p1a}, v_{p2} = v_{p2a}, v_{p3} = v_{p3a}) &= p_{aaaa} \\ P(v_u = v_{ua}, v_{p1} = v_{p1a}, v_{p2} = v_{p2a}, v_{p3} = v_{p3b}) &= p_{aaab} \\ &\vdots \\ P(v_u = v_{ub}, v_{p1} = v_{p1b}, v_{p2} = v_{p2b}, v_{p3} = v_{p3b}) &= p_{bbbb} \end{aligned}$$

In the estimation procedure we actually estimate the transformed probabilities q_j, $j = aaaa, abaa, \ldots, bbbb$ which are implicitly defined by

$$p_j = \frac{exp(q_j)}{\sum_{i=aaaa}^{bbbb} q_i}$$

Because the p_j sum to one, we normalise by taking $q_{bbbb} = 0$. Estimating q_j instead of p_j has the advantage that no boundary restrictions have to be imposed on the parameter space.

When estimating the full model we have problems with estimating all the unobserved heterogeneity terms. We thus impose the restriction that the unobserved heterogeneity terms of the different programs are perfectly related[5]. Hence only $p_{aaaa}, p_{abbb}, p_{baaa}$ and p_{bbbb} are different from 0.

4 Data

We use data on individual labour market careers which combine information from the social security records and from registers of the Austrian public employment office (AMS). The set under consideration includes the total inflow into unemployment from March to August 1999. A special feature of the Austrian labour market are high seasonal fluctuations in employment owing to the importance of tourism and construction sectors in the economy. Therefore the spring/summer inflow period was selected to minimise conflicts with seasonal unemployment. During the inflow period we observe 245,234 individuals. From the AMS registers we use information on personal characteristics of the individuals. In addition all ALMP program spells for these persons during the years 1997 to 2001 are collected. From the social security records we match employ-

[5]Under this restriction a test for correlation of the unobserved heterogeneity terms for unemployment duration and program entry is given by the hypothesis $q_{aaaa} = q_{abbb} + q_{baaa}$.

ment and wage histories for the period 1988 to 2001, which are given on a daily basis.

For the empirical analysis we select the first unemployment spell during the inflow period (March to August 1999) for each individual. From the ALMP spells we select the first program spell during the unemployment spell and mark these individuals as program participants. Closely connected with seasonal employment is the phenomenon of temporary layoffs, i.e. unemployment spells terminated by reemployment with the former employer. Hence we exclude from the analysis all workers who returned to their previous employer after unemployment[6] (19% excluded). Further we only consider individuals between 20 and 50 years of age (16% excluded). Younger individuals may not have finished their education. For individuals over 50 years special rules for unemployment benefits and early retirement apply. The reduced set includes 164,901 individuals. The empirical estimations are based on an 8% subsample of this set which includes 13,283 individuals. Descriptive statistics are given in table 1.

In the sample a share of 19% of the unemployed are observed to participate in an ALMP program during the unemployment spell. Program participants differ from the average unemployed with respect to their mean unemployment durations which are more than twice as long. Among program participants we find more women and individuals with Austrian nationality than in the complete sample. We also find evidence for recurrent program participation as the average number of ALMP program spells before the selected unemployment spell is much higher for program participants. Labour market histories in the 2 years before the unemployment spell were less fortunate for program participants. This can be seen from the number of employment spells or the share of time unemployed during this period.

If the unemployment spell ended in a transition to a job the spell is considered to be completed. If the unemployment spell ended in the transition to another state (e.g. maternity leave, out of labour force) it is considered to be censored. In our sample we observe a share of 33% censored unemployment spells. Empirical hazard rates for the transitions to jobs are shown in Figure 1. The job hazard rate for non-program participants reaches a peak of 11% between 30 and 60 days of unemployment and drops sharply afterwards. The decrease in the job hazard rate slows down after about 100 days when the hazard rate has fallen to half of the maximum value. ALMP program participants experience increasing

[6] These indviduals fully anticipate their unemployment duration, which contradicts with the model assumptions.

job hazard rates during the first half year of unemployment. Afterwards their rate flattens and decreases slowly. In Figure 2 the hazard rate of entry into a ALMP program has 2 peaks. One after a duration of about 4 months and a second after one year.

Information on ALMP participants in our sample is given in Table 2. We distinguish between training and job-search assistance programs. Due to a problem with the classification of ALMP programs in the records of the Austrian public employment service not all program spells could be classified and we have a residual group of unclassified programs. This group of programs is supposed to include a very heterogeneous set of measures, either programs targeted at special groups of unemployed (disabled, long-term unemployed) or unclassified training or active job-search programs. Hence in the sample a share of 24% of program participants is observed to attend a training program, 31% can be classified into active job-search programs and the residual group attends an unclassified program[7]. Mean unemployment durations for all program participants are about 10 months. Training programs have an average duration of 2 months, but with a high variation. Active job-search programs have shorter durations of about one month on average. Entry into a training program occurs on average after 3-4 months of unemployment. Entry into active job-search programs is on average after 4-5 months. Note that there is a high variation in the timing of program entry as can be seen from the standard deviations.

5 Results

In this section we first discuss the estimation results of the basic model. The assumptions are that the three program types (training programs, active job-search programs and other programs) have different effects, that unobserved heterogeneity plays a role in determining the hazards, and that the program effects are measured at program entry. Further, we assume that the effects are constant for the remaining unemployment spell and homogeneous for all individuals. We then contrast the results to a model where no selection occurs, the correlation of unobserved heterogeneity terms for unemployment exit and program entry is set to zero. In order to analyse the sensitivity of the results with respect to the assumptions we compare several alternative specifications. The first model alternative allows for heterogeneous program effects by population groups. The other alternatives deal with the variation of program effects over time.

[7] All programs with a minimum number of 15 participants could be classified, however

5.1 Basic model

Column A in table 3 gives the main results for the basic model. The parameters of primary interest are δ_{pi} the program effects. A positive value of δ_{pi} increases the hazard rate out of unemployment and therefore corresponds to a shorter unemployment duration. Hence a positive value can be interpreted as a positive program effect. For training programs $\delta_{p1} = -0.126$. This means that training programs reduce the transition rate from unemployment to employment by 12% ($\exp(\delta_{p1}) - 1$). Note that this is the combined effect of lock-in during program participation and skill enhancement after the program. For active job-search programs the effect is positive, however. We find that entry into an active job-search program increases the job hazard by 67%. For other programs being an indistinguishable mix of the two former we do not find any significant effect.

The program effect on mean unemployment duration depends on the moment at which the program occurs. For example consider an individual who has an expected unemployment duration of 130 days (equal the sample mean) without entering a program. If active job-search is given to her within the first month the mean unemployment duration is reduced by approximately one third. If the same program is given before the fourth month of unemployment, mean duration is reduced by 20%.

From the estimated parameters of the unobserved heterogeneity distribution we learn that after controlling for all observable characteristics we can still distinguish two different groups of unemployed. Concerning transitions from unemployment to jobs, there is a group of about 15% of all unemployed, who have hazard rates into a job which are five times lower than the others'. Similarly we can distinguish groups from the hazards into each program. The correlation between unobserved heterogeneity terms in the hazard rate from unemployment to jobs and the hazard into training programs is 0.162 which means that positive selection into training programs occurs. The correlation between unobserved terms in the job rate and the entry rate into active job-search programs is negative. This can be interpreted in a way that unemployed with, ceteris paribus, longer expected unemployment durations were selected into these programs.

We contrast the results from the basic model to the incorrect specification where selection based on unobserved heterogeneity is omitted. The estimation results are given in column B of table 3. The changes in parameter estimates of the program effects reflect the correlations in the unobserved heterogeneity terms we discussed before. The positive selection into training programs corresponds to

an overestimation of the program effect in the incorrectly specified model. In the same way the program effect of active job-search programs is underestimated.

Now let us turn to selected covariate effects on the hazard rates which are given in table 4. From the results for the hazard rate into jobs, in the first column, we find that: Unemployment durations are longer for women and Austrian citizens. They shrink with the level of education, but rise with age. Recipients of both, unemployment benefits and unemployment assistance have longer unemployment durations. Interestingly, also the number of past ALMP program spells (form 1997 until the current spell of unemployment) increases unemployment durations. We find an influence of the labour market career in the recent past (1997-1999) on the length of the current unemployment spell, but none form more distant events.

The composition of participants in training programs is determined by their hazard into the program. We find that women and Austrians are admitted to training programs at a higher rate. Education above the primary level helps in getting admitted, as well as age above 30 years. Non-benefit recipients have higher hazard rates into training-programs. The number of past program spells has a huge positive impact on the entry rate. We seem to be confronted with a phenomenon of program careers, where the same individuals are repeatedly admitted to programs. Both the recent and distant labour market histories of the individual have an impact on the hazard into training programs, especially the number of past unemployment spells.

Participants of active job-search programs seem to be selected by different criteria. Again Austrians face high entry rates. But here benefit recipients, lowly educated unemployed and young people are preferred. The number of past program spells again plays a role, but the impact is not as high as for the entry rate into training programs. Past labour market outcomes, either in the recent or in the distant past, do not play a role in the selection of active job-search program participants. The complete estimation results for the basic model can be found in table 8.

5.2 Heterogeneous program effects

So far we have assumed homogeneity of the treatment effects $\delta = (\delta_{p1}, \delta_{p2}, \delta_{p3})$ on the exit rate to employment over individuals and over time. We now allow for heterogeneous treatment effects. First, we let δ be different for certain population groups. Specifically we investigate whether the treatment effect varies between men and women, Austrians and persons with foreign nationality, or

persons with compulsory education as opposed to higher educated individuals. Table 5 gives the estimated program effect parameters for this model. We find considerable variation in the program effects. First of all, women profit more than men from all types of programs. We even find a positive overall program effect for women in training programs. Training effects are higher for Austrian citizens in all programs, but the coefficient is only significant for other programs. We also find a higher program effects for low educated individuals in training programs. This is remarkable as we noticed before that they are admitted to training programs at a lower rate. A chi-square test for the hypothesis that there is no heterogeneity can be rejected.

5.3 Time variation in program effects

In the previous models we assume the training effect sets in at the moment of entry into the program, and then remains constant over time. Now suppose there was a lock-in effect during program attendance, as a result of reduced search effort or the individual just wanting to finish the course before taking up employment. What we measure in the basic model is a combination of this lock-in effect and a skill-enhancement effect. In the next model specification we allow the program effect to vary over time. In the sample mean program durations for all programs are about 2 months. We let the program effect vary between the first half of an average course (0-30 days), the second half (30-60 days) and the time after the course (more than 60 days). The estimation results are given in Table 6. It shows that the program effect is always lowest during the first 30 days after program entry. For training programs we find a significantly negative effects during the first 60 days. But after that time the program effect turns positive. This hints at a pronounced lock-in effect. For active job-search programs the effect is small but significantly positive at program start. But from the second month on the full effect is attained. Given that active job-search programs usually last 6-7 weeks we can conclude that the full effect is at work already during the program and the lock-in effect is small if existent. The chi-square test again rejects the hypothesis of no heterogeneity.

These results are not surprising given the differences in design between the two program types we compare here. Training programs provide a complete educational course and participants are at least not encouraged to leave before the course ends. Active job-search programs intend to motivate participants to increase their search effort, besides helping them to make search more efficient. This is also supported by the part-time nature of the courses. Hence we would

expect lock-in effects in training programs and a time delay in the positive skill-enhancement effect for training programs, but no lock-in effect in active job-search programs. Thus using an evaluation design that measures the program effect form the point of program entry disadvantages training programs. To evaluate training programs it might be more appropriate to stop the time clock, measuring the unemployment duration, at program entry and set it back on after program end. The time when the individual is not actively searching, but attending the program is subtracted from the unemployment duration.

In our last model we try out this modification. We keep the setting of the basic model but use unemployment durations net of program spells (for all program types). The main results are given in table 7. For this model we find considerable positive effects for all types of programs, which are comparable in size.

6 Conclusion

In this paper we examine the effect of different types of Austrian ALMP programs on unemployment durations. Mainly we distinguish formal training programs and active job-search programs. The further aim at increasing employment relevant skills with a long-term perspective and the latter try to motivate individuals to move back into employment by training mainly job-search related skills. We employ the timing-of-events method and model the program effect as a permanent shift in the individual hazard rate from unemployment to jobs which occurs at the moment of program entry. This method also takes possible selectivity in the inflow into programs into account.

The main finding is that the program effect differs substantially by program type. The transition rate from unemployment to employment is significantly increased by entry into an active job-search program. Entry into a training programs prolongs the unemployment duration. The effects seem to be in line with the differences in program design. Active job-search programs aim at immediate transitions into employment. The size of the effect demonstrates the program success in this respect. The negative effect of training programs may be a consequence of measuring a combination of lock-in during the program and skill-enhancement which comes to effect only when the program is finished. Our results indicate that after controlling for all observable information, selection into programs by unobservable characteristics still occurs.

The aim in the further analysis is to test the assumption of constancy of the

program effect, first with respect to social characteristics and second with respect to time. We find that women benefit from participation in all types of programs. We even find a positive overall program effect for women from training programs. Allowing for time-varying program effects we find evidence for a strong lock-in effect in training programs. Whereas for active job-search programs the effect is positive from the program start and reaches its full size after the first 30 days, training programs have a positive effect only after 60 days.

Overall we find strong and rather positive effects of ALMP programs in Austria, which is uncommon in comparison with international evidence. We argue that our findings may be a result of the favourable macroeconomic environment During the years 1998-2000 the Austrian economy faced a period of strong economic growth, with comparatively high increases in employment and also in vacancies. The programs analysed in this paper are operated independently from each other. Even higher gains migth be obtainend if the program design would coordinate training and job-search assistance activities. In the case of a special redundancy-training project in Austria Winter-Ebmer (2000) points out that the combination of orientation, training and job-search assistance contributed to the positive program effect.

There are at least three areas for further research. First, we do not consider longer-term effects of ALMP programs. A full evaluation needs to consider the stability of the jobs taken up after unemployment (see for example van Ours, 2000). Program types might differ in this respect. The data is not yet available to perform such an analysis. Second, we find evidence for substantial time variation in the program effect. The analysis so far is not exhaustive. Additional research could consider program effects during and after participation or heterogeneity in program effects due to the timing of the program (program effects on short-term versus long-term unemployed). Further, the results show that repeated program participation (program careers) has a strong impact on the unemployment duration as well as on entry into further programs. Some people seem to be sent to programs repeatedly and some never. The effects of repeated program participation could be investigated in a multiple spell model framework.

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Table 1: Descriptive Statistics, 8% subsample of total inflow into unemployment March-August 1999.

	All unemployed		ALMP participants	
	Mean	Std.dev	Mean	Std.dev
Unemployment duration	127.19	173.60	294.16	238.02
Duration until program entry			122.47	124.18
Program duration			62.82	85.33
Censored unemployment spell	0.33		0.34	
Female	0.48		0.58	
Married	0.44		0.42	
Austrian	0.85		0.91	
Level of education				
Compulsory school	0.39		0.39	
Vocational training	0.48		0.47	
High school and above	0.09		0.11	
Age (years)	31.72	8.12	32.71	8.02
Unemployment benefit recipient	0.60		0.58	
Unemployment assistance recipient	0.13		0.22	
Number of past program spells	0.06	0.35	0.31	0.76
Recent history 1997-1999				
Number of unemployment spells	1.53	1.74	1.34	1.61
Percentage unemployed	0.17	0.22	0.21	0.27
Number of employment spells	2.23	1.85	1.79	1.61
Percentage employed	0.57	0.36	0.54	0.38
Mean wage (Euro)	1170.41	672.89	1117.71	712.87
St.dev wage	191.43	172.52	73.77	135.36
Distant history 1988-1996				
Number of unemployment spells	3.43	3.98	3.35	3.76
Percentage unemployed	0.09	0.13	0.12	0.16
Number of employment spells	5.05	4.18	4.52	3.69
Percentage employed	0.47	0.31	0.48	0.32
Mean wage (Euro)	1087.56	536.33	1110.64	546.08
St.dev wage	191.44	172.52	186.7	173.45
Regional unemployment rate (NUTS 3)	4.27	1.46	4.46	1.45
Region of residence				
Wien	0.24		0.38	
Burgenland	0.03		0.03	
Kärnten	0.08		0.06	
Niederösterreich	0.15		0.13	
Oberösterreich	0.16		0.16	
Salzburg	0.07		0.03	
Steiermark	0.13		0.13	
Tirol	0.09		0.04	
Vorarlberg	0.04		0.03	
Occupation				
Agriculture	0.01		0.01	
Manufacturing	0.28		0.28	
Construction	0.07		0.04	
Retail Sale	0.15		0.16	
Services	0.07		0.06	
Tourism	0.16		0.09	
Technical	0.04		0.05	
Office	0.15		0.24	
Health	0.08		0.08	
Number of observations	13283		2498	

NOTE: Standard deviations are only given for non-dummy variables.

Table 2: Descriptive Statistics of Active Labour Market Programs, program participants in 8% subsample of total inflow into unemployment 3-8/1999.

	Training $^{+}$		Active job search $^{++}$		Other programs **	
	Mean	Std.Dev	Mean	Std.Dev	Mean	Std.Dev
Unemployment duration*	283.33	(234.39)	312.22	(251.19)	287.62	(230.21)
Duration until program entry	105.55	(120.7)	146.99	(133.41)	114.74	(116.97)
Program duration	70.95	(94.56)	41.64	(61.08)	72.82	(91.55)
Number of participants	589		766		1143	
Transitions to employment (%)	0.64		0.65		0.68	

Note: *Durations given in days.
$^{+}$ Training programs,
$^{++}$ Active job search programs,
** Unclassified training and active job search programs and other kinds of training and orientation.

Table 3: Basic model: program effects and heterogeneity distribution

	A		B	
	Parameter	Std.err	Parameter	Std.err
Program Effects				
Training	-0.126	(0.049)	0.011	(0.056)
Active job search	0.515	(0.041)	0.344	(0.055)
Other program	-0.032	(0.037)	0.126	(0.04)
Heterogeneity distribution				
Mass points				
Regular job v_a	0.988	(0.02)	0.898	(0.02)
v_b	-0.827	(0.028)		
Training v_a	-1.725	(0.094)	-2.274	(0.089)
v_b	-5.636	(0.152)		
Active job search v_a	-8.588	(0.106)	-2.571	(0.105)
v_b	-1.934	(0.107)		
Other program v_a	-0.95	(0.069)	-1.526	(0.068)
v_b	-2.999	(0.072)		
Probabilities				
p_{aaaa}	0.276			
p_{abbb}	0.572			
p_{baaa}	0.056			
p_{bbbb}	0.097			
Correlations				
job, training	0.162	(0.011)		
job, active job search	-0.162	(0.011)		
job, other program	0.162	(0.011)		
Number of observations	13283		13283	
log Likelihood	-6032		-61245	

NOTE: Column A: multivariate mixed proportional hazard model for unemployment duration and time until program entry; heterogeneous programs effects by program type; correlated unobserved heterogeneity in hazard rates; program effects are measured at program entry and constant for the remaining unemployment spell. Full estimation results given in table 8.
Column B: like A but no correlation in unobserved heterogeneity in hazard rates.
Standard errors in parentheses.

Table 4: Basic model: effects of selected explanatory variables on the transition rates in regular jobs, training programs, active job-search programs, and other programs

	Job	Training	Active JS	Other
Female	-0.202*	0.286*	0.104	0.144*
Married	-0.010	-0.033	-0.161*	-0.084
Austrian	-0.300*	0.659*	0.272*	0.129
Educational Level (High School and above)				
Compulsory School	-0.291*	-0.435*	0.277*	0.015
Apprenticeship	-0.069*	-0.010	0.167	0.005
UI benefit recipient	-0.315*	-0.206*	0.299*	-0.094
UA benefit	-0.572*	-0.313*	0.555*	0.013
Age (40-50 years)				
20 - 30	0.278*	-0.242*	0.207*	-0.030
30 - 40	0.124*	0.123	0.165	0.189
Number of past program spells	-3.192*	12.501*	3.778*	8.390*
Recent History 1997-1999				
Number of unemployment spells	0.693*	1.216*	-0.406	0.881*
Percentage unemployed	-0.188*	-0.999*	0.181	-0.492*
Number of employment spells	1.052*	0.628	0.359	0.063
Percentage employed	0.509*	0.193	0.293	0.426*
Mean wage	0.071*	0.108	0.144*	0.035
Stdev wage	-0.002	-0.781*	-0.423	-0.181
Distant History 1988-1996				
Number of unemployment spells	-0.011	0.467*	-0.093	0.293*
Percentage unemployed	-1.271*	-1.473*	0.010	-1.077*
Number of employment spells	0.310*	-0.192	-0.168	-0.244
Percentage employed	-0.010	-0.408*	0.099	-0.487*
Mean wage	-0.051	-0.265*	-0.067	0.017
Stdev wage	-0.320*	0.261	0.217	0.027

NOTE: multivariate mixed proportional hazard model for unemployment duration and time until program entry; heterogeneous programs effects by program type, correlated unobserved heterogeneity in hazard rates, program effects are measured at program entry and constant for the remaining unemployment spell.
$*$ denotes significance at 5% level.
Full estimation results given in table 8.

Table 5: Heterogeneous program effects by individual characteristics

	Training	Active job search	Other programs
Constant	-0.178	0.509	-0.70
	(0.056)	(0.043)	(0.038)
Female	0.344	0.138	0.314
	(0.095)	(0.077)	(0.067)
Austrian	0.182	0.231	0.242
	(0.201)	(0.127)	(0.113)
Compulsory School	0.235	0.130	0.190
	(0.105)	(0.079)	(0.071)
LR test $\chi^2(9)$	31.8		
number of observations	13283		
log Likelihood	-6015		

NOTE: multivariate mixed proportional hazard model for unemployment duration and time until program entry; heterogeneous programs effects by program type and selected individual characteristics; unobserved heterogeneity in hazard rates, program effects are measured at program entry and constant for the remaining unemployment spell; standard errors in parentheses.

Table 6: Time dependent program effects

	Training	Active job search	Other programs
0–30 days	-0.921	0.219	-0.566
	(0.163)	(0.085)	(0.093)
31–60 days	-0.368	0.452	-0.164
	(0.127)	(0.091)	(0.083)
more than 60 days	0.294	0.443	0.307
	(0.055)	(0.053)	(0.042)
LR test $\chi^2(6)$	178		
number of observations	13283		
log Likelihood	-5942		

NOTE: multivariate mixed proportional hazard model for unemployment duration and time until program entry; heterogeneous programs effects by program type; unobserved heterogeneity in hazard rates, program effects are measured at program entry and allowed to vary over the remaining unemployment spell; standard errors in parentheses.

Table 7: Model for unemployment durations net of program spells: program effects and heterogeneity distribution

	Parameter	Std.err
Program Effects		
Training	0.717	(0.048)
Active job search	1.008	(0.050)
Other program	0.918	(0.037)
Heterogeneity distribution		
Mass points		
Regular job v_a	1.057	(0.02)
v_b	-0.738	(0.028)
Training v_a	-1.551	(0.098)
v_b	-5.597	(0.154)
Active job search v_a	-8.614	(0.107)
v_b	-2.081	(0.107)
Other program v_a	-0.881	(0.072)
v_b	-2.484	(0.071)
Probabilities		
p_{aaaa}	0.282	
p_{abbb}	0.503	
p_{baaa}	0.108	
p_{bbbb}	0.107	
Correlations		
job, training	-0.121	(0.007)
job, active job search	0.121	(0.007)
job, other program	-0.121	(0.007)
number of observations	13283	
log Likelihood	-5267	

NOTE: multivariate mixed proportional hazard model for unemployment duration net of program spell and time until program entry; heterogeneous programs effects by program type; unobserved heterogeneity in hazard rates; program effects are measured at program entry and constant for the remaining unemployment spell; standard errors in parentheses.

Table 8: Estimation results: MPH model for unemployment duration and program entry with unobserved heterogeneity

Program Effects								
Training	-0.126	(0.049)						
Active job search	0.515	(0.041)						
Other program	-0.032	(0.037)						
	Regular Job		Training		Active job search		Other program	
	Parameter	Std.err	Parameter	Std.err	Parameter	Std.err	Parameter	Std.err
Female	-0.202	(0.023)	0.286	(0.097)	0.104	(0.088)	0.144	(0.071)
Married	-0.010	(0.020)	-0.033	(0.082)	-0.161	(0.077)	-0.084	(0.062)
Austrian	-0.300	(0.029)	0.659	(0.180)	0.272	(0.130)	0.129	(0.101)
Educational Level (High School and above)								
Compulsory School	-0.291	(0.037)	-0.435	(0.143)	0.277	(0.139)	0.015	(0.106)
Apprenticeship	-0.069	(0.034)	-0.010	(0.125)	0.167	(0.129)	0.005	(0.100)
UI benefit recipient	-0.315	(0.024)	-0.206	(0.092)	0.299	(0.098)	-0.094	(0.074)
UA benefit	-0.572	(0.039)	-0.313	(0.131)	0.555	(0.123)	0.013	(0.095)
Age (40-50 years)								
20 30	0.278	(0.025)	-0.242	(0.099)	0.207	(0.092)	-0.030	(0.072)
30 - 40	0.124	(0.027)	0.123	(0.106)	0.165	(0.095)	0.189	(0.079)
Number of past program spells	-3.192	(0.346)	12.501	(0.494)	3.778	(0.494)	8.390	(0.402)
Recent History 1997-1999								
Number of unemployment spells	0.693	(0.094)	1.216	(0.362)	-0.406	(0.394)	0.881	(0.273)
Percentage unemployed	-0.188	(0.070)	-0.999	(0.235)	0.181	(0.187)	-0.492	(0.165)
Number of employment spells	1.052	(0.080)	0.628	(0.365)	0.359	(0.405)	0.063	(0.282)
Percentage employed	0.509	(0.040)	0.193	(0.155)	0.293	(0.152)	0.426	(0.117)
Mean wage	0.071	(0.022)	0.108	(0.081)	0.144	(0.072)	0.035	(0.060)
Stdev wage	-0.002	(0.074)	-0.781	(0.349)	-0.423	(0.352)	-0.181	(0.253)
Distant History 1988-1996								
Number of unemployment spells	-0.011	(0.051)	0.467	(0.205)	-0.093	(0.184)	0.293	(0.139)
Percentage unemployed	-1.271	(0.134)	-1.473	(0.431)	0.010	(0.317)	-1.077	(0.275)
Number of employment spells	0.310	(0.041)	-0.192	(0.179)	-0.168	(0.152)	-0.244	(0.124)
Percentage employed	-0.010	(0.043)	-0.408	(0.179)	0.099	(0.164)	-0.487	(0.128)
Mean wage	-0.051	(0.027)	-0.265	(0.109)	-0.067	(0.096)	0.017	(0.075)
Stdev wage	-0.320	(0.066)	0.261	(0.283)	0.217	(0.247)	0.027	(0.217)

(continues)

Table 8: Estimation results: MPH model for unemployment duration and program entry with unobserved heterogeneity, continued

	Regular Job		Training		Active job search		Other program	
	Parameter	Std.err	Parameter	Std.err	Parameter	Std.err	Parameter	Std.err
Regional unemployment rate	0.021	(0.010)	-0.116	(0.071)	0.100	(0.056)	0.002	(0.041)
Region of Residence (Wien)								
Burgenland	0.321	(0.061)	-1.326	(0.377)	-1.432	(0.321)	0.293	(0.156)
Kärnten	0.426	(0.040)	-0.163	(0.160)	-1.588	(0.236)	-0.246	(0.129)
Niederösterreich	0.378	(0.042)	-1.225	(0.243)	-0.972	(0.194)	-0.092	(0.138)
Oberösterreich	0.411	(0.045)	0.154	(0.252)	-0.529	(0.204)	-0.340	(0.164)
Salzburg	0.450	(0.045)	-1.318	(0.323)	-1.424	(0.330)	-0.322	(0.189)
Steiermark	0.268	(0.037)	-0.994	(0.181)	-0.306	(0.135)	-0.531	(0.118)
Tirol	0.380	(0.037)	-1.535	(0.311)	-0.851	(0.179)	-0.654	(0.158)
Vorarlberg	0.221	(0.056)	-1.634	(0.347)	-1.609	(0.356)	0.018	(0.153)
Occupation (Manufacturing)								
Agriculture	0.031	(0.090)	-0.075	(0.503)	-1.070	(0.592)	-0.066	(0.282)
Construction	0.388	(0.038)	-0.082	(0.215)	-0.217	(0.185)	-0.265	(0.163)
Retail Sale	-0.064	(0.031)	0.034	(0.132)	-0.036	(0.111)	0.056	(0.089)
Service	-0.027	(0.044)	-0.547	(0.222)	-0.300	(0.152)	-0.399	(0.132)
Tourism	0.149	(0.030)	-0.408	(0.174)	-0.287	(0.141)	-0.173	(0.106)
Technical	-0.119	(0.053)	0.956	(0.175)	0.171	(0.197)	0.163	(0.161)
Office	-0.232	(0.034)	0.564	(0.120)	-0.002	(0.117)	0.148	(0.091)
Health	-0.161	(0.042)	-0.351	(0.182)	0.020	(0.147)	-0.151	(0.125)
Baseline Hazards								
31 to 61 days	0.183	(0.029)	0.396	(0.122)	0.388	(0.142)	0.500	(0.093
62 to 152 days	0.036	(0.029)	0.553	(0.112)	1.059	(0.117)	0.721	(0.084
153 to 365 days	0.012	(0.034)	0.871	(0.133)	0.910	(0.128)	0.884	(0.097
over 365 days	-0.020	(0.049)	0.814	(0.220)	0.181	(0.188)	0.260	(0.175
Probability points								
v_a	0.988	(0.020)	-1.715	(0.094)	-8.588	(0.106)	-0.950	(0.069)
v_b	-0.827	(0.028)	-5.636	(0.152)	-1.934	(0.107)	-2.999	(0.072)
Probabilities								
q_{aaaa}	1.568	(0.070)						
q_{abbb}	1.495	(0.096)						
q_{baaa}	-0.956	(0.222)						
number of observations	1383							
log Likelihood	-6032							

Figure 1: Empirical hazard rates: unemployment duration

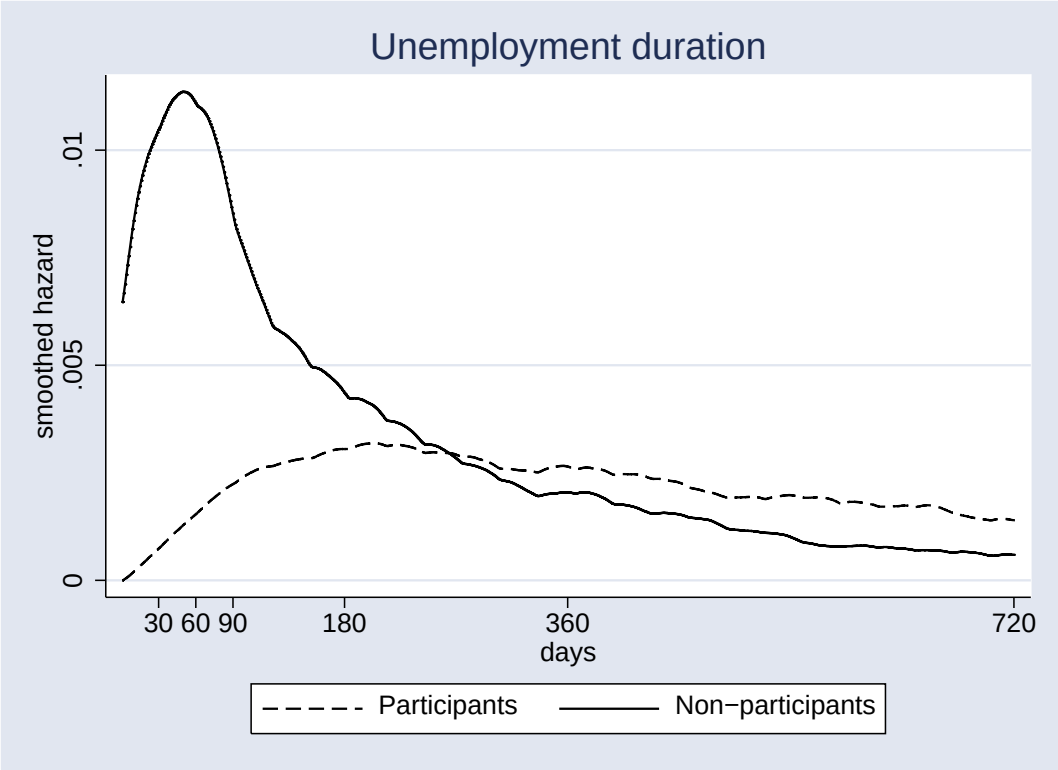
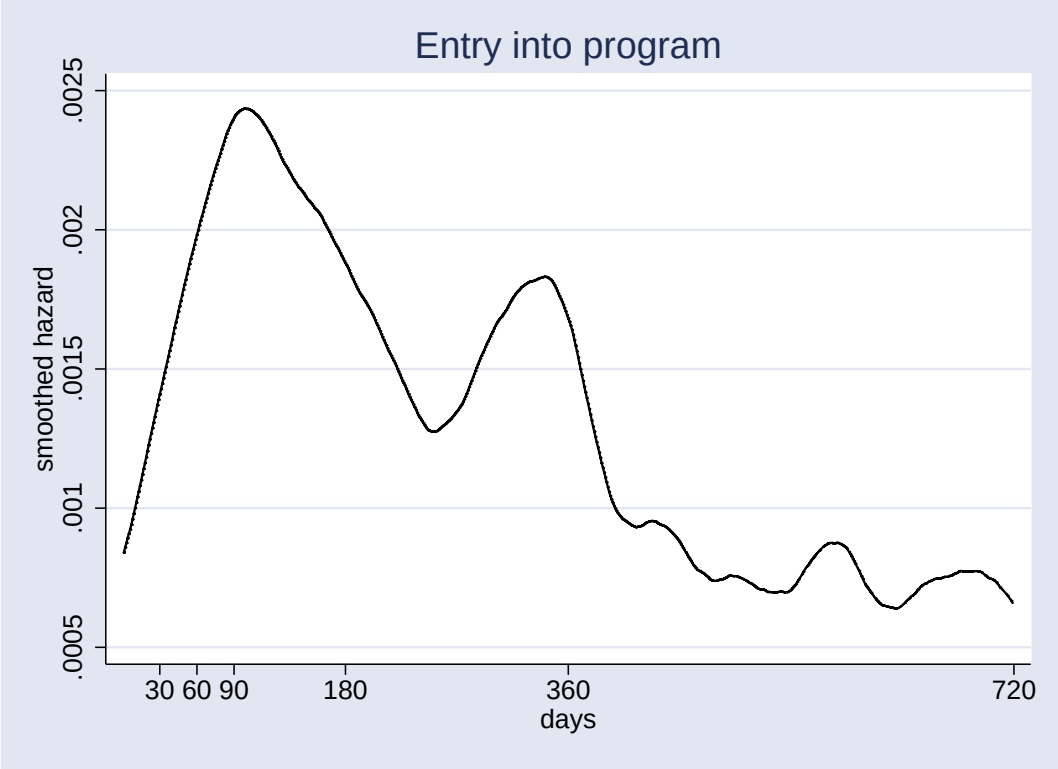


Figure 2: Empirical hazard rate: duration until entry into program



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