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ABSTRACT

The Employment Effects of Active Social Policy

We analyse the effects of active social policy (ASP) on the dynamics of welfare dependence. We evaluate the impact of various ASP measures (employment and training) on the duration of welfare spells and subsequent employment spells, based on data from Denmark. The results show that employment measures improve the chances of leaving welfare dependence whereas training measures have detrimental effects on the exit rate from welfare spells. We investigate the optimal timing of ASP and show that there is a case for assigning individuals to early participation in employment programmes, as the net effect is larger the earlier participation begins.

JEL Classification: I38, J18, J64, J68

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1. Introduction

Active labour market policy (ALMP) has received considerable attention in the economics literature. Much less attention has been given to the counterpart of active social policy (ASP), even though it in many aspects resembles active labour market policy and contains the same instruments (see, however, Gueron (1990) and Cockx and Ridder (2001)). On the other hand, there has been an increasing interest in the duration of welfare spells (see Blank (1989), O'Neill et al. (1987), Barrett (2000), and Hoynes (2000)) and most recently particularly in the welfare dependence of immigrants (see Riphahn and Rosholm (2001) and the references therein).

The international empirical evidence from the numerous evaluations of ALMP and the few evaluations of ASP shows rather varying results. No consensus is found on the impact of ASP or ALMP on participants' employment rates. The results vary between different countries and different measures, but apart from a few success stories for certain target groups the employment prospects of the participants are in general not encouraging. Among youth, the evidence mainly differs between European and U.S. studies. U.S. studies find no or even negative effects of ALMP on youth employment rates, whereas some of the European studies show substantial positive effects on the young participants' employment rates.¹ Calmfors et al. (2002) have surveyed studies of both micro- and macroeconomic effects of the Swedish active labour market policy, which in many aspects resembles the Danish. They find that the microeconomic employment effect of labour market training is either insignificant or negative, whereas positive effects of job creation measures are found in several studies. However, the macroeconomic studies show a more positive (or less negative) effect on regular employment of labour market training compared to job creation measures.

Denmark has an extensive welfare assistance programme with a quite generous income support system. During the 1990s, this programme has been augmented by a host of active social policies that are supposed to help the welfare recipients regain their economic independence. The measures applied in the active social policy include counselling and monitoring, labour market training, subsidized employment, relief jobs in the public sector, etc.

The purpose of this study is to investigate the effects of the measures applied in the active social policy. The main question is whether active social policy can help people regain their economic independence. This is analysed by looking at two related questions: Does ASP help people to return faster to employment?

¹See Heckman et al. (1999) for a comprehensive survey of North American and European evaluations of active labour market programmes, and Martin and Grubb (2001) for a survey of different effects of different ALMP programmes.

Does ASP help people to keep their employment following welfare dependence? In both cases, answers are provided by duration analyses of welfare spells and subsequent employment spells, respectively. The institutional setting of the active social policy in Denmark does not allow an analysis of the effects *per se*, but we provide assumptions under which the causal effect of participation in a social policy measure on the dependent variable of interest is identified. Since individuals may participate in different ASP measures and since both type and timing of participation may be endogenous, we extend the framework developed by Abbring and van den Berg (2003) to allow for different treatments. This implies that we jointly estimate the duration of the welfare spell, the time until participation in ASP, and the type of measure.

In addition, we compare the different measures applied in ASP and investigate locking-in effects of ASP. As an extra dimension, we analyse the timing aspect of ASP by letting the post-programme effect of the ASP measures vary with time until participation. Based on this, we calculate net effects on the expected duration of welfare dependence and find that only employment programmes have the desired impacts, while training and other programmes prolong welfare spells. Moreover, this allows us to determine the optimal timing of ASP and to show that there is a case for assigning individuals to early participation in employment programmes as the net effect is larger the earlier participation begins. We provide an interpretation of our results within the framework of search theory.

The analysis is based on a longitudinal register-based data set covering Aarhus, the second largest municipality in Denmark. These data contain very rich information on the active social policies both regarding type and timing. This enables us to analyse the dynamics of welfare dependence, in particular the transition from welfare to work or ordinary education. By modelling the duration of the welfare spells, we are able to evaluate the impact of the various social policy measures as well as the importance of individual characteristics, such as age, gender, education, family status, and immigrant or refugee status.

The longitudinal structure of the data also allows us to investigate the occurrence of repeated spells of welfare dependence and thereby to provide evidence on the determinants of recidivism of reliance on social assistance. The literature on recidivism is rather scarce (see e.g. Blank and Ruggles (1994)). By estimating duration models for the subsequent employment spells, we also obtain evidence on the determinants of recidivism, and particularly we estimate the causal impact of earlier participation in ASP on the likelihood of returning to welfare.

The remainder of the paper is organized as follows. Section 2 presents the Danish welfare system and the institutional background. The data are described in Section 3, while the empirical approach is outlined in Section 4. The results from the empirical analysis are presented and discussed in Section 5, and finally

Section 6 contains the conclusion.

2. The Danish welfare system

The Danish welfare system is organized as two parallel systems: one system providing active labour market policy and another system providing active social policy.² The distinction between the two systems is related to the organization of the unemployment insurance system. In Denmark, membership of an unemployment insurance fund is voluntary, and only members will receive UI benefits if they become unemployed. The active labour market policy is designed for unemployed *insured* workers. On the other hand, non-insured workers who become unemployed can obtain social assistance benefits, and part of the active social policy is designed for unemployed *non-insured* workers. In addition, the social system also covers non-workers, sick and disabled people, and persons with other social problems. The active social policy distinguishes between these two groups: those who have unemployment as their only problem, and those who have other social problems in addition to unemployment. Basically, the former are unemployed workers who receive means-tested unemployment benefits, while the latter are the more traditional welfare recipients.

As it should be clear from this brief description, some very similar persons (*non-insured* unemployed workers with no problems besides unemployment and *insured* unemployed workers) are treated quite differently in two different systems.³ The systems also differ markedly with respect to benefits and organization. The UI benefits of the labour market system are not means-tested (apart from own labour earnings) and they are of a limited duration, whereas the welfare benefits (social assistance) are means-tested and they are of unlimited duration. The labour market system is quite centralized, whereas the social system is decentralized and run by the municipalities.

The main guiding principle behind the active labour market and social policies can be described as a 'right-and-duty' principle,⁴ which means that in order to receive benefits unemployed persons have to undertake an activity. The basic principle of the active social policy is thus that the unemployed person has a *right*

²This is in contrast to a number of other European countries where labour market and social policy are organised in the same system. In Denmark, the labour market system is the responsibility of the Ministry of Labour and the social system is the responsibility of the Ministry of Social Affairs. However, the systems are currently being redesigned and will eventually be merged into a common system.

³The underlying reasons for this and the historical development of the two parallel systems would form a fascinating case study for political scientists.

⁴This is also sometimes referred to as a 'mutual obligation' principle (see e.g. Richardson (2001) for a description of a similar principle in Australia) or as workfare.

to assistance in the form of an ASP programme offer, but at the same time a *duty* to participate in the ASP offer in return for the public financial support he or she receives.

The ASP measures comprise a broad range of different forms of programmes which the municipal authorities may use. There are two main categories of measures: employment and training measures. The employment measures comprise different types of subsidised employment where the person on social assistance is temporarily employed in a private or public enterprise or is participating in a municipal employment project. The training measures are specially organized education or training activities in the form of courses or classes. In addition, it is also possible to participate in counselling programmes and various specially organized ASP programmes. These programmes are grouped as other ASP measures in the analysis.

Persons under the age of 30 years shall have an offer to participate in ASP before reaching 13 weeks on welfare benefits, while persons over 30 years shall have an offer before reaching 12 months on welfare benefits. However, these time limits are minimum requirements and many municipalities have chosen to give programme offers at a much earlier stage. Persons under the age of 30 years have a right to receive a new offer if the first offer does not lead to ordinary employment or education. The new offer shall be given within a period of 13 weeks.⁵

The municipal authorities are responsible for the organization and administration of ASP measures. In addition, the legislation contains detailed rules concerning the co-operation between the municipal authorities and other actors, such as for instance enterprises, trade unions, and unemployment insurance funds.

3. Data

The data set used in this paper is a longitudinal register-based data set covering the municipality of Aarhus, the second largest municipality in Denmark. The data are taken from the administrative registers of the municipality, where the data have been used to determine welfare benefit payments, and they are therefore much more reliable than survey data. The final data set is obtained by merging the register data from the municipality of Aarhus with register data from Statistics Denmark in order to supplement with information not available at the municipality. The data set covers a three-year period from 1997 to the end of 1999. The current data set contains 2,985 persons, who each contributes with one welfare spell to the analysis. The persons in the data set are those individuals in the social system of the municipality who begin their welfare spell during the first

⁵The age limit has changed during the period of observation from 25 to 30 years.

6 months of 1998.

The data provide information on all welfare payments to the persons in the data set as well as information on all the policy measures they have participated in, including the type of the measure and the period of participation. This information allows us to construct event histories with a sequence of states and dates of transitions between states. In this study, the two main states of interest are welfare and employment. Other states that are identified in the event histories are sickness, rehabilitation, and out-of-the-labour-force. Participation in the various policy measures is treated as part of the welfare spell, but time-varying indicators are constructed for participation in each activity during the welfare spell. To make the analysis tractable, we will group the ASP measures into three different types: employment, training and other types of measures.

The data contain information on a large number of individual characteristics (demographic variables, labour market variables, etc.). These individual characteristics are used as explanatory variables in the empirical analysis. The demographic variables include gender, age, marital status, number of children, citizenship, and country of origin for immigrants and refugees. The labour market variables include previous working experience and labour market status of the spouse (if present), and the income variables include income obtained from various sources. Finally, the individual characteristics include highest obtained level of education and type of dwelling.

Descriptive statistics on the welfare spells are given in Tables 3.1 and 3.2. It is seen that there is a little overweight of men in the sample and that 2/3 of the sample consist of welfare recipients with unemployment as their only problem, as opposed to recipients with problems besides unemployment. Among individuals with unemployment as their only problem about 50 per cent are below 25 years and about 30 per cent are above 30 years, hence a considerable fraction of this group belongs to the youngest age group. In Table 3.2, the average duration of the welfare spells as well as the distribution between the completed and incomplete spells are shown. It is seen that more than 1/4 of the welfare spells were incomplete by the end of the observation period, and the average duration of these spells is obviously given by the length of the observation period. Because of the relatively large fraction of incomplete spells, it is hard to say anything about the true average duration of welfare spells, other than it for sure is above 12.7 months.

Table 3.1. Descriptive statistics on the welfare spells. Subgroups.

	Number		Distr. (%)	
Men	1,685		56.5	
Women	1,300		43.5	
Other problems	979		32.8	
Only unemployment	2,006		67.2	
<i>Among these</i>	<i><25 years</i>	<i>1,007</i>	<i>50.2</i>	
	<i>>30 years</i>	<i>624</i>	<i>31.1</i>	
All	2,985	<i>1,631</i>	100.0	<i>81.3</i>

Table 3.2. Descriptive statistics on the welfare spells. Mean duration and destinations states.

Destination	Number	Distribution (%)	Mean duration*
Employment	1,407	47.1	7.1
Other destinations	766	25.7	6.8
Incomplete	812	27.2	28.1
All	2,985	100,0	12.7

*Measured in months.

Descriptive statistics on the subsequent employment spells are given in Tables 3.3 and 3.4. It is seen that the analysis is based on a total of 1,695 subsequent employment spells, that is, more than half of the welfare recipients do, within the observation period, experience employment at some time after their welfare spell. 1,407 of these individuals enter employment directly from welfare, whereas the remaining 288 have had a period outside welfare (e.g. in rehabilitation) before entering employment. The average duration of the subsequent employment spells is around 10 months covering both completed and incomplete spells. Actually almost 50 per cent of the subsequent employment spells were incomplete by the end of the observation period, making the observed average duration downward biased.

Table 3.3. Descriptive statistics on the subsequent employment spells. Subgroups.

	Number		Distr. (%)	
Men	954		56.3	
Women	741		43.7	
Other problems	418		24.7	
Only unemployment	1,277		75.3	
<i>Among these</i>	<i><25 years</i>	<i>643</i>	<i>50.4</i>	
	<i>>30 years</i>	<i>371</i>	<i>29.1</i>	
All	1,695	<i>1,014</i>	100.0	<i>79.5</i>

Table 3.4. Descriptive statistics on the subsequent employment spells.
Mean duration and destinations states.

Destination	Number	Distribution (%)	Mean duration*
Unemployment	503	29.7	5.8
Other destinations	444	26.2	5.3
Incomplete	748	44.1	16.3
All	1,695	100,0	10.3

*Measured in months.

Table A.1 in the Appendix shows the sample characteristics for four subsamples divided according to participation in different types of ASP measures. In general, individuals participating in training measures seem to deviate from the other groups, especially with respect to the country of origin, past labour market experience, education and past income.

4. Model specification

Before the econometric specification is derived, it is necessary to define the state space and to provide an adequate description of the process of welfare, participation in active social policy programmes, and employment. The main problem is how to classify programme periods; Should they be considered a separate state, part of employment spells, or part of welfare spells? A number of approaches have been used in the literature.

Gritz (1993) works with three mutually exclusive states; employment, nonemployment, and programme participation. He assumes competing risks into the two states not occupied. In this way, selection into and out of programmes is explicitly modelled. He then compares the post-participation hazard rates of participants with hazard rates of non-participants. The same approach is used by Bonnal et al. (1997), and by Ham and LaLonde (1991, 1996) who use experimental data. Ridder (1986) defines subsidized employment as employment. He includes time-varying indicators for programme participation and completion. He does not model the selection process; he conditions on it. Dolton et al. (1994) treat participation as an event that takes place immediately after leaving school. They then use the traditional approach of Heckman (1979) to deal with selection bias.

When deciding on how to treat periods of programme participation in the present study, it is useful to review a few characteristics of the relationships between employment, welfare and ASP in Denmark. First, as mentioned earlier the

Danish active social policy is based on a 'right-and-duty' principle. As a consequence, the welfare recipients will participate in ASP measures if they stay on welfare sufficiently long. In this context, it seems unfair to compare the post-participation welfare hazard rate of a participant to a fresh welfare hazard of a non-participant, unless of course welfare duration is exponentially distributed. Rather, it should be compared to what the participant's welfare hazard would have been at the (duration) time of participation and thereafter, in the absence of participation. This suggests treating participation as an activity undertaken while on welfare, and measuring its effect by using time-varying indicators. Treating a participation period as a separate state would mean that the welfare spell of an individual returning to 'open welfare' after completion of the participation period would be treated as a fresh welfare spell. The same holds if the participation period is treated as part of an employment spell. Secondly, the duration of a participation period is not influenced by the individual (it is fixed in advance). Hence, the time spent in ASP measures does not fit into a duration model framework. Again, this suggests not to treat participation as a separate state.

Therefore, consider the following description of the process: Let there be two states; welfare and employment. When a welfare spell begins another process also begins, parallel to the welfare spell, measuring the time until programme participation and the type of participation. If the person finds a job before entering the ASP programme, the time until participation is treated as right censored. In this way, the selection process into and between programmes is explicitly modelled. When the person is in a programme, he is still in a welfare spell, but the hazard rate out of welfare is allowed to increase or decrease during the programme participation period. In the same way, we allow programme participation to have an effect after completion of the programme.

This approach, i.e. to treat programme participation as an activity undertaken while on welfare, is similar to that used by Abbring et al. (1996) to analyse the effect of a sanction on unemployed workers' search intensity. Non-parametric identification of the parameters of the model is proved by Abbring and van den Berg (2003).

4.1. Econometric specification

Let the random variable T_w denote the duration of welfare, T_e the duration of employment, T_a the duration from start of the welfare spell until participation in ASP, and $a(t)$ the type of ASP at time t , taking the value 0 when not participating and the values 1, 2 or 3 when participating in an employment programme, a training programme, or another type of ASP, respectively. In addition, let $c(t)$ be a time-varying indicator vector (3×1) for having completed an active social

policy period at some time previous to t . x_w , x_e and x_a are time-invariant vectors of explanatory variables, while v_w , v_e and v_a are unobserved terms.

When specifying a model for the duration of time spent in a given state, it is most convenient to do so in terms of the hazard rate. The hazard rate is the transition rate out of the state at time t , conditional on being in the state at least until t , i.e.

$$h(t) = \lim_{\Delta \rightarrow 0} \frac{\Pr(t < T \leq t + \Delta | T > t)}{\Delta}$$

The hazard functions for welfare and employment spells are assumed to be mixed proportional hazards,

$$h_w(t|x_w, a(t), c(t), v_w) = \lambda_w(t) \cdot \varphi_w(x_w, a(t), c(t)) \cdot \exp(v_w) \quad (4.1)$$

$$h_e(t|x_e, a, v_e) = \lambda_e(t) \cdot \varphi_e(x_e, a) \cdot \exp(v_e) \quad (4.2)$$

where it should be noted that the type indicator of ASP measures, $a(\cdot)$, is not time-varying in employment spells, since only the type of the last ASP completed in the previous welfare spell is used. By defining non-censoring indicators d_w and d_e (taking the value 1 if an observation is not censored, and 0 if it is), the likelihood contribution of a welfare spell and an employment spell is

$$\mathcal{L}_w = h_w(t|x_w, a(t), c(t), v_w)^{d_w} \cdot \exp\left[-\int_0^t h_w(s|x_w, a(s), c(s), v_w) ds\right] \quad (4.3)$$

$$\mathcal{L}_e = h_e(t|x_e, a, v_e)^{d_e} \cdot \exp\left[-\int_0^t h_e(s|x_e, a, v_e) ds\right] \quad (4.4)$$

We only consider the case of transition from welfare to employment, that is, if a welfare spell is ended for another reason than employment (for instance sickness or rehabilitation) the spell will be considered as censored at the time of leaving welfare.

To model the duration until participation in ASP, as well as the type of participation (employment, training or other), we use a competing risks specification, so the model is presented in terms of destination-specific hazard rates,

$$h_{ai}(t|x_p, v_{ai}) = \lambda_{ai}(t) \cdot \varphi_{ai}(x_a) \cdot \exp(v_{ai}), \quad i = 1, 2, 3 \quad (4.5)$$

$$h_a(t|x_a, v_a) = h_{a1}(t|x_a, v_{a1}) + h_{a2}(t|x_a, v_{a2}) + h_{a3}(t|x_a, v_{a3}) \quad (4.6)$$

where $v_a = (v_{a1}, v_{a2}, v_{a3})$. The likelihood contribution is

$$\begin{aligned} \mathcal{L}_a &= h_{a1}(t|x_a, v_{a1})^{\mathbf{1}_{\{a(t)=1\}}} \cdot h_{a2}(t|x_a, v_{a2})^{\mathbf{1}_{\{a(t)=2\}}} \cdot h_{a3}(t|x_a, v_{a3})^{\mathbf{1}_{\{a(t)=3\}}} \\ &\quad \cdot \exp\left[-\int_0^t h_a(s|x_a, v_a) ds\right] \end{aligned} \quad (4.7)$$

where the indicator functions are for transitions into the three different ASP measures.

The baseline hazard rates are assumed to be piecewise constant, i.e. $\lambda_j(t) = \exp(\alpha_{jm})$, $m = 1, \dots, M_j$, $j = w, e, a$, where M_j is the number of intervals for baseline hazard j . The observed part of the individual-specific hazard function has the following specification: $\varphi_j(X_j(t)) = \exp(X_j(t)'\beta_j)$, $j = w, e, a$, where $X_w(t) = \{x_w, a(t), c(t)\}$, $X_e(t) = \{x_e, a\}$ and $X_a(t) = x_a$.

An important issue concerns the treatment of unobserved variables in the models specified above, and in particular the treatment of their interdependencies. If there were no unobservables or if the unobservables were independent, the log-likelihood function would be additively separable in the parameters describing time spent in each of the states, and inference concerning the effects of ASP measures on the duration of welfare could be based on maximization of the product of terms like \mathcal{L}_w above. If this is not the case, neglect of unobservable characteristics and their potential correlation may lead to biases in the estimated returns to participation in the ASP measures.

In the present study, we apply a flexible formulation where we model unobservables by allowing a separate unobserved variable in each of the hazard rates with arbitrary correlation between them. Let there be three unobservable variables, V_w, V_e and V_a . V_a consists of three unobservable variables, V_{a1}, V_{a2} and V_{a3} , entering each of the three hazard rates for transitions into ASP. This specification allows for arbitrary correlation between the unobserved variables in the selection equation, employment equation, and welfare equation, whereas the correlation of the unobservables in the three hazard rates for transition into ASP, V_{a1}, V_{a2} and V_{a3} , is restricted to be either 1 or -1 . The contribution to the likelihood function for a single individual is then the product of likelihood contributions from the person's employment, welfare, and pre-participation spells, conditional on the unobserved variables, and then integrated with respect to the distribution of unobserved variables, that is, a three-dimensional integral:

$$\mathcal{L} = \int_{V_w} \int_{V_e} \int_{V_a} \mathcal{L}_w(t_w|x_w, V_w) \cdot \mathcal{L}_e(t_e|x_e, V_e) \cdot \mathcal{L}_a(t_a|x_a, V_a) dG(V_w, V_e, V_a) \quad (4.8)$$

In this analysis we apply a discrete distribution with two unrestricted mass-point locations for each of the marginal distributions of the unobserved variables. Let $v_w^1, v_w^2, v_e^1, v_e^2, v_a^1$ and v_a^2 be the six mass-points of V_w, V_e and V_a , respectively. The associated probabilities are then as follows:

$$\begin{aligned} \Pr(V_a = v_a^1, V_e = v_e^1, V_w = v_w^1) &= p_1 & \Pr(V_a = v_a^2, V_e = v_e^1, V_w = v_w^1) &= p_5 \\ \Pr(V_a = v_a^1, V_e = v_e^1, V_w = v_w^2) &= p_2 & \Pr(V_a = v_a^2, V_e = v_e^1, V_w = v_w^2) &= p_6 \\ \Pr(V_a = v_a^1, V_e = v_e^2, V_w = v_w^1) &= p_3 & \Pr(V_a = v_a^2, V_e = v_e^2, V_w = v_w^1) &= p_7 \\ \Pr(V_a = v_a^1, V_e = v_e^2, V_w = v_w^2) &= p_4 & \Pr(V_a = v_a^2, V_e = v_e^2, V_w = v_w^2) &= p_8 \end{aligned}$$

with $0 \leq p_i \leq 1$ for $i = 1, \dots, 8$, and $\sum_{i=1}^8 p_i = 1$. We normalize the distribution of the unobservables by letting $\exp(v_j^1) = 1$ for $j = w, e, a$.

We next turn to a discussion concerning the identification of the main parameters of interest: the baseline parameters and the causal effect of different types of ASP measures. Contrary to the case analyzed by Abbring and van den Berg (2003), these parameters are not necessarily non-parametrically identified, due to the universality of the social system; no one is left to go without any kind of ASP measures. This means that we cannot identify the baseline parameters non-parametrically, due to the lack of a non-treated comparison group. Since the baseline is not identified, it follows that the causal effect parameters are not identified either (as they are measured against the baseline of the otherwise identical comparison group). There is, however, variation in the type and timing of ASP applied, which can be used to identify all parameters of the model with one assumption, often invoked anyway:

A1: The multiplicative causal effect of at least one of the social policy measures is constant over the course of a welfare spell.

Persons participating in a certain policy measure in the early stages of the welfare spell thus contribute by identifying the causal effect of that measure (since in the early stages, there will be some individuals who have not been in ASP yet - a comparison group). Any later periods of not participating in any measures for these persons thus identify the baseline parameters in the later stages of the welfare spell. Hence, the baseline is identified, and therefore so are all the remaining causal effect parameters.

Assumption A1 may be weakened substantially by allowing the effect to vary with the time until participation in the first ASP programme. In the estimations reported in the next section, we allow for the causal effects of the two main types of ASP programme to be a quadratic function of time until participation, while for the 'other' ASP measure we assume a constant effect.

Another necessary assumption is the absence of an anticipation effect: the welfare recipients may know the distribution of the duration until participation in an ASP measure, but we assume that they do not know in advance the exact realisation of that duration.⁶ Anticipation effects are not likely to be a serious problem in the present context, where durations are measured in months, since only in very rare cases do individuals know more than a month in advance the exact date at which they are scheduled to start in an ASP measure.

The baseline hazard of the welfare spell, $\lambda_w(t)$, is divided into 12 intervals:

⁶See Abbring and van den Berg (2000), Lalive et al. (2002) and Richardsson and van den Berg (2002) for more discussion of anticipation effects.

0-1, 1-2, 2-3, 3-4, 4-5, 5-6, 6-8, 8-10, 10-12, 12-18, 18-24, 24-36 and >36 months; the baseline hazard of the employment spells, $\lambda_e(t)$, is divided into 5 intervals: 0-3, 3-6, 6-12, 12-18 and >18 months; and the baseline hazards of the time until each type of ASP, $\lambda_{ai}(t)$, $i = 1, 2, 3$, are each divided into 3 intervals: 0-1, 1-6 and >6 months, where the baseline hazard in each interval is assumed constant. We hence estimate α_{wm} ($m = 1, \dots, 12$), α_{em} ($m = 1, \dots, 5$), α_{a1m} ($m = 1, \dots, 3$), α_{a2m} ($m = 1, \dots, 3$), α_{a3m} ($m = 1, \dots, 3$), β_w (vector of 36 parameters), β_e (vector of 23 parameters), $\beta_{a1}, \beta_{a2}, \beta_{a3}$ (each a vector of 16 parameters), $v_w^2, v_e^2, v_{a1}^2, v_{a2}^2, v_{a3}^2, p_1, p_2, p_3, p_4, p_5, p_6$ and p_7 .

When estimating the full model, we have problems identifying all of the unobserved heterogeneity terms. We thus impose the restriction that the unobserved heterogeneity terms of the welfare and the employment spells, v_w and v_e , are perfectly correlated, hence $p_2 = p_3 = p_6 = p_7 = 0$.⁷

5. Results

In this section we will present and analyse the various estimation results from the model in (4.8).

5.1. The transition from welfare to employment

The estimated average baseline hazards for the welfare spells are plotted in Figures 5.1 and 5.2, while the rest of the estimation results on the duration of welfare are shown in Tables 5.1 and 5.3. The presented average baseline hazard rates are evaluated at the mean values of the covariates (observed as well as unobserved). The results are presented for different groups divided by certain characteristics. This allows us to differentiate effects of the ASP between different types of individuals and thereby identifying the individual groups experiencing the largest gains from ASP. The sample is sequentially split into males and females, individuals with problems besides unemployment and individuals with unemployment as the only problem, and finally for individuals with unemployment as the only problem the group is further split into individuals below 25 years and individuals above 30 years.⁸

The most prevalent result in the international literature of negative duration dependence for transition from welfare to employment is also found in the present

⁷This restriction still allows for unrestricted correlation between the selection equation and the equations of interest.

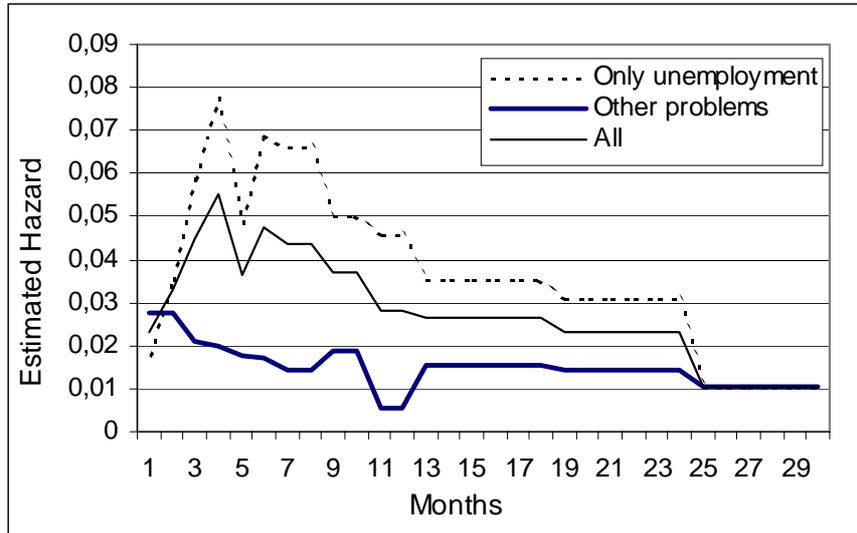
⁸The last division is based on a division in the social law between younger and older persons. The reason for not including individuals between 25 and 30 years is that the age limit was changed from 25 to 30 years in June 1998, and hence by including them we would risk getting the results for the two subgroups (partly) mixed up.

analysis for individuals who have been welfare recipients for 6 months or more. However, we see a steep *positive* duration dependence during the first four months. The finding of positive duration dependence during the first months is not unique. van den Berg et al. (2004) also find a positive duration dependence for the first months, although less steep. These results differ from previous results of overall negative duration dependence (see e.g. Blank (1989) or Barrett (2000)) in two main aspects: First of all, the welfare benefits in both Denmark and the Netherlands are means-tested. This implies that the income of a possible partner and the level of personal assets influence the level of welfare benefits the applicant is entitled to. Furthermore, at least in Denmark, knowledge of future high incomes might also prevent the applicant from being entitled to welfare benefits or they might have to pay back some of the welfare benefits. These restrictions might prevent people with only temporary need for welfare benefits from applying at all. Another potential explanation is the presence of the ASP itself; the expectation of future participation in ASP might motivate some welfare recipients to find employment.⁹ Furthermore, by keeping individuals active during their welfare spell, the entire baseline hazard might be tilted towards more positive duration dependence, making the later drop in the baseline hazard less extensive. However, these hypothesized effects are not testable unless one removes the ASP system again (at least for some individuals or regions).

We find no significant gender difference in the estimated average baseline hazard (not shown). Figure 5.1 shows the difference between the hazard rates of individuals with unemployment as the only problem and individuals with problems besides unemployment. For individuals with problems besides unemployment, we find overall negative duration dependence. This result corresponds to the findings of Blank (1989), and can be explained by the fact that American welfare recipients are similar to Danish welfare recipients with problems besides unemployment. Not surprisingly, the level of the hazard from welfare to employment is lower for this group than for persons with unemployment as the only problem, which just confirms the *a priori* expectation that persons with problems besides unemployment will have more difficulties escaping welfare dependence. After 24 months of welfare dependence the transition rate from welfare to employment is, however, at the same level for the two groups. In Figure 5.2, the estimated hazard rate, for welfare recipients with unemployment as the only problem, is further divided into people aged 25 or less and people aged 30 or more. It is seen that the initial steep increase in the hazard rate is most prevalent for the young age group. This might be further evidence on the presence of a motivation effect, i.e. knowing they soon have to participate in ASP motivates the welfare recipients to

⁹For more evidence along these lines, see Black et al. (2002). Basically, this also corresponds to using workfare as a screening device, see Kreiner and Tranæs (2001) for a formal analysis.

Figure 5.1: Estimated hazard rate for transition from welfare to employment.

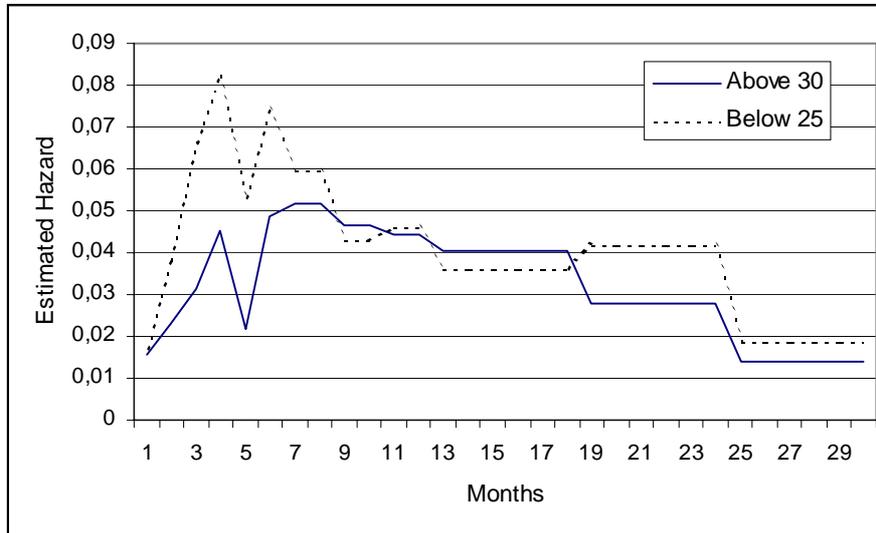


leave welfare before participation. Since individuals below 25 will be subjected to an ASP measure during the first three months on welfare, the motivation effect will result in a higher initial increase in the hazard rate. For welfare spells lasting 9 to 18 months the transition to employment is the same for the two age groups, whereas the young age group both have higher transition rates out of short and long welfare spells.

5.1.1. The effects of ASP on the duration of welfare

The estimation results from the part of the model concerning the effects of ASP on the duration of welfare is presented below in Table 5.1. The estimated employment effects of the ASP measures vary for the three different types of ASP. Since 'other ASP' covers a wide range of different ASP measures, we do not present explicit results for this type of ASP programme. We find locking-in effects both for training measures and employment measures, although the locking-in effect for the employment measures only is significant at a 10 per cent significance level. Regarding the post-programme effects we find a significant positive effect of the employment measures. Actually, the transition rate from welfare to employment is more than three times as high after a period of employment-based ASP compared to no ASP. For training measures on the other hand we find a negative post-programme effect. We find that having attended training measures lowers

Figure 5.2: Estimated hazard rate for transition from welfare to employment.



the transition rate from welfare to employment to half of the transition rate for non-participants. The ASP effects differ between the subgroups. We find for instance no locking-in effects of employment-based ASP for male participants, and the post-programme effect of training measures is insignificant for female participants. That is, the effect of employment measures seems to be better for men, and the effect of training measures seems to be less damaging for women.

Table 5.1. The effect of ASP on the transition from welfare to employment.

Variable	All		Women		Men	
<i>Effects of social policy measures</i>						
During employment ASP	-0.37	<i>0.23</i>	-1.47	<i>0.64</i>	0.04	<i>0.26</i>
After —————	1.21	<i>0.27</i>	0.92	<i>0.54</i>	1.46	<i>0.33</i>
During training ASP	-1.82	<i>0.21</i>	-1.56	<i>0.32</i>	-2.10	<i>0.32</i>
After —————	-0.60	<i>0.24</i>	-0.39	<i>0.38</i>	-0.87	<i>0.33</i>
During other ASP	-0.10	<i>0.15</i>	0.33	<i>0.22</i>	-0.39	<i>0.24</i>
After —————	-0.70	<i>0.22</i>	-0.43	<i>0.32</i>	-0.92	<i>0.35</i>
After empl. ASP*time ¹⁾	1.64	<i>0.90</i>	3.35	<i>1.78</i>	1.87	<i>1.97</i>
After empl. ASP*time sqd.	-1.03	<i>0.69</i>	-1.53	<i>1.21</i>	-2.55	<i>2.30</i>
After training ASP*time ¹⁾	1.97	<i>1.19</i>	1.90	<i>2.11</i>	2.37	<i>1.60</i>
After training ASP*time sqd.	-1.54	<i>1.20</i>	-1.90	<i>1.99</i>	-1.57	<i>1.74</i>

Note: Standard errors in italic.

Parameter estimates in bold are significant at a 5 % significance level

1) Time until participation is measured in years

Table 5.1 (cont...). The effect of ASP on the transition from welfare to employment.

Variable	Only unemploy.		Other problems		Below 25		Above 30	
<i>Effects of social policy measures:</i>								
During employment ASP	-0.71	<i>0.32</i>	-0.27	<i>0.56</i>	-1.11	<i>0.28</i>	-1.34	<i>0.50</i>
After —————	0.93	<i>0.42</i>	1.12	<i>0.66</i>	1.13	<i>0.28</i>	-0.94	<i>0.67</i>
During training ASP	-2.01	<i>0.43</i>	-1.42	<i>0.33</i>	-2.76	<i>0.60</i>	-1.18	<i>0.58</i>
After —————	0.29	<i>0.44</i>	-0.96	<i>0.56</i>	0.18	<i>0.32</i>	-1.27	<i>1.13</i>
During other ASP	-0.47	<i>0.38</i>	0.55	<i>0.26</i>	-0.84	<i>0.42</i>	-0.28	<i>0.72</i>
After —————	-0.57	<i>0.37</i>	0.32	<i>0.43</i>	-0.69	<i>0.40</i>	-0.90	<i>1.06</i>
After empl. ASP*time ¹⁾	1.90	<i>1.01</i>	0.17	<i>5.47</i>	-0.05	<i>0.53</i>	4.75	<i>2.22</i>
After empl. ASP*time sqd.	-1.30	<i>0.72</i>	-0.09	<i>5.41</i>	-0.01	<i>0.03</i>	-3.10	<i>1.69</i>
After training ASP*time ¹⁾	0.59	<i>1.74</i>	2.72	<i>2.69</i>	0.54	<i>1.69</i>	5.23	<i>3.52</i>
After training ASP*time sqd.	-0.71	<i>1.63</i>	-2.21	<i>3.10</i>	-0.68	<i>1.67</i>	-3.28	<i>2.62</i>

Note: Standard errors in italic.

Parameter estimates in bold are significant at a 5 % significance level

1) Time until participation is measured in years

5.1.2. Timing effects of ASP

The post-programme effects of the various ASP measures are allowed to depend on the timing of the ASP by including a quadratic function of time until participation

in ASP interacted with the completion indicators for the employment and training measures. The multiplicative effects are illustrated in Figures 5.3 and 5.4, where we have plotted the effects as a function of time on welfare until participation.¹⁰ For the employment measures we find that the post-programme effect for all reaches a maximum when ASP is applied after nearly ten months on welfare. We actually find that individuals who participate in employment programmes after ten months on welfare have a hazard rate 6.5 times as high as the hazard rate for non-participants. The highest post-programme effect of training measures for all is found when the participation occurs after nearly 8 months on welfare, although the transition rate here is the same as the transition rate for non-participants. The timing effects differ between subgroups as well. Figures 5.3 and 5.4 also show the different effects for male and female participants, and it is seen that both the level and time of the maximum effect differ between male and female participants. The figure implies that the optimal effects of employment-based ASP are obtained by targeting men for early participation (after 4-5 months), whereas women should start their ASP measure after about 13 months. Since we find no evidence of locking-in effects for men, there appears to be a strong case for early participation in employment-based ASP for men. For women, the presence of severe locking-in effects in combination with a maximum post-programme effect at 13 months of welfare duration, implies that it is better to postpone participation in employment-based ASP until after one year. For training measures the largest post-programme effect is found for women participating after about 6 months of welfare, although the effect is not significantly different from zero.¹¹ Concerning the other subgroups (not shown graphically), we find that employment measures are better for people with problems besides unemployment than for people with unemployment as the only problem, *if* the participation period is in the beginning of the welfare spell. However, if ASP is applied after between 2 and 15 months of welfare the largest post-programme effect is found for individuals with unemployment as the only problem. Furthermore, for people with unemployment as the only problem both employment and training measures show the best effect for individuals aged 25 or below. For training measures, the post-programme effect does not depend significantly on the time until participation for any of the subgroups.

5.1.3. Expected duration of welfare and the optimal timing of ASP

For some groups, we find that participation in certain types of programmes has a locking-in effect as well as a positive post-programme effect. This raises the

¹⁰In these figures, a multiplicative effect equal to 1 corresponds to no post-programme effect.

¹¹The estimates presented in Table 5.1 show that none of the individual coefficients of the quadratic function of time are significant at a 5 per cent significance level. However, below in Section 6 we present evidence on test statistics showing that they are jointly significant.

Figure 5.3: Multiplicative post-programme effect of employment measures as a function of time until participation.

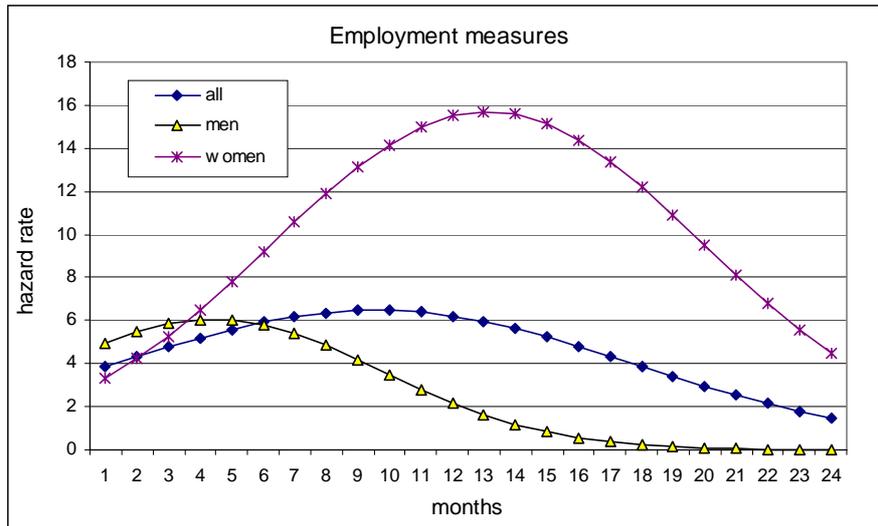


Figure 5.4: Multiplicative post-programme effect of training measures as a function of time until participation.



question of whether the net effect on the expected duration of a welfare spell is positive or negative. Moreover, it may also be the case that the net effect of a programme varies with time until participation, not only because the post-programme effect varies, but also because the locking-in effect has more weight when an individual participates early in a welfare spell. It is easily shown that for a piecewise constant baseline hazard model, with covariates that are also constant within unit time intervals, the expected duration of a welfare spell is

$$E[T_w|\{X_w(t)\}, v_w] = \sum_{i=1}^{\infty} \frac{1}{h(i|X_w(i), v_w)} \cdot \Pr[i-1 < T_w \leq i|X_w(i), v_w]$$

where $\{X_w(t)\}$ denotes the entire covariate process. We have calculated the expected duration of a welfare spell for a standard person¹² as a function of the type and timing of programme participation. It is assumed that employment programmes last for 6 months, training programmes for 9 months, and that other programme participation lasts for 5 months.¹³ The expected duration is plotted as a function of time until participation in Figure 5.5. It is seen that the expected duration for the standard person in the absence of programme participation is 21 months. The net effect of programme participation is the vertical distance between the expected duration for a non-participant and the expected duration for a person participating in a certain programme. The net effect of employment programmes is positive, irrespective of when the participation period begins, but it is larger the earlier the person begins in the programme. This might be a bit surprising since the post-programme effect is largest if programme participation begins after 9 months on welfare, but the reason is that the locking-in effect is quite small and the post-programme effect can be enjoyed for a longer period of time the earlier the person begins. For training and other programmes it is evident that the net effect is always negative.

In Figures 5.6 and 5.7, we plot the expected durations for men and women, respectively. It is seen that for men, only employment programmes have a positive net effect, and it is only positive if participation starts during the first 14 months on welfare. Hence, there is a strong case for targeting men for early participation

¹²The standard person is male, aged 30-40, of Danish nationality, has 5-10 years of previous working experience, has a high school education, is not married, has no children, owns his own home, is on welfare because of unemployment, which is his only problem, is not a refugee or an immigrant, and had an income in 1997 of DKK 100,000. Note, that the choice of standard person does not influence the relative effect of the timing of ASP, i.e., changing the standard person will solely shift the curves presented in Figures 5.5-5.7 up or down.

Since the unobserved variable takes two values, one of which corresponds to perpetual welfare receipt, we have calculated the expected duration for the group with a non-zero hazard rate.

¹³These numbers correspond to the average duration of the three ASP measures observed in the data.

Figure 5.5: Expected duration of welfare, all

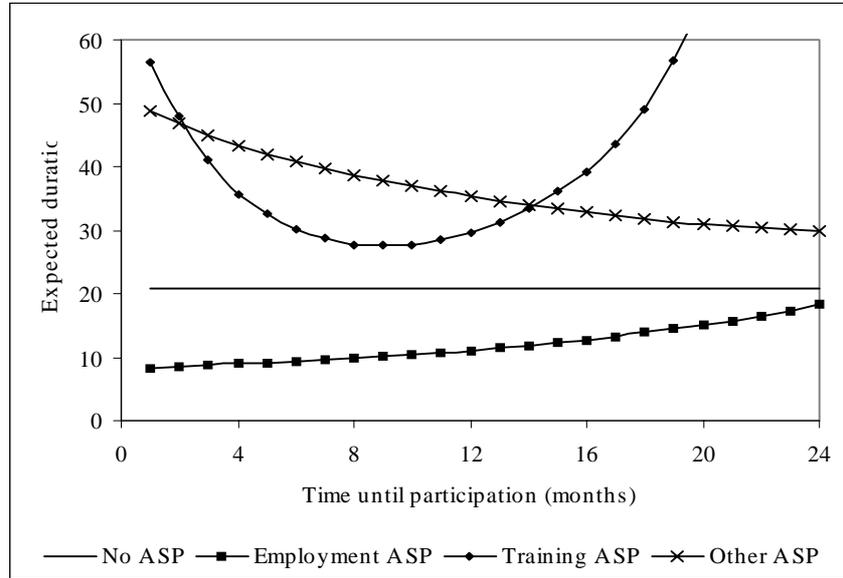


Figure 5.6: Expected duration of welfare, men

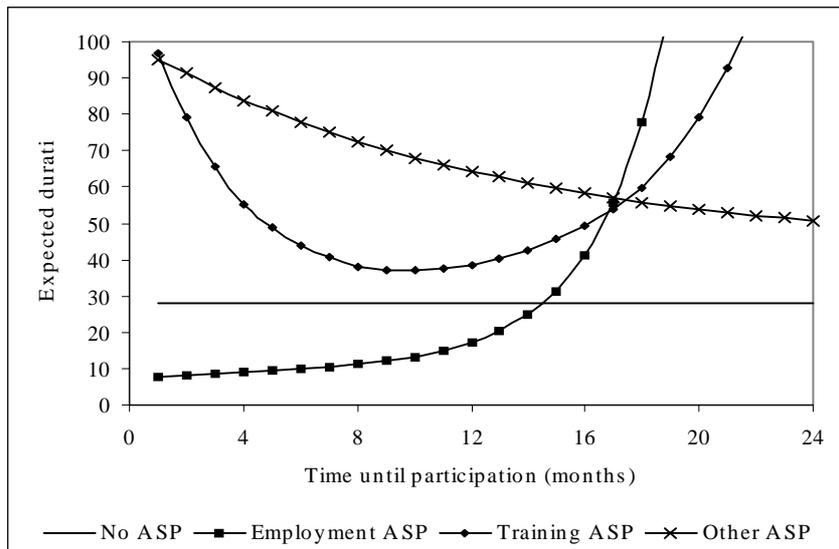
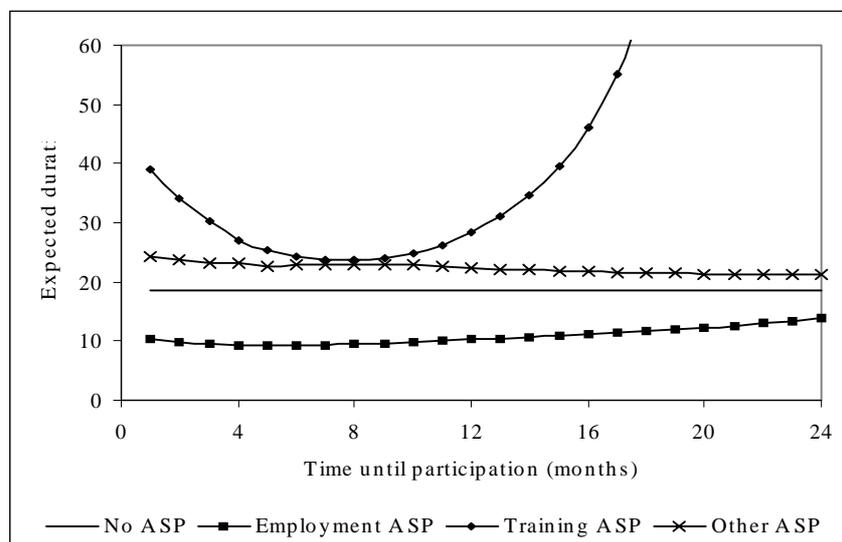


Figure 5.7: Expected duration of welfare, women



in employment programmes. However, none of the other programmes can be recommended for men, as they all imply large negative net effects. For women, the post-programme effect of an employment programme is largest if participation in the programme begins after 13 months on welfare. However, the net effect is largest after 6 months on welfare. This is caused by two things: first, by participating earlier, the positive post-programme effect can be enjoyed for a longer period, and secondly, early participation implies more weight on the locking-in effect, which is significantly negative for women. Nevertheless, the net effect of employment programmes is positive for women irrespective of when the participation period begins. The effects of training and other programmes are once again unequivocally negative.

We can thus conclude that employment programmes generally imply a reduction in the expected duration of welfare, although for men this only holds if the person begins the programme before 15 months of elapsed welfare. Moreover, men should be targeted for very early participation in employment programmes, while women should participate after approximately 6 months of welfare duration in order to achieve the maximum net effect. All other programmes should be abandoned, unless their purpose is something else than 'employability'.

Next, we will compare the optimal application of ASP with the way ASP on average is applied to the individuals in the sample. As we saw above, the standard woman would have an expected welfare duration of about 9 months if

she is participating in employment-based ASP after 6 months of welfare, which is the optimal application of ASP for females. The standard man would have an expected welfare duration of about 8 months if he is participating optimally in ASP, which is the case with instant participation in employment-based ASP. Table 5.2 shows the potential gains in the expected welfare duration for individuals participating in ASP. It is seen that 80 per cent of the female participants are participating in either training or other ASP measures. By changing the type and timing of their present ASP to the optimal ASP, the potential gain in the expected duration would be of between 14 and 18 months. For male participants, the potential gains in expected welfare durations are even larger. About 41 and 26 per cent are participating in training and other types of ASP, respectively. The gain from changing the type and timing of ASP for these groups is a decrease in the expected duration of respectively 37 and 72 months. For men participating in employment-based ASP there is a potential gain of 3 months if the timing of the ASP is changed from participating after on average 8 months of welfare to instant participation. Hence, there is a large potential gain by changing the present type and timing of ASP to the optimal ASP.¹⁴

Table 5.2. Potential gains in the expected duration of welfare by changing present type and timing of ASP.

Present type and timing	Per cent of participants	Exp. duration ¹⁾		Potential gain*
		present timing*	optimal ASP*	
<i>Women:</i>				
employment after 7 months	20 %	9	9	0
training after 7 months	44 %	27	9	18
other after 6 months	36 %	23	9	14
<i>Men:</i>				
employment after 8 months	33 %	11	8	3
training after 6.5 months	41 %	45	8	37
other after 6.5 months	26 %	80	8	72

1) For the standard person calculated above.

* In months

Previous studies have also found that training measures are doing less well or worse than other types of programmes (see for example Carling and Richardson (2001) and Sianesi (2002)). However, the result found in this analysis is

¹⁴It should, however, be emphasized that the full potential gains may not be realisable, since the analysis does not take general equilibrium effects into account.

much stronger: training measures are directly damaging for the welfare recipients' chance of obtaining employment. How can this be? It certainly seems - also from international evidence - that training measures do not improve the chance of leaving welfare for employment, but how can they damage the chance? The answer should most likely be found in the behaviour of the job-seeker. According to the basic job search model (as presented by e.g. Mortensen (1986)) the employment possibilities of an unemployed person depend on the rate at which jobs are offered to the unemployed and the probability with which the unemployed accepts the offered jobs. The job offer arrival rate depends among other things on the qualifications of the unemployed, and the acceptance probability depends on the reservation wage of the unemployed which is determined by the expected present value of unemployment. Hence, there are basically two ways of increasing the employment possibilities of an unemployed person: either by increasing the job offer arrival rate or by lowering the reservation wage. The intention of training measures is to increase the qualifications of the participants and thereby increase the job offer arrival rate. The welfare recipients might, however, overestimate the qualifications obtained by the training programmes in such a way that the demands he or she puts on a future job will increase, leading to a more narrow search and/or higher reservation wages. That is, instead of increasing the job offer arrival rate, training programmes may simultaneously increase the reservation wage due to a (false) belief in improved qualifications and decrease the job offer arrival rate due to a more narrow search, thus producing two effects that lower the transition rate out of welfare.

The positive effect of the employment measures is on the other hand more in line with the intention of the active social policy. According to search theory the increased transition rate from welfare to employment after participation in employment measures can be due to several factors. Employment measures may increase the search intensity, for instance due to a higher self-confidence of the job-seeker, improved work habits, or a closer contact to the labour market. Employment measures may also increase the job offer arrival rate because the qualifications of the job-seeker have been improved. Finally, employment measures may also lead to a lower reservation wage, since the (subjective) present value of being unemployed will decrease when the job-seeker realise that he or she has an obligation to 'work', in some cases even at a wage that is not higher than social assistance benefits.

5.1.4. The effects of background characteristics

The effects of the background variables are presented in Table 5.3 below.¹⁵ It is seen that the individual characteristics also are important in explaining the duration of welfare. The age-variables indicate that the younger the recipients are, the higher is the transition rate from welfare to employment. Ethnicity also influences the hazard, in such a way that persons with an LDC origin experience much longer welfare spells. Working experience has a strong positive effect on the hazard rate; persons with less than 5 years of previous working experience have a significantly lower transition from welfare to employment. Education affects the transition rate from welfare to employment in such a way that individuals with basic schooling or vocational education as their highest educational level have a lower transition rate compared to individuals with a short or medium higher education.¹⁶ Having children between 0 and 6 years of age decreases the hazard from welfare to employment, whereas being married or being a woman does not influence the hazard. Not surprisingly, being a welfare recipient with no other problems than unemployment decreases the duration of welfare compared to the group of people with problems besides unemployment. The level of income the year before entering welfare is included as an approximation of the welfare recipients' expected income during employment. In accordance with previous analyses (see e.g. Jensen and Verner (1996)), we find a positive effect on the transition rate to employment for this variable, indicating that a higher expected employment income decreases the duration of the welfare spell, supposedly because of the economic incentives to find employment. Surprisingly, the labour market status of the partner does not seem to have a significant effect on the duration of welfare, despite the fact that welfare benefits are means-tested. Finally, the reason for applying for welfare is included as indicator variables for the three most frequent reasons: unemployment, sickness and being refugee/immigrant. We find that being welfare recipients because of a refugee/immigrant-status increases the duration of welfare compared to the other states, although the difference between the refugee/immigrant and the sickness groups is not significant.

¹⁵The effects of the background variables for the different subgroups do not differ substantially from those for the entire group. We have consequently chosen only to present one set of results.

¹⁶Individuals with missing educational level are mainly immigrants and refugees who have not undertaken any education in Denmark, since home country education is not observed for these individuals.

Table 5.3. Estimates of parameters for the transition rate from welfare to employment.

Variable	All	
<i>Background characteristics:</i>		
Female	-0.05	<i>0.07</i>
< 25 years	0.68	<i>0.14</i>
25 - 30 years	0.55	<i>0.14</i>
30 - 39 years	0.37	<i>0.13</i>
> 50 years	-0.80	<i>0.27</i>
Danish origin	-0.13	<i>0.13</i>
LDC origin	-0.65	<i>0.15</i>
Labour market experience 0-5 years	-0.26	<i>0.11</i>
Labour market experience 6-10 years	-0.08	<i>0.12</i>
Schooling variable missing	-0.41	<i>0.20</i>
Basic schooling	-0.37	<i>0.18</i>
High school	-0.14	<i>0.19</i>
Vocational education	-0.36	<i>0.17</i>
Long higher education	-0.34	<i>0.27</i>
Married	-0.03	<i>0.10</i>
No. of children 0-6 years	-0.20	<i>0.09</i>
Dwelling: rented	-0.25	<i>0.10</i>
Dwelling: owned	-0.15	<i>0.12</i>
Partner on welfare	-0.17	<i>0.11</i>
Partner employed	-0.09	<i>0.08</i>
Unemployment as only problem	0.18	<i>0.09</i>
No income in 1997	-0.14	<i>0.09</i>
Income in 1997 (in DKK 100,000)	0.11	<i>0.04</i>
<i>Reason for first welfare application:</i>		
Unemployment	-1.05	<i>0.08</i>
Sickness	-1.58	<i>0.19</i>
Refugee/immigrant	-1.93	<i>0.32</i>

Note: Standard errors in italic.

Parameter estimates in bold are significant at a 5 % significance level.

Reference groups can be seen in Table A1 in the Appendix.

5.2. The duration of subsequent employment spells

We next turn to the duration of subsequent employment. Figures 5.8 and 5.9 present the estimated baseline hazards, and Tables 5.4-5.5 present the estimation

results. As expected, we find negative duration dependence, indicating that the risk of ending a subsequent employment spell decreases with the duration of the spell. For individuals who during their welfare spell had problems beside unemployment, no significant duration dependence is found. Surprisingly, the hazard rate out of subsequent employment is lower for this group, indicating that the risk of ending a possible employment spell is lower for individuals with problems beside unemployment. When analyzing the welfare durations we found that the chance of getting subsequent employment was lower for this group; however, if individuals in this group do succeed in finding employment it seems that they have a higher chance of remaining employed. This may be related to the type of job that they obtain, but the data do not allow us to investigate this issue further. Those who had unemployment as their only problem have an initially high separation rate from their subsequent employment. This may be due to a lot of temporary jobs for this group or it may be a result of a strong sorting process by the employers. Again, the data contain no information on this. When splitting the group of individuals who had no problems besides unemployment into the young and old age groups, we see that the high hazard out of subsequent employment is due to the old age group. Individuals younger than 25 have a lower risk of leaving subsequent employment again.

Figure 5.8: Estimated baseline hazards for subsequent employment spells. Transition out of employment.

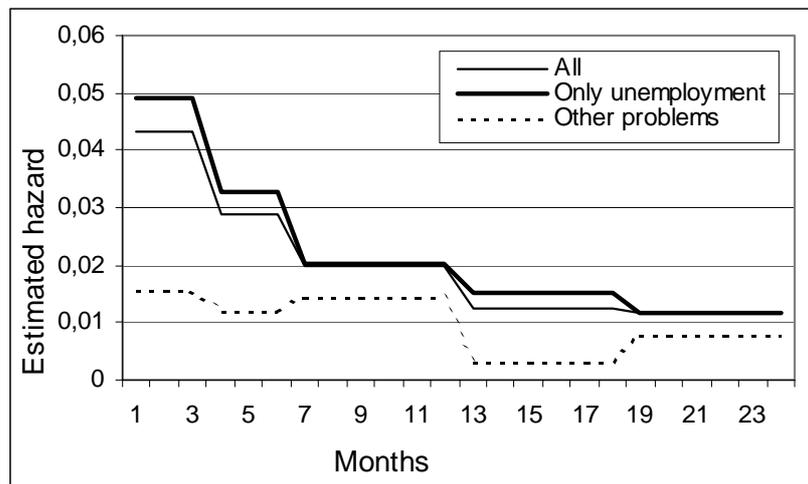
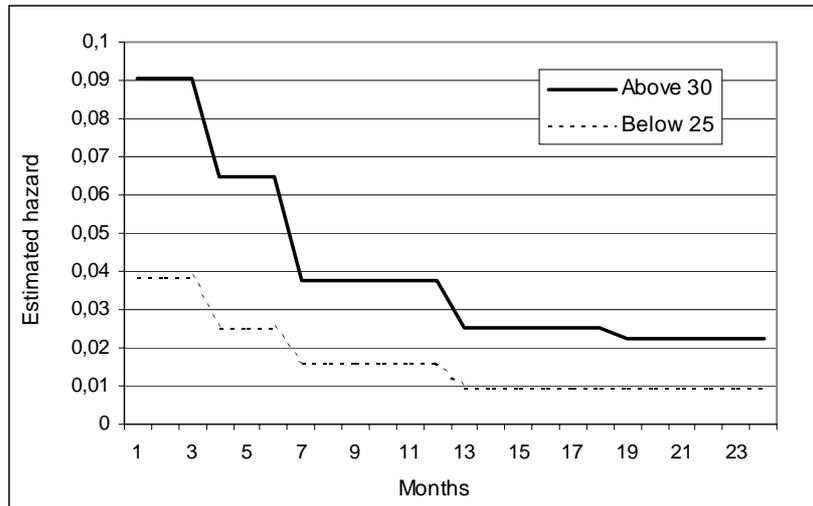


Figure 5.9: Estimated baseline hazards for subsequent employment spells. Transition out of employment.



5.2.1. The effects of ASP on the duration of subsequent employment

The effects of ASP on the duration of subsequent employment are given by two different effects: that of the type of the latest ASP programme applied during the welfare spell and that of the cumulated duration of time spent in ASP. The reference group for each of these effects is the group of non-participants. Table 5.4 presents the results. We find no significant effects of the cumulated duration of ASP measures. Having attended either employment or training measures affects the hazard rate out of employment positively compared to not having participated in ASP. An explanation for this result might be that participating in ASP leads the unemployed to certain jobs which they might not yet be qualified for, and therefore the subsequent separation rate will be high. However, none of these affects are significant at a 5 per cent significance level.

Table 5.4. The effect of ASP on the transition out of subseq. employment.

Variable	Total		Women		Men	
<i>Effects of ASP:</i>						
Employment measure	0.52	<i>0.36</i>	0.05	<i>0.62</i>	1.14	<i>0.59</i>
Training measure	0.33	<i>0.25</i>	0.21	<i>0.43</i>	0.53	<i>0.35</i>
Other measure	-0.11	<i>0.23</i>	0.30	<i>0.35</i>	-0.42	<i>0.38</i>
Cumulated dur. of ASP (years)	-0.03	<i>0.29</i>	0.13	<i>0.57</i>	-0.35	<i>0.37</i>
ln(duration of welfare (months))	0.07	<i>0.06</i>	0.19	<i>0.11</i>	0.02	<i>0.08</i>

Note: Standard errors in italic.

Parameter estimates in bold are significant at a 5 % significance level.

Table 5.4(cont...). The effect of ASP on the transition out of subseq. employment.

Variable	Only unemploy.		Other problems		Below 25		Above 30	
<i>Effects of ASP:</i>								
Employment measure	0.17	<i>0.39</i>	1.50	<i>0.79</i>	0.18	<i>0.38</i>	0.10	<i>0.55</i>
Training measure	0.33	<i>0.33</i>	1.03	<i>0.67</i>	0.57	<i>0.35</i>	0.42	<i>0.61</i>
Other measure	0.84	<i>0.35</i>	0.18	<i>0.48</i>	0.96	<i>0.43</i>	1.07	<i>0.55</i>
Cum. dur. of ASP (years)	0.32	<i>0.37</i>	-0.92	<i>0.70</i>	-0.03	<i>0.50</i>	-0.09	<i>0.79</i>
ln(dur. of welfare (months))	0.06	<i>0.07</i>	-0.06	<i>0.16</i>	-0.06	<i>0.11</i>	0.14	<i>0.13</i>

Note: Standard errors in italic.

Parameter estimates in bold are significant at a 5 % significance level

5.2.2. The effects of background characteristics

The individual characteristics, on the other hand, seem to have a strong influence on the duration of subsequent employment.¹⁷ The estimation results in Table 5.5 show that women have a significantly lower hazard rate out of employment. The same is true for married as well as younger individuals. In accordance with human capital theory, individuals with basic schooling or vocational education as their highest level of education have a higher risk of ending the employment spell again. This is also true for individuals with less than ten years of previous work experience. Finally, we rather surprisingly find that individuals with a Danish origin have a higher risk of ending subsequent employment compared to individuals with a western non-Danish origin, whereas individuals with a LDC origin do not have a significantly different hazard rate out of employment.

¹⁷Again we have chosen only to present the results for the entire group.

Table 5.5. Estimates of parameters for the transition rate out of subsequent employment.

Variable	Total	
<i>Background characteristics</i>		
Female	-0.34	<i>0.10</i>
< 25 year	-0.35	<i>0.20</i>
25-30 year	-0.41	<i>0.21</i>
30-39 year	-0.30	<i>0.20</i>
> 50 year	-0.18	<i>0.48</i>
Danish origin	0.37	<i>0.19</i>
LDC origin	0.28	<i>0.23</i>
Labour market experience 0-5 years	0.73	<i>0.17</i>
Labour market experience 6-10 years	0.50	<i>0.19</i>
Schooling variable missing	1.10	<i>0.34</i>
Basic schooling	0.82	<i>0.31</i>
High School	-0.03	<i>0.32</i>
Vocational education	0.56	<i>0.31</i>
Long higher education	-0.70	<i>0.62</i>
Married	-0.36	<i>0.18</i>
No. of children 0-6 years	0.21	<i>0.14</i>
Dwelling: rented	-0.43	<i>0.13</i>
Dwelling: owned	-0.50	<i>0.16</i>

Note: Standard errors in italic.

Parameter estimates in bold are significant at a 5 % significance level.

5.3. Selection and unobserved heterogeneity

When estimating employment effects of different ASP measures, the problem of sample selection may be encountered, i.e. participation in the different measures is not by random assignment; rather the choice of programme is influenced by different individual characteristics, observed as well as unobserved. As described above, this problem is accounted for in the present analysis by specifying a competing risks model for the duration until participation as part of the full model. The estimation results for the destination-specific hazards into different ASP programmes are presented in Table 5.6 for the entire sample.¹⁸ Generally, we find that individual characteristics do affect participation in different ASP measures. Women tend to have a lower chance of participating in employment measures.

¹⁸The results for the subgroups are not very different from the results for the entire sample. Accordingly, we do not show results for the subgroups.

People who are 50 years or older have a higher transition rate to employment measures, whereas the transition to training measures is significantly lower for this group compared to the 40-49 years age-group. Individuals with either basic schooling or long higher education as their highest education level have a significantly higher transition rate into training measures compared to individuals with short or medium higher education. Having children aged 0-6 years decreases the chance of entering both employment and training measures, whereas the transition into other measures is increased. The reason for being on welfare also seems to affect the transition rate to measures. Individuals receiving welfare benefits because of unemployment have a higher transition to both employment and training measures. Individuals receiving welfare benefits because of sickness do also have a higher transition to employment measures, but a lower transition to other measures. Finally, individuals receiving welfare benefits because of their refugee/immigrant status only have a higher transition to training measures.

Table 5.6. Parameter estimates of the selection into different ASP measures

Variable	Employment measures		Training measures		Other ASP	
<i>Duration dependence:</i>						
0-1 months	-6.74	<i>0.83</i>	-3.62	<i>0.60</i>	-1.57	<i>0.35</i>
1-6 months	-7.67	<i>0.82</i>	-4.89	<i>0.60</i>	-3.91	<i>0.40</i>
> 6 months	-7.36	<i>0.80</i>	-4.27	<i>0.60</i>	-2.64	<i>0.40</i>
Women	-0.34	<i>0.17</i>	-0.10	<i>0.11</i>	0.17	<i>0.14</i>
< 25 years	0.61	<i>0.28</i>	0.35	<i>0.19</i>	-0.44	<i>0.22</i>
25-30 years	0.19	<i>0.32</i>	0.25	<i>0.20</i>	-0.19	<i>0.23</i>
30-40 years	0.11	<i>0.30</i>	-0.06	<i>0.19</i>	-0.10	<i>0.21</i>
> 50 years	1.08	<i>0.43</i>	-1.64	<i>0.38</i>	-0.58	<i>0.33</i>
Schooling variable missing	-0.81	<i>0.46</i>	1.89	<i>0.57</i>	-0.49	<i>0.33</i>
Basic schooling	-0.09	<i>0.41</i>	1.28	<i>0.57</i>	-0.13	<i>0.32</i>
High school	-0.61	<i>0.46</i>	0.82	<i>0.59</i>	-0.32	<i>0.39</i>
Vocational schooling	-0.17	<i>0.41</i>	0.82	<i>0.57</i>	-0.07	<i>0.31</i>
Long higher education	-1.40	<i>1.09</i>	1.13	<i>0.67</i>	0.23	<i>0.43</i>
Married	-0.08	<i>0.26</i>	0.11	<i>0.14</i>	-0.56	<i>0.17</i>
Children 0-6 years	-0.55	<i>0.22</i>	-0.36	<i>0.14</i>	0.73	<i>0.16</i>
<i>Reason for welfare application:</i>						
Unemployment	0.83	<i>0.19</i>	0.35	<i>0.14</i>	-0.21	<i>0.18</i>
Sickness	0.64	<i>0.36</i>	0.05	<i>0.22</i>	-0.91	<i>0.27</i>
Refugee/imigrant	0.05	<i>0.78</i>	0.92	<i>0.20</i>	-0.44	<i>0.33</i>
Unemployment as only problem	1.28	<i>0.22</i>	-1.24	<i>0.15</i>	-1.72	<i>0.19</i>

Note: Standard errors in italic.

Parameter estimates in bold are significant at a 5 % significance level

The estimation results for the unobserved heterogeneity terms confirm a need for correcting for unobserved heterogeneity. As mentioned earlier, it has not been possible to identify the model with arbitrary correlation between all three unobserved heterogeneity terms. We have therefore estimated the model with the unobserved heterogeneity terms for the welfare spells and the employment spells, V_w and V_e , restricted to being perfectly correlated. The estimation results show (see Table 5.7) that the correlation between the unobserved heterogeneity term of the duration until participation, V_a , and the other terms are nearly perfectly correlated as well, since only p_1 and p_8 are significantly different from zero. p_8 is the probability that the values of the unobserved heterogeneity terms equal $v_w^2, v_e^2, v_{a1}^2, v_{a2}^2, v_{a3}^2$. Since all $v_j^2 < 0$ except v_{a1}^2 , p_8 represents the fraction of the sample that has low transition rates out of welfare, into training measures, into other ASP and out of subsequent employment, and high transition rates into

employment measures. p_1 represents the fraction of the sample with exactly the opposite combination of high and low transition rates. It is unexpected that the individuals who for unobserved reasons have a high transition rate out of welfare also have a high transition rate out of subsequent employment, since we would expect the group of individuals with short welfare spells to have a stable employment attachment.

Table 5.7. Parameter estimates of the unobserved heterogeneity terms.

	Parameter estimates						
	All	Women	Men	Only un- employm.	Other problems	Below 25	Above 30
v_w^2	-1.83	-2.42	-1.60	-1.68	-6.12	4.68	-5.82
v_e^2	-1.17	-4.03	-1.19	-1.11	-3.83	-2.30	-5.03
v_{a1}^2	2.57	2.66	2.85	1.81	-0.67	-1.63	1.00
v_{a2}^2	-2.69	-3.76	-3.20	0.80	-4.56	-0.23	-0.66
v_{a3}^2	-2.90	-2.80	-2.42	0.71	0.17	-0.84	-0.41
p_1	0.74	0.82	0.70	0.75	0.81	0.00	0.00
p_4	0.03	0.03	0.03	0.01	0.01	0.05	0.20
p_5	0.03	0.01	0.01	0.01	0.00	0.94	0.77
p_8	0.20	0.13	0.26	0.23	0.18	0.01	0.03

Note: $p_2 = p_3 = p_6 = p_7 = 0$.

Parameter estimates in bold are significant at a 5 % significance level

6. Sensitivity analyses

In this subsection we aim to test the model specification and the sensitivity of the parameter estimates to different specifications. First, we will test whether our model would do as well if the unobserved heterogeneity terms were independent. Assume there is no correlation between V_w , V_e and V_a ; then model (4.8) can be estimated as three separate models. By use of the likelihood ratio (LR) test we can test the null hypothesis that the unobserved heterogeneity terms are independent. Under the maintained assumption that the three terms are dispersed the LR-test will be chi-square distributed with 4 degrees of freedom. Table 6.1 reports the likelihood values under the restricted and the unrestricted model and the corresponding LR-value. The unrestricted model is in this case the full model, i.e. model (4.8). Since the critical value at a 5 per cent significance level of the chi-square distribution with four degrees of freedom is 9.49 we clearly reject the null hypothesis. We thus find strong indication of a correlation between the unobserved heterogeneity terms, and hence selectivity cannot be ignored. However,

as mentioned earlier, in the estimated model we have assumed that V_w and V_e are perfectly correlated, i.e. $p_2 = p_3 = p_6 = p_7 = 0$, and therefore the restricted model is no longer nested within the estimated model. As an alternative to the LR-test, we therefore apply the Vuong-test (see Vuong (1989)) which allows testing of two non-nested models against each other. We can thus test the estimated model, where V_w and V_e are perfectly correlated (call this model (a)), against the model where the unobserved heterogeneity terms are independent (call this model (b)). We have the following hypotheses: H_0 = the two models are equivalent, H_a = model (a) is better than model (b), and H_b = model (b) is better than model (a). Under H_0 the test statistic, V , is standard normally distributed; under H_a V converges almost surely to $+\infty$; and under H_b V converges almost surely to $-\infty$. The calculated test statistic is 4.19, and this is strictly above the 5 per cent limit for both H_0 and H_b , and we can hence reject both that the two models are equivalent and that model (b) is better than model (a).

Table 6.1. LR-test of a restricted model with
 H_0 : The unobserved heterogeneity terms are independent.

Log-likelihood value:	Restricted	Unrestricted	LR
All	-12,360.4	-12,321.3	78.2

When the unobserved heterogeneity terms are restricted to be independent, the estimation results from the model are not corrected for selectivity. In that case, the estimated effects of ASP might change due to selection bias. When estimating the model without selectivity correction (model (b) mentioned above), we do find that the effects of the ASP change slightly (see Table 6.2). We find a higher degree of locking-in for individuals attending employment-based ASP combined with a lower post-programme effect for this measure. For individuals attending training measures the locking-in effects are nearly the same as in the model corrected for selectivity, whereas the post-programme effect is less negative and not significantly different from zero. Hence, in the model without selection the effects of the two ASP measures are closer to each other; thus correcting for selectivity seems to differentiate the effects of the ASP measures further.

Table 6.2. Parameter estimates of the effects of ASP with and without selection.

Variable	With selection (model a)		Without selection (model b)	
<i>Effects of social policy measures:</i>				
During employment measures	-0.37	<i>0.23</i>	-0.84	<i>0.19</i>
After —————	1.21	<i>0.27</i>	0.49	<i>0.17</i>
During training measures	-1.82	<i>0.21</i>	-1.44	<i>0.20</i>
After —————	-0.60	<i>0.24</i>	-0.07	<i>0.22</i>
During other ASP	-0.10	<i>0.15</i>	0.25	<i>0.12</i>
After —————	-0.70	<i>0.22</i>	-0.34	<i>0.21</i>
After employment measures*time ¹⁾	1.64	<i>0.90</i>	1.25	<i>0.72</i>
After employment measures*time squared	-1.03	<i>0.69</i>	-0.78	<i>0.59</i>
After training measures*time ¹⁾	1.97	<i>1.19</i>	1.67	<i>1.14</i>
After training measures*time squared	-1.54	<i>1.20</i>	-1.38	<i>1.13</i>

Note: Standard errors in italic.

Parameter estimates in bold are significant at a 5 % significance level

1) Time until participation is measured in years

Next, we turn to the specification of the ASP effects. In the estimated model, we assume that the post-programme effect is a quadratic function of time until participation in ASP. A likelihood ratio test for a constant effect is presented in Table 6.3. The test statistic of 10.0 is above the critical value of the chi-square distribution with four degrees of freedom, thus the null hypothesis that the linear and quadratic terms can be jointly excluded, is rejected at a 5 per cent significance level. The analysis for subgroups of the sample gave estimates showing that the linear and quadratic terms for time until participation were not individually significant. The test statistics in Table 6.3 show that these terms are jointly significant, since the restricted models for women and men are rejected at a 5 per cent significance level.

Table 6.3. Test statistics for a restricted model with

H₀: Post-programme effect of ASP independent of time until participation.

Group:	Log-likelihood value		LR
	Restricted	Unrestricted	
All	-12,326.5	-12,321.5	10.0
Women	-5,148.2	-5,143.0	10.4
Men	-7,088.3	-7,083.5	9.6

Finally, we will take a look at the division of the sample into subgroups. As we have seen in the previous section, the effects differ substantially between different

subgroups. When estimating the model for all compared to models for separate subgroups, we might hence lose a lot of information, if the ASP have different effects for each subgroup. Table 6.4 presents the log-likelihood values and LR-test statistics for the models divided into the following subgroups: male and female, recipients with and recipients without problems besides unemployment, and for individuals with no problems besides unemployment we test the further division into individuals aged below 25 years and above 30 years. As expected, we clearly reject the null hypothesis of equal coefficients across subgroups. The largest gain is found when dividing the sample into welfare recipients with no problems besides unemployment and welfare recipients with other problems. This is most likely due to a combination of the big difference in the unobserved characteristics of the two groups and the difference in institutional settings, since the two groups are treated by two different authorities.

Table 6.4. Test statistics for a restricted model with
 H_0 : The coefficients are equal across subgroups.

Models:	Log-likelihood value		
	Restricted	Unrestricted	LR
All vs. male/female	-12,321.5	-12,226.5	190.0
All vs. problem/no problem	-12,321.5	-12,085.2	472.6
No problem vs. <25 years/>30 years	-6,945.2	-6,886.6	117.2

7. Conclusion

This paper analyses the effects of active social policy on welfare dependence. This is done through an analysis of the dynamics of welfare dependence, in particular the transition from welfare to employment. By modeling the duration of the welfare spells, we are able to evaluate the impact of various social policy measures as well as the importance of individual characteristics, such as age, gender, education, marital status, and ethnicity. The applied social policy measures are divided into three main groups: employment measures, training measures, and other ASP measures. We also model the duration of the subsequent employment spells to investigate whether active social policy helps people keep their employment following welfare dependence. This also allows us to investigate the occurrence of returning to welfare dependence and thereby to provide evidence on the determinants of recidivism of reliance on social assistance.

The analysis, which is based on a longitudinal register-based data set covering the second largest municipality in Denmark (Aarhus), is carried out in a duration

model framework. The data enables us to analyse locking-in effects as well as post-programme effects of the measures applied in the active social policy of Denmark. Furthermore, the selection effect into the different ASP measures is accounted for by specifying a competing risks model for the duration until participation in ASP.

The results show that the effect of ASP depends significantly on the type of measure that is applied. Employment measures have weak or insignificant locking-in effects, whereas training measures have strong locking-in effects. Employment measures have positive post-programme effects, while training measures have negative post-programme effects. Broadly speaking, employment measures improve the chances of leaving welfare dependence whereas training measures have detrimental effects on the exit rate from welfare spells. In the analysis, the post-programme effect of ASP is also allowed to vary with time until participation in ASP. We generally find an inverse u-shaped relationship, with the post-programme effect of ASP reaching a maximum after about 8-10 months on welfare. Concerning the selection effect into different ASP measures, we find that correcting for selectivity tends to differentiate the effect of the ASP measures further.

The overall effects of the active social policy are evaluated by the calculation of net effects on the expected duration of welfare, and from this it is clear that only employment measures have the desired net effects, whereas training and other measures definitely prolong welfare spells. Moreover, this allows us to determine the optimal timing of ASP. We find evidence in favour of targeting men for very early participation in employment programmes, while women should participate after approximately 6 months of welfare duration in order to achieve the maximum net effect. The reason that employment measures are more effective for men than for women is the difference in locking-in effects.

Although the results clearly favour early participation in employment measures, there might be some caveats to recommending instant ASP participation; first of all, the effects found concern the participants and it is unclear whether and how the effects will change if instant employment-based ASP is applied to all welfare recipients; secondly, the present analysis has not been accounting for the cost of ASP, and instant participation in (employment-based) ASP may result in considerably higher costs of administration etc., thereby making instant participation an undesirable policy.

The results concerning the subsequent employment spells show evidence of a considerable short-term recidivism of welfare dependence. Furthermore, the results show that the active social policy measures applied during the welfare spells only have weakly significant effects on the duration of the subsequent employment spells. When an effect is present, the ASP measures have negative effects, i.e. participation in ASP tends to shorten the duration of subsequent employment.

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10. Appendix

Table A.1. Population characteristics divided into spells with different types of ASP measures.

	No ASP	Employment measures	Training measures	Other ASP*
Count	.	1.29	1.10	1.00
Female	0.44	0.34	0.45	0.52
Male ^R	0.56	0.66	0.55	0.48
Age < 25 years	0.44	0.46	0.41	0.24
Age 25-30 years	0.19	0.17	0.21	0.20
Age 30-40 years	0.23	0.22	0.23	0.33
Age 40-50 years ^R	0.10	0.11	0.13	0.16
Age > 50 years	0.04	0.04	0.02	0.06
Danish origin	0.80	0.73	0.42	0.79
DC origin ^R	0.04	0.02	0.02	0.02
LDC origin	0.12	0.20	0.42	0.13
Other origin ^R	0.04	0.05	0.14	0.06
Experience < 5 years	0.63	0.70	0.84	0.49
Experience 5-10 years	0.16	0.13	0.08	0.18
Experience >10 years ^R	0.21	0.17	0.08	0.33
Basic schooling	0.29	0.38	0.36	0.28
High school	0.20	0.09	0.07	0.10
Vocational education	0.33	0.35	0.18	0.36
Short higher education ^R	0.02	0.02	0.00	0.02
Median length higher edu. ^R	0.03	0.01	0.00	0.06
Long higher education	0.03	0.01	0.01	0.06
Missing education information	0.11	0.13	0.37	0.12
Married	0.16	0.17	0.32	0.21
Not married ^R	0.84	0.83	0.68	0.79
Children 0-6 years	0.19	0.17	0.25	0.43
No children 0-6 years	0.81	0.83	0.75	0.57
Rented dwelling	0.68	0.71	0.83	0.71
Owned dwelling	0.19	0.18	0.08	0.18
Unknown/other dwelling ^R	0.13	0.11	0.09	0.11

Partner: unemployed ^R	0.16	0.23	0.19	0.23
Partner: on welfare	0.10	0.12	0.14	0.12
Partner: employed	0.22	0.28	0.18	0.39
Partner:others / no partner ^R	0.52	0.37	0.49	0.26
Only unemployment as problem	0.76	0.77	0.42	0.33
Problems besides unemployment ^R	0.24	0.23	0.58	0.67
Income in 1997 (DKK)**	102,265.8	99,510.6	84,560.2	125,724.7
No income in 1997	0.21	0.26	0.36	0.16
<i>Reason for first welfare application:</i>				
Unemployment	0.37	0.69	0.44	0.33
Sickness	0.04	0.06	0.07	0.07
Refugee/immigrant	0.01	0.02	0.21	0.03
Other reasons*** ^R	0.58	0.23	0.28	0.57
Number	1944	342	466	233

* Mainly counselling and job search courses.

** Among those having positive income in 1997.

*** Such as end of married life, compulsory service, imprisonment, ended education, and end of U.I. benefits.

R : The reference group in the statistical analyses.

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