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INCREASING INCENTIVES FOR REEMPLOYMENT*

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This paper studies the incentives of unemployed workers for reemployment using search models and semi-parametric econometric methods of reemployment. The incentives for reemployment can be increased by suspending the protective rules regarding labour mobility stipulated in the Finnish Unemployment Insurance Act and reducing the benefits after a fixed period of unemployment. The econometric results support such an interpretation. The unemployment benefits have first a negative effect on the probability of becoming employed, but after three months this effect vanishes when the rules of the system become stricter. (JEL J64, J65)

1. Introduction

This paper analyses the effect of unemployment benefits, reemployment bonuses and features of the Finnish unemployment insurance system using search theoretical models and econometric models of unemployment duration. It is well known that unemployment benefits have a disincentive effect on reemployment [See Lippman and McCall (1976a, b, 1979), Mortensen (1977) and Kiefer and Neumann (1989)]. From the stand-point of the functioning of labour markets it is evident that the level of benefits is not necessarily the only policy question. It is shown that the conditions of paying the benefits are extremely important. The reemployment probability can be increased substantially by offering reemployment bonuses to unemployed persons.

The effects of the waiting period, mobility rules and reductions of benefits are discussed. The waiting period for the eligibility of benefits is usually one week. For the persons who have entered the labour force or persons who have quit their previous jobs the waiting period is six weeks. Unemployed persons who are reluctant to relocate when offered a job elsewhere or persons who are reluctant to change their occupations may lose their unemployment insurance (UI) benefits after the first three months of unemployment. Non-members of UI funds are eligible for the basic unemployment allowance, which is not limited with respect of the duration of unemployment. Unemployed workers who are members of UI funds are eligible for earnings-related unemployment allowances, which consists of the basic unemployment allowance plus the earnings-related part. In 1985–87 the earnings-related unemployment benefits were reduced by 20 per cent at the 100*th* day of unemployment. In 1987–89 the reductions were 12.5 % at the 200*th* day of unemployment.

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Based on search theoretical foundations it is evident that the waiting period of unemployment benefits has only a slight positive effect on the reemployment probability. On the other hand the risk of losing benefits after the first three months and reductions of benefits have a large positive effect on the reemployment probability.

Using semi-parametric models of unemployment duration it is found that unemployment benefits have a disincentive effect during the first three months. After that period the effect of benefits on the reemployment probability turns positive. The results of econometric models show that the risk of losing benefits has a very strong effect on the reemployment probability. Furthermore the results indicate that the reductions are very effective in increasing the reemployment probability. Just after the reduction the probability is about twice as high as it would otherwise be.

The remainder of this study is set out as follows. The search theoretical results are presented in section 2. The empirical evidence is presented in section 3 and section 4 concludes the study.

2. Search Theoretical Results

2.1 The Effects of Benefits and Reemployment Bonuses

This section examines the opposing effects of unemployment benefits and reemployment bonuses. These effects are analyzed in a search theoretical framework. All the offers that provide at least the reservation utility u^* are acceptable. Thus the endogenous variable u^* determines the selectivity of the person with respect to jobs. In the basic search model the unemployed persons are assumed to be eligible for UI benefits b and to pay a searching cost c in each period of search. The arrival rate of job offers is assumed to follow a Poisson process with intensity a.

Often people wonder why there is an excess demand for labour while (in the other parts of the country or occupations) there are high unemployment rates. One explanation for the rigid labour markets is that there are high reemployment costs c_e, which decrease the incentives for moving or changing occupations. These costs have been discussed in the search theoretical context for example by Hey and McKenna (1979), Loikkanen (1982) and Burgess (1988). A way of reducing these reemployment costs is to offer reemployment bonuses b_e to the persons who find acceptable job offers. In Finland the state is offering small benefits on rather strict conditions for the persons who relocate to get a job. Unfortunately we do not have any data on these payments. Neither do we have any data on the reemployment costs.

Workers maximize the expected present value of their utility. In an infinite horizon case the differential equation of the value function can be written as (cf. Mortensen, 1986)

$$(1)\qquad V(t) = (b-c)/r + a/r \int_{u^*(t)}^{\bar{u}} [u/r - c_e + b_e - V(t)]\,dF(u).$$

The first term of the value function on the right-hand side describes the discounted instantaneous utility during a spell of unemployment. The second term is related to employment and it is the discounted expected utility of an offer. The expectation is taken with respect of the distribution function of utility F(u). The parameter $\bar{u}$ is the maximum attainable utility and $u^*(t)$ is the reservation utility at time t. The offers that are at least $u^*(t)$ are accepted.

Setting $\partial V/\partial u^* = 0$ gives the optimal reservation utility $u^*(t) = r[(c_e - b_e) + V(t)]$, which can be rewritten as

$$(2)\qquad u^*(t) = b - c + r(c_e - b_e) + a/r \int_{u^*(t)}^{\bar{u}} (u - u^*)\,dF(u).$$

It is easily found that $\partial u^*/\partial b = 1 > 0$ and $\partial u^*/\partial b_e = -r < 0$. The effects of b and b_e on the reservation utility are found to have opposite signs.

The conditional reemployment probability, i.e. hazard function, is a product of the arrival rate and probability that an offer is acceptable

$$(3)\qquad h(t) = a[1 - F(u^*(t))].$$

The UI benefits b increase the reservation utility. Hence their effect on the reemployment probability is negative. On the other hand, the reemployment bonus b_e has the desired properties of decreasing the reservation utility. Therefore its effect on the reemployment probability is clearly positive.

According to experimental evidence from the U.S., the reemployment bonuses appear to have had substantial positive effects on the reemployment. In Australia bonuses have been used for the long-term unemployed since 1989 (See Woodbury and Spiegelman, 1987). Lump-sum reemployment bonuses may, however, have undesirable effects. Firstly, the inflow to unemployment could be expected to increase, since workers intending to change jobs would have an incentive to register as unemployed in between jobs. Secondly, the bonus programme would provide an incentive for temporary lay-offs. Thirdly, if the bonuses are offered to persons having been unemployed for a certain length of time, then they are expected to have a disincentive effect on the reemployment during the qualifying waiting period (See Meyer, 1988). Presumably a way of avoiding these problems is to offer a bonus which is proportional to the duration of unemployment. However this remark is not justified by a theoretical model presented above. Therefore it is suggested here that further research could include an extension of the search model which would pay attention to the duration dependent bonus.

In practice an effective means of encouraging unemployed persons to become employed is to turn a proportion of the unemployment benefits into bonuses. It could be done by collecting for example the earnings-related part of the benefits to the UI funds and pay the cumulative benefits as a reemployment bonus when the person has found a job. Turning benefits into bonuses would have a double effect, since it would have the effect of cutting benefits and paying reemployment bonuses. This kind of economic policy is recently suggested in Relander (1992).

2.2 *The Effects of the Waiting Period, Rule of Labour Mobility and Reduction of Benefits*

In this section the effects of the waiting period, rule of labour mobility and reduction of benefits are briefly discussed. An extensive search theoretical analysis of these features of the system is found in Kettunen (1992).

Unemployed workers are usually informed about the waiting period when they register with the employment office. Normally the waiting period is one week, but if the person has entered the labour force or if he has quit his previous job the waiting period is six weeks. When the person knows in advance that he will be eligible for benefits, he will discount the benefits to the present day. Having a relatively short waiting period the discount factor is near to one. Therefore it can be concluded that a short waiting period has a relatively slight impact on the reservation utility, search intensity and reemployment probability.

According to the Finnish UI Act unemployed persons do not have to accept offers from other areas or occupations during the first three months. After that they may lose their benefits if they are reluctant to relocate or change their occupations. The risk of losing UI benefits decreases the value of a search. The risk is realized with a probability which is the product of an arrival rate of offers and probability that the offer is less than the lowest acceptable offer, i.e. the distribution function of offers at the reservation utility. It is obvious that the risk of losing benefits decreases the selectivity and increases the search intensity and reemployment probability. If the persons are told just after the first three months by the unemployment offices that they have to accept the offers the selectivity will decline sharply while the search activity and reemployment probability will jump up. In practice this happens quite often.

The persons who are eligible for the earnings-related unemployment allowance had during 1985–89 reductions in their benefits. It is obvious that the reductions will decrease the selectivity and increase the search intensity and reemployment probability. In practice at least some of the persons learn the rules when they obtain the reduced benefit. In that case the selectivity will drop while the search activity and reemployment probability will increase. These effects will be studied in the next section using semi-parametric models and data on unemployment durations.

3. *Semi-Parametric Inference*

3.1 *Models of Unemployment Duration and Labour Mobility*

For the econometric analysis of reemployment a sample of 2077 unemployed workers was drawn from the administrative data of the

Ministry of Labour. Every hundredth individual was selected to be included in the sample from the flow into unemployment during 1985. The persons were followed until the end of their spells of unemployment or until to the end of 1986, whichever came first. Therefore the data set includes censored observations, which are rather common in econometric studies of unemployment duration. The data on unemployed persons' annual income and taxable assets was compiled from the tax register. The data on the basic unemployment allowance and the earnings-related unemployment allowance during the unemployment period was compiled from the unemployment allowance register of the Social Insurance Institution and the bank Postipankki, respectively. The data are fairly rich in individual characteristics and labour market specific variables (See Kettunen, 1991a). Furthermore, the full pattern of benefits over the unemployment durations is observed. This is the first set of Finnish microeconomic data where the levels on unemployment benefits are available. A description of the variables used in the study is found in the appendix.

Studies using parametric models of unemployment duration (Kettunen 1990, 1991b, c) have shown that the benefits have a negative effect on the reemployment probability and labour mobility. However, using parametric models the specification of the duration distribution and duration dependence may be difficult. The Finnish unemployment insurance system is such that the rules concerning the eligibility of benefits vary over the duration of unemployment. Therefore the interest of this study lies in the semi-parametric models and duration-dependent effects of the UI system on reemployment and the regional and occupational mobility of unemployed workers.

The proportional hazards model presented by Cox (1972) studies the effects of explanatory variables on the hazard rate without specifying the form of duration-dependence. The estimation of Cox's model leads to the partial conditional likelihood function, where the time-dependent part of the likelihood function is cancelled out, because it is identical for the individuals leaving unemployment and individuals in the risk set.

Concerning any period of unemployment the individuals experience two events, the entry τ^0 and exit τ^1, measured in calendar time. The duration of unemployment is then $\tau = \tau^1 - \tau^0$. The hazard function of the proportional hazards model presented by Cox (1972) can be written as

$$h(t, x) = h_0(t) h_1(x; \beta), \tag{4}$$

where the first factor $h_0(t)$ is the unknown baseline hazard. These kinds of models are called semi-parametric, since one does not have to define the baseline hazard. The second factor, which is known up to a finite dimensional parameter vector β, usually takes the log-linear form $h_1(x; \beta) = \exp(x\beta)$.

Let $t_1, t_2, \ldots, t_n$ denote the ordered durations of n individuals and let I^* be the set of indices identifying observed times of becoming employed. The partial likelihood function can be written as (See Cox, 1972, 1975)

$$L(\beta) = \prod_{i \in I^*} \frac{\exp(x_i\beta)}{\sum_{j \in R(t_i)} \exp(x_j\beta)}, \tag{5}$$

where $R(t_i)$ denotes the risk set, i.e. the observations with $t \geq t_i$. Multiplying the numerator and denominator by $h_0(t)dt$, it can be seen that the contribution of an observation i is just the probability that the duration ends in $[t_i, t_i + dt)$ given that some duration in the risk set ends in that interval.

The values of explanatory variables may change over the duration of unemployment for the individuals. The inclusion of such variables in the semi-parametric proportional hazards model is considered below. Models with duration-dependent replacement ratios of unemployment benefits are estimated using different kinds of model specifications. With duration-dependent covariates the hazard function of the proportional hazards model can be written as

$$h(t, x, z) = h_0(t) e^{x\beta + z(t)\beta_z}, \tag{6}$$

where x includes the covariates, which are constant over time, and z(t) includes the duration-dependent covariates.

Models with duration-dependent replacement ratios of unemployment benefits are estimated and the results are presented in Table 1. For comparison the first column of Table 1 includes the model where the benefit replacement ratio is fixed at an average value over the unemployment spell.

The second column of Table 1 includes a model where the duration-dependent unemployment benefits were used in the two intervals $(t_0, t_1]$ and $(t_1, t_2]$, where $t_0 = 0$, $t_1 = 3$ and $t_2 = 24$ months. The mean values of the replacement ratios for each individual are used in the relevant time-periods. The mean values of these replacement ratios over the recipients of earnings-related unemployment allowance are 0.29 and 0.55 in these two intervals. The corresponding means for the recipients of the basic unemployment allowance are 0.26 and 0.41 respectively. The results show that the effect of unemployment benefits is lower with duration-dependent replacement ratios.[1]

The third possibility is to assume that the effects of duration-dependent variables vary over time, remaining constant within predefined intervals. The reason for this kind of specification is that the replacement ratios may have different effects on the reemployment probability at different points in time. With duration-dependent effects in the intervals $t_{j-1} < t \leq t_j$, $j = 1, 2$, the hazard function can be written

$$(7) \qquad h_j(t, x) = h_0(t) e^{x\beta + z(t)(\beta_z + \mu_j)}.$$

To avoid singularity μ_1 is set equal to zero. This approach has been also followed by Moreau, O'Quigley and Mesbach (1985). Moreau, O'Quigley and Lellouch (1986) and O'Quigley and Pessione (1989).

The parameter estimates of the model (7) with duration-dependent replacement ratios are in the third column of Table 1. It can be seen that the unemployment benefits have a negative effect on the reemployment probability during the first three months, but after that period the effect turns positive. An obvious reason is that the eligibility rules of benefits become stricter. As mentioned above the unemployed persons have a risk of losing benefits after the first three months if they do not move to another region or change their occupations. Furthermore, after the 100*th* day of unemployment the earnings-related unemployment allowances decrease by 20 per cent. Because of these rules the incentive for reemployment is higher for the persons with higher benefits. These findings are confirmed by Table 2, which shows that the negative effect of benefits is higher for the non-members of labour unions even though their benefits are lower.

Since the rules concerning labour mobility change during the spell of unemployment, it is reasonable to study the probabilities of moving and changing occupations. The semi-parametric models of labour mobility are presented in Table 3. In the case of regional mobility the set of indices identifying complete spells of unemployment includes the persons who have become employed by moving to another area of residence. In the case of occupational mobility the interesting set of indices includes the persons who have changed their occupations.

3.2 Baseline Hazard Functions

The estimated values of the parameters can be used to construct an estimator for the integrated baseline hazard, which has been proposed for Cox's model by Breslow (1972, 1974). The integrated baseline hazard can be written

$$(8) \qquad \hat{I}_0(t_i) = \sum_{t_j \leq t_i} \frac{c_j}{\sum_{k \in R(t_j)} \exp(x_k \hat{\beta})},$$

where c_j is an indicator for a noncensored observation.[2] The corresponding Breslow's estimate for the baseline hazard is based on the subdivisions of the time scale at those points where the event occurs

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[1] *It should be pointed out that introducing time varying variables into single spell duration models may be inherently dangerous, but there seems to be no general solution to the model sensitivity problem (See Heckman and Singer, 1984). Also there may be measurement errors involved in these variables. Since the benefits are based on the actual payments, short intervals would increase the standard errors of the parameter estimates.*

Cox's model allows in principle for fixed time dependent covariates and parameters. However maximizing the partial likelihood may produce inefficient or even inconsistent estimators if some of the covariates are stochastic. General principles for success are that no omitted factors should contain information on the parameter vector β, and that the partial likelihood itself should only depend on β. Conditions under which the partial likelihood methods seems to work have been covered eg. by Johansen (1983), Gill (1984) and Arjas (1988).

[2] *The integrated baseline hazards multiplied by the log-linear terms exp ($x_i\beta$) are the generalized residuals of these models. They can be used to examine the model specification. (See Kay, 1977, Crowley and Hu, 1977, Lagakos, 1980, Crowley and Storer, 1983 and Horowitz and Neumann, 1989). Alternatively one can make a direct*

Table 1. Semi-parametric models of unemployment duration with duration-dependent replacement ratios

	Std.errors in parentheses		
Number of children	–0.002	–0.097	–0.086
	(0.048)	(0.049)	(0.049)
Married	0.143	0.171	0.159
	(0.067)	(0.070)	(0.069)
Sex	–0.014	–0.054	–0.056
	(0.063)	(0.061)	(0.061)
Age	–0.039	–0.037	–0.036
	(0.004)	(0.003)	(0.003)
Level of education	0.045	0.081	0.102
	(0.067)	(0.064)	(0.064)
Training for employment	0.183	0.206	0.202
	(0.074)	(0.079)	(0.079)
Member of UI fund	0.209	0.216	0.205
	(0.063)	(0.065)	(0.065)
Came from schooling	0.283	0.300	0.280
	(0.090)	(0.083)	(0.084)
Came from housework	–0.648	–0.655	–0.671
	(0.140)	(0.137)	(0.137)
Regional demand	0.114	0.248	0.131
	(0.256)	(0.252)	(0.252)
Occupational demand	0.551	0.656	0.547
	(0.586)	(0.622)	(0.590)
Taxable assets	0.783	0.770	0.682
	(0.994)	(1.112)	(1.112)
Replacement ratio, β_z	–1.232	–0.325	–1.375
	(0.132)	(0.138)	(0.205)
Replacement ratio, μ_2			2.127
			(0.271)
Log likelihood	–8415.6	–8453.6	–8422.1
Number of observations	2077	2077	2077

Table 2. Semi-parametric models of unemployment duration for the non-members and members of labour unions

a Non-members b Members	a	b
	Std.errors in parentheses	
Number of children	–0.019	–0.016
	(0.069)	(0.073)
Married	0.048	0.235
	(0.106)	(0.095)
Sex	–0.021	–0.047
	(0.083)	(0.096)
Age	–0.032	–0.048
	(0.005)	(0.005)
Level of education	0.154	–0.154
	(0.085)	(0.103)
Training for employment	0.181	0.179
	(0.119)	(0.108)
Came from schooling	0.300	0.200
	(0.097)	(0.188)
Came from housework	–0.729	–0.548
	(0.191)	(0.201)
Regional demand	–0.061	0.410
	(0.327)	(0.411)
Occupational demand	–0.387	1.276
	(0.925)	(0.886)
Taxable assets	0.120	1.494
	(2.015)	(1.193)
Replacement ratio	–1.725	–0.851
	(0.219)	(0.221)
Log likelihood	–4178.7	–3362.2
Number of observations	1212	865

$$(9) \quad \hat{h}_0(t_i) = \frac{c_i}{(t_i - t_{i-1}) \sum_{k \in R(t_i)} \exp(x_k \hat{\beta})} .$$

For a graphical presentation of the baseline hazard it is more natural to assume that $h_0(t)$ is a slowly varying function of t. If the estimates of the integrated baseline hazards are available, an estimate for the baseline hazard for each distinct duration can be rewritten as a difference quotient of the integrated baseline hazards

$$(10) \quad \hat{h}_0(t_i) = \frac{\hat{I}_0(t_i) - \hat{I}_0(t_{i-\upsilon})}{t_i - t_{i-\upsilon}},$$

where $\upsilon = 1$. Then it can be seen that (10) is essentially equal to (9) for noncensored observations. It is suggested here that the smoother estimates of the baseline hazard function are obtained by choosing υ for each t_i such that $\min(t_i - t_{i-\upsilon})$ is larger than a predefined constant ε. In this application ε was set equal to 5 weeks and the estimates of the baseline hazard function were centered at the midpoint of the intervals $(t_i, t_{i-\upsilon})$. An advantage of this kind of simple smoothing is that the baseline hazard can not obtain negative values, which is possible using the method suggested by Anderson and Senthilselvan (1980).

The estimates of the baseline hazard function for a cohort of unemployed workers are

comparison between an estimated cumulative hazard and the corresponding observed failure count. This procedure was presented by Arjas (1988). According to these kinds of graphical examinations the models of unemployment duration were well specified.

Table 3. Semi-parametric models of labour mobility

a Regional mobility b Occupational mobility	a	b
	Str.errors in parentheses	
Age	–0.053	–0.035
	(0.022)	(0.010)
Level of education		0.305
		(0.182)
Training for employment		0.340
		(0.194)
Member of UI fund	–1.382	0.376
	(0.467)	(0.156)
Came from schooling		–0.034
		(0.248)
Came from housework		0.084
		(0.254)
Regional demand	–2.036	1.223
	(1.433)	(0.597)
Occupational demand	2.836	–3.544
	(3.179)	(1.637)
Taxable assets		–3.918
		(3.264)
Replacement ratio	–5.116	–0.446
	(1.005)	(0.334)
Log likelihood	–321.8	–1364.3
Number of observations	2077	2077

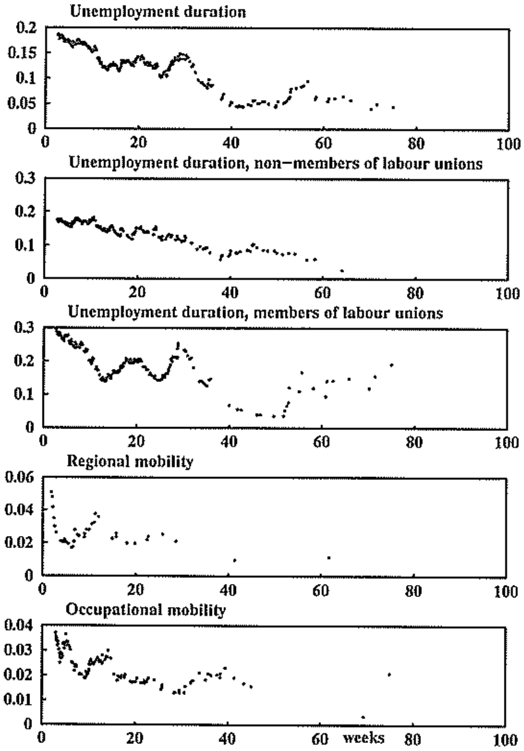

Figure 1. Baseline hazard functions of unemployment duration and labour mobility

presented in Figure 1. The first baseline hazard is based on the first model of Table 1. The second and third baseline hazards are based on the models of Table 2. The baseline hazards of these models include the time-dependent effect of the replacement ratio. Figure 1 shows that the risk increases the probability of becoming employed. It means that there is a good reason to estimate the time-dependent effect of the replacement ratio. Reluctant movers risk losing benefits after the first three months. The elasticity of the hazard function with respect to the replacement ratio is the product of the replacement ratio and its parameter estimate. Therefore the effect of this risk is larger for the members of labour unions, who are usually eligible for higher benefits.

Members of labour unions face a 20 per cent reduction in their benefits after the 20*th* week of unemployment. The reduction has a strong positive effect on the reemployment probability. The hazard is approximately 100 per cent higher just after the reduction than it would otherwise be indicating that in the case of decreasing benefits the elasticity of the hazard with respect to the replacement ratio is about –5. These findings are confirmed by Table 2, which shows that the negative effect of benefits is higher for the non-members of labour unions even though their benefits are lower. Cox's model is crucially dependent on a common baseline hazard assumption. The estimates of Table 2 clearly indicate differences among the members and non-members of labour unions. Therefore the results of Table 2 are preferred.

The employment office had to offer a job to a person who had been unemployed for a year. Therefore the baseline hazard functions are increasing at the end of a year of unemployment. The low estimates of the baseline hazard function for the durations just less than a year are rather low. This is probably affected by the rules and practice of the employment office. However, it is not possible to drawn strong conclusions about these effects, since the number of observations is low in the relevant time range.

The baseline hazard functions of labour mobility are presented in Figure 1. They are based on the models of Table 3. The unemployed persons seem to be prone to move at the beginning of their unemployment spell and just after the first three months of unemployment. However, one can not draw very strong conclusions about the regional mobility, since it is a rather rare phenomenon.

Occupational mobility is measured on the most accurate 5-digit level, which includes 1320 occupations. Unemployed persons change their occupations most often at the beginning of their unemployment spells and just after the first three months of unemployment.

4. Concluding Remarks

The aim of this study has been to investigate the process of reemployment of unemployed Finnish workers using both the search theoretical and econometric approaches. According to the comparative static results the UI benefits have a disincentive effect on the reemployment probability. This is a well-known result, but from the policy point of view it is interesting to note that the reemployment probability of unemployed workers can be increased by offering reemployment bonuses.

According to experimental evidence from the U.S. and Australia reemployment bonuses appear to have positive and substantial effects on the reemployment. Instead of paying generous benefits it would be worthwhile to consider paying stingy benefits and generous reemployment bonuses. An effective means is to turn a proportion of the unemployment benefits into bonuses. It could be done by collecting for example the earnings-related part of the benefits to the UI funds and pay these cumulative benefits as a reemployment bonus when the person has found a job.

According to the search models the qualifying waiting period has a slight positive effect on the reemployment probability. On the contrary the threat of removing benefits from persons who are reluctant to move or change their occupations and reductions of benefits substantially increase the reemployment probability.

The econometric part of this paper studied the time-dependent effects of the UI system using semi-parametric models of unemployment duration. Models with duration-dependent replacement ratios of unemployment benefits were estimated. The model with a duration-dependent replacement ratio gives a substantially lower parameter estimate of the replacement ratio than the model where the benefit replacement ratio is fixed at an average value over the unemployment spell. Studying more carefully the duration-dependent effects, it was noted that the benefits have a negative effect on the reemployment probability during the first three months of unemployment, but after that period the effect turns positive. One reason is that the unemployed persons may lose their benefits after the first three months if they do not move or change occupations. Another reason is that the reduction of benefits by 20 per cent after the 100*th* day of unemployment doubles the reemployment probability just after the reduction. Because of these rules the incentive for reemployment is higher for the persons with high benefits. Using graphs of the baseline hazard functions it was shown that these features of the UI system are of a great importance when looking at the probabilities of reemployment and regional and occupational mobility.

There are several factors which will increase the duration of unemployment. Elderly persons are more apt to incur problems in finding acceptable offers. They are less prone to move and change occupations than younger persons. The persons who came from housework have longer durations than other persons. Education and skills were found to help substantially the reemployment. The greatest cause for concern is that persons with high unemployment benefits tend to have longer unemployment spells.

The incentive for the reemployment can be effectively increased by removing the protective rules of regional and occupational mobility and reducing benefits after a fixed period. It can also be argued that the basic unemployment allowance should have a limited period of eligibility. These kinds of changes in the UI system would promote shorter durations of unemployment. These kinds of changes are difficult, however, from the economic policy point of view. On the other hand the income of unemployed persons can be increased by removing the waiting period of unemployment benefits, since the waiting period does not substantially increase the reemployment probability.

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Data appendix. Variables of the data

Duration of unemployment is calculated in weeks and it is the difference between the date of entry into unemployment and the date of returning to work. The data includes also other forms of exit than becoming emplyed. These are called censored observations. Mean = 15.06.

Number of children is the number of unemployed person's children who are younger than 18 years. Mean = 0.23.

Married is a dummy variable, 1 = yes. Mean = 0.37.

Sex is a dummy variable, 1 = male. Mean = 0.54.

Age is measured in years. Mean = 31.2.

Level of education is a dummy variable, 1 = at least 12 years of education. The level of education is based on the education code of the Central Statistical Office of Finland. Mean = 0.45.

Training for employment is a dummy variable, 1 = The person has got training for further employment. Training for employment is course participation, which have been occurred before the unemployment, but not necessarily immediately before it. Mean = 0.15.

Member of UI fund is a dummy variable, 1 = yes. Mean = 0.42.

Came from schooling is a dummy variable, 1 = The person has come from schooling or from the military service. Mean = 0.13.

Came from housework is a dummy variable, 1 = The person has come from housework or elsewhere outside the labour force. Mean = 0.07.

Regional demand describes the regional rate of jobs available. It is the number of vacancies divided by the number of job seekers in the area. Mean = 0.10.

Occupational demand describes the occupational rate of jobs available in the whole country. It is the number of vacancies divided by the number of job seekers in the occupation group. Mean = 0.12.

Taxable assets has been compiled from the tax register and it is measured in millions of marks. Mean = 0.011.

Replacement ratios in the intervals, 1–3 and 3–24 months are unemployed person's average replacement ratios after tax in those intervals. Average weekly unemployment benefits after tax have been divided by the average weekly income in 1985 after tax. Means: 0.15 and 0.25.

The corresponding means of the replacement ratios are 0.29 and 0.55 for the persons receiving earnings-related unemployment allowance and 0.26 and 0.41 for the persons receiving the basic unemployment allowance. The average replacement ratios are lower during the first three months, since no benefits are paid during the qualifying waiting period of benefits. Also reductions and disqualifications of benefits decrease the average replacement ratios. Some persons do not even apply for the benefits.