The effect of benefit sanctions on the duration of unemployment

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Abstract

This paper investigates the effectiveness of benefit sanctions in reducing unemployment duration. Data from the Swiss labor market allow making a distinction between the effect of a warning that a person is not complying with eligibility requirements and the effect of the actual enforcement of a benefit sanction. We find that both warning and enforcement have a positive effect on the exit rate out of unemployment. Moreover, the stricter the sanction policy the shorter is the duration of unemployment of the non-sanctioned. This can be taken as evidence of a strong ex-ante effect of a strict sanction policy.

JEL Classification: J64, J65, J68

Keywords: Unemployment duration, benefit sanctions, monitoring.

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1 Introduction

The part of Becker's (1968) theory on crime and punishment that deals with fines (for less serious offences) is straightforward to apply to the labor market where unemployed workers receive unemployment benefits conditional on particular search requirements. Monitoring to detect possible criminal activities is equivalent to monitoring the search behavior of unemployed workers to detect whether they violate search requirements. Punishment in the form of fines is equivalent to enforced reduction of benefits, that is benefit sanctions. In theoretical studies by Boone and Van Ours (2000) and Boone et al. (2001) it is shown that from a welfare point of view it may be optimal to introduce monitoring and sanctions into the system of unemployment insurance. In Becker's theory with risk neutral agents the social loss from offenses would be minimized by setting fines high enough to eliminate all offenses. If unemployed workers are risk averse this result may not hold for the labor market and a combination of intensive monitoring and small fines may be the optimal outcome.

This paper estimates empirically the quantitative importance of two potential channels by which benefit reductions may affect unemployment duration. The ex-ante effect is the effect that the *risk of getting a benefit sanction* influences the search behavior of the unemployed worker. The ex-post effect is the effect that an *actually imposed benefit reduction* stimulates a worker in his or her search effort. This is the first study to investigate the magnitude of the ex-ante effect of a system of benefit sanctions. Moreover, this study investigates the magnitude of the ex-post effect based on data that allows distinguishing between a warning that a sanction will be imposed from the actual enforcement of the sanction. Availability of such data is critical for the identification of the ex-post effect.

Interest in benefit sanctions is motivated by the observation that, on one hand, the frequently used policy of active labor market programs is not successful in getting unemployed back to work. On the other hand, the potentially successful policy of close monitoring and benefit sanctions is not frequently used. The overview by Grubb (1999) shows a wide range of experiences in terms of sanction policies. For instance, sanctions enforced on unemployed job seekers are frequently applied in Switzerland and the Netherlands, while in Sweden they are hardly used. Furthermore, an interesting result in the recent evaluation literature is that, among the broad range of active labor market policies, programs with close monitoring, intensive counseling and job search assistance did much better than other programs, in particular

when combined with close monitoring and enforcement of the work test. Typically these programs do not involve risks that participants are locked into programs with reduced search activity as a consequence.[1]

There is a small literature that deals with estimating the *ex-post* effect of benefit sanctions. Two Dutch studies find that a reduction of unemployment benefits may have a substantial effect on the outflow from unemployment to a job. Abbring et al. (1997) study the effect of financial incentives by comparing the unemployment duration of individuals that have faced a benefit reduction with similar individuals that have not been penalized. They find that benefit sanctions have a positive effect on individual transition rates from unemployment to a job. The job finding rate doubles after a sanction has been imposed. Van den Berg et al. (2002) perform a similar study for welfare recipients in the city of Rotterdam. Although this group of unemployed has a labor market position that is often considered to be very weak they too find that benefit sanctions stimulate the transitions from welfare to work. Again, the job finding rate doubles when a sanction gets imposed. From this study it also appears that the size of the benefit sanction is not very relevant. It is the shock of getting a benefit sanction imposed that activates the job seeker, not the size of that sanction. A Danish study (Jensen et al., 1999) used a grouped duration model to find a small effect of the sanctions that are part of a youth unemployment program.

This study contributes to the literature on the ex-post effect of benefit sanctions by investigating the effectiveness of Swiss benefit sanctions. Contrary to the previous literature, this study is based on data which contain detailed information not only about enforcement of sanctions but also about warnings issued about the possibility that a sanction could be imposed in the near future. Such data is critical for the identification of the ex-post effect of

[1]Martin and Grubb (2001) in their survey on the success of ALMPs in OECD countries conclude that governments should rely as much as possible on in-depth counseling, job-finding incentives and job-search assistance programs. The prototypical country that relied heavily on active labor market policies is Sweden. Recent evidence by Calmfors et al. (2001) suggests that Swedish programs were not very effective in maintaining regular employment. Furthermore, Swedish labor market training had no or negative employment effects, whereas a lot of other programs had a locking-in effect. Participants are not willing to exit from the programs before they are completed. In an earlier study Calmfors (1994) concludes that intensified counseling and job search assistance raise re-employment probabilities substantially. In Lalive et al. (2001) and Gerfin and Lechner (2000) similar pessimistic conclusions are drawn with respect to the effectiveness of Swiss active labor market programs.

benefit sanction. Moreover, such data allow us to distinguish empirically between the effect of a warning and the effect of enforcement of the sanction.

This paper contains the first analysis of the potentially more important effect of benefit sanctions on the duration of unemployment of the non-sanctioned: the impact of the risk of getting a sanction upon non-compliance with the benefit rules. This *ex-ante* effect of benefit sanctions is identified using data serving to identify the 'strictness' of the sanction policy. The strictness of the sanction policy is the variation across public employment service units in the rate that a warning will be issued conditional on meeting eligibility requirements. Findings indicate that the exit rate from unemployment of the non-sanctioned is higher the stricter the sanction policy is. This result is in line with the theoretical model by Boone and Van Ours (2000).

The set-up of the paper is as follows. In Section 2 we give a description of the unemployment benefit system and the sanction procedures in Switzerland. In Section 3 we present a stylized theoretical model. In Section 4 we discuss our data and present some interesting descriptive statistics. Section 5 contains information about our evaluation methodology and Section 6 presents the estimation results. In Section 7 we draw conclusions.

2 Institutional background

2.1 Unemployment benefits in Switzerland

Job seekers are entitled to unemployment benefits if they meet two a priori requirements. The unemployed must have paid unemployment insurance taxes for at least six months in the two years prior to registering at the public employment service (PES). The contribution period is extended to 12 months for those individuals who have been registered at least once in the three previous years. Individuals entering from non-employment who are looking for work are exempted from the contribution requirement if they have been in school, in prison, employed outside of Switzerland or have been taking care of children. Moreover, job seekers must possess the capability to fulfill the requirements of a regular job - they must be 'employable'. If a job seeker is found not to be employable there is the possibility to collect social assistance. Social assistance is means tested and relatively generous. For instance, social assistance is roughly 76% of unemployment benefits for a single job seeker with no other sources of income (OECD,

1999).

The potential duration of unemployment benefits is 2 years for individuals who meet the contribution and employability requirement. After this period of two years unemployed have to rely on social assistance provided by the city of residence. Unemployment benefits are 80% if the previous monthly income did not exceed Sfr. 4030 (about Euro 2500) or for job seekers with children, and 70% for the remaining part of the unemployed. Unemployment benefits can not exceed either 70% or 80% of previous monthly earnings of Sfr. 8100. Job seekers have to pay all social insurance taxes except for the unemployment insurance contribution.

The entitlement criteria during the unemployment spell concern job search requirements and participation in active labor market programs. Job seekers are obliged to make a minimum number of applications to 'suitable' jobs each month. A suitable job has to meet four criteria: (i) the travel time from home to job must not exceed two hours, (ii) the new job contract can not specify longer hours of availability than are actually paid, (iii) the new job must not be in a firm which lays off and re-hires for lower wages, and (iv) the new job must pay at least 68% of previous monthly earnings. Potential job offers are supplied by the public vacancy information system of the PES, from private temporary help firms or from the job seeker's own pool of potential jobs. Setting the minimum number of job applications is largely at the discretion of the caseworker at the PES.

In 1997, Switzerland introduced an ambitious active labor market program comprising mainly of classroom training programs and employment programs.[2] Participation in these programs is the second requirement during the unemployment spell. The exact nature and scope of the participation requirement is determined at the beginning of the unemployment spell and in monthly meetings with the caseworker.

Compliance with the job search and program participation requirements is monitored by roughly 2500 caseworkers at 150 PES offices. When individuals register at the PES office they are assigned to a caseworker on the basis of either previous industry, previous occupation, place of residence, last name or the caseworker's availability. Job seekers have to meet at least once a month with the caseworker. Compliance with the job search requirements is enforced by way of communication with the human resources department of the potential employer.

[2]Gerfin and Lechner (2000) and Lalive et al. (2001) contain background information on and an evaluation of the active labor market programs.

Participation in a labor market program is monitored by the caseworker as well as the program staff. Because program funding depends on the actual number of participants, the probability that non-participation will be detected is very high.

2.2 The Swiss Sanction System

It is useful to distinguish two types of sanctions. First, benefits can be withheld for quitting the previous job, i.e. for causing 'unnecessary' job loss. Second, job-seekers can be punished for lack of compliance with eligibility requirements during the spell. The first type of sanctions is inflicted upon workers at the start of the unemployment spell. The second type of sanctions are imposed during the spell of unemployment. In this paper we focus on this second type of sanctions.

The process until a sanction is imposed can be divided into two stages. The first stage of the sanction process starts when some type of misbehavior by the unemployed is detected and reported to the cantonal ministry of economic affairs (CMEA) either by the caseworker, by a prospective employer or by the active labor market program staff. In this case the job seeker must be notified of the possible sanction and be given the opportunity to clarify why he or she was not able to fulfil the eligibility requirements (Article 4 of Federal Social Insurance Law). Notification is in written form and contains the reason for the sanction, and the date until which the clarification is to be sent back. The average duration between the date job-seekers are informed and the date until which the clarification is to be received is about two weeks.

The second stage of the sanction process starts as soon as the clarification period has ended. Depending on the nature of the clarification provided by the job seeker the CMEA decides whether or not the sanction will be enforced. If there is sufficient ground for an excuse the sanction process will be stopped. If the excuse is deemed not valid, the sanction is enforced. A benefit sanction entails a 100% reduction of benefits for a maximum duration of 60 work days. The unemployment insurance law distinguishes three duration classes: (i) sanctions of short duration (1 to 15 work days), (ii) sanctions of medium duration (16 to 30), and (iii) sanctions of long duration (31 to 60). In the dataset used for the empirical analysis, 88 % of the sanctions imposed were of short duration, 8% of all benefit reduction were of medium duration, and 9 % of long duration. A short stop in benefits is typically imposed if an unemployed worker fails to apply to the minimum number of jobs. A sanction of medium duration may be imposed, for

instance, if the unemployed does not show up for the monthly interview. Refusal to apply for a 'suitable' job leads to a sanction of at least 31 work days. Benefits are immediately stopped after the CMEA has decided on legitimacy and duration of the sanction.

Once the sanction has been imposed, the unemployed can appeal to a cantonal court within 30 days of the start of the benefit sanction. The court then decides whether the sanction conforms to current legal practice. However, it takes at least one year until the court reaches a decision. Appeal to the court does not keep the CMEA from imposing the sanction.

The actual application of these rules is delegated to the CMEA of the 26 cantons of Switzerland. All cantons have delegated the first phase of the sanction process to the public employment service. Some cantons have also delegated the second phase of the sanction process to the public employment service. Thus, the actual application of the sanction policy may differ both across cantons and within cantons. For instance, in December 1998 the average sanction rate was 19.1 sanctions enforced per 1000 job seekers. The standard deviation of the sanction rate across cantons was 21.3, the minimum being 0, the maximum being 91.2 sanctions per 1000 job seekers. The principal reasons for these differences in the actual implementation of the Swiss sanction policy are differences in 'PES-culture', the amount of administrative procedures until a sanction is enforced, substantial leeway in the interpretation of the law, the preferences of the head administrator of a PES, and the number of job seekers registered with the PES (Atag Ernst & Young, 1999). Below, we proxy the 'strictness' of the application of the sanction policy with the warning rate at the PES level, conditional on observed covariates of the job seekers.

3 Modeling benefit sanctions

To illustrate how benefit sanctions affect search behavior we present a stylized partial equilibrium model of the labor market.[3] We assume that all jobs offer the same wage w. When unemployed, the worker receives an unemployment benefit that is constant over the unemployment spell unless a sanction is imposed. Let $b_u = bw$ denote the regular unemployment benefit level. If a sanction is imposed there is a permanent reduction in the unemployment

[3]The model is based on Boone and Van Ours (2000) in which a general equilibrium model of a labor market with benefit sanctions is presented. Boone et al. (2001) investigate the characteristics of an optimal system of benefit sanctions within the framework of a general equilibrium model of the labor market.

benefit level. Hence a worker can be punished at most once during an unemployment spell. The benefit level after a sanction is imposed equals $b_p = (1-p)\,bw$.

A worker invests time (or intensity) $s \in [0,1]$ to find a job. Since all jobs offer the same wage unemployed have only one instrument of search, their search intensity. The disutility of searching for a time s equals $\gamma(s)$, with $\gamma(0) = 0$, $\gamma'(0) = 0$, $\gamma'(s) > 0$, and $\gamma''(s) > 0$. The Poisson arrival rate of a new job is equal to μs and does not depend on whether or not a sanction has been imposed. Monitoring search intensity is not perfect. The probability of being sanctioned has a Poisson arrival rate $\xi(1-s)$ with $\xi > 0$ capturing the intensity of monitoring hence the likelihood of being sanctioned. An agent can only avoid a benefit sanction by searching at maximum intensity.

Agents are assumed to be risk averse and value money income w with a concave felicity function $u(w)$. Let V_u denote the value of being unemployed without being sanctioned; V_p the value of being sanctioned and V_e the value of being employed. Then the following Bellman equations can be derived

$$\rho V_u = \max_{0\le s\le 1} \left[u(b_u) - \gamma(s) + \mu s\,(V_e - V_u) + \xi(1-s)\,(V_p - V_u)\right] \quad (1)$$

$$\rho V_p = \max_{0\le s\le 1} \left[u(b_p) - \gamma(s) + \mu s\,(V_e - V_p)\right] \quad (2)$$

The value of unemployment in equation (1) consists of three parts: utility during unemployment (utility of benefits minus search costs), expected additional income when a job is found and the expected (negative) income change when a sanction is imposed. The value of unemployment after a sanction is imposed is given in equation (2) and consists of two parts: utility during unemployment, which is now lower because of the penalty, and expected additional income after a job is found. The value of employment equals the value of being unemployed plus a share of the production surplus, which is determined in wage bargaining.

The optimal search intensities are given by

$$\gamma'(\hat{s}_u) = \mu(\widehat{V}_e - \widehat{V}_u) + \xi(\widehat{V}_u - \widehat{V}_p) \quad (3)$$

$$\gamma'(\hat{s}_p) = \mu(\widehat{V}_e - \widehat{V}_u) + \mu(\widehat{V}_u - \widehat{V}_p) \quad (4)$$

For our empirical research it is interesting to investigate how changes in the parameters of the sanction system affect both search intensities. The effect on s_u is referred to as the *ex-ante effect* of the sanction system, while the difference between s_p and s_u is referred to as the *ex-post*

effect, that is the increase in search intensity after a sanction has been imposed. The ex-post effect is positive if $\xi < \mu$ and $\widehat{s}_u < 1$.

The effect of an increase in the penalty p on both search intensities is intuitively clear. If the penalty increases, the expected loss in income due to a sanction increases as well. This stimulates the non-sanctioned unemployed to increase their search intensity ($\frac{\partial s_u}{\partial p} > 0$, the ex-ante effect increases). If the penalty increases, the value of being unemployed-with-sanction decreases relative to the value of employment. This stimulates the sanctioned unemployed to increase search intensity after a sanction is imposed ($\frac{\partial s_p}{\partial p} > 0$, the ex-post effect increases).

The effect of an increase in the sanction rate ξ on the search intensities depends on whether or not a sanction has been imposed. For a non-sanctioned unemployed, an increase in the sanction rate makes search more effective in avoiding a sanction. An increase in ξ increases the ex-ante effect of a system of benefit sanctions, $\frac{\partial s_u}{\partial \xi} > 0$. Because sanctions last forever, for a sanctioned job seeker the sanction rate ξ has no direct effect on search s_p. Instead, the reduction in $(V_u - V_p)$ due to the rise in ξ causes agents to search less, since there is less to gain by finding work: $\frac{\partial s_p}{\partial \xi} < 0$. Hence, the larger ξ the smaller the ex-post effect ($\frac{\partial (s_p - s_u)}{\partial \xi} < 0$).

In the empirical analysis below we test the prediction that the search intensity of the job seekers who are not sanctioned increases with the strictness of the sanction policy. For this, we exploit information at the level of public employment service offices. There are several of these offices within a canton. Conditional on the characteristics of the individual, differences in sanction policy between employment offices within the same canton are used to identify the strictness of the sanction system. Hence, relating the transition rate to jobs before a sanction has been imposed to the strictness of the sanction policy constitutes the first test of the ex-ante effect. Moreover, in the empirical analysis below we test the prediction that the ex-post effect of benefit sanctions decreases with the strictness of the sanction policy by relating the size of the sanction effect in the area of a particular employment office with the strictness of the sanction policy of that office.

4 Data and Descriptive Analysis

The empirical analysis is based on unemployment insurance register data covering the entire inflow into unemployment over the period September 1997 to March 1998. Job seekers are observed up until May 1999. The data contain information on the exact timing of events

during the unemployment spell. The records contain information on the date the job seeker registered at the PES as well as the date when individuals started a regular job, entered an active labor market program, or left the register.[4] Most relevant to the analysis in this paper is the fact that there is also information on both stages in the sanction process. We observe the date when a sanction was announced to the job seeker and the date when the sanction was actually enforced. Besides the information on the timing of events, the data also contain information on previous job and various socio-demographic characteristics of the individual.

Because the primary focus of the current paper is the identification of the effect of benefit sanctions on the duration of unemployment, data on the flow of sanction-related information between the job seeker and the PES is critical. In principle, the data record all information concerning the notification of the job seeker. In practice, information on the date of notification is missing for 34 % the individuals with at least one sanction. Therefore, we restrict our analysis to the 3 cantons with nearly perfect registration of information on warnings - Zurich (ZH) with 98 %, Fribourg (FR) with 98.1 %, and Graubünden (GR) with 98.9 % registration of warnings. These 3 cantons cover almost 30 percent of all sanction spells.[5]

In order to focus on a homogeneous sample we excluded widows(ers), self-employed, home-workers, foreigners with a seasonal permit, workers from the banking or insurance industry, disabled workers, and part-time unemployed. We also limit the analysis to workers between age 20 and 50. Finally, we excluded all unemployed individuals who had been unemployed in the two years prior to this spell. The resulting subsample consists of 10,417 individuals. Because the data on warnings is not perfect, we exclude 13 individuals for whom we do not observe the date of notification of the sanction, which yields the final number of 10,404 observations.

The starting point of the analysis is the effect of benefit sanctions on the exits from open unemployment. The duration of open unemployment is defined as the duration of unemployment until either a regular job starts, or the job seeker leaves the register, or the individual chooses to enter an active labor market program. The motivation for this is that the sanction policy aims at enforcing compliance with either job search requirements or attendance in ALMPs.

[4]See Lalive et al. (2001) for a description of the ALMP system in Switzerland.

[5]These three cantons are in a loose sense 'representative' for Switzerland and the Swiss labor market. FR is located between the French-speaking West and the German-speaking East, ZH in the (German-speaking) Center, and GR in the (German-, Italian-, and Romanic-speaking) East of Switzerland.

Table 1 displays the unemployment and sanction histories of the individuals in the dataset. Unemployed individuals are observed in one of the following three states: (i) with neither a warning nor an enforced sanction; (ii) with a warning but no enforcement, and (iii) with both, a warning and an enforced sanction. The column labeled 'First state' shows that roughly 12 percent of all job seekers are observed with at least one warning. The average duration of unemployment until a sanction is announced for the first time is 121 days.[6] The remaining 86 % of individuals exit open unemployment after 111 days.[7] The number of open unemployment spells still in progress at the end of the observation period is very small (2 %).

Table 1

The column labelled 'Second state' in Table 1 shows that 34 % of sanctions that have been announced are subsequently enforced. The average duration between the warning and the actual enforcement of the sanction is substantial, 46 days. This can be explained by the fact that a substantial share of notifications do not lead immediately to the sanction being enforced. Rather, the PES may give the job seeker a 'second chance'. Again, the dominant share of the remaining job seekers exit open unemployment. The column labelled 'Third state' in Table 1 shows that 89 % of the job seekers with at least one warning and at least one enforced sanction exit open unemployment. The number of spells still in progress at the end of the observation period is 11 %. This finding is in line with the fact that these individuals have already spend an average of 166.7 days in open unemployment (= 120.7 + 46.0). In the empirical analysis we focus on the *first* occurrence of a notification and the *first* occurrence of an enforcement of a sanction.[8]

Figure 1 shows the Kaplan-Meier estimates of the exit rate from open unemployment and the warnings hazard. The exit rate from open unemployment starts at a level of about 12 % per month, increases quickly to reach the maximum of about 30 % per month after three months of elapsed duration, and then declines gradually to 15 % per month after 18 months of

[6]Note that this average is biased towards zero due to right censoring. However, the bias is likely to be of minor importance because only 2 % of all unemployment spells are right censored.

[7]The dominant exit states are entering an ALMP (43 %) and starting a regular job (38 %). Moreover, 5 % of the job seekers are found to be leaving the register. It is possible that these individuals start a regular job but do not inform the PES about this fact.

[8]The focus on the *first* occurrence of warning and enforcement simplifies the econometric analysis considerably and hardly affects the estimation results because less than 1 % of all individuals have two or more warnings.

elapsed duration. The warnings hazard gradually increases from about 2 % to 5 % per month in the first six months of open unemployment, and stays constant thereafter. Note that due to the small number of individuals, both hazard rates are estimated with low precision after 15 months of elapsed open unemployment.

Figure 1

Figure 2 displays the Kaplan-Meier estimates of the enforcement hazard as a function of the time since a warning has been issued. This hazard rate starts at a rather high level of more than 20 % per month in the first two months after the warning has been issued. Then, there is a strong decline to 10 % per month in the third month, and, again, a decrease to 5 % per month in the fourth month after the warning. Then the enforcement hazard declines gradually to zero. Note that contrary to the description of the sanction system, the time between a warning has been issued until the sanction takes effect is rather long. There are a number of reasons for this. While PES staff may choose to inform about the sanction, the administrative procedures associated with actually enforcing it may be prohibitive, job seekers may get a second chance, and so on.

Figure 2

5 The Evaluation Methodology

5.1 Identification of the ex-post effect of benefit sanctions

We use the model of potential outcomes of Roy (1951) and Rubin (1974) to discuss the identification problem concerning the *ex-post* effect.[9] In our study we focus on the effect of treatment (a sanction) on the exit rate out of open unemployment. Such exits are either to a regular job, to an ALMP, or to non-participation (out of labor force). Define $\omega_0(t)$ as the exit rate from open unemployment without a sanction, $\omega_1(t)$ as the exit rate from open unemployment with a sanction, and D as the indicator variable that takes the value 1 after an individual gets a sanction and 0 otherwise. If t_u is the time (unemployment duration) at which a transition to job occurs, and t_s is the time at which the sanction process starts, then $D \equiv I(t_s < t_u)$.[10]

[9] See Section 6.3 for a discussion how we estimate the ex ante effect.

[10] In the empirical analysis we will make a distinction between the warning that a sanction may be imposed and the actual enforcement of the sanction. For ease of exposition we ignore this difference in the current

An evaluation study usually aims at identifying the effect of a treatment. This effect - the *effect of treatment on the treated* - is defined as follows

$$\exp(\delta) = \frac{\omega_1(t|D=1)}{\omega_0(t|D=1)} \tag{5}$$

where δ shows by how much the (log-)exit rate changes because of a sanction. Such a shift could occur because individuals increase their search intensity, or accept job offers that they would have rejected without a sanction.

The evaluation problem is due to the absence of information on the counterfactual, information on the outcome if a sanction had not been imposed, $\omega_0(t|D=1)$ (Holland, 1986). Because we do not observe the counterfactual, the effect of treatment on the treated is not identified without further assumptions. Here, we use the assumption that conditional on observables x *and unobservables* u participation is independent of potential outcomes.[11] This implies that

$$\begin{aligned} \omega_0(t|x,D,u) &= \omega_0(t|x,u) \\ \omega_1(t|x,D,u) &= \omega_1(t|x,u) \end{aligned} \tag{6}$$

Potential outcomes are the same for treated and non-treated individuals, conditional on observables and unobservables. This assumption implies that data on the non-sanctioned can be used to estimate $\omega_0(t|D=1)$.

The implementation of this approach requires a bivariate duration model where the exit from unemployment and the sanction rate are modeled simultaneously.[12] Both transition rates are specified as mixed proportional hazards (MPH), which is standard in duration analysis (Van den Berg, 2000).

In the MPH model the observed characteristics x and the unobservables u enter the hazard multiplicatively separable from elapsed duration t

$$\theta_u(t|x,D,u) = \lambda_u(t)\exp(x'\beta_u + \delta D + u) \tag{7}$$

subsection.

[11]Note that this assumption is less restrictive than the "conditional independence assumption" (CIA) that is the basis of the method of matching. CIA implies that treatment status conditional on only observed characteristics is independent of non-participation outcome.

[12]See Bonnal et al. (1997), Gritz (1996), Lalive et al. (2001), Van Ours (2000) for applications of a related model to the evaluation of active labor market programs or Abbring et al. (1997) and Van den Berg et al. (2002) for applications concerning the ex post effect of benefit sanctions.

where $\theta_u(t|x, D, u)$ is the exit rate from unemployment at time t conditional on observed and unobserved characteristics and conditional on the sanction status.[13] Furthermore, $\lambda_u(t)$ captures the effect of elapsed duration. The sanction rate is also assumed to follow a proportional hazard specification

$$\theta_s(t|x, v) = \lambda_s(t) \exp(x'\beta_s + v) \tag{8}$$

where $\lambda_s(t_s)$ captures the effect of elapsed duration and v introduces unobserved heterogeneity in the transition to a sanction. The joint distribution of u and v is denoted by $G(u, v)$.

The MPH-assumption and the bivariate approach are critical in identifying the treatment effect of benefit sanctions. As shown by Abbring and Van den Berg (2000) the model specified in (7) and (8) is identified. Intuitively, this method uses variation in unemployment duration and variation in the duration until the start of a benefit sanction to identify the unobserved heterogeneity distribution. The variation in unemployment duration comes from the stochastic search and matching process in the labor market. The variation in duration until the start of a benefit sanction is determined by a combination of the search behavior of the unemployed workers and the decision process of the administrators. Thus the introduction of unobserved heterogeneity creates homogenous subsamples and compares the transition rate from unemployment to regular jobs of individuals *within* such a homogenous group after the sanction is imposed.

The 'timing of events' method described above has a number of advantages. First, it addresses explicitly the fact that participation in a program may be selective. By accounting for unobservables in the selection process and the outcome process, the 'causal' effect of the treatment is identified. Second, there are no exclusion restrictions needed in order to provide identification. This is particularly advantageous since there is no formal way to select 'valid' instruments. Furthermore, there is no instrumental variables estimator in duration analysis. Third, the estimator is semi-parametric. While we do assume that covariates shift the hazard in the same proportion irrespective of elapsed duration of unemployment, the model allows for complete flexibility in the treatment effect, baseline hazard and in the effect of other covariates.

[13] Note that $\omega_0(t|x, u) = \theta_u(t|x, D = 0, u)$ and $\omega_1(t|x, u) = \theta_u(t|x, D = 1, u)$

5.2 The empirical model

To obtain unbiased estimates of the impact of sanctions on unemployment durations it is necessary that individuals do not behave in anticipation to future events. This is evident in (7) which assumes that the exit rate in the sanction state is identical to the exit rate in the non-sanction state before a warning has been issued. Arguably, this assumption can only be justified if the data are sufficiently rich concerning the flow of sanction-related information between the PES and the job seeker. Therefore, in the empirical analysis we make a distinction between (i) the date a warning has been issued stating that a sanction might be imposed and (ii) the date the sanction is actually enforced. We denote t_{s_1} as the date of the warning and t_{s_2} as the date of enforcement (as measured from the date of the warning). We assume that individuals do not anticipate a warning. Once an individual got such a warning he or she may anticipate getting the benefit sanction enforced. Because our data provide information about the date of warning this latter anticipation effect is explicitly modelled and taken into account in the empirical analysis.

We start with a baseline model in which the transition rates are not affected by the presence of unobserved heterogeneity components. In this baseline model we assume the different transition rates to be uncorrelated. Later on, to account for possible selectivity in the sanction process we introduce unobserved heterogeneity components in the different transition rates where we allow these terms to be correlated.

Our starting point are specifications (7) and (8) where we ignore the heterogeneity terms and introduce a distinction between warning and enforcement

$$\theta_u(t|x, D_1, D_2) = \lambda_u(t) \cdot \exp(x'\beta_u + \delta_1 D_1 + \delta_2 D_2) \tag{9}$$

where $\lambda_u(t)$ represents individual duration dependence, $D_1 \equiv I(t_{s_1} < t_u)$ and $D_2 \equiv I(t_{s_2} < t_u)$[14] and the parameters δ_1 and δ_2 measure the effect that a warning and an enforcement have on the transition rate from unemployment. Note that δ_2 measures the additional effect of enforcement relative to the effect of a warning. We model flexible duration dependence by using a step function

$$\lambda_u(t) = \exp(\Sigma_k(\lambda_{u,k} \cdot I_k(t)) \tag{10}$$

[14]Note that by definition $t_{s_2} > t_{s_1}$.

where $k(=1,..,4)$ is a subscript for time-intervals and $I_k(t)$ are time-varying dummy variables that are one in subsequent time-intervals. We distinguish four time intervals: 1-3 months, 3-6 months, 6-12 months and 12 and more months. Because we also estimate a constant term, we normalize $\lambda_{u,1} = 0$.

The critical assumption in our *baseline model* is that the inflow into the program is a random process in the sense that it is independent of the process by which unemployed find jobs. The selection into the program is exogenous and does not depend on unobserved characteristics that also affect the job finding rate. In that case the density of realized unemployment durations t_u is simply

$$f_u(t_u|x, t_{s_1}, t_{s_2}) = \theta_u(t_u|x, t_{s_1}, t_{s_2}) \exp(-\int_0^{t_u} \theta_u(s|x, t_{s_1}, t_{s_2})ds). \tag{11}$$

In a similar way we model the rate by which individuals are warned about a possible sanction and the rate by which a sanction is enforced at time t conditional on x as

$$\theta_{s_j}(t|x) = \lambda_{s_j}(t) \exp(x'\beta_s) \quad \text{for } j = 1, 2 \tag{12}$$

where for $j = 1, 2$, $\lambda_{s_j}(t) = \exp(\Sigma_k(\lambda_{s_j,k} \cdot I_k(t))$ and the normalization is $\lambda_{s_j,1} = 0$. The density of realized durations until a warning is issued ($j = 1$) or a sanction is imposed ($j = 2$) is equal to

$$f_{s_j}(t_{s_j}|x) = \theta_{s_j}(t_{s_j}|x) \exp(-\int_0^{t_{s_j}} \theta_{s_j}(s|x)ds). \tag{13}$$

The observations can be divided into three groups: (i) individuals without a sanction, N_1 observations, (ii) individuals with a warning, but no enforced sanction, N_2 observations, and (iii) individuals that got both a warning and an enforced sanction, N_3 observations. Denote by c an indicator such that $c = 1$ if the outcome is a completed unemployment duration and $c = 0$ if the unemployment duration is censored. Then the log-likelihood can be written as

$$\begin{aligned}
\log L \;=\; & \sum_{i=1}^{N_1} c_i \ln[(f_u(t_{u,i}|x_i, t_{s_{1,i}}, t_{s_{2,i}})(1 - F_{s_1}(t_{s_{1,i}}|x_i))] \\
& + (1 - c_i) \ln[(1 - F_u(t_{u,i}|x_i, t_{s_{1,i}}, t_{s_{2,i}}))(1 - F_{s_1}(t_{s_{1,i}}|x_i))] \\
& + \sum_{i=1}^{N_2} c_i \ln[(f_u(t_{u,i}|x_i, t_{s_{1,i}}, t_{s_{2,i}})(f_{s_1}(t_{s_{1,i}}|x_i))(1 - F_{s_2}(t_{s_{2,i}}|x_i))] \\
& + (1 - c_i) \ln[(1 - F_u(t_{u,i}|x_i, t_{s_{1,i}}, t_{s_{2,i}}))(f_{s_1}(t_{s_{1,i}}|x_i))(1 - F_{s_2}(t_{s_{2,i}}|x_i))] \\
& + \sum_{i=1}^{N_3} c_i \ln[(f_u(t_{u,i}|x_i, t_{s_{1,i}}, t_{s_{2,i}})(f_{s_1}(t_{s_{1,i}}|x_i))(f_{s_2}(t_{s_{2,i}}|x_i))] \\
& + (1 - c_i) \ln[(1 - F_u(t_{u,i}|x_i, t_{s_{1,i}}, t_{s_{2,i}}))(f_{s_1}(t_{s_{1,i}}|x_i))(f_{s_2}(t_{s_{2,i}}|x_i))]
\end{aligned} \tag{14}$$

where i indexes individuals and $F(.)$ is the distribution function.

In our *extended model* we allow for unobserved heterogeneity to affect the transitions to both a job and to a program:

$$\begin{aligned} \theta_u(t|x, t_{s_1}, t_{s_2}, u) &= \lambda_u(t) \cdot \exp(x'\beta_u + \delta_1 D_1 + \delta_2 D_2 + u) \\ \theta_{s_j}(t|x, v_j) &= \lambda_{s_j}(t) \exp(x'\beta_s + v_j) \quad \text{for } j = 1, 2, \end{aligned} \tag{15}$$

where u, v_1 and v_2 are the components of unobserved heterogeneity in the transition rates to a regular job and to the two (subsequent) sanction states. Now we can allow for selectivity in the sanction process. We define $G(u, v_1, v_2)$ to be the joint distribution of the unobserved characteristics u, v_1, v_2. Then, the joint density function of t_u, t_{s_1}, t_{s_2} conditional on x equals

$$f_{u,s_1,s_2}(t_u, t_{s_1}, t_{s_2}|x) = \int_u \int_{v_1} \int_{v_2} f_u(t_u|x, u, t_{s_1}, t_{s_2}) f_{s_1}(t_{s_1}|x, v_1) f_{s_2}(t_{s_2}|x, v_2) dG(u, v_1, v_2). \tag{16}$$

We assume G to be a multivariate discrete distribution of unobserved heterogeneity. Work by Heckman and Singer (1984) suggests that discrete distributions can approximate any arbitrary distribution function G. We assume that each transition rate has two points of support, (u_a, u_b) for the exit rate out of unemployment and $(v_{j,a}, v_{j,b})$ for the transitions into the sanction states, $j = 1, 2$. Because we distinguish between two sanction states and one exit state, this implies that the joint distribution has 8 mass points. The associated probabilities are denoted as follows

$$\begin{aligned} Pr(u &= u_a, v_1 = v_{1,a}, v_2 = v_{2,a}) = p_1 \qquad Pr(u = u_a, v_1 = v_{1,a}, v_2 = v_{2,b}) = p_2 \\ Pr(u &= u_a, v_1 = v_{1,b}, v_2 = v_{2,a}) = p_3 \qquad Pr(u = u_a, v_1 = v_{1,b}, v_2 = v_{2,b}) = p_4 \\ Pr(u &= u_b, v_1 = v_{1,a}, v_2 = v_{2,a}) = p_5 \qquad Pr(u = u_b, v_1 = v_{1,a}, v_2 = v_{2,b}) = p_6 \\ Pr(u &= u_b, v_1 = v_{1,b}, v_2 = v_{2,a}) = p_7 \qquad Pr(u = u_b, v_1 = v_{1,b}, v_2 = v_{2,b}) = p_8 \end{aligned} \tag{17}$$

where $0 \leq p_i \leq 1,\ i = 1, .., 8$. We model $p_i = \exp(\alpha_i)/(1 + \sum_i \exp(\alpha_i))$, normalizing $\alpha_8 = 0$, to have a multinomial logit specification. The set-up of the likelihood is similar to the one presented in (14).

6 Estimation Results

6.1 The ex-post effect of benefit sanctions

Table 2 shows results concerning the ex-post effects δ_1 and δ_2 based on a model which does not allow for selectivity in warnings and sanctions (Column A) as well as from a model which allows for selective warnings and exits (Column B).

Estimates which do not allow for selectivity indicate that there is a moderate increase in the unemployment exit rate by 11 % if a job seeker is warned that the sanction process will be started. More surprisingly, results indicate that there is no further increase in search intensity once the sanction has been imposed. These results suggest that the entire adjustment in the job search intensity takes place before the sanction has been imposed. This is not plausible because the descriptive analysis shows that not all warnings actually lead to enforcement.

In the estimates of the extended model where we allow for correlated unobserved heterogeneity we were not able to identify all eight mass points that were modelled in the previous section. The parameter estimates of six mass points turned out to be at the boundary of the parameter space. We do identify two mass points, which implies that the unobserved heterogeneity components are perfectly correlated. The estimates which allow for selectivity show that the estimated impact of a warning and a sanction are both positive and quantitatively important. There is a shift of 28 % ($= exp(.249) - 1$) in the exit rate from open unemployment once a warning has been issued.[15] The exit rate from unemployment increases again by 23 % once the sanction has actually been imposed.[16]

Table 2

We conclude that failure to account for selectivity in the sanction process underestimates the causal effect of benefit sanctions on the exit rate from open unemployment. The intuition for the change in results is that individuals who are likely to be warned and sanctioned have lower unobserved job search skills or are less willing to attend ALMPs than the average job

[15] Black et al. (1998) finds such a warning effect for training programs. The main effect of these programs is that unemployed start searching for a job more intensively once they learn that they might be enrolled in a training program, just to avoid entrance.

[16] The log likelihood improves by about 12 points. Note, however, that a likelihood ratio test is not appropriate because in the restricted model (Column A) the parameters are at the boundary of the parameter space.

seeker. There are two groups in the population, one consisting of 25 % of the unemployed that has a low exit rate and a high warning rate and a high enforcement rate conditional on observed characteristics and elapsed duration. The other group, 75 % of the unemployed, has a high exit rate from open unemployment, a low warning rate and will never be sanctioned. Estimates which do not allow for selectivity identify the effect of a warning by comparing the exit rate of the average job seeker with a warning to the average job seeker who has not been warned. Because the average job seeker has a higher exit rate than the average job seeker with a warning, estimates which do not allow for selectivity are biased towards zero.

6.2 Sensitivity analysis

This subsection reports estimates of the ex-post sanction effect if we ignore information on warnings. Furthermore, we investigate the duration dependence of the treatment effect.

Table 3 presents results where we only estimate the *enforcement effect* (ignoring warnings) to compare our results with previous studies which rely on data without information on warnings. Again, estimates which do (Column B) and which do not (Column A) allow for selectivity are reported. Clearly, data on warnings appears to be critical for the model which allows for selectivity. While the estimate in Column A shows an effect of the enforcement of a sanction which is similar to the one reported previously, results based on the model allowing for correlated unobserved heterogeneity imply that the exit rate increases by 165 % upon enforcing the sanction.

The reasons for the fact that these results differ from those presented in Table 2 are twofold. First, one would expect that the ex-post effect of benefit sanctions is estimated to be smaller because the comparison group includes individuals with a warning who have a higher exit rate than the non-sanctioned. This first effect of ignoring data on warnings can be seen when comparing column A of Table 2 and with column A of Table 3. In Table 2 the enforcement effect is about .132 (=.107+.025) whereas this effect is estimated to be .114 ignoring data on warnings (Table 3). Thus, ignoring warnings has the effect of reducing the ex-post effect by .018.

Second, because data on warnings is omitted, the unobserved heterogeneity distribution is misspecified (the model does not allow for unobserved heterogeneity in warnings). This effect can be seen by comparing column B in Table 2 with column B in Table 3. The estimate of the

enforcement effect based on the entire data is .455 (=.249+.206). The estimate based on data which does not contain information on warnings in Table 3 is .976. Thus, misspecification of the unobserved heterogeneity distribution leads to an increase in the estimated enforcement effect of .503 (=.976-.455-.018). Therefore, the change in results is mainly due to the misspecification of the unobserved heterogeneity distribution.

Table 3

As a further sensitivity analysis we consider the results allowing for selectivity as well as for *non-constant duration dependence* in the effect of warnings and enforcements on the exit rate from open unemployment. The motivation regarding duration dependence in the ex-post effect is that the warning effect may have short-term effect and a long-term component. The short-term effect of a warning is that individuals increase search intensity because a benefit reduction is likely. As time passes without the sanction being enforced, however, the likelihood that the sanction will eventually be enforced decreases strongly (Figure 2). Thus, one would expect that the effect of a warning on the exit rate from open unemployment is high immediately after the warning and lower in the longer term. In the estimates, we allow for a change in the effect of a warning after 30 days. If it was certain that no sanction will be enforced after 30 days, the exit rate should revert to the level before the warning.

Also the enforcement effect has both, a short-term and a long-term aspect. The short-term refers to the time when the sanction is still in effect and the long-term is the time after the sanction. The hypothesis is that individuals will increase search intensity strongly right after the sanction has been imposed. The search intensity is then expected to decrease gradually when individuals are approaching the end of the sanction. If being sanctioned has no impact on the monitoring intensity by the PES the search intensity should revert to the level before the sanction. In the estimates, we allow for a change in the enforcement effect after 60 days. This is because more than 90% of all enforced sanctions entail a benefit reduction shorter than 60 calendar days (Section 2).

Figure 3

The estimated effects are presented graphically in Figure 3 (also see Table A2). The baseline exit rate of those with no warning and no enforcement is drawn as a constant line

at the level of one.[17] There is a statistically significant increase in the exit rate from open unemployment by 39 % at the date a warning is issued (t_{s_1}). 30 days after the warning there is an insignificant reduction in the exit rate by about 16 %, but the exit rate is still significantly higher than before the warning. At the date when the sanction is enforced (t_{s_2}), the exit rate increases to a level 54 % higher than without a sanction. 60 days after the enforcement there is an insignificant increase in the exit rate by about 9 %. Thus the results in Figure 3 are in line with our hypothesis regarding the warning effect but are in a stark contrast with our hypothesis regarding the enforcement effect. The fact that individuals with a sanction have a permanently higher exit rate than the non-sanctioned is most likely due to stricter monitoring of previously sanctioned unemployed on the part of the PES.

Further sensitivity analyses were conducted to assess whether the ex-post effect varies with age or gender. However, no significant differences were found.

6.3 The ex-ante effect

The theoretical analysis in Section 3 shows that there are two possibilities to examine the importance of the ex-ante effect of a sanction system. The ex-ante effect predicts that the 'stricter' the sanction policy (the higher ξ) the higher the search intensity of the non-sanctioned s_u and the higher the exit rate from open unemployment of the non-sanctioned. Moreover, the theoretical model holds that the stricter the sanction policy, the lower the search intensity of the sanctioned, s_p. Thus, the ex-post effect of benefit sanctions will be decreasing in the strictness of the sanction policy.

In the dataset, we distinguish 29 different public employment service offices. As argued in Section 2, it is mainly the responsibility of the head administrator of each PES to enforce a sanction. As a consequence, there may be substantial differences in the rate at which warnings are issued conditional on observed individual characteristics. Arguably, such variation reflects differences in the actual implementation of the Swiss sanction policy across public employment service units. We refer to this variation as the 'strictness' of the sanction policy.

In Figure 4 we exploit the variation in the likelihood that a warning will be issued across PES to identify the ex-ante effect of the strictness of a sanction system. The figure compares

[17] The empirical estimates allow for duration dependence in the exit rate. We do not show this in the figure in order to facilitate the exposition of the result on the duration dependence of the sanction effects.

the PES effect in the rate at which warnings are issued in 29 different PES to the PES effect in the exit rate from open unemployment.[18] In the estimates we condition on differences in observed individual characteristics and for the sanction history. This means that the variation in warnings across PES can not be due to observable individual differences in meeting eligibility requirements.

Figure 4

Figure 4 shows that there is tremendous variation in the rate at which warnings are issued. The highest warning rate is 12 times higher than the lowest warning rate. Such differences are, however, in line with the variation in the sanction rate across cantons (Section 2). There is a clear positive relationship between the warning rate and the exit rate from open unemployment at the PES level. The slope parameter measuring the elasticity of the exit rate with respect to the warning rate is 0.101 with standard error 0.054, so the relationship is statistically significant at the 10 % level. The ex-ante effect is of quantitative importance as will be shown in the next subsection. Note that only variation *within cantons* in the warning rate and in the exit rate from open unemployment is used. Hence, the variation in the exit rate across PES is *not due to labor demand differences* because, arguably, cantons reflect labor market regions.

Figure 5 contains a scatter plot of the ex-post effect across PES against the PES effect in the warnings hazard.[19] Note that horizontal axis is identical to the horizontal axis in Figure 4. There is no clear relationship between the ex-post effect of a warning and the PES warnings rate (the slope parameter is -0.04 with standard error 0.10). This evidence is in contrast to the theoretical prediction of a negative relationship between the strictness of the sanction

[18]Specifically, the measures for the strictness of the sanction system (horizontal axis) are obtained by estimating 29 PES effects on the warnings rate θ_{s_1} as defined in (12) and taking deviations from the canton mean (recall that our analysis refers to the three cantons Fribourg, Graubunden,and Zurich). The measures for the unemployment exit rates are obtained by estimating 29 PES effects in the exit rate from open unemployment θ_u as defined in (9) and taking deviations from the canton mean.

[19]The ex-post effect consists of two elements: the effect of warnings on the exit rate as well as the effect of enforcements. Because there are few observations within PES on enforcements, we restricted the ex post effect of warnings and enforcements to be identical and call it δ. This restriction implies that we identify the 'combined' effect of warnings and enforcements on the exit rate. We estimate the variation in this effect across PES by first interacting the ex-post effect of benefit sanctions δ with 29 PES dummies, and then take deviations from canton means of these effects.

policy and the ex-post effect. However, our theoretical analysis assumes that sanctions last forever. This latter simplifying assumption implies that the strictness of the sanction policy has no direct effect on the search intensity of the sanctioned. However, if sanctions do not last forever, there is a positive probability that the job seeker reverts to the state without a sanction. This implies that the search intensity of a job seeker with a previous sanction will be affected by the strictness of the sanction system. Given that 88 % of all sanctions imposed in Switzerland last only for a short period of time (less than 15 days) this effect should be quantitatively important and erodes the theoretical prediction of a significantly negative relationship between the strictness of the sanction policy and the ex-post effect.

Figure 5

A discussion of the extent to which the correlation in Figure 4 is likely to display a causal relationship seems warranted. The main concerns regard 'sorting' and 'PES-culture'. The sorting concern holds that job seekers may differ across PES with respect to unobservables which affect the exit rate and the warning rate. However, the empirical model allows for this identifying a negative correlation between unobservables in the exit rate and in the warning rate. So, to the extent that the model is correctly specified, the sorting critique does not apply. To the extent the empirical model does not capture this negative correlation appropriately, Figure 4 identifies a lower bound of the ex-ante effect. The 'PES-culture' concern holds that there are other aspects that may differ across PES which are correlated with warnings. For instance, it is possible that PES with strict sanction policies are also very efficient in acquiring vacancies. In that case the ex-ante effect is overestimated. Since we do not have access to data on 'PES-culture', it is not possible to assess the validity of this concern empirically. However, since the sorting and the PES-culture concern have opposite effects on the bias in the ex-ante effect, Figure 4 may indeed reveal a causal relationship between the strictness of the sanction policy and the exit rate of the non-sanctioned.

6.4 Simulations

Table 4 presents the result of two sets of simulations of the effect of benefit sanctions on expected unemployment duration. The upper panel reports the effect of sanctions on those who are sanctioned (ex-post effect; effect of treatment on the treated). The lower panel reports the

effect of increasing the warning rate on unemployment duration (ex-ante effect). All simulations are based on actual unemployment histories.[20] Expected duration conditional on observed characteristics x and sanction history t_{s_1}, t_{s_2} is

$$E(T|x) = \int_0^\infty (1 - F_u(t|x, t_{s_1}, t_{s_2}))dt$$

where $1 - F_u(t|x, t_{s_1}, t_{s_2}) = \int_u (1 - F_u(t|x, t_{s_1}, t_{s_2}, u))dG(u)$ is the mixture survivor function accounting of unobserved heterogeneity in the exit rate from open unemployment. Averaging over x yields expected duration $E(T)$ for the entire sample.

The upper panel in Table 4 reports the ex-post effect of benefit sanctions on expected unemployment duration $E(T_1 - T_0|D_1 = 1)$ for those with at least one warning. Note that the sign of this effect can already be inferred from the hazard rate estimates presented in Table 2. Because the warning and enforcement effect are both greater than zero, the sign of the ex-post effect on expected unemployment duration is necessarily negative. The simulation reveals that the ex-post effect of benefit sanctions is quantitatively important. Benefit sanctions decrease the duration of open unemployment by about three weeks, or almost 10 % of expected duration for those with sanction.

Table 4

The previous subsection shows that increasing the warning rate leads to a higher exit rate of the non-sanctioned while leaving the ex-post effect unchanged. The simulation in the lower panel of Table 4 evaluates the quantitative importance of this ex-ante effect. First, expected duration of unemployment in the average public employment service unit is reported. Moreover, the second row in the bottom panel of Table 4 reports the expected duration of unemployment if the warning rate were increased by 1 standard deviation. Such an increase in the warning rate will decrease unemployment duration because the exit rate of all individuals increases while leaving the ex-post effect constant. According to Table 4, the reduction in unemployment duration is almost 5 calendar days. This is a substantial decrease in unemployment duration because it applies to all job seekers. Moreover, the reported estimate is a lower bound on the ex-ante effect because it does not take into account that a larger fraction of the individuals in the sample would face a warning in the more strict system.

[20] This implies that the reported results represent a lower bound on the effect of benefit sanctions on the duration of open unemployment.

In sum, benefit sanctions reduce unemployment duration via two channels: They reduce unemployment duration of the sanctioned as well as increase the exit rate of the non-sanctioned. Both effects are quantitatively important.

7 Conclusions

Becker's (1968) celebrated analysis of crime and punishment can be applied to the labor market straightforwardly when the penalty is a fine (for less serious offences). In the typical unemployment insurance system unemployed workers receive unemployment benefits conditional on particular search requirements. Monitoring the search behavior of unemployed workers to detect whether they violate search requirements is equivalent to monitoring to detect possible criminal activities in the set-up of Becker. Furthermore, enforced reductions of benefits, that is benefit sanctions, are equivalent to punishments in the form of fines. Our empirical evidence is broadly consistent with Becker's conjectures. Benefit sanctions do not only affect job search behavior of the sanctioned because of the benefit reduction (ex-post effect) but also the search behavior of the non-sanctioned due to stricter monitoring of job search requirements (ex-ante effect).

The present analysis is the first in evaluating the strength of the ex-ante effect of a system of benefit sanctions by using variation in sanction practices across regional public employment services in Switzerland. Switzerland is an interesting example because labor market policy relies more heavily on close monitoring and sanctioning than in other countries. Results indicate that the ex-ante effect is of quantitative importance. Increasing the 'strictness' of the sanction policy by one standard deviation will reduce the duration of unemployment by about one week.

This study relies on a unique dataset allowing to distinguish between a warning of a sanction and the actual enforcement of the sanction. Availability of such information is critical for the identification of the ex-post effect of benefit sanctions. Our results indicate that not only the actual reduction of the benefits stimulates unemployed to leave unemployment more quickly. Already the warning that a sanction may come has a similar and quantitatively important effect. Our results suggest that unemployment duration decreases by about three weeks due to the announcement and the actual enforcement of benefit sanctions.

Our results have at least two interesting implications for labor market policy, one for

'passive' and one for 'active' labor market policies. The first implication is that in spending a given budget to support unemployed individuals, there is scope for policy makers in the sense that a system with a relatively generous benefits when combined with strict monitoring and benefits sanctions, may be equally costly than a less generous system that does rely on monitoring and activity testing. The second implication refers to active labor market policies. Recent studies that evaluate active labor market programs do not draw positive conclusions on the success of these programs. Expensive programs which offer unemployed training facilities or supply them with a job created in the public sector have adverse effects because participation in these programs actually reduces search efforts to find regular jobs due to locking-in effects. In a companion paper (Lalive et al. 2001) we show that, in Switzerland, active labor market policies are as inefficient as they seem to be in other countries. However, for cheap programs of intensified counseling and job search assistance, the conclusions in evaluation studies are more optimistic. The current study that deals with benefit sanctions in Switzerland is in line with this optimism. A policy of intensive monitoring of search activities and enforcement of search behavior may be a very effective way to reduce the duration of unemployment.

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Table 1. Unemployment and sanction histories

First state				Second state				Third state			
	N	% of total	Avg. duration (days)		Freq.	% of A	Avg. duration (days)		Freq.	% of B	Avg. duration (days)
Sanction announced (A)	1267	12.2	120.7	Sanction enforced (B)	425	33.5	46.0	Exit from open unemployment	379	89.2	96.5
								In progress	46	10.8	206.6
								Total	425	100.0	108.4
				Exit from open unemployment	799	63.1	79.2				
				In progress	43	3.4	294.2				
				Total	1267	100.0	75.3				
Exit from open unemployment	8979	86.3	110.5								
In progress	158	1.5	450.1								
Total	10404	100.0	116.9								

Notes: Exit from open unemployment is either a transition to a regular job, to an ALMP, or leaving the register.
Source: Own calculations.

Table 2. The effect of benefit sanctions on the duration of unemployment

	A		B	
	Coeff.	z	Coeff.	z
Treatment effects				
Warning (δ_1)	0.107	(2.81)	0.249	(3.82)
Enforcement (δ_2)	0.025	(0.39)	0.206	(2.16)
Transition rates (% per day)				
Exit from open unemployment				
$\exp(u_a)$	0.508	(14.17)	0.361	(6.97)
$\exp(u_b)$			0.546	(13.62)
Warning				
$\exp(v_{1a})$	0.094	(5.59)	0.269	(3.78)
$\exp(v_{1b})$			0.042	(3.93)
Enforcement				
$\exp(v_{2a})$	0.403	(3.08)	0.692	(2.39)
$\exp(v_{2b})$			0.000	-
Probabilities				
p_1			0.252	(4.98)
p_8			0.748	-
Correlations				
corr(exp(u), exp(v_1))			-1.000	
corr(exp(u), exp(v_2))			-1.000	
corr(exp(v_1),exp(v_2))			1.000	
Unobserved heterogeneity	No		Yes	
Control variables	Yes		Yes	
Log likelihood	-71756.7		-71744.3	
N	10404		10404	

Notes: Asymptotic z values in parentheses. Additional probabilities are zero.
Source: Own calculations.

Table 3. Sensitivity analysis: Working without data on warnings

	A		B	
	Coeff.	z	Coeff.	z
Treatment effect				
Enforcement (δ_2)	0.114	(2.00)	0.976	(6.71)
Transition rates (% per day)				
Exit from open unemployment				
exp(u_a)	0.512	(14.17)	0.189	(6.97)
exp(u_b)			0.549	(13.62)
Enforcement				
exp(v_{2a})	0.012	(5.59)	0.080	(3.78)
exp(v_{2b})			0.000	-
Probabilities				
p_1			0.119	(7.10)
p_8			0.748	-
Correlation				
corr(exp(u), exp(v_2))			-1.000	
Unobserved heterogeneity	No		Yes	
Control variables	Yes		Yes	
Log likelihood	-63339.6		-63292.2	
N	10404		10404	

Notes: Asymptotic z values in parentheses. Additional probabilities are zero.
Source: Own calculations.

Table 4. Simulations: The effect on expected duration

	Expected duration (days)
Ex post effect	
With sanction	189.87
Without sanction	212.43
Effect of announcing and enforcing a benefit sanction	-22.55
Ex ante effect	
Unemployment duration if log warning hazard increases by 1 standard deviation	189.06
Unemploymen duration at mean log warnings hazard	193.73
Effect of increasing the warnings hazard by 1 standard deviation	-4.67

Notes: Simulation is based on actual sanction and unemployment histories.
Source: Own calculations.

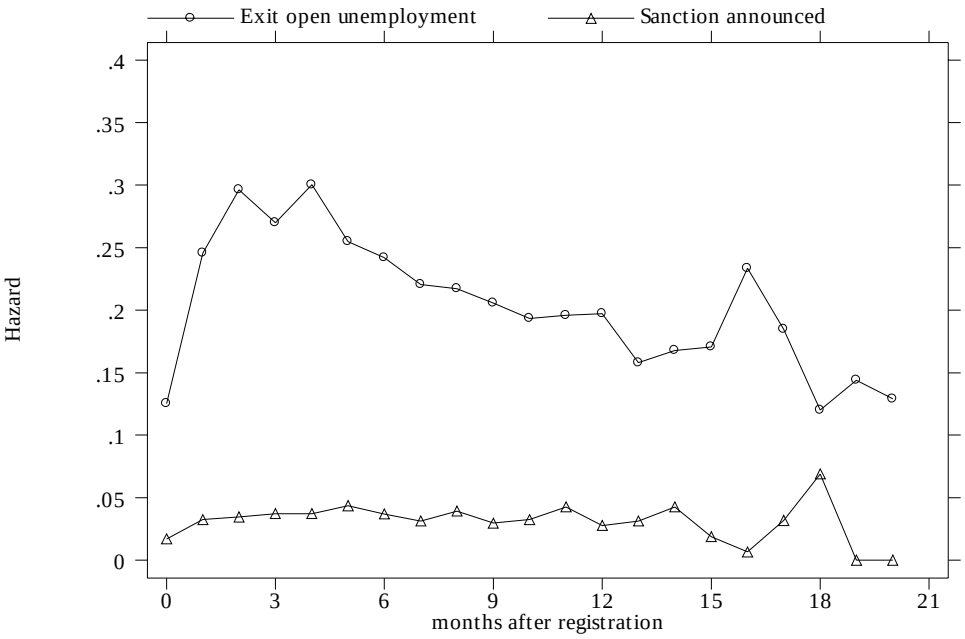

Figure 1. Kaplan-Meier transition rates

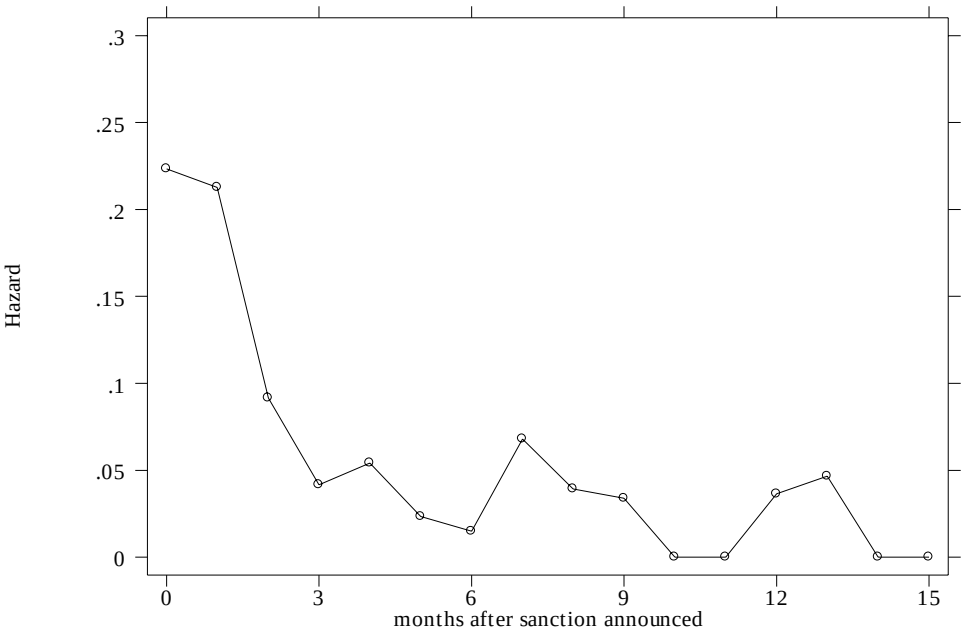

Figure 2. Kaplan-Meier transition rate to sanction enforced

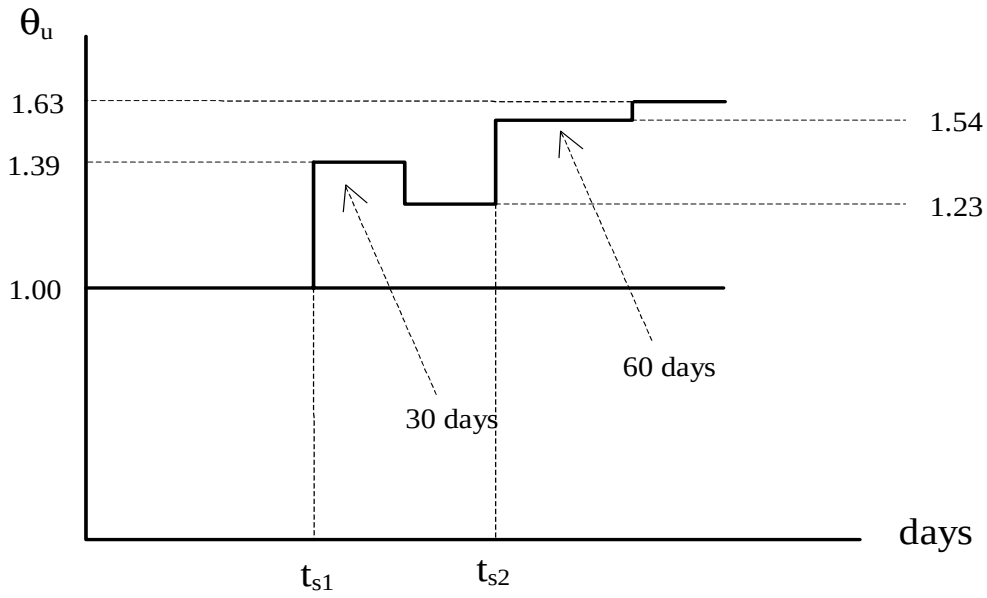

Figure 3. Results concerning duration dependence of the treatment effect
t_{s1} = warning, ts2 = enforcement of the sanction

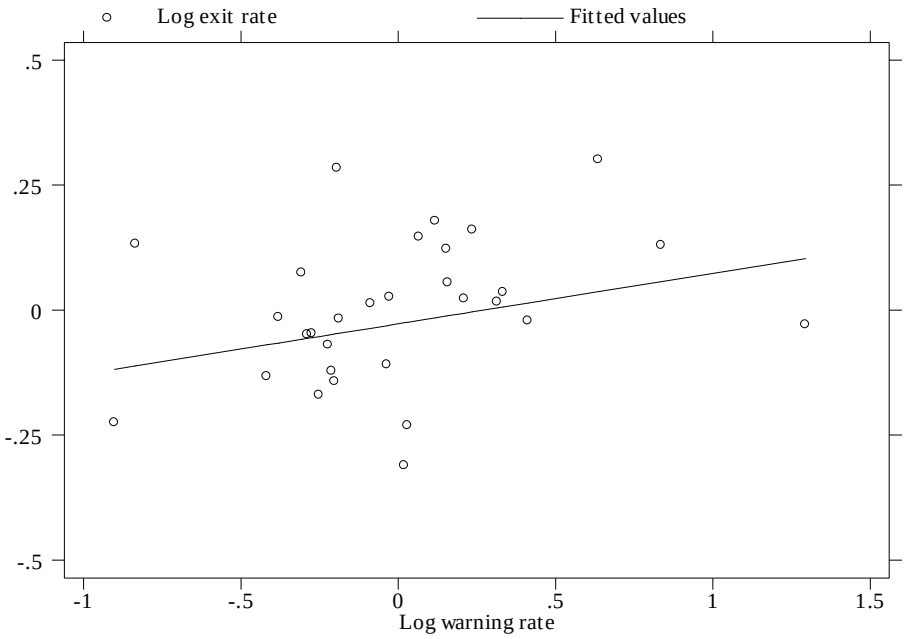

Figure 4. The ex-ante effect
Effect of Warning Rate on Exit rate of the non-sanctioned

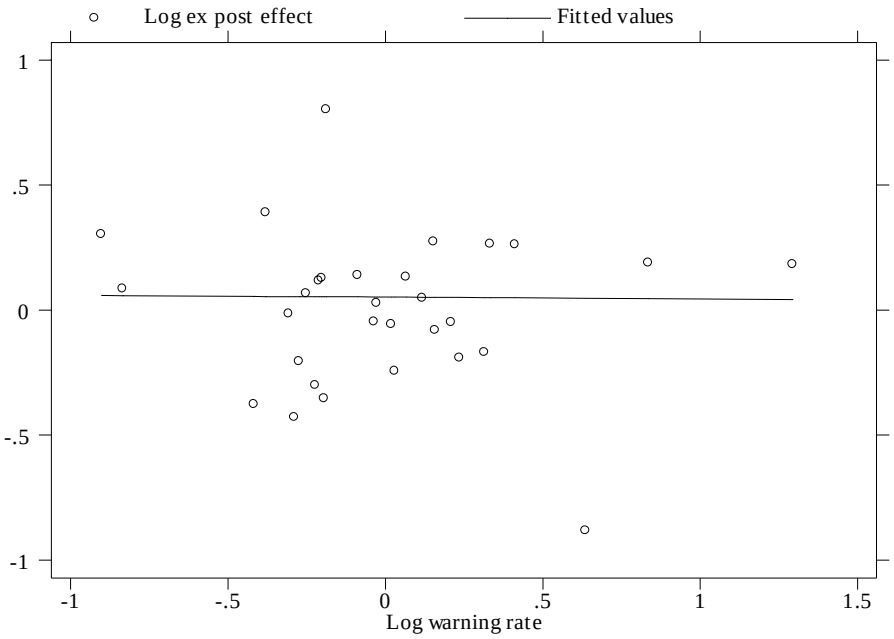

Figure 5. The ex-ante effect
Effect of Warning Rate on the ex post effect

Table A1. Full Results for Table 2 Column B

	Exit open unemployment		Warning		Enforcement	
	Coeff.	z	Coeff.	z	Coeff.	z
Treatment effects						
Warning (δ_1)	0.249	(3.82)				
Enforcement (δ_2)	0.206	(2.16)				
Individual Characteristics						
Female	0.218	(6.23)	-0.795	(-6.45)	-0.483	(-2.01)
Married	0.144	(2.96)	-0.221	(-1.57)	-0.394	(-1.40)
Separated	-0.088	(-1.46)	0.379	(2.27)	-0.425	(-1.43)
Female * married	-0.356	(-5.04)	0.050	(0.22)	0.542	(1.23)
Female * separated	0.016	(0.19)	-0.104	(-0.39)	0.040	(0.08)
Number of dependents	-0.021	(-1.14)	-0.059	(-1.13)	-0.019	(-0.19)
Female * number of dep.	-0.012	(-0.44)	0.224	(2.88)	0.214	(1.41)
Foreign	-0.125	(-3.31)	0.314	(2.73)	0.009	(0.04)
Age (20 to 29)						
30 to 39	-0.161	(-5.81)	0.046	(0.55)	0.028	(0.18)
40 to 50	-0.241	(-7.00)	-0.172	(-1.64)	-0.145	(-0.73)
Language skills (poor)						
medium	0.081	(2.05)	0.415	(3.75)	0.034	(0.16)
good	0.174	(4.10)	0.526	(4.05)	0.079	(0.31)
Apprenticeship (None)						
less than 2 years	0.029	(0.78)	0.028	(0.28)	0.012	(0.07)
more than 2 years	0.194	(5.84)	-0.413	(-4.34)	-0.306	(-1.67)
Previous industry (none, rest)						
construction	0.020	(0.56)	0.110	(1.01)	0.489	(2.41)
tourism	0.060	(1.79)	-0.034	(-0.32)	-0.037	(-0.19)
machines	-0.002	(-0.05)	0.039	(0.36)	0.207	(1.00)
transport	0.045	(0.89)	0.110	(0.75)	0.000	(0.00)
retail	-0.037	(-1.12)	0.080	(0.78)	0.403	(2.14)
Previous wage (less than CHF 2000)						
2000 to 3999	0.111	(2.58)	-0.200	(-1.66)	0.436	(2.00)
4000 to 5999	0.260	(5.02)	-0.269	(-1.82)	0.417	(1.50)
6000 and above	0.279	(4.57)	-0.899	(-4.49)	0.155	(0.44)
Replacement rate (70 %)						
80%	-0.073	(-2.28)	0.067	(0.69)	0.292	(1.51)
Canton (ZH)						
FR	0.001	(0.02)	0.052	(0.53)	-1.310	(-5.32)
GR	0.281	(7.86)	0.855	(8.29)	0.557	(2.74)

Table A1 continued on next page

Table A1 (continued)

Duration dependence (0 to 2 months)						
3 to 5	0.372	(14.89)	0.462	(6.29)	-1.229	(-5.56)
6 to 8	0.238	(6.54)	0.367	(3.23)	-1.265	(-3.67)
8 to 12	0.146	(2.91)	0.463	(2.74)	-1.792	(-3.09)
12 and more	0.062	(1.03)	0.396	(1.88)	a)	
Masspoints (% per day)						
$\exp(u_a)$	0.361	(6.97)				
$\exp(u_b)$	0.546	(13.62)				
$\exp(v_{1a})$			0.269	(3.78)		
$\exp(v_{1b})$			0.042	(3.93)		
$\exp(v_{2a})$					0.692	(2.39)
$\exp(v_{2b})$					0.000	-
Probabilities						
p_1	0.252	(4.98)				
p_8	0.748	- -				
log Likelihood	-71744.3					
N	10404					

Notes: Asymptotic z values in parentheses. Additional probabilities are zero.
a) due to lack of observations, the last interval ranges from 8 months until the end.
Source: Own calculations.

Table A2. Duration dependence in the treatment effects

	Coeff.	z
Warning (δ_1)		
0 to 29 days	0.330	(4.02)
30 days and more	0.204	(2.65)
Enforcement (δ_2)[a)]		
0 to 59 days	0.431	(3.58)
60 days and more	0.490	(4.53)
log Likelihood	-71742.7	
N	10404	

Notes: Asymptotic z values in parentheses. Additional probabilities are zero.
a) Note that the effect presented is relative to the non-warned
Source: Own calculations.

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