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Statistical Assistance for Programme  
Selection - For a Better Targeting of  
Active Labour Market Policies in  
Switzerland

Stefanie Behncke, Markus Frölich, Michael Lechner

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Editor: Prof. Jörg Baumberger  
University of St. Gallen  
Department of Economics  
Bodanstr. 1  
CH-9000 St. Gallen  
Phone +41 71 224 22 41  
Fax +41 71 224 28 85  
Email [joerg.baumberger@unisg.ch](mailto:joerg.baumberger@unisg.ch)

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University of St. Gallen  
Bodanstrasse 8  
CH-9000 St. Gallen  
Phone +41 71 224 23 25  
Fax +41 71 224 22 98

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Author's address:

Stefanie Behncke, Dr. Markus Frölich,  
Professor Dr. Michael Lechner  
SIAW-HSG  
Bodanstrasse 8  
9000 St. Gallen  
Tel. +41 71 224 2299  
Fax +41 71 224 2298  
Email stefanie.behncke@unisg.ch,  
markus.froelich@unisg.ch., michael.lechner@unisg.ch  
Website [www.siaw.unisg.ch/lechner](http://www.siaw.unisg.ch/lechner)

## **Abstract**

In this paper the motivation and various concepts of statistical systems for assisting case workers in assigning unemployed persons to active labour market programmes (ALMP) are examined and the particular implementation of such a statistical system in Switzerland, which was introduced in the form of a randomized pilot study, is discussed.

## **Keywords**

Statistical treatment rules, treatment effect heterogeneity

## **JEL Classification**

C21, J68

## **Introduction\***

Struggling with increasing unemployment rates, many European countries intensified the role of active labour market policies (ALMP) in the 1990s. Active labour market programmes include training programmes such as job search and personality courses, computer courses, language courses, further vocational training. They also contain temporary wage and employment subsidies for competitive and for non-competitive (extraordinary) jobs. The latter are often referred to as job creation schemes or employment programmes, whereas the former may be in the form of subsidies for temporary jobs (interim jobs) or subsidies for jobs intended to become long-term (job introduction allowances). Other forms of subsidies and incentives for raising mobility also exist. These measures were introduced to reduce unemployment by providing and maintaining skills of job seekers, by improving job matching between employers and employees and by serving as a signalling device for job seekers or a screening device for firms. When assigned by the case worker, participation in programmes is often mandatory.

In this article, we argue that an inefficient allocation of job seekers into programmes could be one of the reasons why ALMPs were not as successful in reducing unemployment as their proponents had expected. We mention evaluation studies for Switzerland, such as Gerfin and Lechner (2002), and Gerfin, Lechner and Steiger (2005), which cast some doubts on the effectiveness of Swiss ALMP. These studies suggest that programmes have different effects for different groups of job seekers, in particular some individuals seem to gain from a programme, while others are harmed by it. We review the evidence of a simulation study (Frölich, Lechner and Steiger, 2003, Lechner and Smith, 2006), which indicated that overall employment rates could have been increased by a better assignment of people into programmes.

In order to examine whether the reintegration of unemployed could indeed be increased through a better targeting, a field study was initiated by the Swiss State Secretariat for Economic Affairs (seco) and conducted in 2005 by the Swiss Institute for

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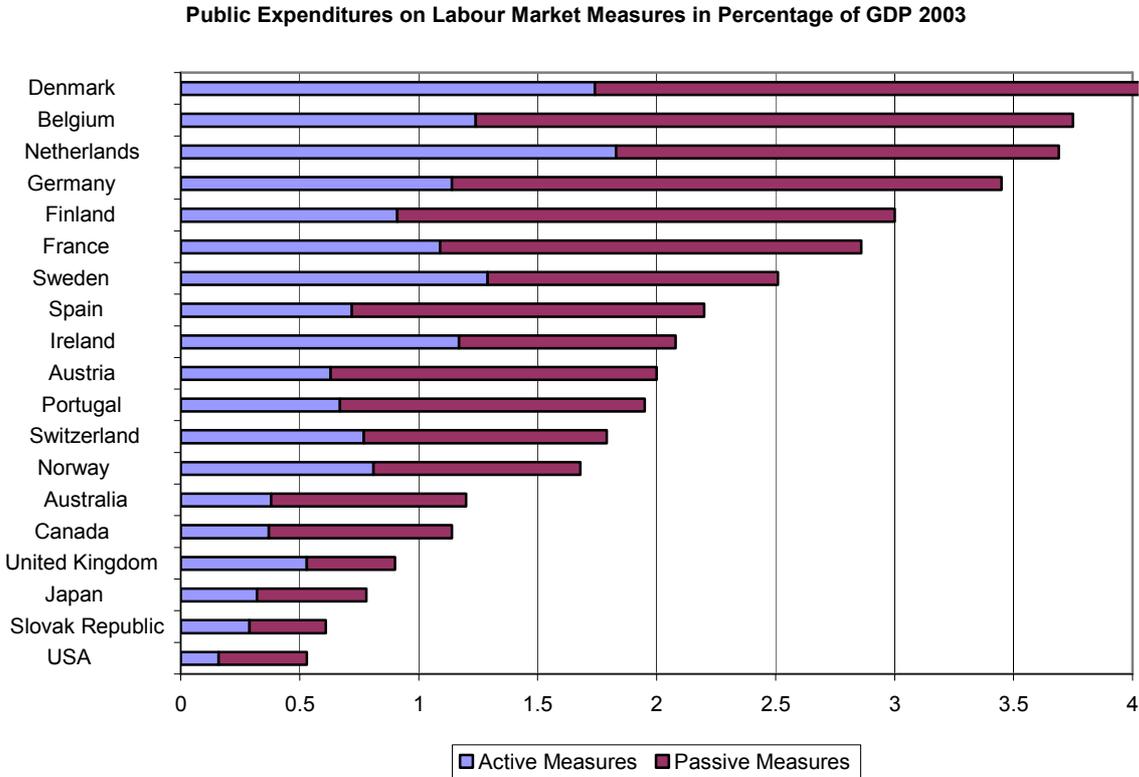
\* The second author is also affiliated with IZA (Bonn) and IFAU (Uppsala). The third author has further affiliations with ZEW

International and Applied Economics of the University of St.Gallen (SIAW-HSG). Case workers were provided with individual predictions on a job seeker's employment chances when participating in a particular programme, to assist them in selecting appropriate measures. We describe the implementation of the pilot study, whose objective is to evaluate whether statistically assisted programme selection (SAPS) could improve the allocation of unemployed to labour market programmes.

### **High Unemployment despite ALMPs**

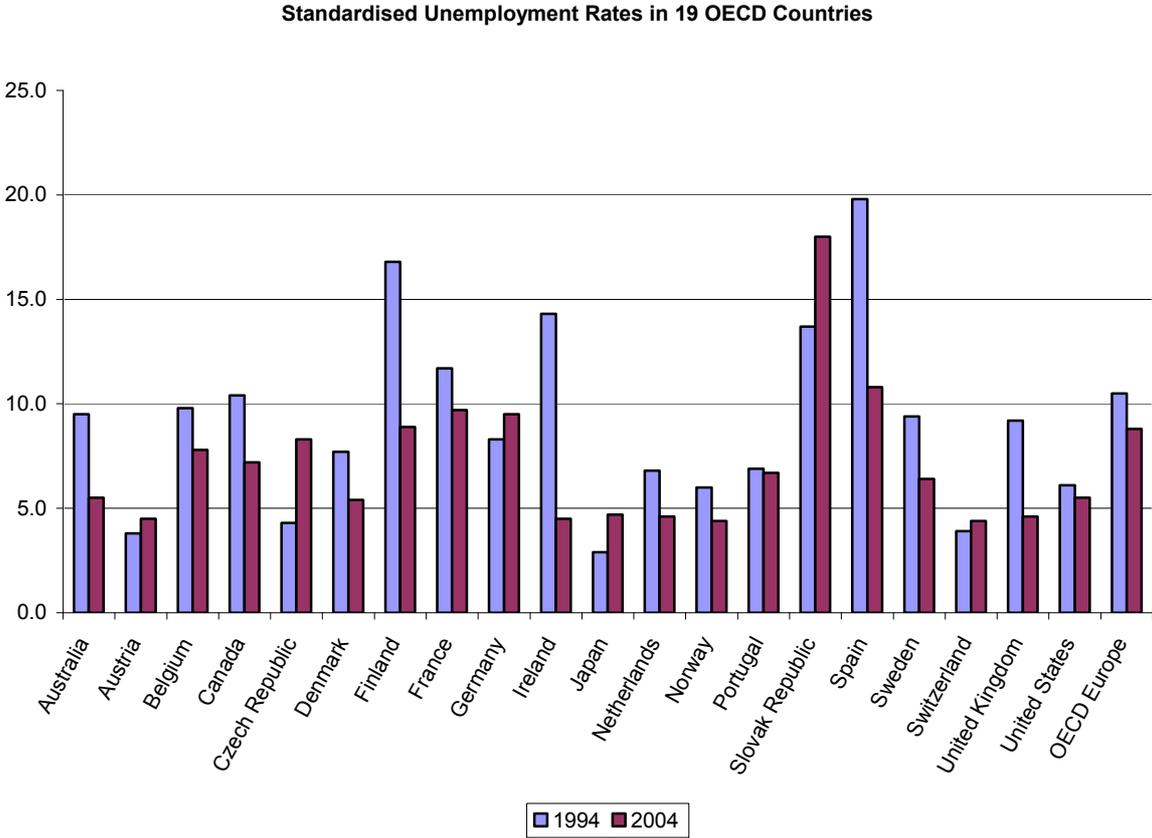
Many European countries introduced active labour market policies during the 1990s. Their main purpose, as laid down by law, is to reintegrate unemployed persons into the regular labour market. Some active labour market programmes are also designed to support disadvantaged groups, persons with low earnings or to alleviate social imbalances. However, since the reintegration is the primary purpose of ALMP, we are interested in whether they reached their aims. Many European countries spend a considerable amount on training and employment programmes, as can be seen in table 1. Germany's public expenditures on ALMP amounted to 1.14 percentage points of its GDP in 2003, while Switzerland spent 0.77 percentage points of its GDP.

Table 1, Source: OECD Employment Outlook 2005



Despite this large spending on ALMP, many countries are still plagued with high and persistent unemployment. Standardised unemployment rates for some OECD countries are depicted in table 2. Compared to the situation in Germany, with an official unemployment rate of 11.7 %, unemployment in Switzerland with a rate of 3.8 % in 2005 may appear modest on a first sight. Nevertheless, unemployment is the main concern even for Swiss citizens according to a Credit Suisse survey (Credit Suisse Bulletin 2005). Since expenditures on ALMP as well as unemployment rates remain high, the evaluation of ALMP has become an important issue for policymakers.

Table 2, Source: OECD Employment Outlook 2005



**How to Evaluate ALMP**

Obviously, it is not possible to deduce from ongoing high unemployment rates that ALMP had failed since we do not know how high unemployment rates would have been without ALMPs. To assess the success of an active labour market programme, one should not consider subsequent employment to be necessarily a result of previous programme participation. Suppose there is a highly skilled young unemployed person who is assigned to participate in a full-time computer course. After four months this person finds a job. Had he not attended the time-consuming computer classes, however, he might have found a job already after two months since he could have spent more time and effort on job-search. Thus, in order to determine the effect

of a programme, one should compare, for all different available programmes, the hypothetical employment situation that would ensue when participating in this programme. This should also include the option of not participating in any programme at time  $t$ , which may be called the "no-programme" option. This comparison is complicated by the fact that it is possible to observe the employment state only after participation and only for the programme actually chosen. In other words, when a person attended a language course, her potential employment state had she, e.g., participated in an employment programme instead is unobservable by definition. We cannot simply compare the labour market outcomes of persons attending language courses with those assigned to employment programmes as it is likely that people in the different schemes differ with respect to their characteristics. If there are, for example, high skilled job seekers in programme A and low skilled in programme B, the first group would have had higher employment chances even without participating in programme A. With microeconomic techniques it is possible to overcome the selection bias that arises if participants in programmes A and B differ systematically in characteristics which are relevant for labour market outcomes.

One possible technique is based on the idea that we want to compare the employment state of a person in programme A with the one of a *similar* person in programme B, where *similar* means that the two persons should be identical with respect to all characteristics that matter for their employability as well as their selection into programmes. Conditional on all these characteristics, there is no selection bias. Therefore, conditional on these characteristics, the labour market outcomes of participants in programme A and programme B can be compared to judge the impact of programme A versus B. Such an estimation technique, however, is only applicable if a very rich data set including all variables that affected both programme assignment and labour market outcomes is available.

## **International Experiences with Profiling and Targeting Systems**

In principle, there are two very different systems how job seekers can be allocated to programmes by statistical means: targeting and profiling. A targeting system predicts, for a specific person, her potential labour market outcomes for *every* available programme, including the no-programme option. The case worker can then choose the programme which maximizes the expected outcome. In contrast, a profiling system computes only a single risk factor for each person, usually the probability of becoming long-term unemployed, and allocates persons to programmes according to the estimated risk factor. This risk factor, or score, is supposed to reflect the needs for intensive assistance in order to get back to work.

Profiling systems are applied, for example, in Australia, the USA, and in Germany since 2005. The Australian Job Seeker Classification Instrument (JSCI) computes the risk of becoming long-term unemployed on the basis of 14 individual characteristics including gender, age and nationality. Only job seekers with a high risk are counselled immediately by their case managers, whereas low-risk job seekers are eligible to job search training only after a few months.

The Worker Profiling and Reemployment Service system (WPRS) in the USA identifies persons most likely to exhaust their benefits and entitles them to reemployment services, which include counselling, job search assistance and job placement. Referrals to training are not made on the basis of this profiling score, though.

In Germany unemployed persons are segmented into four categories of clients: market clients, counselling- and activating clients, counselling- and promoting clients and looking-after clients<sup>1</sup>. The re-employment chances of the first and the last groups are not expected to be improved by participation in labour market programmes.

A *targeting* system, in contrast, estimates the potential outcomes for a particular person for each available programme. Every person can then be assigned to the pro-

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<sup>1</sup> Markt-, Beratungskunde-Aktivieren, Beratungskunde-Fördern und Betreuungskunde.

gramme with the best chances of success. Canada planned such a targeting system, the so-called Service and Outcome Measurement System (SOMS), but eventually did not implement it mainly out of two reasons: The data base created for its implementation was considered a violation of privacy rules, and case workers were afraid of being replaced. For the USA, the Frontline Decision Support System (FDSS) is described in Eberts and O'Leary (2002). The first pilot phase started in 2002 in the state of Georgia. However, as stated by Eberts and Randall (2005) the FDSS was not long in place enough to undergo a rigorous evaluation, because the Georgia department of labour discontinued to support the project for "several reasons". In Germany, the Treatment Effect and Prediction Project (Treffer) is at an experimental stage. The Swiss Statistical Assisted Programme Selection project (SAPS), which will be described further below, is the first pure targeting system that has been implemented and will undergo a full (experimental) evaluation of its impact in 2007.

### **Targeting Matters for Effectiveness of ALMP**

Several microeconomic evaluation studies found treatment *effect heterogeneity* in that a particular programme seems to impact differently on different subgroups of unemployed persons being at different stages in their unemployment spell (see e.g. Gerfin and Lechner, 2002, for Switzerland). Case workers are probably aware of this heterogeneity when assigning programmes, which is also visible in that participants in different services differ with respect to their characteristics. For example, foreigners are more likely to be assigned to language courses whereas highly qualified unemployed persons participate more often in computer courses. In a simulation study, however, Lechner and Smith (2006) concluded that case workers did about as well as a *random assignment* of clients to services would have done, when success is measured in terms of predicted employment rates one year after the start of a programme. Furthermore, had individuals been assigned to programmes according to the highest predicted outcomes, the post-programme employment rates could have been raised by nearly 8 percentage points under the same programme endowments or even by 14

percentage points in the absence of resource constraints. In other words, employment of job seekers could have been improved by allocating them into different programmes, or at different times in their unemployment spell or not at all. Frölich, Lechner and Steiger (2003) provide further evidence in that targeting towards employment does not seem to lead to a deterioration in earnings among those who find a job, while it seems to increase the overall employment rate. When persons are assigned to programmes in a way to maximize the employment rates after 7, 12 or 17 months, respectively, the monthly earnings gains due to statistical targeting are estimated to be about 230, 220 and 190 CHF, respectively, per person.

The simulation studies indicate that higher overall employment rates could be achieved by statistical targeting. This does not imply that every person would be better off with statistical targeting than with the discretion of the case workers, though. If policymakers are restricted by budget constraints such that the number of training slots is limited, statistical targeting could possibly result in a situation where some job seekers are made worse off since they might no longer gain access to training as the slots are taken by other job seekers with higher predicted impacts. At least in a world without resource constraints, statistical targeting should in principle improve every persons' employment chances.

Nevertheless, compared to a pure statistical assignment system, case workers have the advantage of knowing many more details about the particular job seeker through their interviews and counselling. Some of these details are too individual specific for that a statistical system could incorporate them. On the other hands, case workers have only limited possibilities to assess the effectiveness of programmes for certain job seekers as they have counselled only a rather small number of job seekers with similar characteristics. Furthermore, they usually cannot observe labour market outcomes of their clients after deregistration from the unemployment office. If clients do not register again at the same office, case workers do not know whether they are employed or not or whether they have moved to another city. There is therefore scope for assisting the case workers' estimates of the effects of a programme by providing

them with information on programme effects obtained from a larger population. When counselling an unemployed person they may find it helpful to know that other unemployed persons with similar characteristics were on average employed for 10 months after participating in programme A, but only for two months if they had attended programme B. The basic idea is thus to combine case specific knowledge of the case workers with group specific knowledge processed by a statistical expert system.

### **Statistical Assistance for Programme Selection**

The evaluation methods mentioned cannot only be used to find out that allocation was not optimal in the past, but might also provide predictions about which measure would be best for a job seeker today and tomorrow. If we are able to identify ex ante which programme improves labour market outcomes for which subpopulation and when, we could achieve higher employment rates through a more efficient allocation. A prediction has to deal with many more challenges compared to an ex-post evaluation of ALMP. Every estimation is necessarily based on data of past participants. Predictions only make sense if economic relationships do not change too much or only in a more or less predictable way. We might then be able to predict potential labour market outcomes for a job seeker going to participate in programme A or B only if other job seekers had already participated in it before. If a new programme C with different features is introduced, predictions are not possible or become less accurate.

A second challenge is that a lot of data that can be used to estimate the effects of the programmes for past participants, may not be available for deriving predictions for a specific unemployed person out of administrative or data security reasons. The approach described below is based on first using all available data on past participants to estimate impacts free of selection bias, which are then averaged with respect to all the variables not available for the current specific client.

## **SAPS - The Pilot Study in Switzerland**

The Swiss unemployment insurance system was completely revised in 1996, making ALMP a first priority. Evaluations of Swiss active labour market programmes in Gerfin and Lechner (2002) and Gerfin, Lechner and Steiger (2005) found negative employment effects for some programmes and positive effects for others. The simulation studies by Frölich, Lechner and Steiger (2003) and Lechner and Smith (2006) found that case workers did not appear to be very effective in selecting the most appropriate programmes in order to maximize reintegration of the unemployed. Furthermore, they found evidence that statistical assisted targeting could achieve a considerable improvement. Based on these studies the Swiss State Secretariat for Economic Affairs (seco) initiated a pilot study on statistically assisted programme selection (SAPS), which took place from May 2005 to December 2005 in 21 regional employment offices in five different regions (Basel, Berne, Geneva, St. Gallen and Zurich). About 150 randomly selected case workers were provided with predictions on potential labour market outcomes for their clients. Another about 150 case workers, in the same office, constitute the control group to evaluate the impact of the system.

The predictions are based on two types of datasets. The first is a very rich data set on previous job seekers, obtained from the unemployment insurance system merged with the pension database, which is used for estimating the causal effect of programmes. The second data set contains information on current job seekers from the unemployment insurance database. The variables contained in this dataset for the current clients are a strict subset of those available for the past job seekers since the information from the pension system are not accessible as they would be available only with a substantial delay.

The first dataset consists comprehends all 460,442 job seekers who were registered at an employment office between 2001 and 2003, and information from the unemployment insurance information system (AVAM/ASAL) is available up to December 2004. This data has been combined with information from the social security records (AHV) for January 1990 to December 2002. These combined data sources contain

very detailed information on registration and de-registration of unemployment, benefit payments, sanctions, participation in ALMP, ten year employment histories with monthly information on earnings and employment status and many socio-economic characteristics such as qualification, education, language skills, job position, experience, profession, industry and an employability rating by the case worker. Given this very detailed data on labour market histories and current skills, it appears reasonable to assume that by conditioning on these characteristics selection bias can be avoided.

The second data set for all the new job seekers is updated very two weeks, with the latest information from the unemployment insurance data system. A new semi-parametric methodology was developed (Frölich, 2006) to combine the information from the first dataset, with the larger set of regressors available, in a way to derive predictions that only depend on the regressors available in the second data set.

In the current implementation of the SAPS system, employment outcomes are predicted as the expected number of months in stable employment within the following *twelve* months. This short term measure was motivated by the official goals of the federal unemployment system and also for being able to evaluate the impact of SAPS within a reasonable time frame. An employment spell is considered as stable if it lasts for at least three months without a break. If an individual finds a job that lasts only for a few weeks, this is not considered as a positive outcome since avoidance of instable jobs and frequent re-registration of unemployment is also one of the official goals. This definition of the outcome variable favours fast re-employment and penalizes short employment spells.

A variety of programmes are available in Switzerland, with the official classification distinguishing 43 different types. These were grouped to broader categories of 6 or 7 programmes, depending on the region. One programme category ("no programme") is to not participate in the programme today, but to leave the option for later. Other categories were job search and personality courses, language skills training, com-

puter skills training, further training and employment programmes or job creation schemes in a sheltered labour market. There are several reasons for not choosing very narrow categories. If too many different programmes were to be distinguished, the number of past participants observed in the data would be small for some courses and statistical precision would suffer. Furthermore, case workers also have better information for choosing the specific course out of a broader category, e.g. whether an intermediate or advanced English course would be more appropriate. In addition, employment predictions made for the years 2005 and 2006, are based on participants of the years 2001 to 2003. Some courses may have been modified or providers may have changed, such that very narrow categories would be inappropriate as specific courses might even no longer exist. On the other hand, the broader structure of the programmes remained largely unchanged.

The case workers participating in the pilot study could retrieve the predictions online via the internet, having access only to the predictions for their respective clients. After entering the job seekers' identification number, e.g. before or during an interview, the predictions for this particular job seeker for the different programmes are shown on the screen. In addition to these predictions, also their statistical precision is indicated. An example of these predictions is shown in table 3 and an exemplary screen-shot is given in the following figure.

*Table 3, Predictions of employment outcomes for a particular job seeker*

<b>Category of active labour market programme</b>	<b>Months of stable employment</b>
<b>Computer skills training</b>	<b>5.9</b>
No programme	3.5
Language skills training	2.7
Further vocational training	2.3
<i>Job search and personality course</i>	<i>2.0</i>
<i>Employment programme</i>	<i>1.8</i>

**Bitte überprüfen Sie folgende Angaben**

AVAM-Nr.: 1001      Letzte Aktualisierung: 31.12.2004      [frühere Feedbacks anzeigen](#)  
 Geschlecht: m  
 Nationalität: Schweiz      Versicherter Verdienst: < 2500 CHF  
 Jahrgang: 1959      Ehepartner und/oder Kinder: Ja

**SAPS-Prognose**

Massnahme	Beschäftigungs-Indikator	Welche Massnahme(n) ist/sind Ihrer Meinung nach am sinnvollsten?
Informatik-Anwenderkurs	<b>5.9</b>	<input type="checkbox"/>
Keine Massnahme	3.5	<input type="checkbox"/> Grün: Massnahme ist signifikant besser
Sprachkurs	2.7	<input type="checkbox"/> Schwarz: Prognose ist nicht signifikant
Fachkurse / Weiterbildung	2.3	<input type="checkbox"/> Rot: Massnahme ist signifikant schlechter
Basisprogramm	2.0	<input type="checkbox"/>
vorübergehende Beschäftigung	1.8	<input type="checkbox"/>

**Feedback:** Sind Sie den SAPS-Prognosen gefolgt?

Ich bin den SAPS-Prognosen gefolgt.

Mein Hauptgrund, warum ich den SAPS-Prognosen nicht gefolgt bin:

- Angebot ist nicht vorhanden
- persönliche Eigenschaften des Stellensuchenden
- (noch) kein Anspruch auf Massnahme
- ich verfolge andere Ziele als schnellen Beschäftigungserfolg
- Massnahme ist in diesem Fall zu teuer
- bereits andere Massnahme(n) geplant
- Stellensuchender befindet sich in laufender Massnahme
- Stellensuchender befindet sich im Zwischenverdienst
- anderer Grund (nachfolgend erläutert)

For this specific job seeker a computer course is recommended, and an expected 5.9 months of stable employment, during the next 12 months, are then predicted. On the other hand, when attending a language course only 2.7 months of stable employment would be predicted. If not attending any programme now, about 3.5 months of employment are predicted. The statistical precision of the predictions is also conveyed to the case worker. The truly best programme is contained with high precision among all the **bold** printed programmes. In other words, if only one of the options is bold (as the computer skills training), this is likely to be the best programme. If many options are bold, this indicates that the predictions were less precise and that the best programme cannot be determined uniquely with high statistical confidence. Nevertheless, the set of all bold programmes is likely to contain the best programme. If two programmes appear in bold, the case worker should choose one of them. And in the case of a uniquely bold programme, this would be the best option to follow. Pro-

programmes in *italics* (as the job search course and the employment programme in this example), on the other hand, appear to be worse options in some statistical sense.

The case workers participating in the pilot project were encouraged to choose among the greenly shaded programmes, including the no-programme option. The case workers, nevertheless, retained full discretion in choosing the type and timing of programmes. Case workers often have additional information on their clients that is not contained in the available data set. The case worker may know about psychological and physical problems or illnesses or other impediments. The case workers were therefore asked to combine their personal assessments and beliefs with the predicted employment outcomes of the SAPS system, and to provide feedback justifying their decision.

The case workers were encouraged to retrieve the predictions before or during every interview since the predicted outcomes may change over time as they take elapsed unemployment duration and other time-varying covariates into account. This also takes the optimal timing for a programme into consideration. For example, it can be optimal to assign no programme in the beginning of an unemployment spell but to assign a programme if the client has not found a job after four months.

### **Evaluating Statistical Assisted Programme Selection**

The pilot study is designed as a social experiment. It is comparable with a randomized (non-blinded) medical study, in which one half of the patients receives a new drug, while the other half gets the placebo. After some time both groups are compared to see whether one group is significantly healthier as the other. The participating case workers for the field study were randomly selected in order to avoid any selection bias which could occur, for example, if only highly motivated or highly qualified case workers participated. In each employment office, about 50% of the case workers were selected, with the other 50% representing the control group. Twelve months after the end of the field study, the employment careers of the job seekers

will be followed up. Their employment state will be compared with the labour market outcomes of those job seekers whose case workers were not assisted by statistical information. In this manner it can be evaluated whether statistically assisted programme selection (SAPS) improved the allocation of active labour market programmes. First results are expected in 2007.

### **Concluding Remarks**

Recent evaluation studies suggested that the overall effectiveness of active labour market policies in Switzerland might have been suboptimal and could perhaps be increased by improving the process of allocation of job seekers to programmes. A statistical targeting system might help to do so by providing case workers with individualized predictions about which programme, including the no-programme option, is likely to be best for this person.

Several studies indicated the existence of effect heterogeneity with respect to programmes and demographic groups not only for Switzerland, but also for other countries, see for instance Caliendo, Hujer, and Thomsen (2005) or Lechner, Miquel, and Wunsch (2004) for Germany or the review by Heckman, Smith, and Clement (1997).

There is also mounting empirical evidence that employment rate presumably could have been higher if job seekers had been assigned to programmes in a different way. For Switzerland, the studies by Frölich, Lechner and Steiger (2003) and Lechner and Smith (2006) had been referred to. For Germany, Lechner, Miquel and Wunsch (2004) find that if unemployed persons had been assigned to re-training instead to other programmes they would have been more likely to be employed.

These findings triggered the development of a statistical targeting system (Statistically assisted programme selection, SAPS) that was implemented in a pilot study in Switzerland in 2005 and will be evaluated in 2007. Due to the setup as a randomized field experiment, its evaluation will provide important insights (not only for Switzerland) on statistical targeting in practice, and how it might be further improved.

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