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DETERMINANTS OF JOB SEARCH INTENSITY – SOME EVIDENCE FROM THE NORDIC COUNTRIES

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ABSTRACT

This paper examines the determinants of the job search intensity of unemployed job seekers in three Nordic countries: Denmark, Finland and Norway. For this purpose we use data from a survey carried out in the three countries in 1998 by means of a common questionnaire. For each country we study two samples; a stock sample consisting of individuals still unemployed at the time they were interviewed and a flow sample including the job seekers who had left unemployment when interviewed. The analysis concerns two decisions: i) whether or not to search, and ii) given positive search, the magnitude of the search effort. In addition to individual characteristics, the explanatory variables are participation in labour market programmes, unemployment benefits, attitudes to work, individual consequences of unemployment and the demand situation in the local labour market. We find rather big differences between the countries with respect to the relative importance of the determinants of job search intensity. Some common features are: Positive work attitudes are positively related to job search. Those reporting economic problems as a consequence of their unemployment search more intensively than others. In Finland and Norway, unemployment benefit recipients are more likely to search actively than non-claimants, whereas in Denmark the groups do not differ. A positive impact is consistent with non-claimants being less attached to the labour market.

Keywords: Unemployment, Job search intensity, Economic incentives, Work values
JEL classification: J64, J65

TIIVISTELMÄ

Tässä työssä tutkitaan työttömien työnhakijoiden työn etsinnän intensiivisyyteen vaikuttavia tekijöitä kolmessa pohjoismaassa: Ruotsissa, Suomessa ja Tanskassa. Tutkimuksessa hyödynnetään kaikissa kolmessa maassa vuonna 1998 kerättyä samanlaista kyselyaineistoa. Kustakin maasta on kerätty kaksi otosta; ns. varanto-otos, joka on otos tiettynä ajankohtana olleista työttömistä ja ns. virtaotos, jossa on mukana tiettynä ajankohtana työllistyneet tai työvoiman ulkopuolelle siirtyneet. Analyyseissä tarkastellaan kahta päätöstä; i) etsiäkö työtä vai ei, ja ii) jos työtä on etsitty, kuinka paljon voimavaroja työn etsintään on käytetty. Yksilötekijöiden lisäksi työn etsintää selittävinä tekijöinä on käytetty työvoimapoliittisiin toimenpiteisiin osallistumista, työttömyysturvaa, asennetta työhön, työttömyyden seuraamuksia yksilötasolla ja paikallisten työmarkkinoiden kysyntätilannetta. Tutkittujen maiden välillä on melko suuria eroja siinä, mitkä tekijät selittivät työn etsintää. Myös joitakin yhteisiä tekijöitä löytyi: Myönteinen asenne työhön lisäsi työn etsintää. Ne, joilla työttömyys aiheutti kielteisiä seuraamuksia, etsivät muita ahkerammin töitä. Suomessa ja Norjassa työttömyysturvan piirissä olevilla oli muita suurempi todennäköisyys etsiä töitä kun taas Tanskassa näiden ryhmien välillä ei ollut eroja. Työttömyysturvan myönteinen vaikutus työn etsintään on yhdenmukainen sen ajatuksen kanssa, että työttömyysturvaa saavat ovat muita sitoutuneempia työmarkkinoille.

Aivansanat: Työttömyys, työn etsinnän intensiteetti, taloudelliset kannustimet, työn arvostaminen
JEL luokitus: J64, J65

1. INTRODUCTION

Following the seminal paper by Mortensen (1977), the bulk of the literature on the determinants of job search, and search duration in particular, has predominantly been concerned with the economic incentives for individuals to *accept* job offers. Considerable less attention has been paid to the factors influencing the intensity with which job seekers search for job vacancies. Apart from a number of rather descriptive analyses of job seekers' use of different channels of search – see e.g. Rosenfeld (1977) and Moylan et al. (1982) – relatively few empirical studies attempt to explain differences in individuals' search *effort*. Some notable exceptions are Barron and Mellow (1979), Barron and Gilley (1979), (1981), Chirinko (1982), Holzer (1988), Albrecht, Holmlund and Lang (1989), Wadsworth (1990), Lindeboom and Theeuwes (1993). For two recent and comprehensive reviews; see Devine and Kiefer (1991), Pedersen and Westergård-Nielsen (1998).

The key dependent variable in job search analyses has been unemployment duration. In most studies the outcome variable is specified as a hazard rate, the probability of exiting unemployment, or as a transition from unemployment to employment. Such a transition is the product of the search intensity (and thus the probability of locating a job offer) and the probability that the offer is accepted. A main purpose of this paper is to focus on the first of these components, *the search intensity* and its determinants. A novelty of our analysis is that we decompose the search strategy into two components: whether the individual searches at all, and if so, how much or how intense.

Another distinguishing feature of the paper is that it uses data from three different countries: Denmark, Finland and Norway. These data sets were collected by means of a survey questionnaire, which asks the same questions in all three countries. For each country we construct two samples on the basis of the status of the respondents at the time they were interviewed. Those still unemployed constitute the stock sample and those who had left unemployment are in the flow sample.[1]

[1] In fact, the same questionnaire survey was also carried out in Sweden, too. However, the Swedish data are not included in the analysis in this paper.

As is well-known, long-term unemployment spells are over-represented in stock samples (Salant (1977)). By comparing the results for stock and flow samples we are able to check if the sampling procedure – and thus a possible impact of unemployment duration – is reflected in the analyses of job search behaviour.

The three countries have in common some features of Nordic labour market institutions, but differ in other respects. For instance, the demand conditions in the labour market during the time of the study were quite different. Norway had a strong labour demand and consequently a low unemployment rate, Denmark experienced falling unemployment for the fifth year in a row, and finally Finland had high but decreasing unemployment during her recovery from the severe economic crisis of the early nineties. They also differ regarding the generosity and other aspects of the unemployment benefit system. In Denmark and Finland membership in the income related unemployment insurance system is voluntary, whereas in Norway it is compulsory. In Denmark the replacement ratio may be as high as 90 per cent for low paid workers and the job seeker must have had a job for at least twelve months to be eligible. In Norway the replacement ratio is 63 per cent at maximum, and eligibility depends on previous annual earnings; 2.5 months of employment is sufficient in most cases.

We find that the three countries also differ with respect to average levels of job search effort. Thus, for example a considerably larger share of the Danish and Finnish respondents does not search at all. Conditional on searching, also the level of search intensity is higher among Norwegian respondents. A second aim of the analysis is to contribute to the understanding of these differences in job search strategies and hence also to what extent such differences may explain the differences in unemployment rates. Finally, the third aim of the paper is to shed additional light on how search intensity differs between those eligible and not eligible for unemployment benefits, respectively and between the genders, age groups and individuals with differing breadwinner status. The question concerning the impact of unemployment benefit receipt is important, since if this effect is positive, it works against the negative reservation wage effect.

The remainder of the paper is organised as follows. Next we briefly sketch the theoretical framework underlying our empirical analysis. Section 3 gives a description of some of the key characteristics of the labour markets and labour market institutions in the three

countries under study. The fourth section presents the data sets used and the fifth section contains the empirical model. Estimation results are presented in the sixth section. Section 7 concludes. More details are found in Appendix A and B.

2. THEORETICAL CONSIDERATIONS

Next we discuss the job search behaviour by unemployed within a simple framework. We assume the probability of employment for an unemployed job seeker (p_e) is the product of the probability that he or she will receive a job offer (p_o) and the probability (p_a) that the offer is accepted:[2]

(1) $p_e = p_o\, p_a$.

The probability of acceptance can be written as follows:

(2) $p_a = (1\text{-}F(w_R))$

where w_R is the reservation wage (minimum acceptable wage offer), and F(w) is the cumulative distribution of possible job offers, assumed to be independent on the job search strategy. Thus $(1\text{-}F(w_R))$ is the probability of getting an acceptable job offer. Further, the job offer probability p_o depends on the level of demand in the labour market (d) and the intensity of search activity undertaken by the job seeker (s):

(3) $p_o = p_o(d, s)$, assuming p_o to be increasing in both d and s.[3]

Search effort provides information on job offers. The amount of information and the probability of contacting a job offer are positively related to search effort:

(4) $s = s(t, z)$, assuming s to be increasing in both t and z.

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[2] See e.g. Barron (1975), Lynch (1983) and Wadsworth (1990).

[3] As emphasised by Barron (1975), in addition to an increase in the arrival rate of job offers, an increase in demand may also lead to searchers becoming more choosy, that is, their acceptance probability is lowered. Consequently, the effect of demand on the probability of employment is *a priori* ambiguous.

where t represents time (and other resources) devoted to search activity, and z represents the influence of individual (and other) background exogenous characteristics. Both the reservation wage and the search effort are results of optimal behaviour. We assume the job seeker maximises the welfare given by the present value of expected future net income. *As employed* net income is given by the value of the wage contract. For an interest rate r, the present value of an indefinite wage contract w is given by

(5) $V(w) = w/r$

Disregarding the possibility of loosing the job and becoming unemployed, the expected value of an acceptable contract is depending on the reservation wage and is given by

(6) $x = E(w \mid w > w_R) = (1/p_a) \int_{w_R} w\, f(w)\, dw$

The present value of such an acceptable and indefinite wage contract is:

(7) $V(x) = x/r$

As unemployed net income is given by non-labour income y, and unemployment benefits b, minus the job search costs. Assume there is a fixed cost per time unit of search, e. Then the net income per period is given by $(y + b - et)$. Starting as unemployed the present value of expected net income in the future is:

(8) $U = (y+b-et)/(1+r) + p_e V(x)/(1+r) + (1- p_e)\, U/(1+r)$

Accounting for (7) and solving for U yields:

(9) $U = \{ r(y+b-et) + p_e x \} / r(r + p_e)$

Maximising (9) with respect to search effort and taking (1)-(4) into consideration gives an interior solution $t=t^*>0$. The corresponding present value of expected net income for all future is given by $U=U^*$. It is, however, optimal to search for a job only if the value of U^* is larger than the present value of expected net income value for $t=0$, $U=U^0$. If Ut^* is less than U^0 the optimal behaviour is not to search at all, but to choose $t=0$. (Even without searching, an acceptable offer may arrive.)

For any given value of search effort t, the reservation wage w_R is determined by the equality of $V(w_R) = U$, i.e. for a job offer $w = w_R$ the job seeker is indifferent between staying unemployed or accepting the job. Thus, we obtain

$$(10) \quad w_R = (y+b-et) + (p_o/r) \int_{wR} (1 - F(w))\, dw$$

The value of search is a function of the reservation wage and job offer probability. Both are influenced by job search effort, which in turn is a function of general demand factors and individual characteristics.

The above framework suggests that the decision to search actively is basically composed of two parts. First, the job seeker decides whether or not to search at all. Second, if it is optimal to search, the job seeker decides on how intensively or on how many hours to search. In particular, if the decision process for searching-or-not is different from that for hours of search, it is important to model search behaviour as two separate decisions.[4] If these decisions are driven by different mechanisms analysing search activity and its determinants as a single decision may lead to misleading (policy) conclusions.

3. KEY FEATURES IN THE NORDIC LABOUR MARKETS

A common notion is that the Nordic labour markets are very similar. Although these markets do indeed have many features in common, there are also significant differences regarding both labour market regulations and policies that have been less emphasised in public discussions. Furthermore, the performance of the Nordic labour markets has historically been quite different.

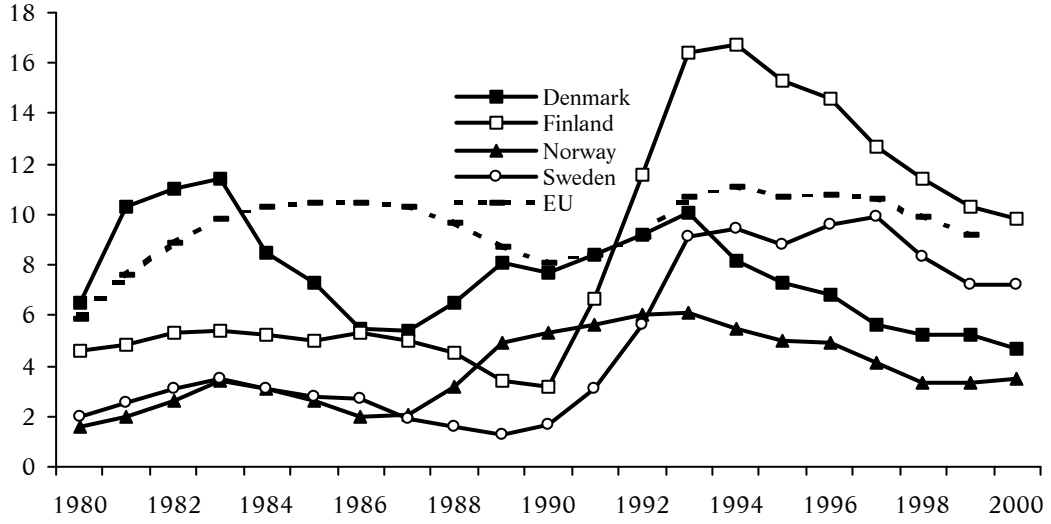
From Figure 1, which compares the unemployment rates in four Nordic countries and the EU average, it can be seen that the labour market tightness has varied considerably over time and between countries.[5] Denmark has a longer history of high unemployment than the other Nordic countries. Today, however, unemployment is a lesser problem in the

[4] The labour supply literature emphasizes the importance of distinguishing between the decisions whether or not to work and of the number of hours of work supplied; see e.g. Killingsworth (1983).

Danish labour market than in most other European countries. Finland had a good track record in the 1980s, but the exceptionally deep recession in the early 1990s completely changed the situation. Despite a long period of economic growth the Finnish labour market still struggles with high unemployment rates.

Unemployment in Norway has remained at relatively low levels, although Norway like many other countries, experienced a rise in unemployment in the late 1980s and early 1990s. In 1993, the Norwegian unemployment rate reached its peak at a level of 6.1 per cent only. Until the beginning of nineties, Sweden was admired for her excellent labour market performance until the beginning of the 1990s. Thus, in the 1980s and early 1990s unemployment rates stayed around or below three per cent. In 1993 the unemployment rate rose sharply to 9.1 per cent and has since then remained at relatively high levels.

Figure 1. Unemployment 1980-2000
Nordic countries and EU
Per cent of labour force



[5] For a more detailed discussion, see Björklund and Eriksson (1996).

As for the unemployment benefit system there are marked differences both in terms of coverage and benefits between the Nordic countries. Table 1 describes the basic features of the unemployment insurance system in the Nordic countries.[6] In Denmark participating in the UI-system is voluntary (through membership of unemployment insurance funds) whereas in Norway insurance is public and compulsory. In 1998 as many as 83 per cent of the labour force was covered by the UI-system in Denmark. In Finland and Sweden the UI-system is voluntary as in Denmark but unlike Danish and Norwegian benefit systems it is complemented by two other systems; a basic unemployment assistance system and a means tested labour market subsidy.

In order to be eligible for UI-benefit one must fulfil either employment or earnings condition. In Denmark the unemployed job seeker must have been employd for at least 12 months during last three years to be eligible for the benefit. In Finland (Sweden) 10 (6) months of employment during two previous years is required for eligibility.[7] In Norway a minimum level of earnings is required which is calculated either from last year (NOK 56,712) or from the previous 3 years (NOK 136,110). A person with average earnings would need to work for 2.5 months to fulfil the earnings condition in Norway. These eligibility rules imply that an unemployed job seeker in order to receive UI-benefits has to a certain extent have been attached to the labour market prior to becoming unemployed.

Due to the relatively strict eligibility rules for UI-benefits, there are members of the UI-system who do not receive benefits. Among unemployed job seekers about 71–80 per cent in Sweden, 68–78 per cent in Denmark, 53–73 per cent in Norway, and 45–55 per cent in Finland receive UI-benefits. In Denmark, Finland, and Sweden these figures also reflect the fact that not all job seekers are members of the UI-system. In Finland most of those who are not eligible for UI-benefits can apply for either basic unemployment allowance or labour market subsidy. In Sweden basic support is an alternative option for the unemployed

[6] The year for comparison is chosen to be 1998, which is the year when the survey data for subsequent empirical analyses were collected.

[7] The employment condition was lifted from 26 to 43 weeks in 1997 to make it more difficult to fulfil it merely through participation in labour market programmes. In Finland, basic unemployment allowance has the same employment condition for eligibility as the UI-benefit system. If the employment condition is not fulfilled the job seeker can apply for means-tested labour market subsidy.

job seekers. In Denmark and Norway it is the social insurance system that mainly provides for those not covered by the UI-system.

Table 1. Major features in the unemployment insurance (UI) system, 1998

	Denmark	**Finland**	**Norway**	**Sweden**
Institutions	Several independent unemployment insurance funds (mostly run by the trade unions)	Several independent unemployment insurance funds (mostly run by the trade unions)	One public, Social Insurance Scheme	Several independent unemployment insurance funds (mostly run by the trade unions)
Membership Per cent of labour force	Voluntary 83 %	Voluntary 77 %	Compulsory 100 % (of all employees)	Voluntary 90 %
Employment/earnings conditions for eligibility	Employed at least 12 months in last 3 years	Employed at least 10 months, 18 hours per week, in last 2 years	Earnings last year at least NOK 56 712, or NOK 136 110 in last 3 years	Employed at least 6 months, 70 hours per month, in last year
Coverage among unemployed (from last 5 years)	68–78 %	45–55 %	53–73 %	71–80 %
Waiting days	0 waiting days	7 waiting days	3 waiting days	5 waiting days
Length of benefit period	260 weeks	100 weeks	156 weeks	60 weeks (renewable)
Benefit base (R)	Average daily earnings from last 12 weeks	Average daily earnings = 0.95*(monthly earnings) / 21.5, average monthly earnings from last 43 weeks	Annual earnings from last year (or average last 3 years)	Average daily earnings in last 52 weeks
UI-compensation per day (full rate)	90 per cent of R	120 FIM + 42 per cent of (R-120 FIM)	0,24 per cent of R (compensation rate = 62,4 per cent)	80 per cent of R
Minimum level of UI	DK 441	FIM 120	--	--
Maximum level of UI	DK 538	--	NOK 653	SEK 580
Child support	No	Yes	Yes	No
Supplementary benefits	No	Basic unemployment allowance Labour market subsidy		Basic support
Special regulations for older job seekers	From 50+ years of age UI runs until 60.	From 57+ years of age UI runs until 60. Unemployment pension from 60 years onwards. Old age pension at 65.	From 64+ years of age UI runs until 67. Old age pension at 65.	From 57+ years of age benefit period 90 weeks. Old age pension at 65.

Notes: **Denmark**: Regulations refer to January 1998. Employment condition: 52 weeks for full-time insured, 34 weeks for part-time insured. Benefit period: Total of 5 years of which maximum 3 years in labour market programmes. **Finland**: Maximum level of UI: for earnings exceeding FIM 10,800 the compensation is 20 per cent. **Norway**: Regulations refer to May 1998. Benefit period: 78 weeks for those in part-time jobs (annual earnings less than NOK 90,740). **Sweden**: For further details, see Regnér and Wadensjö (1999). Source: TemaNord (1999).

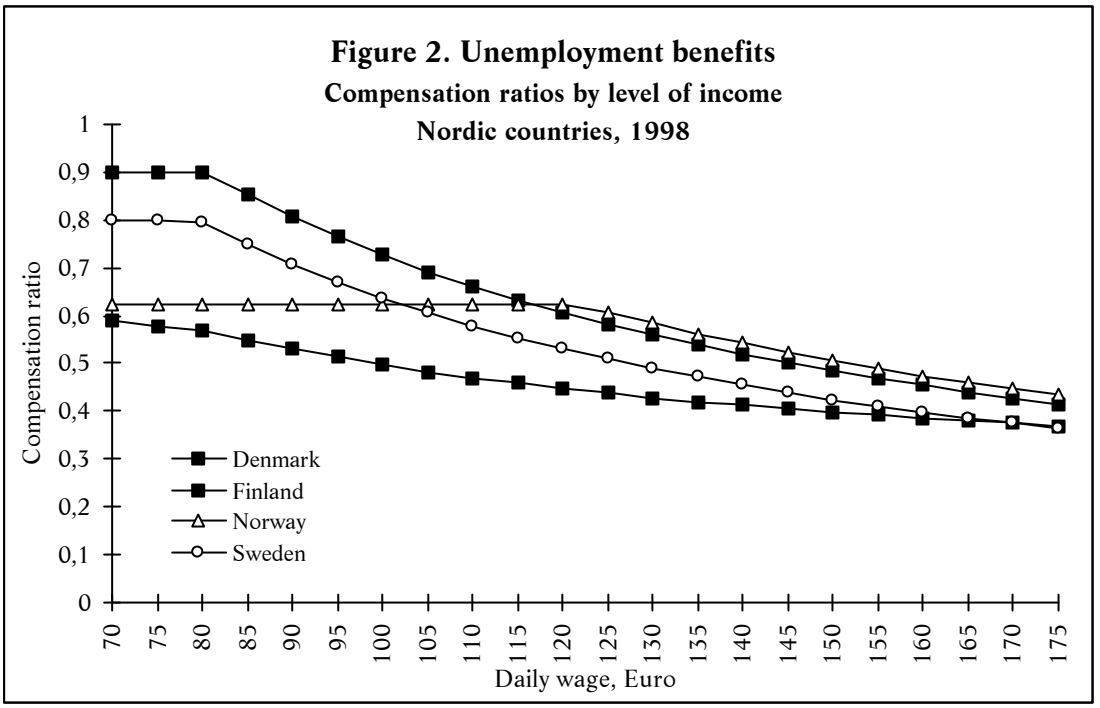
The period for paying UI-benefits is longest in Denmark (260 weeks) and shortest in Sweden (60 weeks). However, in Sweden attending a labour market programme qualifies the person to a new benefit period. The Finnish unemployment benefit system is a kind of a two-tier system due to supplementary benefits available to job seekers. When the UI-benefit period of 100 weeks has elapsed, the unemployed job seeker can apply for means tested labour market subsidy, which, if granted, provides a lower benefit level than the earnings related UI-benefit system but has no time limit.[8]

The gross replacement ratio is highest in Denmark and lowest in Finland. In Denmark the basic rule is that UI-benefits equal 90 per cent of previous earnings. Due to the upper limit of DK 538 per day for the UI-benefit the 90 per cent rule does not, however, apply for higher earnings; see Figure 2. In Norway the basic rule is that UI-benefits correspond to 62.4 per cent of previous average earnings, but as in the Danish case, the upper limit of NOK 653 per day means that this level is not reached by those with higher earnings. The same is true for the Swedish 80 per cent replacement that only those job seekers with relatively low earnings receive in full amount. In Finland the replacement ratios are lower; even at relatively low earnings levels the replacement ratio rarely exceeds 60 per cent.

Figure 2 shows the linkage between previous earnings and UI-benefits (gross replacement ratios). However, other economic support is also available to unemployed job seekers. In addition to the UI-benefits family, housing and child-care benefits can be paid to the unemployed job seekers affecting their incentives to search for a job. The net replacement rates for families with 2 children vary between 85–95 per cent in Denmark, Finland and Sweden and in Norway between 73–77 per cent.[9] In all four countries the economic incentives for job search are lowest among the low-income families with children. This feature is shared with most OECD benefit systems.

[8] There are special regulations for ageing unemployed job seekers in all Nordic countries, which make it possible for them to prolong the UI-benefit period from those mentioned above. Due to these regulations economic incentives for job search are not very strong among older job seekers.

[9] See OECD (1998).



The role of labour market policy authorities is crucial in mitigating potential disincentive effects for job search that the benefit systems may create.[10] In the Nordic countries public employment offices play an integral part in this respect as they administer benefit systems, inform job seekers about vacant jobs, and choose participants to labour market programmes. The fact that the administration effectively monitors job search (and there are sanctions related to the refusal to search for a job) can have substantial incentive effects on job search among the unemployed. Regular interventions during the unemployment spell, such as job-search monitoring, intensive interviews, and referrals to vacant jobs can be regarded as an "activation" strategy that aims at raising the employment probability of a job seeker. In this respect these measures are complementary to active labour market programmes.

In the 1990s, new instruments of active job search were introduced and penalties related to job rejections became tougher in Finland. Job seekers rights and duties were clearly specified. All job seekers are to be interviewed and individual job search plans should be

[10] Holmlund (1998).

made at the latest when the unemployment spell is approaching 12 months.[11] Job seekers can loose their benefits for relatively long periods (up to 3 months) if they refuse a job offer.[12]

In Norway job seekers will not receive UI-benefits for 8 weeks if they leave their job voluntary or refuse a job offer or to take part in a labour market programme, or don't show up for a planned meeting at the employment office. If the rules are broken several times the sanction may last for up to 26 weeks. The length of the corresponding sanction period in Denmark is 5 weeks.

The role of labour market policy programmes differs markedly among Nordic countries. Historically, the total spending on these programmes as of GDP has been highest in Denmark, where in 1993 it was as high as 7 per cent.[13] This is true even today despite the fact that the unemployment rate in Finland far exceeds the Danish rate. In Sweden total spending has been at an average EU-level except in the high unemployment year 1993. Due to the low unemployment, total spending on labour market programmes in Norway has been lower than EU average (2.5 per cent in 2000).

The importance of active labour market *programmes* relative to passive measures as unemployment benefits – measured by the share of active spending of total spending – varies considerably between the four countries. The share of active spending was relatively low in Denmark in the 1980s and early 1990s (between 21-25 per cent). In 2000 this share had risen to 34 per cent. In Sweden active spending peaked in the 1980s reaching over 70 per cent. In the 1990s with the risen unemployment rates this share fell to 50 per cent, which was still a high level compared with other countries. In Norway, where the labour market situation has been rather good, active spending has been at a relatively high level: in the 1980s around 44–56 per cent and in 2000 as high as 67 per cent. In Finland, in the 1980s when the labour market situation was good, the share of active spending was 40–46 per cent of the total spending. In early 1990s when the situation deteriorated dramatically, it was as low as 26 per cent but has increased since then to about a third.

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[11] For younger job seekers this time limit was six months.

[12] See Lilja and Savaja (1999).

[13] See e.g. Martin & Grubb (2001).

4. THE SURVEY DATA

The subsequent empirical analysis is based on data from a comprehensive and with only a few exceptions, identical surveys directed at job seekers in Denmark, Finland and Norway in 1998. The original samples were drawn randomly from the national unemployment registers and were subsequently interviewed. The surveys were administered as telephone interviews. Obtaining a reasonably high response rate may sometimes be a problem in studies with this type of design. For Finland we were quite successful with a response rate of 61 per cent. The response rates for Denmark and Norway were 47 and 29, respectively. The latter is clearly rather low.

The respondents were asked several questions regarding different aspects of their job search behaviour (JSB), and in particular concerning JSB during the preceding four weeks. Those no longer unemployed at the time of the interview were asked retrospective questions about their JSB during the last four weeks of their unemployment period. In addition the respondents were interviewed about their work values and attitudes, their experiences regarding the consequences of being unemployed, as well as about conventional human capital characteristics. The survey also asked about the respondent's receipt of unemployment benefits. Further details about the survey and the key findings for each of the four countries are found in TemaNord (1999).

For each country two separate samples were selected. The *stock sample* includes persons who were either openly unemployed[14] or in active labour market programmes at the time of sampling. The *flow sample* contains those who left the unemployment register during the period of sampling and interviewing either to begin a job or to exit the labour force. As long-term unemployment spells are over-represented in stock samples, comparing the two kind of samples enables us to examine the extent to which the sampling procedure adopted affects the results of the analysis of job search behaviour. In order to preserve the

[14] Note that since the survey did not ask the respondents whether they were temporarily laid off by their previous employer, this category cannot be excluded from the two samples.

flow samples as real outflow samples, the persons who had re-entered unemployment at the time of the interview are excluded from the sample.[15]

St Louis et al. (1986) argue that the choice of sampling design is of utmost importance when it comes to the analysis of possibly incentive effects of unemployment benefits (UB). According to them analyses based on data sets including *re-employed* workers (as we typically find in our flow samples) will indicate that receiving UB is *positively* correlated with job search intensity. In studies based on samples of *unemployed* only, UB are either *negatively* correlated or uncorrelated with job search intensity.[16] As we have access both kinds of samples, we are able to study this design effect.

Job search behaviour

The survey is rich on information concerning different channels of job search, the amount of job contacts and the time devoted to job search. In the empirical analysis we will – in addition to *job search as such* – focus on two measures on job search *intensity.* The first one is a job search intensity *index*, taking on values from 0 to 9 and which aims at capturing the intensity of search both by the multiple use of job search channels and by the time input used for job search during the last four weeks. The second measure is *reported hours spent searching* (during the same four weeks period), which has also been used in earlier job search studies; see e.g. Wadsworth (1990) and Barron & Mellow (1979). The data set enables us to distinguish between two stages in the job seekers' decision process. In the first stage we assume the job seeker decides whether or not to search at all. Then conditional on the outcome of this decision, she decides on the intensity of job search. The construction of the job search indicators is described in Appendix A. Table 2 presents some key figures on job search behaviour.

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[15] From the original samples we excluded 25 per cent in Denmark, 13 per cent in Finland and 22 per cent in Norway.

[16] St. Louis et al. (1986) are also very critical about the use of reported (versus actual) job search among UI recipients. Their results suggest that UI recipients may engage in substantial over-reporting of their actual search efforts when active job search is required for UI benefit eligibility. In the case of the Nordic data sets, this over-reporting could manifest in the stock sample, which includes unemployed job seekers, but not in the flow sample, which includes those who already got a job or exited from the labour market.

As can be seen from Table 2 most unemployed search for a job, the proportion is higher in Norway than in Denmark and Finland, and higher in flow samples than stock samples (except in Norway). The same pattern can also be seen for the number of search hours and the search index.

In the survey the respondents were also asked whether they currently were searching more, less, or with the same intensity as in the beginning of their unemployment spell: see TemaNord (1999). As is described in Eriksson et al. (1999), 22 to 32 per cent of the stock samples and 14 to 22 per cent of the flow samples said they were searching less than before. The corresponding shares for those searching more were 18 top 28 and 19 to 23 per cent for the stock and flow samples, respectively. Clearly the differences in the shares between the stock and the flow samples are most likely reflecting differences in unemployment durations. Thus the higher share reporting falling search intensity in the stock sample may be due to increasing discouragement with increasing duration of unemployment. In the following empirical analyses we have, unlike for example Wadsworth (1990), not included the duration of the individual's unemployment spell as an explanatory variable since this is obviously not exogenous and we are unable to find an instrumental variable to help solving the simultaneity problem.

Work values and unemployment experience

The survey has some questions related to general attitudes towards work and the mental and economic consequences from unemployment. In the empirical analyses we assume that general attitudes towards work influences the job seeker's decision whether or not to search for a job, whereas her intensity of job search is influenced by experienced consequences from unemployment. This makes it possible to identify subsequent empirical model specifications for the determinants of job search and job search intensity. As policy variables we include information on present and former participation in active labour market programmes and receipt of unemployment benefits. Table A1 in Appendix A presents some descriptive statistics for the explanatory variables.

Table 2. Job search behaviour. Nordic survey 1998. Stock and flow samples. Per cent and average values

	Denmark		Finland		Norway	
Job search activities, 4 weeks period	Stock (N=641)	Flow (n=631)	Stock (n=749)	Flow (n=715)	Stock (n=845)	Flow (n=677)
Search for a job (per cent)	62	84	63	89	95.3	92.8
Average hours of search (if hours >0)	10.1	12.8	7.1	10.4	14.0	18.4
Index (0–9 points), average (if search)	3.5	3.8	4.1	4.2	4.6	4.8

Note: The index is defined in Appendix A.

Economic incentives

The economic incentives to search for a job are represented by dummy variables based on self- reported information regarding whether the individual (1) receives (has received) unemployment benefits[17] – the whole or part of the (present) period of unemployment, and (2) has experienced economic problems as unemployed. The last indicator is based on a affirmative answer to the question: *"As unemployed, is it / was it a problem to meet an unexpected bill of an amount equivalent to about 250 Euro?"* Those who receive (or received) unemployment benefits were asked how much they actually receive(d).

The majority of persons in the stock samples were unemployed at the time of the interview. They were asked about their minimum acceptable wage offer, that is, their reservation wage. For this subsample we have estimated a wage equation correcting for selection bias. Next, we predicted the reservation wage for the whole stock sample. The predicted log reservation wage is used as an explanatory variable in analyses of the stock samples.

At the time of the interview, most individuals in the flow samples were employed. They were asked about their wage in their current job. Again, for all individuals in the flow samples we predict their wages by means of an estimated wage equation in a simultaneous

[17] In Denmark and Norway unemployment benefits includes only income related insurance benefits. In Finland it includes both income related benefits, unemployment assistance and labour market subsidy.

model correcting for selection bias. The predicted values of the wage are then used as an explanatory variable in analysis of the flow samples.

To construct a measure of the replacement ratio we use information about individuals' unemployment benefits, reservation wages and actual wages. For individuals in the stock sample with UB we define the replacement ratio as reported benefits divided by predicted reservation wage. For those in the flow sample who received UB while unemployed we define the replacement ratio as reported benefits divided by predicted wage. For those not receiving UB the replacement ratio equals zero. The effects of unemployment benefits on job search intensity may go two ways. On the one hand, search intensity increases because providing the searcher with benefits subsidizes search effort. On the other hand, the additional income can also be spent on more leisure. The net effect is of key importance since if this is positive, this means that possible negative effects of unemployment benefits on becoming employed via the reservation wage are mitigated.

5. THE EMPIRICAL MODELS

In the theoretical section it was assumed that the job seeker first makes a choice *whether or not to search* for a job, and conditional on that choice, she decides upon the *intensity of her job search*. In the empirical model for job search, let us first assume that there is a latent, continuous variable S_i^* (for person *i*) that reflects the basic thrift to search for a job. The model for job search can thus be written as:

(11) $S_i^* = \beta_1' x_{i1} + \varepsilon_{i1}$; where $\varepsilon_{i1} \sim N(0,1)$,

where β_1 is a parameter vector, x_{i1} is a vector of explanatory variables for person *i* and ε_{i1} is a normally distributed error term with zero mean and unit variance.

A dichotomous indicator variable S_i related to observed job search is defined as:

(12) $S_i =$ 1 iff $S_i^* > 0$ (person *i* is observed to search for a job);
0 otherwise

Equations (11) and (12) define a probit model for the dichotomous choice to search for a job. The *intensity* of job search is modelled separately from the overall decision to search for a job.

Let I_i^* be a latent variable related to job search intensity. This variable is not directly observable. Instead an observable job search intensity *index* I_i is defined.[18] This is ordinal and hence, the values of I_i represent only a ranking order (below from 0 to J), where there is no significance to the unit distance between these values. Therefore, it is natural to model the job search intensity as an *ordered probit*:[19]

(13) $I_i^* = \beta_2' x_{i2} + \varepsilon_{i2}$; where $\varepsilon_{i2} \sim N(0,1)$

$I_i = 0$, if $I_i^* \leq \mu_0$

1, if $\mu_0 < I_i^* \leq \mu_1$ ...

J, if $I_i^* > \mu_{J-1}$, where μ_j's are the free parameters to be estimated.

When (I_i, x_{i2}) is estimated conditional on $S_i = 1$, it is assumed that $[\varepsilon_{i1}, \varepsilon_{i2}] \sim BVN[0,0,1,1,\rho_{12}]$, where ρ_{12} is the correlation coefficient between ε_{i1} and ε_{i2}.

Under these conditions this likelihood function provides unbiased and efficient estimators for the ordered probit model.

Let us next specify an alternative model for job search intensity using *hours of search* H_i. As was the case for S_i^*, a latent, continuous variable P_i^* defines the thrift to use positive hours for job search:

(14) $P_i^* = \beta_3' x_{i3} + \varepsilon_{i3}$, where $\varepsilon_{i3} \sim N(0, \sigma_3^2)$

We observe positive hours of search $H_i > 0$ only if $P_i^* > 0$. When $P_i^* \leq 0$, $H_i = 0$ is observed.

A log-linear regression model for hours of job search, H_i can be defined as follows:

(15) $\ln H_i = \beta_4' x_{i4} + \varepsilon_{i4}$, where $\varepsilon_{i4} \sim N(0,\sigma_4^2)$

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[18] See section 4 and Appendix A for a more detailed description of this index.

[19] See Greene (2000), pp. 875–879 or McCullagh (1980).

When $(\ln H_i, x_{i4})$ is estimated conditional on $P_i^*>0$, it is assumed that $[\varepsilon_{i3}, \varepsilon_{i4}] \sim BVN [0,0,\sigma_3,\sigma_4,\rho_{34}]$, where ρ_{34} is the correlation coefficient between ε_{i3} and ε_{i4}. Under the condition that $P_i^* > 0$, the expected value of log hours can be written as follows

$$(16) \quad E[\ln H_i \mid x_{i4}, P_i^* > 0] = E[\ln H_i \mid x_{i4}, \beta_3' x_{i3} + \varepsilon_{i3} > 0] = \beta_4' x_{i4} + E[\varepsilon_{i4} \mid \varepsilon_{i3} > -\beta_3' x_{i3}] = \beta_4' x_{i4} + \rho_{34}\sigma_3\sigma_4\{N(\beta_3' x_{i3}) / M(\beta_3' x_{i3})\}$$

where N is the standard normal density function and M the corresponding CDF. The log-likelihood function for this model can be written as follows:

$$(17) \quad \text{Ln } L = \sum_{H_i=0} \ln M[-\beta_3' x_{i3}] + \sum_{H_i>0} \{-\tfrac{1}{2}\ln 2\pi - \ln\sigma_4 - \tfrac{1}{2}[(\ln H_i - \beta_4' x_{i4})/\sigma_4]^2 + \ln M[(-\beta_3' x_{i3} + (\rho_{34}/\sigma_4)(\ln H_i - \beta_4' x_{i4}))/(1-\rho_{34}^2)^{1/2}]\}$$

We have assumed that the decision on spending any time at all to search may be different from – but correlated with – the decision on how many hours to spend. Hence, the hours- and the selection equations should be estimated simultaneously.

6. ESTIMATION RESULTS

Basic model estimations

To begin with we look at the determinants of the decision to search for a job or not. Table 3 contains estimation results from a probit model including five groups of explanatory variables: individual characteristics, participation in labour market programmes, unemployment related factors, attitudes to work, and local labour market indicators. According to the estimates individual traits have a relatively weak impact on the decision to search for a job. Gender is a case in point. In Finland and Norway older workers are less likely to search actively for new employment. This may reflect discouragement and/or the availability of early retirement options for this group. In the main, the job seeker's family status affects her decision to search for a job very little. For Denmark and Finland

is there some evidence that job seekers with small children are more inclined not to search. The magnitude of the marginal effect is not strong, however.

Labour market policy has both a positive and a negative effect on job search. Participating in a labour market programme while unemployed significantly reduces the propensity to search for a job both in Denmark and Finland. This is consistent with some earlier findings that labour market programme participation does not enhance the transition to employment. On the other hand, previous participation in a labour market programme appears to have a positive impact on job search later, in particular for the flow sample in which long-term unemployment spells are relatively rare.[20] Thus, labour market programmes may promote subsequent employment via greater search effort. This potentially important impact is usually ignored in evaluation studies of labour market programmes that typically focus exclusively on the short-term impact of programme participation.

Receipt of unemployment benefits has no influence on Danish job seekers' job search decision. On the other hand, for the Finnish and Norwegian stock samples we find that receiving benefits promotes job search.[21] This result may be the consequence of at least two different mechanisms. First, due to the employment condition related to the eligibility of unemployment benefits people on benefits are on average more attached to the labour market than those who are not on benefits. Therefore, they also have a higher than average probability of searching for a job, see e.g. Wadsworth (1990).

[20] For the flow sample, which did not include job seekers who were presently in labour market programmes, we used only previous participation in the labour market programmes to measure the programme effects. The estimated impact is positive in all but one case and significant in two cases. It seems reasonable to interpret this as a causal relationship.

[21] In Finland unemployment benefit includes unemployment insurance benefits, unemployment assistance and labour market subsidy. The results did not change even if we used an indicator of unemployment benefits that included only unemployment insurance benefits.

Table 3. Propensity to search for a job – probit estimates

Explanatory variables	Denmark		Finland		Norway	
	Stock N=641	Flow N=631	Stock N=749	Flow N=715	Stock N=845	Flow N=N677
Individual characteristics						
Intercept	-0.6423* (0.3475)	1.0746** (0.4238)	-0.8829** (0.3500)	0.47716 (0.4295)	0.6709 (0.8114)	-0.4131 (0.7329)
Woman	-0.2164* (0.1140)	0.2107* (0.1258)	-0.0841 (0.1043)	-0.2143 (0.1377)	0.3851** (0.1854)	0.0553 (0.1654)
Age < 25	-0.0275 (0.1782)	0.2640 (0.2409)	-0.2523* (0.1460)	--	0.3545 (0.2883)	0.3759 (0.4783)
Age > 50	-0.0810 (0.2256)	-0.6305 (0.1734)	-0.5691*** (0.1358)	0.0955 (0.2331)	-0.5167** (0.2446)	-0.2091 (0.2323)
Basic education only	0.1803 (0.2256)	-0.2920 (0.3058)	0.0705 (0.1149)	-0.0073 (0.1642)	-0.2815 (0.1982)	-0.5254*** (0.1761)
University level education	0.4968** (0.2241)	-0.1224 (0.2974)	0.1468 (0.1831)	-0.1093 (0.1865)	-0.1662 (0.2502)	0.2664 (0.2617)
Partner	0.1999* (0.1198)	-0.1946 (0.1560)	0.0855 (0.1113)	0.1828 (0.1677)	-0.2914 (0.1968)	0.0680 (0.1837)
Children	-0.2284* (0.1340)	0.0860 (0.1514)	-0.0678 (0.1564)	-0.2894* (0.1578)	0.0766 (0.2360)	0.0478 (0.1768)
Labour market programme						
Attends now	-0.9133*** (0.1700)	--	-0.4950*** (0.1534)	--	-0.0025 (0.2731)	--
Attended previously	-0.1462 (0.1199)	0.3500** (0.1547)	0.1868 (0.1237)	0.1866 (0.1646)	0.2912 (0.2265)	0.4225* (0.2384)
Unemployment related variables						
Receives unemployment benefit	0.0642 (0.1918)	-0.0941 (0.1777)	0.2793* (0.1679)	0.1344 (0.1835)	0.5832*** (0.1933)	0.1223 (0.1726)
Have had economic problems related to unemployment	0.2076* (0.1130)	0.0872 (0.1303)	0.2271** (0.1117)	0.1330 (0.1427)	0.1444 (0.1823)	0.2657* (0.1629)
Was unemployed before	0.0740 (0.1130)	-0.1263 (0.1421)	0.1348 (0.1168)	0.2700* (0.1573)	n.a.	n.a.
General attitude towards work						
It is very important for me to have a job	0.6221*** (0.1739)	-0.1994 (0.2543)	0.9162*** (0.1735)	0.9371*** (0.2378)	0.8303*** (0.2744)	0.8087** (0.3522)
Even if I won a large sum of money, I would continue working	0.1075 (0.1431)	0.3924** (0.1593)	0.1471 (0.1200)	0.1954 (0.1567)	0.2509 (0.2377)	0.3662 (0.2640)
Regional indicators	No	No	Yes	Yes	Yes	Yes
Log-likelihood function	-389.19	-267.35	-413.70	-214.89	-125.40	-149.63
P^2	74.33***	26.89**	156.33***	63.01***	71.32***	52.44***

Standard errors are in parentheses. Significance: ***= at 1 %, **=at 5 %, and *=at 10 % significance level.

Secondly, if active search is a prerequisite for unemployment benefit, and if employment offices closely monitor job seekers' behaviour, job seekers on benefits may be induced to over-report their actual search effort when interviewed (St. Louis et al., 1986). The fact that the positive correlation between unemployment benefit and job search is found only in the stock sample, and not in the flow sample, supports the latter interpretation. In Finland and Norway employment offices monitor job seekers quite closely, which may partly explain country differences in this respect. Job seekers with economic problems due to unemployment are pushed harder to find a job in all three countries, whereas previous unemployment experience seems to be of less importance in job search.

In all three countries, the most important single factor affecting the decision to search for a job is the person's attitude towards work. Those interviewees for whom "It is very important for me to have a job" are more likely than others to search for a job. The marginal effect of this variable is quite strong. Policy implications from this are less straightforward. Anyway, the result points out that the policy makers cannot ignore the general attitude towards work in the society.

Search intensity index analysis

Given a positive decision to search for a job, the job seeker next decides on different methods of search as well as on the intensity of search. In this study a job search index and hours spent on job search are used as alternative measures for job search intensity.[22] The job search index takes on higher values the more channels and the more time job seeker has used on job search.

Table 4 reports results from the ordered probit model for job search intensity. This is estimated conditional on job search. It turns out that individual background factors have a slightly stronger influence on the job search intensity than on the choice of whether to search at all. In Finland and Norway women search less intensively than men for a job. In Norway, women had a higher general propensity than men to search for a job.

[22] See section 4 of the paper for a further discussion on these measures.

In Norway and Denmark job seekers aged over 50 years of age search for a job less intensively than others. In Finland age appears to have no effect job search effort. This result should be interpreted against the existing unemployment pension system in Finland. It seems that institutional arrangements, which allow job seekers to exit from the labour force, influence the choice of whether or not to search at all. However, once this choice has been made, they do not appear to have an effect on job search intensity among those who do search for a job.

Education plays a greater role in the determination of job search intensity than in the decision to search for a job in the first place. Job seekers with a basic education, even when active, search less intensively than other educational groups. This effect can be detected in all three countries. University level education increases job search intensity in all countries except in Denmark.[23]

Family circumstances have only a minor impact on job search intensity. The negative effect of children remains for job search activity in Finland. In Denmark the individual's marital status and small children loose their importance as compared to their influence on decision to search for a job or not. So, it seems that also in the case of family policy, the major policy challenge is to prevent job seekers with children to stop searching for a job rather than trying to get them search more intensively.

Labour market programme participation has a positive and significant influence on contemporaneous job search intensity in Finland only.

In all three countries job seekers who have previously participated in labour market programmes search more intensively for a job than others. Thus, although a person participating in labour market programmes does not immediately become a more active job seeker, the programme induces her later to search more intensively for a job. Consequently, programme participation appears to keep job seekers more attached to the labour market.

[23] When job search intensity is measured by log hours also in the Danish case university level education has a positive impact on job search.

Table 4. Job search intensity index – ordered probit estimates

Explanatory variables	Denmark		Finland		Norway	
	Stock N=396	Flow N=528	Stock N=749	Flow N=715	Stock N=805	Flow N=628
Individual characteristics						
Woman	0.0441	0.0934	-0.0936	-0.1598*	-0.3963***	-0.1820*
	(0.1265)	(0.1104)	(0.1049)	(0.0939)	(0.0825)	(0.0862)
Age < 25	-0.0422	0.1356	0.0981	--	0.0077	0.0086
	(0.1767)	(0.1699)	(0.1439)		(0.1038)	(0.1948)
Age > 50	-0.1682	-0.4558***	-0.1053	-0.1478	-0.2257*	-0.2126
	(0.1391)	(0.1427)	(0.1622)	(0.1481)	(0.1380)	(0.1420)
Basic education only	-0.6589**	-0.2816	-0.2102*	-0.2656**	-0.2109**	0.1031
	(0.2602)	(0.2136)	(0.1126)	(0.1051)	(0.0929)	(0.1286)
University level education	-0.4588	-0.0632	0.3061*	0.1564	0.2826**	0.4381***
	(0.2831)	(0.1874)	(0.1737)	(0.1239)	(0.1134)	(0.1174)
Partner	-0.1088	0.0102	0.0839	-0.0030	0.2004**	0.0591
	(0.1292)	(0.1190)	(0.1139)	(0.1111)	(0.0827)	(0.0929)
Children	0.1221	-0.0962	-0.1147	-0.2815***	-0.0099	-0.0627
	(0.1445)	(0.1141)	(0.1369)	(0.0988)	(0.0901)	(0.0901)
Labour market programme						
Attends now	0.4938	--	0.4042**	--	-0.0647	--
	(0.3333)		(0.1692)		(0.1152)	
Attended previously	0.0899	0.3045**	0.2193*	0.4372***	-0.0487	0.1810*
	(0.1220)	(0.1369)	(0.1132)	(0.1052)	(0.0865)	(0.1075)
Unemployment experience related variables						
Receives unemployment benefit	0.1308	0.3973***	-0.1116	-0.3713***	-0.0910	-0.0386
	(0.1935)	(0.1329)	(0.1701)	(0.1206)	(0.0935)	(0.0944)
Have had economic problems related to unemployment	0.0310	-0.0031	0.0436	0.2078**	0.0510	0.0843
	(0.1224)	(0.1012)	(0.1134)	(0.0904)	(0.0779)	(0.0910)
Was unemployed before	-0.1935	-0.3475***	-0.0437	-0.0698	n.a.	n.a.
	(0.1113)	(0.1069)	(0.1170)	(0.1006)		
Consequences from unemployment						
Suffered from loosing contact with previous colleagues	0.3374***	0.2518***	0.1311	0.1928**	0.2887***	0.4608***
	(0.1062)	(0.0941)	(0.1075)	(0.0884)	(0.0766)	(0.0863)
Got health problems	0.0819	0.2687	-0.0892	0.1374	0.0563	0.2803**
	(0.1667)	(0.1462)	(0.1283)	(0.1327)	(0.0886)	(0.1135)
Enjoyed freedom	-0.3295**	0.1394	-0.3240***	-0.1191	-0.0426	-0.2675**
	(0.1337)	(0.1082)	(0.1240)	(0.1100)	(0.1007)	(0.1245)
Sample selection term	-0.9892**	0.6199	-0.6225***	-0.6173***	-2.0859***	-1.5624***
	(0.4803)	(0.8235)	(0.1826)	(0.2270)	(0.5578)	(0.5744)
Regional indicators	No	No	Yes	Yes	Yes	Yes
Log-likelihood function	-742.90	-999.72	-1266.13	-1416.85	-1597.46	-1242.03
P^2	45.79***	59.48***	4.70**	5.19**	108.69***	118.16***

Standard errors in parentheses. Significance: ***= at 1 %, **=at 5 %, and *=at 10 % significance level.

In Denmark those on unemployment benefits search more intensively for a job than others. Unemployment benefits did not have any effect on the decision whether or not to search at all suggesting that the monitoring system related to unemployment benefits does not produce over-reporting of job search in Denmark. Therefore, one could argue that receiving unemployment compensation is more or less related to a higher than average labour market attachment in Denmark. This is then reflected in higher than average job search intensity.

In Finland, on the other hand, the share of those reporting that they had searched for a job was higher than average among currently unemployed job seekers (stock sample) who received unemployment benefits. Table 4 shows that among those job seekers, who had completed their unemployment spells (flow sample), receiving unemployment benefits reduces job search intensity. These differences emphasise the point made by St. Louis et al. (1986) about the importance of the sample design. Over-reporting of job search may occur if unemployed job seekers are monitored closely by labour authorities. However, those who have completed their unemployment spells have no incentives to over-report. The Finnish results suggest that unemployment benefits have negative incentive effects for active job search but these effects seem to be restricted to those job seekers that still actively search for a job.

Some earlier studies have looked into how previous unemployment experience, and the duration thereof, affect current duration; see e.g. Corak (1993). It is, therefore, of some interest to examine whether job search intensity is affected too, as this is one mechanism that might generate occurrence and duration dependence. Another mechanism is stigmatisation, which for a given search intensity leads to a lower job offer probability. We find that prior unemployment experience and economic problems during unemployment are not particularly important factors for job search intensity.[24] In contrast, job search intensity is strongly influenced by different consequences from unemployment. Our results suggest that persons, who consider the lost contacts with previous colleagues as a major problem, put forth more search effort to find a new job than those who do not feel this way.

[24] The significant and negative coefficient to previous unemployment in the Danish flow sample may be due to the fairly high proportion of temporary lay-offs among the Danish unemployed; see Jensen and Westergård-Nielsen (1990). Temporarily laid off workers, especially if they have experienced it before, are for obvious reasons less inclined to search.

Not surprisingly, those who expressed that they enjoyed their increased freedom while unemployed, search less intensively for employment than others. Health problems related to unemployment spell do not have a strong impact on the search behaviour. Only in Norway do those who experienced health problems search more actively for a job than others.

An interesting finding related to the correlation between unobservable factors affecting the decision to search for a job and job search intensity is given by the sample selection term.[25] At first glance the results look surprising as they suggest that a job seeker who decides to search for a job searches less intensively than a job seeker drawn at random would have searched. One possible explanation to this result may be that job seekers, for whom it is easy to signal about their unobservable abilities to potential employers, are more likely to search for a job. At the same time they do not need to search as intensively as those who have difficulties in this respect. Thus, if a person has qualities that make her more likely to search for a job, in order to search successfully, she does not need to put forth as much effort as others.

Search hours analysis

When job search intensity is measured by the logarithm of the hours of search, the estimates, which are set out in Table 5, remain largely the same as above. This reflects the fact the variation in the job search index is largely driven by variation in the number of search hours and that individuals that make use of several methods of search of course also spend relatively more time searching. The only notable differences in the estimates refer to education. According to Table 4, persons with a basic education only have lower job search intensity scores than other job seekers. When the intensity is measured by hours spent searching, the differences are, however, smaller. This is probably due to less educated persons using fewer channels in their job search.

[25] For Finland the sample selection term is the correlation coefficient between the error terms in the probit equation for job search and in the ordered probit equation, which were estimated simultaneously. For Denmark and Norway the sample selection term is the inverse of Mills ratio calculated first from the probit equation for job search and added then as an additional variable in the ordered probit equation.

The sample selection term in each case refers to the correlation coefficient between the error terms in the selection equation for positive hours of search and in the log-hours equation. However, there were only a few observations for zero hours in the Danish and Norwegian samples and this may explain why the sample selection terms for Norway attached an estimate close to one and for Denmark the estimates equalled one, and hence the model was re-estimated without correcting for selection.

Alternative measures for the impact of unemployment benefits on job search

Next we briefly discuss some results from estimations using other measures for the impact of unemployment benefits than the binary indicator used above. Firstly, the unemployment benefit indicator is interacted with dummy variables for whether the job seeker is a woman, is over 50 years of age, and has a university level education. It is possible that the incentive effects of unemployment benefits for both women, who have greater care responsibilities in the household, and older job seekers, who have the option of early retirement, differ from those of the other job searchers. It has also been argued that persons with higher earnings power (with a university education) have different search behaviour than others; see Hughes, Peoples and Perlman (1996).

Secondly, the replacement ratio is entered as an additional explanatory variable.[26] However, as was shown in section 3 above, in the Nordic countries the variation in unemployment benefits are strongly correlated with variation in previous income, and hence, so is the variation in replacement ratios, too. Consequently, we have distinguished between the effect of wages and unemployment benefits by estimating the model with log(wages) and log(benefits) as separate regressors.

[26] For a description of how the replacement ratios are constructed, see section 4 above.

Table 5. Job search intensity measured by log(hours)

Explanatory variables	Denmark		Finland		Norway	
	Stock N=641	Flow N=631	Stock N=749	Flow N=715	Stock N=845	Flow N=677
Individual characteristics						
Intercept	0.5028*	1.1144***	1.9081***	3.2695***	3.5406***	3.0163***
	(0.2624)	(0.3112)	(0.4999)	(0.3703)	(0.4556)	(0.5951)
Woman	-0.2250*	0.0550	-0.2160*	-0.1732	-0.2670**	-0.4440***
	(0.1150)	(0.1148)	(0.1157)	(0.1238)	(0.1048)	(0.1466)
Age < 25	0.2376	0.0113	0.0586	--	-0.1500	0.1903
	(0.1905)	(0.1960)	(0.1624)		(0.1363)	(0.3316)
Age > 50	-0.2301	-0.4120**	-0.1775	-0.1581	0.1080	-0.2952
	(0.1396)	(0.1642)	(0.1906)	(0.2073)	(0.1833)	(0.2406)
Basic education only	-0.0967	-0.2224	0.0161	-0.2461*	-0.0425	-0.4412**
	(0.3124)	(0.2510)	(0.1221)	(0.1449)	(0.1379)	(0.1844)
University level education	0.2270*	-0.0257	0.5946***	0.1709	0.3225	0.8373***
	(0.1160)	(0.2390)	(0.1718)	(0.1587)	(0.1462)	(0.1920)
Partner	0.1238	0.0196	-0.0693	-0.0173	-0.0426	0.0874
	(0.1235)	(0.1441)	(0.1296)	(0.1362)	(0.1093)	(0.1581)
Children	0.1222	-0.1553	0.0163	-0.0515	-0.1513	-0.1489
	(0.1373)	(0.1366)	(0.1703)	(0.1509)	(0.1248)	(0.1524)
Labour market programme						
Attends now	-0.0607	--	0.2805	--	-0.0691	--
	(0.1739)		(0.1909)		(0.1492)	
Attended previously	0.2386*	0.3889***	0.3005**	0.4182***	0.1138	0.4831***
	(0.1123)	(0.1215)	(0.1265)	(0.1475)	(0.1106)	(0.1700)
Unemployment experience related variables						
Receives unemployment benefit	0.6334***	0.5884***	0.0606	-0.3043**	-0.0138	0.1730
	(0.1976)	(0.1620)	(0.2022)	(0.1424)	(0.1122)	(0.1583)
Have had economic problems related to unemployment	0.2474**	-0.0090	-0.0389	0.1054	0.1528	0.3965***
	(0.1131)	(0.1200)	(0.1474)	(0.1286)	(0.1008)	(0.1406)
Was unemployed before	-0.0006	-0.3633***	-0.1197	-0.1910	n.a.	n.a.
	(0.1180)	(0.1259)	(0.1270)	(0.1434)		
Consequences from unemployment						
Suffered from loosing contact with previous colleagues	0.1045**	0.0781	0.3640***	0.0808	0.2183 **	0.2930***
	(0.0511)	(0.1171)	(0.1241)	(0.1161)	(0.0996)	(0.1090)
Got health problems	--	--	-0.0491	0.0506	0.1583	0.2789**
			(0.1643)	(0.1773)	(0.1159)	(0.1434)
Enjoyed freedom	-0.3581***	--	-0.2804*	-0.0251	-0.1881	-0.2837**
	(0.2661)		(0.1683)	(0.1670)	(0.1303)	(0.1465)
Sample selection term,	n.c.	n.c.	-0.1097	-0.2293	-0.3240	0.9770***
			(0.3689)	(0.4139)	(0.2327)	(0.0174)
Regional indicators	No	No	Yes	Yes	Yes	Yes
Log-likelihood function	-1073.55	-1074.23	-1031.05	-1167.91	-1374.91	-1143.46
P^2	42.27***	44.76***	n.a.	n.a.	59.36***	96.03***

Standard errors in parentheses. Significance: ***= at 1 %, **=at 5 %, and *=at 10 % significance level.

Table 6. Effects of unemployment benefits on job search. Alternative probit model specifications. Selected results

Model	Denmark		Finland		Norway	
	Stock	Flow	Stock	Flow	Stock	Flow
1. Binary indicator for unemployment benefit plus interaction terms	N=641	N=631	N=749	N=715	N=845	N=677
Receives unemployment benefit	-0.0242	-0.3382	0.4822**	-0.1840	0.5778*	0.3740
(UB)	(0.4440)	(0.3568)	(0.2459)	(0.3042)	(0.3025)	(0.2673)
Woman	-0.2798	0.9804***	0.4680	-0.2436	-0.0150	0.2058
	(0.4047)	(0.3740)	(0.3126)	(0.3074)	(0.2674)	(0.2872)
Age > 50	0.0803	-0.3491	-1.1234*	-0.3379	0.1525	0.1715
	(0.4403)	(0.4325)	(0.6642)	(0.4385)	(0.4339)	(0.4738)
University level education	0.3341	-0.8553*	-0.3977	-0.6485**	0.1083	0.7539
	(0.4500)	(0.4539)	(0.5598)	(0.3276)	(0.4134)	(0.5478)
UB* Woman	0.0647	-0.8775**	-0.6193*	0.0225	0.8668**	-0.2177
	(0.4228)	(0.3961)	(0.3277)	(0.3440)	(0.3964)	(0.3465)
UB* Age > 50	-0.1722	0.3767	0.5878	0.6058	-0.9191*	-0.5097
	(0.4228)	(0.4617)	(0.6694)	(0.5130)	(0.4744)	(0.5269)
UB* University level education	0.1751	0.8533**	0.6199	0.7903**	-0.3676	-0.6781
	(0.4224)	(0.4042)	(0.5860)	(0.3944)	(0.5106)	(0.6081)
2. Binary UB-indicator and replacement ratio	N=287	N=499	N=534	N=544	N=845	N=677
Receives unemployment benefit (UB)	0.0988	-0.0056	--	--	0.7415***	-0.0522
	(0.0775)	(0.3348)			(0.2683)	(0.2122)
Replacement ratio	0.1122	0.2246	0.1336	0.2538	-0.5069	0.4688
	(0.2443)	(0.5673)	(0.3840)	(0.5625)	(0.5731)	(0.3504)
3. Binary UB-indicator, log(wages) and log(benefits)	N=641	N=631	N=749	N=715	N=845	N=677
Receives unemployment benefit (UB)	0.1867	-0.0107	-0.0176	0.2284	1.7362*	-0.0300
	(0.1104)	(0.5456)	(0.0656)	(0.2979)	(1.0370)	(0.2698)
Log(wages)	-0.3382	0.3128	-0.1317	-0.7851*	-1.4773	2.1867
	(0.7763)	(0.6583)	(0.2650)	(0.4370)	(1.0558)	(1.4978)
Log(benefits)	-0.2111	0.0230	0.0193***	-0.0114	-0.1486	0.0195
	(0.5739)	(0.0888)	(0.0072)	(0.0329)	(0.1285)	(0.0325)

Standard errors in parentheses. Significance: ***= at 1 %, **=at 5 %, and *=at 10 % significance level.

All three models presented in the table include the same other explanatory variables as the model presented in Table 3.

Table 6 gives estimation results for the probit model for whether the individual searches or not. Only estimates related to unemployment benefit variables and the main effects are presented. The results differ considerably across the countries. A common feature is that unemployment benefit receipt tends to increase the propensity to search, but the effects vary somewhat across countries and worker groups. Thus, for instance Finnish women receiving unemployment benefits are less likely to search, whereas Norwegian women are more inclined to search. The probability that a jobseeker with a university education is actively searching is higher if she receives unemployment benefits. In general the main

effects are unchanged as compared to the results in Table 3. Consequently, it seems that using different measures for unemployment benefits that take into account the level of benefits do not add much to the picture already obtained.

Table 7. Effects of unemployment benefits on job search intensity measured by an index. Alternative ordered probit models with correction for selection. Selected results

	Denmark		Finland		Norway	
Model	Stock	Flow	Stock	Flow	Stock	Flow
1. Binary indicator for unemployment benefit plus interaction terms	N=396	N=631	N=749	N=715	N=805	N=628
Receives unemployment benefit (UB)	0.1546	0.2434**	-0.3693	-0.2251	0.0819	0.0220
	(0.0898)	(0.1143)	(0.2317)	(0.1917)	(0.1273)	(0.1649)
Woman	0.0768	0.1328	-0.6313*	-0.0622	-0.2546**	-0.0646
	(0.2100)	(0.1993)	(0.3490)	(0.2248)	(0.1250)	(0.1630)
Age > 50	-0.1654	-0.2776**	-0.1263	-0.2297	-0.4301*	-0.4008
	(0.1445)	(0.1350)	(0.1644)	(0.4133)	(0.2515)	(0.2674)
University level education	-0.4455*	0.1124	0.8536	0.5157*	0.6317***	0.3726*
	(0.2398)	(0.1896)	(0.6548)	(0.2937)	(0.1996)	(0.2159)
UB* Woman	0.3660	0.2164	0.5801	-0.1129	-0.2159	-0.1631
	(0.4453)	(0.3275)	(0.3602)	(0.2400)	(0.1575)	(0.1904)
UB* Age > 50	0.0984	0.08863	--	0.0771	0.1904	0.2365
	(0.1286)	(0.1357)		(0.4539)	(0.2708)	(0.3130)
UB* University level education	0.6548*	0.3427	-0.5828	-0.4590	-0.5228**	0.0978
	(0.3317)	(0.1889)	(0.6627)	(0.3185)	(0.2708)	(0.2476)
2. Binary UB indicator and replacement ratio	N=287	N=499	N=534	N=544	N=805	N=628
Receives unemployment benefit (UB)	0.0994	0.3348**	--	--	-0.1686	-0.1328
	(0.2037)	(0.1488)			(0.1182)	(0.1073)
Replacement ratio	0.2239	0.0982	0.0601	0.2573	0.2692	0.2345*
	(0.2785)	(0.1642)	(0.2721)	(0.3355)	(0.2411)	(0.1266)
3. binary UB indicator, log(wages) and log(benefits)	N=396	N=631	N=749	N=715	N=805	N=628
Receives unemployment benefit (UB)	1.4536	-1.629	-0.0491	-0.3750**	-0.3917**	-0.2326
	(1.629)	(1.163)	(0.2127)	(0.1871)	(0.1859)	(0.1511)
Log(wages)	0.2991*	0.490	-0.0200	-1.2174***	0.6272	0.2140
	(0.15992)	(4.515)	(0.8143)	(0.2888)	(0.6340)	(0.8165)
Log(benefits)	-0.1476	0.214*	-0.0121	0.0013	0.0387*	0.0287
	(0.1875)	(0.123)	(0.0252)	(0.0196)	(0.0216)	(0.0179)

Standard errors in parentheses. Significance: ***= at 1 %, **=at 5 %, and *=at 10 % significance level.

All three models presented in the table include the same other explanatory variables as the model presented in Table 3.

Tables 7 and 8 contain corresponding estimates for the job search intensity index and the number of search hours, respectively. In the main the story line does not change: measuring unemployment benefits in different ways do not change the picture given earlier regarding the incentive effects of unemployment benefits in the three countries. For the job search index the main effect for gender now becomes more pronouncedly negative. This is to be expected as female workers entitled to unemployment benefits have a stronger attachment to the labour market. Otherwise most of the interactions or variable decompositions produce insignificant estimates. So, there is not much worth airing here.

Table 8. The effect of unemployment benefits on the log(hours) of job search. Alternative OLS models with correction for selection. Selected results

Model	Denmark		Finland		Norway	
	Stock	Flow	Stock	Flow	Stock	Flow
1. Binary indicator for unemployment benefit plus interaction term	N=641	N=631	N=749	N=715	N=845	N=677
Receives unemployment benefit (UB)	0.1396	0.2243*	-0.14201	-0.0865	0.0924	0.5029*
	(0.2114)	(0.1217)	(0.2732)	(0.2271)	(0.1630)	(0.2624)
Woman	-0.1669	0.0554	-0.5320	0.0840	-0.2638	-0.0512
	(0.2437)	(0.5447)	(0.4446)	(0.2853)	(0.1695)	(0.2705)
Age > 50	-0.0898	-0.1002	-0.1771	-0.5215	0.3855	-0.1897
	(0.1432)	(0.3986)	(0.1882)	(0.4992)	(0.3892)	(0.4596)
University level education	0.1226	0.0065	0.4828	0.5562*	0.7326***	0.8119**
	(0.2372)	(0.2178)	(0.5939)	(0.3446)	(0.2531)	(0.3495)
UB* Woman	0.2764	0.2008	0.3482	-0.3053	-0.0049	-0.5533*
	(0.1400)	(0.3363)	(0.4704)	(0.3044)	(0.2026)	(0.3177)
UB* Age > 50	0.06549	0.1298	--	0.3867	-0.3298	-0.1700
	(0.1273)	(0.4334)		(0.5200)	(0.4120)	(0.5288)
UB* University level education	0.1841	0.0777	0.1184	-0.4874	-0.5813**	0.0373
	(0.4539)	(0.2439)	(0.6158)	(0.3910)	(0.2957)	(0.4065)
2.Bbinary UB-indicator and replacement ratio	N=287	N=499	N=534	N=544	N=845	N=677
Receives unemployment benefit (UB)	0.2242*	0.1279	--	--	-0.0563	0.0165
	(0.1213)	(0.1454)			(0.1428)	(0.1452)
Replacement ratio	0.0876	-0.1998	0.0141	-0.3713	0.1505	0.1800
	(0.2393)	(0.4584)	(0.3043)	(0.3876)	(0.3173)	(0.1940)
3. Binary UB-indicator, log(wages) and log(benefits)	N=641	N=631	N=749	N=715	N=845	N=677
Receives unemployment benefit (UB)	-0.1177	-0.0962	-0.2475	-0.08463	-0.1159	-0.2263
	(0.3219)	(0.3233)	(0.2108)	(0.2865)	(0.2395)	(0.2213)
Log(wages)	1.0047	-0.1667	-1.1133	-0.2946	2.3054***	0.7636
	(1.9654)	(0.4499)	(0.9101)	(0.5493)	(0.8548)	(1.2148)
Log(benefits)	0.0099	0.0663	0.0646***	-0.0312	0.0092	0.0452*
	(0.2065)	(0.2278)	(0.0241)	(0.0335)	(0.0298)	(0.0275)

Standard errors in parentheses. Significance: ***= at 1 %, **=at 5 %, and *=at 10 % significance level. All three models presented in the table include the same other explanatory variables as the model presented in Table 3.

7. CONCLUSIONS

In summary, the main findings of our study are that:

(i) There are rather big differences between the three countries with respect to the relative importance of the determinants of job search intensity. This may to some extent reflect the different levels of demand during the late nineties in the countries studied.

(ii) Unemployment benefit recipients are more likely to search actively in Finland and Norway. This is consistent with non-claimants being less attached to the labour market. On the other hand, given positive search unemployment benefits do not seem to affect the extent the workers searches; neither the number of channels used nor the time spent on job search. So, there is no support for neither the view that unemployment benefits subsidise search effort, nor that the additional income is spent on leisure in stead of search.

(iii) As for individual characteristics, there is evidence of gender and age differences: women spend less time on job search and elderly workers are less likely to search and when they do, they use fewer channels of and less time on search.

(iv) Marital status and the presence of dependents have only small effects on search intensity. Having small children is associated with a lower probability that the person searches at all. But among those who search, the intensity is unaffected by marital status and having small children. Thus, there is little support for the notion of breadwinners having stronger incentives to search.

(v) Regarding labour market policy programmes we find that participation does decrease the probability of job search – but not the job search intensity. However, previous programme participation does increase the likelihood of active job search as well as its intensity. This is especially true for the flow samples.

(vi) Not surprisingly, general positive attitudes to work are positively related to job search. The economic and other consequences of joblessness affect the intensity of search, too. Thus, those who miss having work colleagues search more actively than others. Likewise those who report having economic problems as a consequence of their unemployment also spend more time on and use more channels for their job search.

(vii) The replacement ratio of unemployment benefits and its components do not seem to influence the intensity of individuals' search. Interestingly, these two latter findings suggest that the replacement ratio may not be a good measure of the economic hardship individuals are suffering as a consequence of unemployment.

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APPENDIX A

Indicators of JSB

Three indicators of job search behaviour are used; one for "searching or not" and two for search intensity:

(a) Search: a dummy variable indicating whether or not the unemployed person did search for a job during the last 4 weeks (of the unemployment period).

(b) Hours: the number of hours spent on job search during the last 4 weeks (of the unemployment period).

(c) Index: a measure of search intensity taking on values 0,1,2 … 8,9, based on search activities and time spent on searching during the last 4 weeks (of the unemployment period). The index is defined as follows:

Activity/channel:	Points
- has read advertisements	1
- has responded to (answered) advertisements	1
- has contacted the public employment service	1
- has contacted potential employers	1
- has contacted temporary employment agencies etc.	1
- has asked friends, colleagues etc for a job	1
- time used for job search:	
1–5 hours	1
6–20 hours	2
more than 20 hours	3

Table A1. Nordic survey on job seekers 1998. Descriptive statistics. Denmark, Finland and Norway. Frequencies and mean values. Stock and flow samples

	Denmark		Finland		Norway	
	Stock (N=641)	Flow (n=631)	Stock (n=749)	Flow (n=715)	Stock (n=845)	Flow (n=677)
Search activities during 4 weeks						
Search for a job (yes)	0.62	0.84	0.63	0.89	0.95	0.93
Spent some time on search (if search)			0.54	0.69	0.72	0.76
Average hours (if hours > 0)			7.14	10.19	14.0	18.4
Average log hours (if hours >0)	1.38	1.47	1.31	1.46	1.95	2.08
Average index (0,9) (if search)	3.47	3.82	2.6	3.8	4.6	4.8
Individual characteristics (per cent)						
Woman	0.61	0.53	0.52	0.46	0.51	0.53
Under 25 years of age	0.12	0.10	0.19	--	0.25	0.05
Age 25–39					0.42	0.61
Over 50 years of age	0.29	0.17	0.29	0.12	0.17	0.12
Low education (compulsory school)	0.32	0.29	0.41	0.29	0.23	0.24
High education (college, university)	0.61	0.65	0.10	0.16	0.13	0.16
Partner (married or cohabitant)	0.65	0.73	0.57	0.74	0.57	0.69
Children (below the age of 7)	0.26	0.28	0.15	0.34	0.45	0.55
Program participant at present	0.12	---	0.13	--	0.12	--
Program participant previously	0.28	0.28	0.26	0.27	0.31	0.22
Unemployment benefits	0.84	0.87	0.88	0.83	0.64	0.71
Economic problems (a)	0.50	0.45	0.65	0.60	0.60	0.55
Unemployed previously	0.63	0.68	0,63	0.76	n.a.	n.a.
Work values and unemployment experiences (per cent)						
To work is important for me (b)	0.87	0.93	0.85	0.93	0.94	0.95
I would work even if I won on the Lotto (b)	0.78	0.82	0.67	0.72	0.87	0.88
Has problems with loosing contact with colleagues (b)	0.41	0.42	0.36	0.38	0.47	0.47
Health problems as unemployed (b)	0.11	0.11	0.15	0.12	0.22	0.16
Enjoy freedom from work (b)	0.27	0.26	0.20	0.16	0.16	0.14
Local labour market characteristics						
U-rate (per cent of labour force)			18.04	17.57	1.28	1.30
UV-rate (unemployment/vacancies)	n.a.	n.a.	15.42	15.45	3.30	3.42

Notes: (a) Economic problems: Yes, It is / was a problem to meet an unexpected bill of amount corresponding to about 250 Euro (2,000 Norwegian kroner / 2,000 Danish kroner / 1,500 Finnish marks. (b) Rate of respondents that “Agree” or “Highly agree” to the statements.