The Lot of the Unemployed: A Time Use Perspective

Alan B. Krueger
Princeton University and NBER

and

Andreas Mueller
Stockholm University and Princeton University

This Draft: May 4, 2010
First Draft: April 10, 2008

* We have benefited from helpful discussions with Hank Farber, Per Krusell, Bruce Meyer, Joachim Möller and seminar participants at Princeton, the NBER, the University of Lausanne and the 2nd Nordic Summer Symposium in Macroeconomics. This paper was originally prepared for the LoWER conference, "Institutions, Markets and European Unemployment Revisited," dedicated to the memory of Andrew Glyn. Alan Krueger was the Leon Levy member of the Institute for Advanced Study at Princeton when the paper was written. Andreas Mueller gratefully acknowledges financial support from the Handelsbanken's Research Foundations.

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ABSTRACT

This paper provides new evidence on the time use of employed and unemployed individuals in 14 countries. We devote particular attention to characterizing and modeling job search intensity, measured by the amount of time devoted to searching for a new job. Job search intensity varies considerably across countries, and is higher in countries that have higher wage dispersion. We also examine the relationship between unemployment benefits and job search.

JEL: J64, J65
Key words: unemployment, job search, time use, unemployment benefits, inequality

Alan B. Krueger
Industrial Relations Section
Princeton University
Princeton, NJ 08540

Andreas Mueller
Institute for International Economic Studies
Stockholm University
SE-106 91 Stockholm
Sweden

1. Introduction

Economists have long debated the causes and consequences of unemployment. To some, unemployment is a sign of market failure that causes some workers to be involuntarily prevented from working. To others, unemployment is a form of disguised leisure, a period when labor is voluntarily reallocated to more efficient uses. Time use data provide a new window on the lives of the unemployed. How much time do unemployed workers spend searching for a job? How much time do they spend in leisure activities and home production? Is the lot of the unemployed very different from that of the employed?

In this paper, we analyze the lives of the unemployed using time-use data for 14 countries. A new purchase on the experience of unemployment is made possible by the accumulation of comparable time-use data on large representative samples for several countries. In time-use surveys, individuals keep track and report their activities over a day or a longer period. We acquired time-use data from several sources, including government statistical agencies, the Multinational Time Use Study (MTUS) data from Oxford University's Center for Time Use Research, and the Harmonized European Time Use Survey (HETUS). Section 2 describes and briefly evaluates the data that we use.

In Section 3 we summarize how unemployed and employed individuals allot their time. In all of the regions for which we have data, the unemployed sleep nearly an hour more per day on weekdays than the employed. The

unemployed also spend considerably more time engaged in home production, caring for others, watching TV and socializing.

The amount of time devoted to searching for a new job is of central interest in search theory and an important determinant of unemployment, yet it has rarely been studied directly.[1] We first proceed with a descriptive analysis of time devoted to job search. Key findings are: 1) The percentage of unemployed workers who search for a job on any given day varies from a low of 5% in Finland to 20% in the U.S. 2) Conditional on searching, the average search time ranges from 43 minutes in Slovenia to over 3 hours in Canada. 3) The unemployed spend considerably more time on job search than do the employed and those who are classified as out of the labor force, which suggests that conventional labor force categories represent meaningfully different states.

Section 4 provides a theoretical framework for understanding the time devoted to job search activities. We focus on Mortensen's (1977) canonical model of Unemployment Insurance (UI) and job search.[2] Job search intensity is modeled as time devoted to job search activities, as the opportunity cost of time

[1] Exceptions are Barron and Mellow (1979), who use the May 1976 CPS supplement on job search activities in the last month, and find that the American unemployed searches an average of 7 hours a week, Layard, Nickell and Jackman (1991), who provide some evidence on time spent on job search by the unemployed in the U.S. and the U.K., and Holzer (1987) and Albrecht et al. (1989), who find that youth who devote more time to job search are more likely to find a job.

[2] Similar predictions come from labor supply models such as, e.g., Moffitt and Nicholson (1982).

is foregone leisure. The key prediction is that for a newly laid-off worker time spent on job search activities is decreasing in the level and maximum duration of UI benefits. Job search intensity should also decrease with access to other forms of insurance that provide income support during unemployment (e.g., through the spouse) and increase with mean and variance of the distribution of potential wage offers. Furthermore, time devoted to job search should increase with the expected duration of the new job, and individuals who are relatively more efficient in activities such a home production should search less.

In Section 5 we evaluate the predictions of search theory with micro data from six countries and relate our measure of job search intensity to demographic variables such as age, education, gender and marital status. We find that, on average, women search significantly less than men of the same age and education, and these differences are more pronounced between married women and men. We also find that higher educated workers tend to devote more time to job search activities and that the age profile of time spent on job search is inverse U-shaped.

The unemployed in the U.S. and Canada spend more than twice as much time searching for a new job than do the unemployed in Western Europe and Eastern Europe, and eight times more time than in the Nordic countries. Understanding variability in job search time across countries is important for understanding national differences in the unemployment rate and duration of unemployment. Thus in Section 6 we use our sample of 14 countries to model the job search time as a function of country's unemployment system, wage

dispersion and other variables. Although conclusions are highly speculative with such a small sample of countries, we find that income variability and the escalation of unemployment benefits are the most robust and strongest predictors of job search intensity. The finding that the unemployed devote more time to searching for a new job in countries where wage dispersion is higher, conditional on unemployment benefits, suggests that the potential gain from finding a higher paying job is an important motivator of search intensity.

2. Data Sources

We draw on data from 16 time-use surveys conducted in 14 countries between 1991 and 2006. Combined, the surveys represent 170,347 employed and 13,333 unemployed diary days. The sources are:

- Original micro time-use data files from the government statistical agencies of Austria, France, Germany, Italy, Spain, the U.K. and the U.S.A.
- The Multinational Time Use Study (MTUS) from Oxford University's Center for Time Use Research. The MTUS consists of a multitude of time-use surveys conducted in 20 countries from 1961 to 2003. Activity codes were harmonized to a common set of 41 activities. We use data after 1991.
- The Harmonized European Time Use Survey (HETUS), which is a collection of time-use surveys conducted in 15 European countries, starting in the mid-1990s. There are 49 harmonized activity codes, in comparable format to the MTUS. HETUS does not grant access to the original micro data files, but we made use of the dynamic web application

(http://www.h2.scb.se/tus/tus/), which produces estimated average minutes spent in various activities and participation rates for selected subsamples.

We limit our analyses to the subset of surveys that contain job search activities. For our cross-country comparisons of the time use of the employed and unemployed we harmonized the activity codes from MTUS, HETUS and the original survey files to produce comparable estimates.

Measuring unemployment and job search in time-use surveys

The definition of unemployment that we employ requires that the individual did not work in the previous week, actively looked for work in the previous 4 weeks, and was available to start work (last week or in the next two weeks, depending on the survey).[3] In addition, in the U.S. individuals on layoff who expect to be recalled to their previous employer are classified as unemployed regardless of whether they searched or were available for work. This definition corresponds closely to the definition of unemployment in national labor force surveys. We restrict our sample to people age 20-54 to abstract from issues related to youth unemployment or retirement.[4] For most of the surveys (exceptions are France, U.S. and Italy), the sample unemployment

[3] For Canada, we do not have access to the original micro data and therefore we use unemployment status such as defined in MTUS (self-reported unemployed). In the German surveys, the respondents were not asked the questions listed above and therefore we also use the self-reported unemployment status.

[4] The results are very similar for the sample of unemployed of age 20-65 (see the working paper version, Krueger and Mueller, 2008a).

rate is slightly lower than the official unemployment rate, which is primarily due to our age restrictions. The correlation (weighted by number of job searchers) between the sample unemployment rate and the official unemployment rate in the corresponding year is 0.92.

Job search activities are defined in similar ways across surveys and typically include calling or visiting a labor office/agency, reading and replying to job advertisements and job interviewing/visiting a possible employer (see the Appendix Table A.1 for more details). Table 1 lists the various surveys for which we were able to identify time spent in job search activities. The MTUS does not have an activity code identifying job search activities. However, for a number of countries in the MTUS we were able to identify job search activities because the code "time in paid work at home" (AV2) exclusively contains time allocated to job search for the unemployed. In HETUS, job search activities are included in the code "activities related to employment", which also contains lunch breaks at work and time spent at the workplace before and after work. The unemployed should not engage in activities related to employment except job search and thus we use this activity code in our cross-country comparisons.

We assess the accuracy of the HETUS tabulations by comparing our own estimates of job search time with those from HETUS for the subset of countries where we have access to the underlying micro data files. This enables us to check whether activities related to employment represent job search time in the HETUS. Table 2 shows that we closely reproduce the HETUS estimates of average minutes of job search and the proportion participating in job search

on the diary day. The small differences for France and Spain are mainly due to the fact that we use a different definition of unemployed than HETUS. HETUS slightly overestimates job search for the UK, Germany and Italy. For countries where we have more than one source of data we use the original micro data file when that is available. If we do not have access to the original micro data, we use tabulations from HETUS or the MTUS harmonized data files, whichever is available.

3. Time Use Patterns of the Unemployed and Employed

Table 3 summarizes the number of minutes per day that employed and unemployed individuals spend in various activities for five geographic regions.[5] Results are shown separately for weekdays, weekends and pooled over the entire week. The standard errors are quite small, so they are not reported.[6] Not surprisingly, more pronounced differences between the employed and unemployed arise on weekdays, when most of the employed work. One word of caution is warranted, however, when comparing the unemployed to the employed because of potential selection issues (e.g., the unemployed might be disproportionally those with a strong distaste for work).

[5] Appendix Table A.2 reports the number of minutes per day separately for men and women.

[6] For the employed, the standard errors are usually around 1 or 2 minutes for each activity; for the unemployed they are larger, but usually no more than 5 minutes for most activities and most countries.

In each region, the unemployed sleep substantially more than the employed. Sleep is notably high for unemployed Americans, who average just over 9 hours of sleep a night – almost as much as teenagers.[7] Large differences in time use between the unemployed and employed are also evident for time spent in home production and taking care of others. The unemployed spend from 0.6 hours to 1.7 hours more than the employed engaged in home production and caring activities across the regions. More time is spent on personal care, eating and drinking by the employed in some regions and by the unemployed in others. The unemployed spend considerably more time than the employed in leisure and social activities.[8] A large share of this difference is due to TV watching, which absorbs almost a quarter of the awake time of the unemployed in the U.S. The amount of time the unemployed spend socializing rises by over 10% on the weekends, possibly because it is easier to coordinate social activities with employed individuals on the weekend. In the Nordic countries, the employed spend more time in home production than in other regions, perhaps because taxes are high there and home production is not taxed. Curiously, the unemployed in the Nordic region spend less time on home production than their counterparts in most other countries. The unemployed-

[7] Note that in the ATUS the sleep category includes time spent sleeping, tossing and turning, lying awake and insomnia. All but a few minutes of sleep are classified in the first category. The younger average age of the unemployed does not account for much of the difference in sleep between employed and unemployed individuals.

[8] Freeman and Schetkatt (2005; Table 7) find a qualitatively similar pattern using broader activity categories for 7 countries.

employed gap in time spent on child care is lower in the Nordic countries, probably because child care services are more widely available from public services.

As expected from labor force surveys of work hours, the time use data indicate that Americans and Canadians spend more time engaged in work related activities than workers in Western Europe and the Nordic countries.[9] (The unemployed spend a small amount of time at work because in some of the surveys work includes related activities and because of classification errors.) The average unemployed worker spends about half an hour searching for a job on any given day in the U.S. or Canada, and substantially less in Europe. The unemployed spend almost as much time traveling as do the employed, which suggests that they are not sedentary.

The high sleep hours by the unemployed could result from depression or be a behavioral response to having a low opportunity cost of time. [10] The greater time devoted to home production and caring for others by the unemployed than the employed is also consistent with the unemployed having a lower opportunity cost of time.

[9] In the time use data, Americans spend less time at work than Canadians, which is an interesting discrepancy from the pattern in labor force surveys of weekly work hours.

[10] Interestingly, Krueger and Mueller (2008a) find that the unemployed feel less tired over the course of the day than the employed.

Time Spent on Job Search Activities

How much time do the unemployed devote to searching for work? Table 4 reports the proportion of individuals who search for a job on any given day, called the participation rate, and the (unconditional) average duration of job search by labor force status, for all countries in our sample. As noted above, average search time is highest in the U.S.A., at 32.3 minutes per day, closely followed by Canada. Europeans search much less, but there is considerable variation across countries. In France the unemployed search around 21 minutes a day compared with 3 minutes in Finland.[11]

The proportion participating in job search, which we consider the extensive margin, is highly correlated with the average duration of job search; the weighted correlation is 0.88.[12] The U.S.A. has the highest participation rate in job search at 20.2%, compared with a low of 5% in Finland.

The American unemployed also search more on the intensive margin -- for those who engage in job search activities on a given day, the average duration of job search is 159.7 minutes in the U.S., compared to 104.6 minutes

[11] The unemployed in the Nordic countries tend to spend much more time in education than elsewhere (around 45 minutes a day compared to 23 minutes in the U.S.). However, when we exclude from the sample of the Nordic countries those who indicate that they are a pupil, student, in further training or unpaid traineeship, time spent in education is only around 12 minutes a day, whereas time spent on job search remains unaffected at a low 3 minutes in Finland and 5 minutes in Sweden. This suggests that participation in educational programs does not explain the low job search intensity in these countries.

[12] The weights are the number of job searchers in each country's time-use data set.

in all the other countries in our data set. One can decompose the variance of the log average search time, $Var(ln(s_i))$, into $Cov(ln(s_i),ln(p_i)) + Cov(ln(s_i),ln(s_i|p_i))$, where s_i denotes average search time in country i, p_i the average participation rate and $s_i|p_i$ the average search time conditional on participation. We find that the two terms are of similar size, suggesting that both the intensive and extensive margin contribute equally to the overall variation of search time across countries.

Figure 1 summarizes the distribution of job search times for those who searched on the diary day in a series of box plot diagrams for six countries for which we had access to micro data. The width of the box is drawn in proportion to the fraction of unemployed who searched on the diary day in each country. The median search time among those who searched is 115 minutes in the U.S.A. and 125 minutes in Canada, but just as high (120 minutes) in Spain and nearly as high (110 minutes) in Italy. Note, however, that there is a potential selection issue: countries with low search participation rates such as Italy might have highly motivated searchers, whereas in countries with high participation rates like the U.S.A. or Canada, more marginal searchers are included. Also, Figure 1 does not include countries with low search intensity such as Sweden and Finland as we do not have micro data for these countries.

One important feature to bear in mind is that job search is concentrated on weekdays. For the U.S., for example, participation in job search for those unemployed who are not on temporary layoff is 27.2% during weekdays and the (unconditional) average search time is 44.2 minutes, compared with 8.3%

and 10.8 minutes, respectively, during weekends. In the other countries, job search during the weekend is lower as well. In Spain, for example, the unemployed search on average 23.0 minutes during the week and 6.6 minutes during the weekend.

Table 4 also shows the average duration of job search and participation rates for the employed and those classified as out of the labor force. For both categories, average duration of job search is no more than two minutes in all the countries in our sample (note that HETUS rounds to the nearest integer). Moreover, participation in job search is equal or below 1%, except for Slovenia and Sweden[13]. Even if we limit the sample in the U.S. to those who were classified as unemployed according to the CPS three months prior to the ATUS survey and classified as out of the labor force in the ATUS, average search time is only 1.9 minutes. Together, these results suggest that the unemployed spend considerably more time searching for a new job than do individuals who are classified as employed or out of the labor force. We interpret these results as evidence that the conventional labor force categories represent meaningfully different states and behavior patterns.[14]

[13] In Sweden, students have high participation rates in job search and tend to search almost as much as the unemployed. Students are usually not counted as unemployed because they are not available for work.

[14] Corroborating evidence from job finding rates is in Flinn and Heckman (1983); see Jones and Riddell (1999) for conflicting evidence.

So far, we have only analyzed data on job search for one day. An open question is whether the unemployed who engage in job search on one day are more likely to engage in job search on another day during the same week. Most of the surveys in our sample only collect information on one diary day (or, if two diary days are collected, one is typically a weekend day). The German 2001-02 time-use survey is the only survey which included two weekday diaries for respondents. The following tabulation indicates that there is a high dependence of daily participation in job search: conditional on spending some time searching on day 1, the chance of searching on day 2 is 43%, whereas conditional on not searching on day 1, the fraction of unemployed searching on day 2 is only 7%. This reinforces the impression that the daily participation is an important determinant of the overall time spent on job search activities and that our inferences would not be very different if diary data for more than one day were collected. In particular, one would expect that, because of this high dependence, the same determinants that explain daily participation should also explain participation in job search over several days.

Cross tabulation of participants and non-participants on two weekdays:

	Search on day 2		
Search on day 1	No	Yes	Total
No	232	17	249
Yes	26	19	45
Total	258	36	294

Source: German Time Use Survey, 2001-02. Weighted frequencies. Sample consists of respondents with two weekday diaries. Chi-sq test of independence is 41.75 (p-value=.000).

4. Job Search: A Theoretical Framework

Theoretical search models yield clear predictions on the time devoted to job search activities as opposed to leisure activities or home production. We focus on Mortensen's (1977) canonical model of Unemployment Insurance (UI) and job search. Mortensen presents a search model with variable search effort and analyzes the effects of UI on search effort and, more generally, the escape rate from unemployment. In this model, an individual has two choice variables, search effort, s_t, and the reservation wage, w_t. Search effort is modeled as time allocated to job search, as the opportunity cost of search is foregone leisure. Given search effort, the arrival rate of job offers is constant (αs_t) and the wage is drawn from a known distribution *F(w)* with upper bound $\overline{w}$. The value function of an unemployed individual who is eligible for UI benefits is:

$$V(t,b) = \frac{1}{1+rh} \max_{0 \le s_t \le 1, w_t \ge 0} \left[\begin{array}{l} hu(b,1-s_t) + V(t-h,b) \\ + \alpha s_t h \int_{w_t}^{\overline{w}} [U(x) - V(t-h,b)] dF(x) \end{array} \right] \quad (1)$$

where *t* is time until benefit exhaustion, *h* the length of each period, *u( )* the flow utility for the period, *b* the unemployment benefit, and *U(w)* is the value of a job with wage *w*. There is no saving, so consumption equals the wage.

The first order conditions are:

$$(s_t) : u_2(b,1-s_t) = \alpha \int_{w_t}^{\overline{w}} [U(x) - V(t-h,b)] dF(x) \quad (2)$$

$$(w_t) : U(w_t) = V(t-h,b) \quad (3)$$

The optimal choice of how much time to spend searching trades off the marginal cost of foregone leisure against the increase in the probability of obtaining a job offer (times the expected gain from such an offer), and the optimal reservation wage strategy is to accept any wage offer that yields a value greater than or equal to the value of remaining unemployed at the end of the period.

The Mortensen model predicts that for a newly laid-off worker, search effort is decreasing in the maximum benefit duration T and in the benefit level b.[15] Moreover, an increase in the average wage offer increases the value of all potential jobs and thus increases the returns to search. A higher dispersion of potential wage offers, holding the average wage offer constant, also leads to higher search effort. The intuition for this result is that, with a higher dispersion of potential wages, there is a greater benefit from searching for a high paying job, whereas if wage offers are compressed the individual might as well accept the first job offered, as the next is not likely to be much better.[16] Note, however, that this conclusion depends on the curvature of the utility function: if workers are extremely risk averse, a greater mean-preserving spread in wages

[15] The latter prediction requires the plausible assumption that consumption and leisure are complements.

[16] Ljungqvist and Sargent (1995) make a similar observation concerning the effect of progressive taxation on job search and unemployment. See Stigler (1962) for a seminal discussion of how wage dispersion affects the payoff from search effort.

might actually lower the expected utility gain of getting a job and thus also the time allocated to job search.[17]

The Mortensen model also yields clear predictions across different demographic groups in terms of how much time these groups are expected to devote to job search activities. For example, unemployed workers with higher UI benefits or greater access to other forms of insurance that provide income support during unemployment (e.g., through a working spouse or self-insurance) should spend less time on job search activities. Home production also provides for consumption during unemployment and, therefore, unemployed workers who are relatively more efficient in home production are expected to devote less time to job search. Moreover, the value of a job is increasing in the expected duration of the job and thus job search intensity is expected to decrease with fewer remaining years of work before retirement. Older workers may also search less because of greater access to self-insurance through accumulated retirement savings. Finally, one should expect the highly educated to search more intensively as wages (as well as wage dispersion) tend to increase with human capital.

5. Demographic Determinants of Job Search

To evaluate the predictions of search theory for different demographic groups, we model the likelihood that an unemployed worker searches for a job on any given day as well as the amount of time spent searching, conditional on

[17] See Krueger and Mueller (2008b) for a calibrated version of the Mortensen model.

searching at all, as a function of age, education, gender and marital status. We have comparable micro data for the following six countries: the U.S.A., Canada, France, Germany, Spain and Italy. [18,19] Because participation in job search is low (ranging from 7.8% in Italy to 20.2% in the U.S.A.), we think it is important to analyze participation and time allocated to job search separately.

Table 5a reports the results of linear probability models where the dependent variable equals one if the unemployed individual searched for a job on the reference day, and zero if he or she did not. Several regularities are apparent. First, education is an important predictor of participation in job search. In the U.S.A., for example, those with some college education or more have a 14.4 percentage point higher probability of engaging in job search on any given day than those without a high school degree. Education is associated with a greater likelihood of job search in Canada, France and Germany, but not in Spain or Italy. As outlined above, one would expect a generally higher search time among the higher educated because they reap greater returns to search (higher wages). Wage dispersion also tends to increase with education and might explain some of the observed differences in the effects of education

[18] We also have micro data for Austria and the UK, but we do not report the country-level regressions because of small sample size (less than 250 diary days).

[19] The three education dummies were defined as uncompleted secondary education, completed secondary education and tertiary education (completed and uncompleted). When information was available on whether a respondent was cohabiting with a partner, we defined them as married (USA, France, Germany).

across countries. Additionally, the job search process may be more time consuming in the jobs that higher educated individuals apply for.

A second observation is that women have a much lower probability of engaging in job search, and this is especially the case for married women. This may be because married women are more likely to have access to a secondary source of income from a working spouse and/or because of a comparative advantage in activities such as home production and childcare. Moreover, there are interesting cross-country differences in the effect of marriage and gender: the interaction term of married and female is an important determinant of job search for countries with traditionally low female labor supply. In Spain a married women's probability of search is 19.4 percentage points lower than a married man's and Italy the difference is 23.7 points.

Duration Conditional on Search

To examine whether the same variables explain search on the intensive margin, we estimate a linear regression of time allocated to search (in minutes), for those who engaged in job search on the reference day. Table 5b summarizes the results. Note that the samples are small since we exclude all of those who did not search from the regression.

As with engaging in job search, the higher educated unemployed tend to search more minutes (except in Spain) and women search less intensively, although the coefficients are statistically significant in only some countries. No clear pattern emerges regarding age from the regressions. Notice also that the F-tests of the joint significance of all variables cannot reject the null hypothesis

at the 5% level for the U.S.A. and Canada. Overall we conclude that it is mainly the decision of whether to participate in job search on any given day that drives differences in time allocated to job search across different population groups.

Age Profile of Job Search

To examine the effect of age on total time spent searching for a job, we computed marginal effects on time allocated to job search, including non-participants. Specifically, the expectation of job search conditional on a set of characteristics, x, can be decomposed as $E(s|x) = P(s>0|x)*E(s|s>0,x)$. Using the product rule we obtain the marginal effect $dE(s|x)/dx_i = (dP(s>0|x)/dx_i)*E(s|s>0,x) + P(s>0|x)*(dE(s|s>0,x)/dx_i)$. From our regressions in Table 5a and 5b, we can substitute the coefficients for $dP(s>0|x)/dx_i$ and $dE(s|s>0,x)/dx_i$, and we evaluate $P(s>0|x)$ and $E(s|s>0,x)$ at the average x. (To make the analysis more interesting, we expand the sample to those of age 20-65 and re-estimate the coefficients in Table 5a and 5b.) Figure 2 shows the full effect of age on the duration of job search. We report the age profile of time spent on job search only for the pooled sample as we could not reject the null hypothesis that the coefficients on age and age^2 are the same across all countries with available micro data. The figure shows that search time is increasing in age at early stages of life but decreasing after the late 30s. One possible explanation for the inverse-U shaped age-search pattern is that the returns to search increase at younger ages because of the positive effect of work experience on wages and that older workers search less because the value of

finding a high-paying job decreases with a worker's expected remaining years of work. In addition, older workers may be better able to smooth consumption over the unemployment spell because of accumulated retirement savings and thus spend less time on job search activities.

6. Institutional Factors and Job Search

What explains the large cross-country differences in the amount of time the unemployed devote to job search? Although we have data for only 14 countries, understanding differences in search effort is critical to understanding differences in unemployment across countries. Here we provide an initial analysis of two main factors: features of the Unemployment Insurance (UI) system and inequality. As time-use data become available for more countries, this analysis can be extended.

We start with some simple scatter diagrams. Figure 3 shows average job search time (including those who did not search at all) on the y-axis and an indicator of the generosity of social benefits for the unemployed on the x-axis. The size of the circles is proportional to the number of observations on unemployed individuals from the time-use survey. The benefit indicator that we use is the net replacement rate (NRR), which is the after-tax value of UI benefits, social assistance, family benefits, food stamps and housing benefits relative to after-tax earnings.[20] Because benefits vary over the spell of

[20] Source: OECD, Net replacement rates (NRR) during the initial phase of unemployment 2001-2004 (latest update available on the webpage of the OECD, March 2006). Specifically, we took

unemployment in most countries, we take the benefits available at the beginning of a spell. The bivariate relationship between job search and unemployment benefits is statistically insignificant but downward sloping, as predicted by Mortensen's model.

Note that our data contain both those eligible for UI benefits and those ineligible. Information on UI benefit receipt, however, is only available in a small number of surveys and the average time devoted to job search is usually of similar magnitude for recipients and non-recipients. In the UK survey 2000-01, for example, those unemployed who receive the "jobseeker's allowance" search 1.6 minutes more than those who do not receive the allowance[21], and in the French 1998-99 survey the difference between UI benefit recipients and non-recipients is less than one minute. Although we only have data for a small

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the average of the net replacement rate for two earnings levels (the average annual wage and 67% of the average annual wage) by six family types (single, with dependent spouse, with working spouse, and those three with 2 children). Note that for Slovenia we produced our own estimate of the NRR, with information from a country chapter provided by the OECD.

[21] A survey on "jobseeker's allowance" recipients in the UK in 1997 found that these UI benefit recipients searched around 7 hours a week (see McKay et al., 1999), which is about 8 times more than in the UK time use survey for 2000-01 -- and more than in any other survey in our sample. While it is difficult to reconcile this estimate with the time use data, one possible explanation is that benefit recipients over report their hours of job search when asked to recall how much time they spent searching in the last week, as opposed to reporting job search in a daily time diary.

number of countries, these results suggest that our inferences would not be very different if we restricted the analysis to UI recipients only.

Figure 4 shows a stronger relationship between job search time by the unemployed and wage dispersion, as measured by the country's 90-10 wage ratio.[22] We expect wage inequality to positively influence job search time because the gain from searching for a higher paying job is greater in countries that have greater wage variability. Consistent with our expectation, the correlation between job search time and income inequality is positive and substantial (0.71). The correlation was even higher for the 50-10 wage ratio (0.82), which suggests that dispersion below the median is more relevant for the unemployed in our sample.[23] When we excluded the U.S., Finland and Sweden from our sample, the correlation between average job search and the 90-10 wage ratio was 0.47, showing that the correlation between job search and wage dispersion is not entirely driven by differences between the U.S. and the Nordic region.

Of course, it is possible that income inequality is picking up the effect of factors other than the variability in wages that workers are confronted with in their potential job offer distribution. For this reason, we estimate multiple

[22] The data on the 90-10 wage ratio for OECD countries are from OECD Earnings Inequality Database and for Bulgaria and Slovenia the data are from Rutkowski (2001). We found a somewhat weaker correlation using the Gini coefficient from *The World Income Inequality Database*, produced by UNU-Wider (2007).

[23] We did not have the 50-10 wage ratio for Bulgaria and Slovenia.

regressions to explain job search time using data at the country level in Table 6. In addition to the 90-10 wage ratio and NRR, the explanatory variables include a measure of the rate at which benefits increase or decrease over time (called benefit escalation) and average years of schooling from the Barro and Lee (2001) data set. The benefit escalation rate is measured by the ratio of the gross replacement rate in months 7-24 of an unemployment spell to the gross replacement rate in months 1-6.[24] Again, with only 14 countries, more than the usual grain of salt is required.

Notwithstanding this caution, the 90-10 wage ratio has a relatively robust and sizable effect in the Table 6 regressions, although the coefficient is not quite significant when we include the log NRR, the escalation of benefits and average years of schooling in column 6 (with a p-value of 0.110). Going from the least to the most unequal country, the 90-10 ratio increases by about 248 percentage points. Using the coefficient in the model in column 6, this large a change in inequality is predicted to increase job search time by 24 minutes per day, which is almost twice as large as the average amount of job search time in the average country. The NRR is never statistically significant and its sign flips from negative to positive when other variables are included in the model, but its standard error is large and the point estimate is nontrivial. In

[24] In all countries in the sample, UI benefits decline over time. The underlying gross replacement rate data were provided in a correspondence with Tatiana Gordine of the OECD. For Bulgaria and Slovenia, we used data from UNECE's *Economic Survey of Europe* (2003, No. 1).

column 1, for example, the job search-NRR elasticity is around -1 at the mean. A higher escalation of benefits is associated with less time spent searching for a job, on average, but the effect is statistically insignificant (t-ratio of 0.15) if the 90-10 wage ratio is included in the model.

In results not presented here, we experimented with including the maximum duration of benefits as an explanatory variable, but it generally had a statistically insignificant and small effect. We also estimated the specifications including the country-level unemployment rate, which usually had a negative coefficient but was not statistically significant.[25] Because of concerns about simultaneous causation – a high unemployment rate could cause fewer people to search for a job and could be caused by low job search intensity – we excluded it from the models in Table 6. However, it is reassuring that none of the variables of interest had a qualitatively different effect if the unemployment rate was included in the equation.

Lastly, we analyze the effects of NRR, benefit escalation and wage dispersion using micro data for 8 countries. The micro data allow us to simultaneously control for differences in individual characteristics across countries, such as age and gender, as well as the country-level variables. The dependent variable in Table 7 is the amount of time an unemployed individual spent searching for a job on the diary day (including 0s).[26] Standard errors are adjusted for correlated errors within countries and are robust to

[25] See Shimer (2004) for an analysis of how search intensity varies with the business cycle.

[26] Using the same two-step procedure as in Section 5 gives very similar results.

heteroskedasticity. In general, the pattern of results is similar to what we found at the country level. Most importantly, the 90-10 wage differential has an effect similar to what we found in the country-level analyses in Table 6.

Column 1 in Table 7 also shows a model with country fixed effects. The differences in job search across countries implied by the estimated country effects are similar to the differences of average job search time reported in Table 4, indicating that compositional effects explain only a small part of the total variation in time spent on job search across countries. Unfortunately, most time use surveys do not collect information on unemployment duration (exceptions are France and the U.S.) and thus we cannot control for the longer durations in Europe in our regressions in Table 7. Nevertheless, in France we find that, controlling for the same individual characteristics as in Table 7, those unemployed for more than six months search two minutes more per day than those unemployed for six months or less.[27] This suggests that the longer unemployment durations cannot explain the lower search intensity in Europe.

One caveat of our analysis is that we do not control for other potential factors such as the nature and coverage of the public employment system and the use of active labor market policies. In particular, one might wonder if the cross-country differences in time spent on job search activities are driven by the existence of well developed public employment agencies in Europe and especially in the Nordic region. Even though we cannot exclude this possibility,

[27] See also Krueger and Mueller (2010) for a detailed analysis of time spent on job search by unemployment duration in the U.S.

one should note that, in Mortensen's model, higher search efficiency is associated with *higher* search effort as it raises the marginal gain of time spent on job search relative to its marginal cost (see Section 4 above). In other words, if differences in search efficiency explained the cross-country patterns in time spent on job search activities, one would expect that job search, on the margin, is *less* efficient in Europe than in the U.S.

7. Conclusion

We have documented patterns in the amount of time devoted to searching for a new job. Job search does not take up a huge amount of time for the average unemployed person on any given day, but those who do search for a job devote considerable time to it. Compared with the employed, the unemployed tend to spend a high proportion of time sleeping, watching television, socializing, caring for others and working around the house. This pattern of activities could be explained by a mixture of lethargy and having a low opportunity cost of time.[28]

We also related the amount of time spent on job search to demographic variables such as age, education, gender and marital status. We find evidence that is broadly consistent with predictions from search theoretic models: married women tend to search less than married men, because they are more likely to draw on a secondary source of income from a working spouse and

[28] In some respects, this conclusion was anticipated by Jahoda, Lazarsfeld and Zeisel's (1933) study of unemployed individuals in Marienthal, Austria in the early 1930s.

because they may have a comparative advantage in home production and childcare. We also documented that the more highly educated tend to search more, which is likely due to higher wages, whereas older workers tend to search less, probably because of fewer remaining years of work before retirement and greater access to self-insurance.

Finally, at a national level we did not find much evidence that parameters of a country's unemployment benefit system affect the amount of time devoted to job search, although our sample of countries is small and we cannot rule out some economically significant effect. Another consideration is that our data include both those eligible for UI benefits and those ineligible. The UI system likely has contrasting effects on the two groups of job seekers, as the prospect of qualifying for more generous benefits should make employment more attractive for those currently ineligible for benefits (see Mortensen, 1977, and Levine, 1993).

We do find, however, that inequality is a strong predictor of the amount of time the unemployed devote to job search. While it is possible that this finding is emblematic of a tendency for lower job search in countries with a strong social welfare state and compressed wages, the fact that controlling for unemployment benefits does not attenuate the effect of the 90-10 wage differential on job search suggests that inequality *per se* matters. Our tentative interpretation of this finding is that job search has a higher payoff in labor markets with greater wage dispersion. If the potential wage offer distribution for an individual is compressed, the worker might as well accept the first job

offer he or she receives, as the next is not likely to be much better. But if there is high variance in the potential wage offer distribution, then there is a benefit for searching for a high paying job. Notice that this interpretation requires that wage dispersion is not fully explained by personal differences in ability, as a given individual must have a chance of being offered a high paying job for inequality to affect his or her job search. In any event, the relationship between job search and inequality, which has not previously been documented, deserves further scrutiny and attention.

Appendix

[Insert here Appendix Tables A.1 and A.2, see below]

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Table A.1. Definition and examples of job search activities for selected surveys

American Time Use Survey (ATUS) 2003-06

Job search activities (050401), e.g.:
contacting employer
making phone calls to prospective employer
sending out resumes
asking former employers to provide references
auditioning for acting role (non-volunteer)
auditioning for band/symphony (non-volunteer)
placing/answering ads
researching details about a job
filling out job application
asking about job openings
reading ads in paper/on Internet
checking vacancies
researching an employer
submitting applications
writing/updating resume
meeting with headhunter/temp agency
picking up job application

Interviewing (050403), e.g.:
interviewing by phone or in person
scheduling/canceling interview (for self)
preparing for interview

Other activities related to job search, e.g.:
waiting associated with job search interview (050404)
security procedures rel. to job search/interviewing (050405)
travel related to job search (180504)
job search activities, not elsewhere specified (050499)

UK 2000-01

Activities related to job seeking (1391)
Definition: Activities connected with seeking job for oneself

Examples:
calling or visiting a labor office or agency
job interviews
updating CV
reading and replying to job advertisements
working on portfolio

Germany 2001-02

Activities connected with seeking job for oneself
Job search activities, not defined (150)
Calling or visiting labor office or agency (151)
Job search activities (152), e.g.:
reading and replying to job advertisements
reading ads in internet
interviewing and visiting at a new employer
Other specified job search activities (159)

Canada 1998

Job search; looking for work, including visits to employment agencies, phone calls to prospective employers, answering want ads. (022), e.g.:
picked up job applications
distributing resumes
working on resume
interview with prospective employer
attended job fair at school

Harmonized European Time Use Survey (HETUS)

Activities related to employment (13) such as lunch break at work and time spent at work place before and after starting work and **activities connected with job seeking**, e.g.:
calling or visiting a labour office or agency
reading and replying to job advertisements
presentation at the new employer

Table A.2. Average minutes per day by activity, region, employment status, gender and day of the week

(Western Europe: Austria, Belgium, France, Germany, Italy, Spain, UK; Eastern Europe: Bulgaria, Slovenia, Poland; Nordic: Finland, Sweden)

Employed, Weekday (men | women)

	US		Western Europe		Eastern Europe		Nordic	
Sleep	469	480	464	477	463	470	456	472
Personal care	40	54	45	51	44	48	37	49
Eating	65	59	87	84	82	76	76	77
Work	447	367	447	335	450	363	417	317
Job search	1	1	0	0	n.a.	n.a.	n.a.	n.a.
Education	11	15	7	8	5	7	10	14
Home production and care of others	82	148	74	181	95	204	100	173
of which: childcare	*21*	*43*	*13*	*33*	*16*	*35*	*20*	*37*
Shopping and services	16	30	16	30	16	25	20	29
Voluntary, religious and civic activities	7	8	6	4	3	3	6	5
Sport	17	12	18	15	12	8	24	20
Leisure and socializing	194	178	185	166	190	157	203	195
of which: TV	*114*	*100*	*95*	*77*	*115*	*91*	*97*	*80*
Travel	87	82	88	85	76	72	87	85
Other	5	7	3	4	5	4	5	5

Unemployed, Weekday (men | women)

	US		Western Europe		Eastern Europe		Nordic	
Sleep	553	545	534	508	550	531	502	507
Personal care	47	43	48	55	46	48	37	46
Eating	49	48	103	96	106	104	86	83
Work	17	6	26	17	15	6	62	46
Job search	52	29	23	10	23	6	7	4
Education	26	28	30	28	19	16	64	54
Home production and care of others	181	266	144	284	201	339	140	248
of which: childcare	*23*	*71*	*14*	*46*	*16*	*56*	*11*	*52*
Shopping and services	24	46	33	50	26	40	26	34
Voluntary, religious and civic activities	17	17	8	7	2	4	10	5
Sport	19	12	42	26	33	17	56	23
Leisure and socializing	367	321	357	274	337	256	345	291
of which: TV	*211*	*194*	*167*	*133*	*182*	*140*	*149*	*140*
Travel	75	70	85	80	76	68	79	77
Other	13	9	4	4	5	5	27	22

Employed, Weekend (men | women)

	US		Western Europe		Eastern Europe		Nordic	
Sleep	545	556	540	541	523	532	542	542
Personal care	33	51	49	55	50	54	43	52
Eating	74	69	121	118	112	108	98	100
Work	129	96	110	82	168	107	84	70
Job search	0	0	0	0	n.a.	n.a.	n.a.	n.a.
Education	6	9	5	5	8	12	4	6
Home production and care of others	149	198	127	225	134	254	161	224
of which: childcare	*26*	*35*	*19*	*30*	*24*	*35*	*23*	*31*
Shopping and services	34	52	26	34	14	19	22	27
Voluntary, religious and civic activities	25	27	14	10	17	21	8	8
Sport	34	17	46	32	35	25	43	31
Leisure and socializing	321	271	313	257	298	237	335	291
of which: TV	*184*	*132*	*136*	*99*	*168*	*123*	*141*	*107*
Travel	83	86	87	78	75	67	92	84
Other	8	8	3	4	4	4	8	5

Unemployed, Weekend (men | women)

	US		Western Europe		Eastern Europe		Nordic	
Sleep	569	573	546	557	561	550	570	559
Personal care	34	47	52	59	50	54	45	47
Eating	65	64	115	122	113	118	89	95
Work	4	7	11	3	4	3	15	13
Job search	12	8	5	2	3	1	2	1
Education	17	9	18	9	15	14	3	13
Home production and care of others	159	245	110	232	158	286	128	214
of which: childcare	*25*	*58*	*12*	*36*	*16*	*42*	*16*	*43*
Shopping and services	30	39	27	35	12	19	21	29
Voluntary, religious and civic activities	17	25	8	12	16	19	7	5
Sport	31	22	58	33	45	30	40	30
Leisure and socializing	428	327	399	304	385	279	435	324
of which: TV	*246*	*176*	*185*	*129*	*201*	*148*	*195*	*158*
Travel	63	66	88	70	74	64	72	86
Other	11	8	4	4	5	5	12	24

Employed (men | women)

	US		Western Europe		Eastern Europe		Nordic	
Sleep	490	502	486	495	480	488	481	491
Personal care	38	53	46	52	46	50	39	49
Eating	67	61	97	93	91	85	82	84
Work	356	289	351	263	370	290	322	246
Job search	1	1	0	0	n.a.	n.a.	n.a.	n.a.
Education	10	13	6	7	5	8	8	12
Home production and care of others	101	163	89	193	106	218	117	188
of which: childcare	*22*	*40*	*15*	*32*	*19*	*35*	*20*	*35*
Shopping and services	21	36	19	31	15	23	21	29
Voluntary, religious and civic activities	12	14	8	6	7	8	7	5
Sport	22	13	26	20	19	13	29	23
Leisure and socializing	230	205	222	192	220	180	240	223
of which: TV	*134*	*109*	*107*	*83*	*130*	*100*	*110*	*88*
Travel	86	83	88	83	77	71	88	85
Other	6	7	3	4	5	4	6	5

Unemployed (men | women)

	US		Western Europe		Eastern Europe		Nordic	
Sleep	557	553	538	523	552	537	522	521
Personal care	44	44	50	56	47	50	39	47
Eating	53	53	107	104	108	108	87	86
Work	14	6	21	13	11	5	49	37
Job search	42	23	18	8	17	4	5	3
Education	23	22	27	22	19	15	47	43
Home production and care of others	175	260	134	268	189	324	137	239
of which: childcare	*23*	*67*	*13*	*43*	*16*	*52*	*13*	*50*
Shopping and services	26	44	31	46	22	33	24	33
Voluntary, religious and civic activities	17	19	8	8	6	9	9	5
Sport	22	15	47	28	36	20	51	25
Leisure and socializing	382	323	370	283	351	262	371	300
of which: TV	*220*	*188*	*172*	*132*	*188*	*142*	*163*	*144*
Travel	72	69	86	77	75	67	77	79
Other	12	9	4	4	5	4	22	23

Notes: Survey weights were used to compute country averages. Region averages are weighted by the size of the labor force of each country. Universe: Labor force, age 20-54.

Sources: HETUS, MTUS (Austria, Germany 1991-92, France), ATUS. We do not report the results by gender for Canada because of small sample size (less than 50 observations for some cells).

Table 1. Summary statistics of the time use surveys

Country	Survey	Source: Original	Source: HETUS	Source: MTUS	# diary days	# diary days employed	# diary days unemployed
Austria	1992	x		x*	1	10,191	146
Belgium	1998-2000		x		2	6,068	428
Bulgaria	2001-02		x		2	4,980	871
Canada	1992			x*	1	4,271	286
Canada	1998			x*	1	4,402	207
Finland	1999-2000		x		2	4,872	371
France	1998-99	x	x*		1	6,874	741
Germany	1991-92	x*		x*	2	12,494	828
Germany	2001-02	x*	x*		3	13,819	922
Italy	2002-03	x	x		1	18,493	1,724
Poland	2003-04		x		2	17,029	2,577
Slovenia	2000-01		x		2	5,900	372
Spain	2002-03	x	x		1	17,400	1,884
Sweden	2000-01		x		2	4,994	176
UK	2000-01	x	x		2	8,195	219
USA	2003-06	x			1	30,365	1,581

* Unemployed defined as self-reported unemployed; elsewhere unemployed defined as not working, actively seeking work and available for work.

Sources:

- Multinational Time Use Study, version 5.5.2 (October 2005). Center for Time Use Research, Oxford University. http://www.timeuse.org/mtus/

- Harmonised European Time Use Survey, online database version 2.0 (2005-2007). Statistics Finland and Statistics Sweden. https://www.h2.scb.se/tus/tus/

- We obtained the original micro data files from the government statistical agencies of Austria (through the institute WISDOM), Germany, Italy, France (through the Centre Maurice Halbwachs) and Spain. The micro data files for the UK time use survey were provided by the UK Data archive and for the American Time Use Survey (ATUS) by the Bureau of Labor Statistics.

Table 2. Comparison of estimates from HETUS and original survey data

Country	Survey	Source	# diary days	# diary days employed	# diary days unemployed	Unemployment rate (sample)	Average job search, in minutes per day	Participation rate in job search
France	1998-99	Original	1	6,874	741	11.6%	21	19%
France	1998-99	HETUS*	1	6,865	824	12.7%	19	18%
Spain	2002-03	Original	1	17,400	1,884	10.0%	18	11%
Spain	2002-03	HETUS**	1	17,400	2,378	12.3%	16	10%
UK	2000-01	Original	2	8,195	219	2.8%	7	10%
UK	2000-01	HETUS	2	8,190	219	2.8%	8	14%
Germany	2001-02	Original*	3	13,819	922	6.4%	9	10%
Germany	2001-02	HETUS*	3	14,095	922	6.3%	10	11%
Italy	2002-03	Original	1	18,493	1,724	9.0%	9	8%
Italy	2002-03	HETUS	1	18,493	1,724	9.0%	10	8%

Note: Survey weights are used to compute percentages and averages.

* Unemployed defined as self-reported unemployed.

** The survey questions to define unemployed differ for Spain between HETUS (currently looking for work) and our estimates from the original survey data (actively seeking work in the last 4 weeks).

Table 3. Average minutes per day by activity, region, employment status and day of the week

(Western Europe: Austria, Belgium, France, Germany, Italy, Spain, UK; Eastern Europe: Bulgaria, Slovenia, Poland; Nordic: Finland, Sweden)

	Employed, Weekday					Unemployed, Weekday				
	US	Canada	Western Europe	Eastern Europe	Nordic	US	Canada	Western Europe	Eastern Europe	Nordic
Sleep	474	458	470	466	463	549	511	521	540	504
Personal care	46	44	48	47	42	45	43	51	47	42
Eating	62	54	86	79	76	49	71	100	105	84
Work	410	445	398	411	368	12	50	21	10	54
Job search	1	0	0	n.a.	n.a.	41	38	16	14	5
Education	13	8	7	6	12	27	7	29	18	59
Home production and care of others	113	113	120	144	136	224	170	220	272	198
of which: childcare	*31*	*23*	*22*	*25*	*28*	*47*	*43*	*30*	*37*	*32*
Shopping and services	23	24	22	19	25	35	62	42	33	31
Voluntary, religious and civic activities	7	7	5	3	6	17	9	7	3	7
Sport	15	18	17	11	21	16	37	34	24	39
Leisure and socializing	186	180	177	175	199	344	363	313	295	316
of which: TV	*108*	*90*	*88*	*104*	*89*	*202*	*165*	*150*	*159*	*144*
Travel	85	89	87	75	86	73	79	82	72	78
Other	6	0	3	5	5	11	0	4	5	24

	Employed, Weekend					Unemployed, Weekend				
	US	Canada	Western Europe	Eastern Europe	Nordic	US	Canada	Western Europe	Eastern Europe	Nordic
Sleep	550	520	541	527	542	571	538	551	556	565
Personal care	41	39	51	52	48	41	36	56	52	46
Eating	71	70	119	110	99	65	57	119	115	92
Work	113	129	98	141	77	6	7	7	3	14
Job search	0	0	0	n.a.	n.a.	10	3	3	2	2
Education	8	7	5	9	5	13	0	13	14	8
Home production and care of others	172	178	169	188	191	206	154	177	224	172
of which: childcare	*30*	*32*	*24*	*29*	*27*	*43*	*17*	*24*	*29*	*29*
Shopping and services	42	41	29	16	25	35	17	31	15	25
Voluntary, religious and civic activities	26	12	12	19	8	22	5	10	18	6
Sport	26	39	40	31	38	26	61	46	37	35
Leisure and socializing	298	317	289	270	313	372	471	347	330	378
of which: TV	*160*	*125*	*120*	*148*	*125*	*207*	*186*	*155*	*174*	*176*
Travel	84	86	83	72	88	65	90	79	69	79
Other	8	0	3	4	6	9	0	3	5	18

	Employed					Unemployed				
	US	Canada	Western Europe	Eastern Europe	Nordic	US	Canada	Western Europe	Eastern Europe	Nordic
Sleep	496	475	490	484	486	555	519	530	544	522
Personal care	45	43	49	48	44	44	41	53	49	44
Eating	65	59	96	88	83	53	67	106	108	87
Work	325	356	312	334	285	10	38	17	8	43
Job search	1	0	0	n.a.	n.a.	32	28	12	11	4
Education	11	8	7	7	10	23	5	24	17	45
Home production and care of others	130	131	134	157	151	219	165	207	258	189
of which: childcare	*31*	*26*	*22*	*26*	*28*	*46*	*36*	*28*	*35*	*31*
Shopping and services	28	29	24	19	25	35	50	39	29	29
Voluntary, religious and civic activities	13	8	7	8	6	18	8	8	8	7
Sport	18	24	23	16	26	19	44	37	28	37
Leisure and socializing	218	219	209	202	232	352	393	323	305	334
of which: TV	*123*	*100*	*97*	*117*	*99*	*204*	*171*	*151*	*164*	*153*
Travel	84	88	86	74	86	71	82	81	71	78
Other	7	0	3	4	5	10	0	3	5	22

Notes: Survey weights were used to compute country averages. Region averages are weighted by the size of the labor force of each country. Universe: Labor force, age 20-54.

Sources: HETUS, MTUS (Canada 1998, Austria, Germany 1991-92, France), ATUS. For Canada, we report the results for the more recent survey from 1998.

Table 4. Labor force categories and job search

Country	Survey	Average job search, in minutes per day			Participation in job search		
		Employed	Unemployed	Out of labor force	Employed	Unemployed	Out of labor force
Austria	1992	0.0	10.5	0.6	0.1%	13.0%	0.6%
Belgium	1998-2000	n.a.	6 *	2 *	n.a.	9% *	1% *
Bulgaria	2001-02	n.a.	12 *	2 *	n.a.	8% *	1% *
Canada	1992	0.3	33.8	0.9	0.3%	16.3%	1.0%
Canada	1998	0.2	28.3	0.9	0.3%	15.6%	0.7%
Finland	1999-2000	n.a.	3 *	0 *	n.a.	5% *	1% *
France	1998-99	0.1	20.9	0.9	0.2%	19.4%	0.9%
Germany	1991-92	0.2	7.9	0.6	0.3%	10.5%	1.0%
Germany	2001-02	0.3	9.2	0.2	0.4%	10.2%	0.4%
Italy	2002-03	0.3	9.3	0.2	0.1%	7.8%	0.2%
Poland	2003-04	n.a.	11 *	0 *	n.a.	10% *	1% *
Slovenia	2000-01	n.a.	3 *	1 *	n.a.	7% *	2% *
Spain	2002-03	0.2	18.2	0.7	0.2%	10.7%	0.5%
Sweden	2000-01	n.a.	5 *	2 *	n.a.	12% *	5% *
UK	2000-01	0.3	6.9	0.7	0.4%	10.5%	0.8%
USA	2003-06	0.6	32.3	0.9	0.7%	20.2%	0.7%

Note: Average search time and participation rates were computed with survey weights. Universe: Population, age 20-54.
* HETUS rounds to the nearest integer.

Table 5a. Micro data regressions for 6 countries: linear probability model

Dependent variable: participation in job search	**Pooled**	**USA**	**Canada**	**France**	**Germany**	**Spain**	**Italy**
Mean of dependent variable	**0.129**	**0.202**	**0.160**	**0.194**	**0.104**	**0.107**	**0.078**
Age/10	0.029	-0.044	0.224	-0.004	-0.046	0.008	0.016
	(0.020)	(0.116)	(0.159)	(0.122)	(0.098)	(0.066)	(0.078)
Age^2/100	-0.003	0.01	-0.03	0.001	0.005	-0.004	-0.003
	(0.003)	(0.016)	(0.021)	(0.017)	(0.013)	(0.009)	(0.011)
Uncompleted secondary education or less	---	---	---	---	---	---	---
Completed secondary education	0.005	0.065	-0.055	0.062	0.026	-0.018	-0.034
	(0.021)	(0.038)*	(0.054)	(0.032)*	(0.022)	(0.020)	(0.020)*
Tertiary education	0.069	0.144	0.044	0.216	0.083	0.009	-0.006
	(0.031)*	(0.037)***	(0.052)	(0.051)***	(0.034)**	(0.024)	(0.046)
Female	-0.061	-0.048	-0.134	0.002	-0.047	-0.09	-0.047
	(0.010)***	(0.043)	(0.045)***	(0.045)	(0.037)	(0.023)***	(0.026)*
Married	0.012	-0.016	0.023	0.061	-0.067	0.054	0.145
	(0.032)	(0.047)	(0.061)	(0.049)	(0.034)*	(0.033)	(0.062)**
Female*married	-0.066	-0.053	0.035	-0.146	0.009	-0.104	-0.19
	(0.030)*	(0.056)	(0.079)	(0.059)**	(0.042)	(0.035)***	(0.061)***
Weekend	-0.127	-0.174	-0.214	-0.257	-0.102	-0.106	-0.072
	(0.021)***	(0.022)***	(0.034)***	(0.022)***	(0.017)***	(0.012)***	(0.016)***
First quarter	---	---	---	---	---	---	---
Second quarter	-0.01	0.012	-0.078	0.031	-0.022	-0.01	-0.017
	(0.008)	(0.043)	(0.062)	(0.046)	(0.029)	(0.021)	(0.029)
Third quarter	-0.023	-0.041	-0.025	0.055	-0.019	-0.033	-0.034
	(0.007)**	(0.037)	(0.062)	(0.050)	(0.033)	(0.021)	(0.040)
Fourth quarter	-0.036	-0.072	-0.183	0.011	-0.035	-0.023	-0.003
	(0.015)*	(0.039)*	(0.052)***	(0.046)	(0.029)	(0.021)	(0.041)
Constant	0.068	0.235	-0.244	0.158	0.267	0.241	0.116
	(0.036)*	(0.199)	(0.272)	(0.213)	(0.176)	(0.118)**	(0.137)
Year dummies	x	x	x	x	x		x
Country dummies	x						
Observations	8,527	1,581	489	741	1,750	1,877	1,724
R-squared	0.08	0.09	0.14	0.13	0.06	0.08	0.08
Ftest	59.98 (1)	7.48	3.90	12.55	4.2	12.82	3.43
P-value	0.000	0.000	0.000	0.000	0.000	0.000	0.000

Robust standard errors in parentheses; Standard errors are clustered at the country level in the pooled regression in column 1.
* significant at 10%; ** significant at 5%; *** significant at 1%

(1) Test of joint significance of coefficients for age, education, female, married and the interaction female*married. With clustered standard errors, the number of variables in a test of joint significance cannot exceed the number of clusters.

Note: Regressions were weighted using survey weights. Universe: Unemployed, age 20-54. The pooled regression in column 1 also includes Austria and the UK, but we do not report the country-level regressions for these two countries because the number of observations is small (less than 250 diary days).

Table 5b. Linear micro data regressions for 6 countries (participants only)

Dependent variable: time allocated to job search, in minutes per day	Pooled	USA	Canada	France	Germany	Spain	Italy
Mean of dependent variable	**136.5**	**159.7**	**197.2**	**107.8**	**83.3**	**169.4**	**118.7**
Age	-3.699	-4.871	31.533	-6.291	-2.951	-6.255	0.794
	(1.681)*	(7.008)	(24.056)	(5.197)	(4.321)	(9.232)	(10.686)
Age^2	0.061	0.098	-0.476	0.082	0.046	0.099	0.001
	(0.030)*	(0.096)	(0.348)	(0.068)	(0.058)	(0.137)	(0.149)
Uncompleted secondary education or less	---	---	---	---	---	---	---
Completed secondary education	12.264	1.322	31.544	17.852	29.471	-36.944	51.949
	(13.362)	(43.246)	(58.428)	(15.443)	(14.517)**	(31.402)	(32.574)
Tertiary education	15.69	6.074	94.609	26.064	16.843	-62.545	73.506
	(20.222)	(40.135)	(53.586)*	(17.346)	(15.617)	(33.381)*	(41.428)*
Female	-27.436	-9.321	-41.016	-46.569	-8.386	-40.365	-90.643
	(9.787)**	(26.284)	(58.976)	(21.385)**	(15.311)	(24.348)*	(23.822)***
Married	17.771	-7.99	95.984	21.911	-1.032	24.779	-11.857
	(15.120)	(28.899)	(59.287)	(22.819)	(15.211)	(37.658)	(32.628)
Female*married	-38.901	-39.727	-141.664	-9.002	-17.173	-94.419	3.234
	(17.114)*	(36.930)	(87.120)	(24.926)	(22.431)	(43.683)**	(39.390)
Weekend	-10.196	-30.257	-68.261	54.733	-43.776	49.379	23.068
	(16.610)	(21.953)	(78.132)	(51.743)	(11.393)***	(40.622)	(25.055)
First quarter	---	---	---	---	---	---	---
Second quarter	1.713	25.019	54.95	43.391	-10.866	-47.949	
	(14.356)	(27.420)	(67.814)	(13.552)***	(13.526)	(25.942)*	
Third quarter	-0.34	39.583	18.851	25.478	10.903	-47.247	-39.852
	(17.266)	(25.132)	(50.350)	(13.698)*	(19.860)	(30.605)	(26.170)
Fourth quarter	6.807	-13.37	35.525	96.072	1.621	-31.911	44.441
	(13.230)	(22.970)	(48.381)	(23.122)***	(15.286)	(29.879)	(27.995)
Constant	186.078	185.511	-346.498	184.028	116.34	332.594	127.035
	(36.780)***	(110.396)*	(354.977)	(94.114)*	(73.601)	(152.627)**	(170.595)
Year dummies	x	x	x	x	x		x
Country dummies	x						
Observations	940	276	67	142	161	181	78
R-squared	0.14	0.08	0.28	0.27	0.11	0.14	0.26
Ftest	16.02 (1)	1.58	1.29	3.74	2.23	3.47	3.35
P-value	0.001	0.076	0.251	0.000	0.013	0.000	0.001

Robust standard errors in parentheses; Standard errors are clustered at the country level in the pooled regression in column 1.
* significant at 10%; ** significant at 5%; *** significant at 1%

(1) Test of joint significance of coefficients for age, education, female, married and the interaction female*married. With clustered standard errors, the number of variables in a test of joint significance cannot exceed the number of clusters.

Note: Regressions were weighted using survey weights. Universe: Unemployed, age 20-54. The pooled regression in column 1 also includes Austria and the UK, but we do not report the country-level regressions for these two countries because the number of observations is small (less than 250 diary days).

Table 6. Cross-country regressions

Dependent variable: average job search, in minutes per day	**Mean of variables**	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Mean of dependent variable	**13.58**						
Log(NRR - initial period)	**-0.33**	-13.808			-3.24	14.744	11.515
	(0.120)	(24.423)			(18.375)	(18.451)	(20.119)
Benefit escalation	**0.62**		-24.088		-26.44		-2.679
(= GRR month 7-24 / GRR month 1-6)	*(0.274)*		(7.864)***		(8.609)***		(17.373)
90-10 wage ratio	**3.28**			9.644		11.17	9.748
	(0.731)			(2.558)***		(3.004)***	(5.563)
Average years of school	**9.43**						1.023
	(1.553)						(1.901)
Constant		9.217	28.353	-18.09	29.203	-17.781	-22.19
		(8.523)	(5.267)***	(8.618)*	(9.155)***	(9.379)*	(38.070)
Observations		15	16	16	15	15	15
R-squared		0.02	0.40	0.50	0.45	0.55	0.58
Standard errors in parentheses							
* significant at 10%; ** significant at 5%; *** significant at 1%							

Note: To adjust for differences across countries in the precision of the estimated job search time, we run weighted least squares (WLS) regressions with the weights determined in an auxiliary regression: We first run an ordinary least squares (OLS) regression and subsequently regress the squared OLS residuals on a constant and the inverse of the number of unemployed diary days. The WLS regressions then are weighted with the inverse of the predicted value from the auxiliary regression.

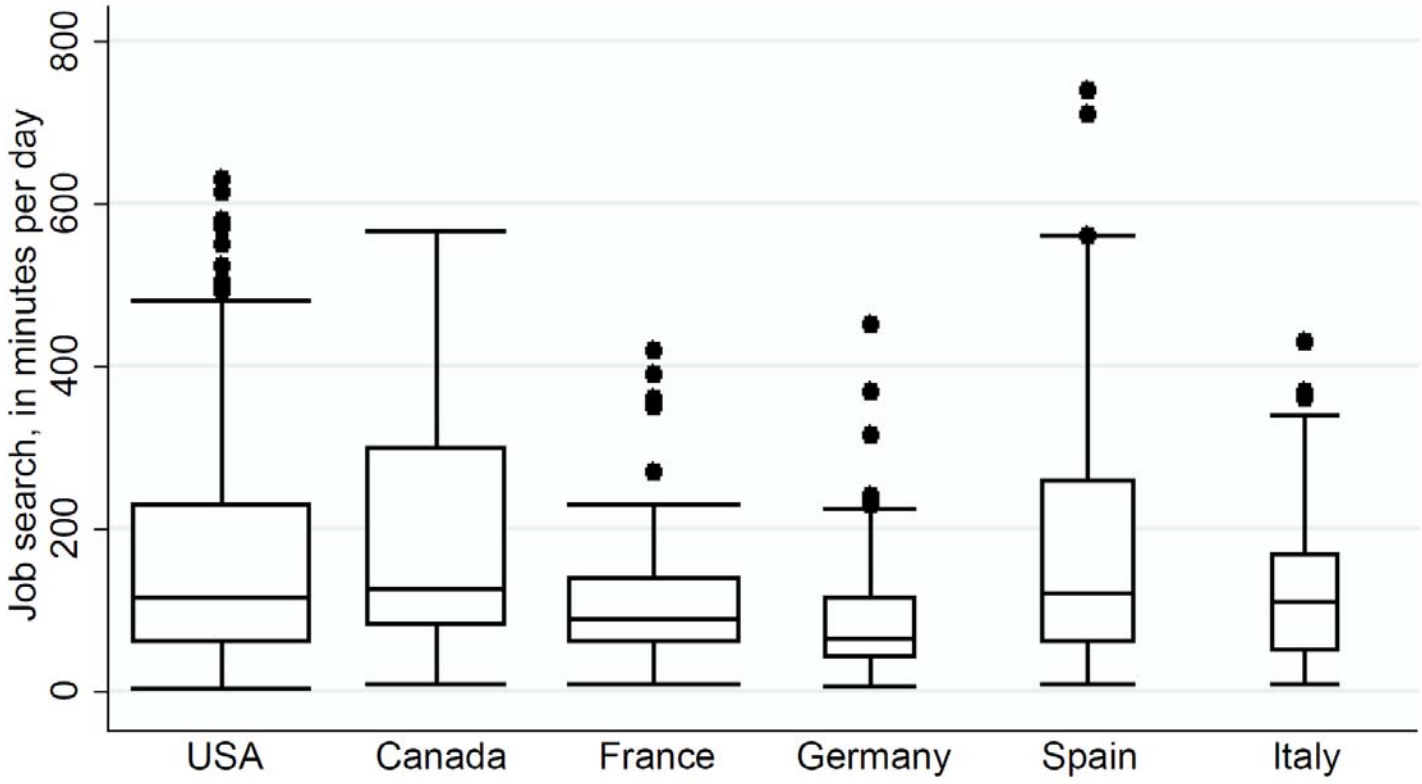
Table 7. Pooled micro data regressions

Dependent variable: time allocated to job search, in minutes per day	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Mean of dependent variable	**17.6**	**17.6**	**17.6**	**17.6**	**17.6**	**17.6**
Log(NRR - initial period)		-1.005			10.6	2.649
		(26.613)			(18.351)	(20.132)
Benefit escalation			-17.593		-18.366	0.227
(= GRR month 7-24 / GRR month 1-6)			(3.335)***		(2.317)***	(8.134)
90-10 wage ratio				8.138		8.238
				(1.468)***		(3.821)*
Age	-0.056	-0.396	-0.13	-0.08	-0.137	-0.084
	(0.454)	(0.549)	(0.457)	(0.446)	(0.453)	(0.447)
Age^2	0.003	0.006	0.002	0.002	0.002	0.002
	(0.008)	(0.010)	(0.008)	(0.008)	(0.008)	(0.008)
Uncompleted secondary education or less	---	---	---	---	---	---
Completed secondary education	1.26	2.617	1.692	0.478	0.998	0.299
	(3.186)	(3.666)	(2.549)	(3.027)	(3.029)	(3.012)
Tertiary education	10.434	15.877	11.669	10.158	11.064	10.036
	(6.056)	(7.268)*	(5.160)*	(6.099)	(5.629)*	(6.012)
Female	-11.731	-11.848	-10.769	-11.026	-10.749	-11.036
	(2.117)***	(2.329)***	(2.289)***	(2.381)***	(2.320)***	(2.400)***
Married	6.808	8.465	7.248	7.106	7.109	7.084
	(5.802)	(5.822)	(5.866)	(5.767)	(5.649)	(5.648)
Female*married	-13.633	-13.927	-13.913	-13.838	-13.867	-13.826
	(5.794)*	(5.732)**	(5.612)**	(5.653)**	(5.523)**	(5.624)**
Weekend	-17.59	-17.942	-17.807	-17.776	-17.857	-17.79
	(4.034)***	(4.045)***	(3.975)***	(3.984)***	(3.971)***	(4.011)***
USA	---					
Austria	-18.244					
	(3.160)***					
Canada 1992	-1.142					
	(1.220)					
Canada 1998	-7.554					
	(1.093)***					
France	-8.073					
	(1.206)***					
Germany 1991-92	-21.633					
	(0.917)***					
Germany 2001-02	-21.93					
	(0.868)***					
Italy	-17.266					
	(2.333)***					
Spain	-10.322					
	(1.004)***					
UK	-25.132					
	(1.468)***					
Constant	38.473	30.351	39.66	0.217	44.702	0.89
	(8.638)***	(12.147)**	(8.072)***	(8.423)	(13.172)**	(25.780)
Dummies for each quarter	x	x	x	x	x	x
Observations	8,527	8,527	8,527	8,527	8,527	8,527
R-squared	0.07	0.05	0.06	0.06	0.06	0.06

Standard errors are clustered at country level (in parentheses)

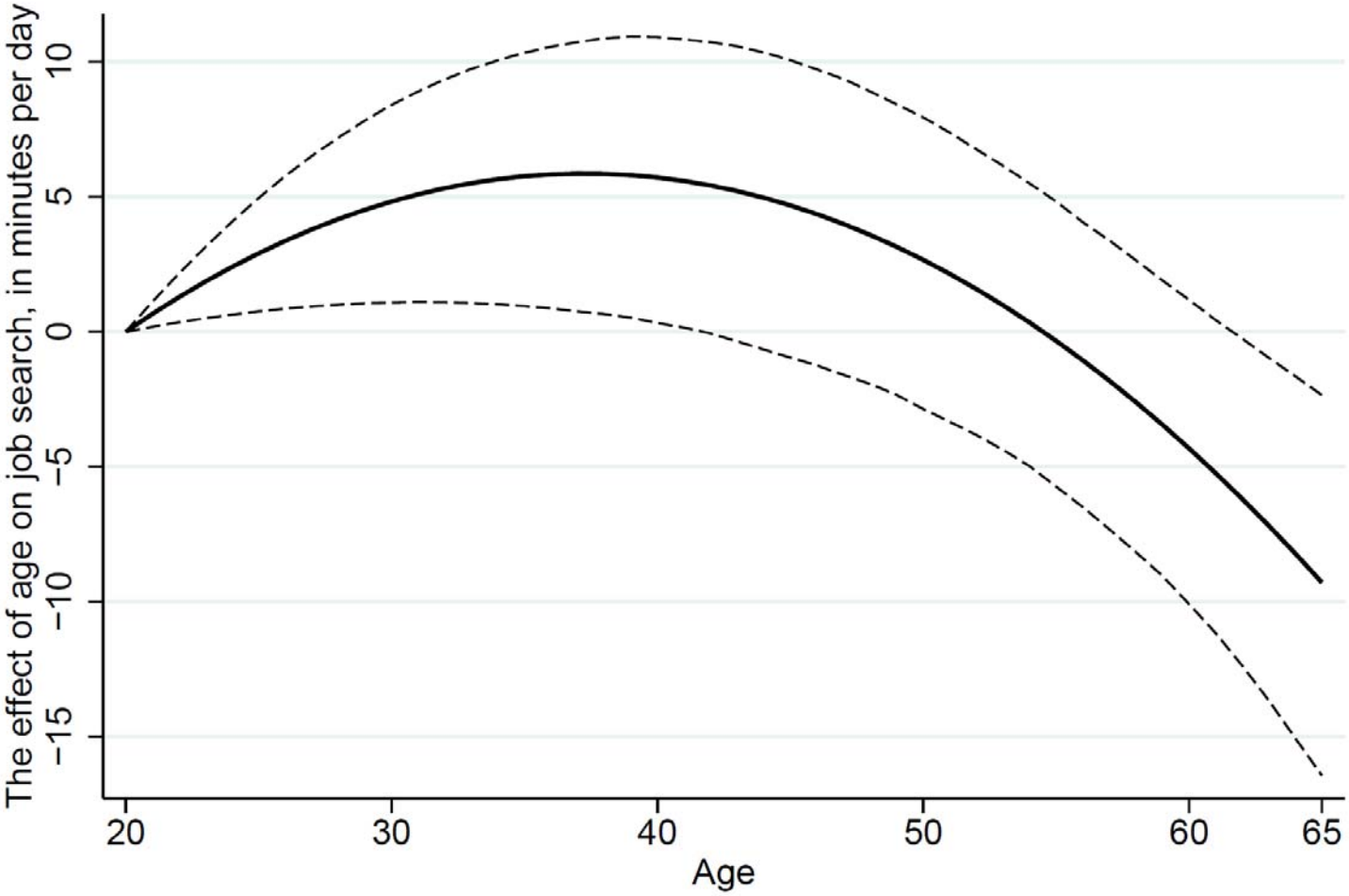
* significant at 10%; ** significant at 5%; *** significant at 1%

Note: Regressions were weighted using survey weights. Universe: Unemployed, age 20-54.



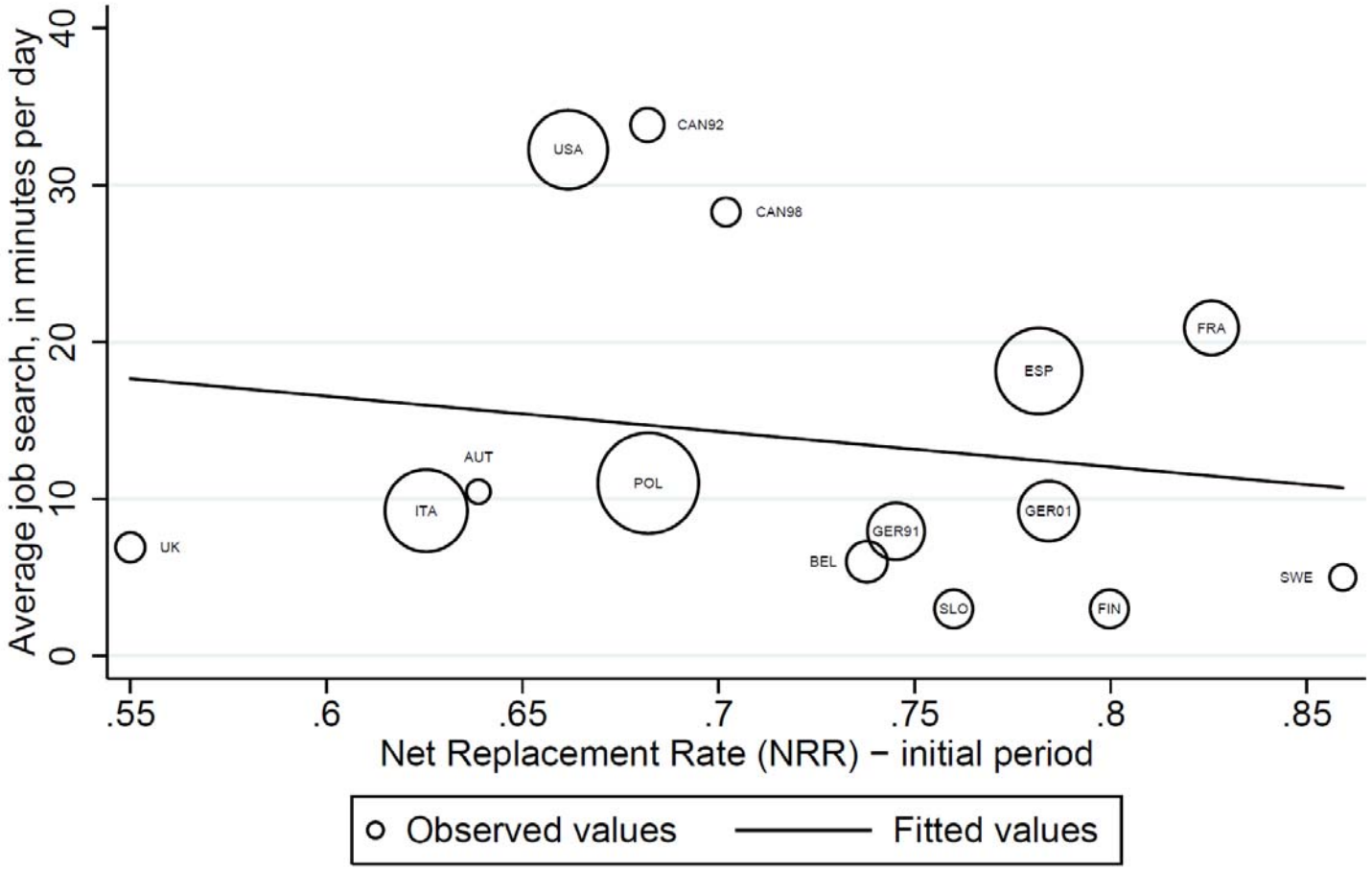
Notes: Survey weights were used. The box plot excludes those unemployed who did not search for a job on the diary day. The upper limit of the box represents the 75th percentile, the lower limit the 25th percentile and the median is drawn in the box. The interquartile range (IQR) is defined as the difference between the 75th and the 25th percentile and observations that are 1.5xIQR above the 75th percentile are shown as dots. The width of the box is proportional to the fraction of the unemployed who searched on the diary day. Two surveys were used for Canada (1992, 1998) and Germany (1991/92, 2001/02).

Figure 1. Box plot of job search for 6 countries



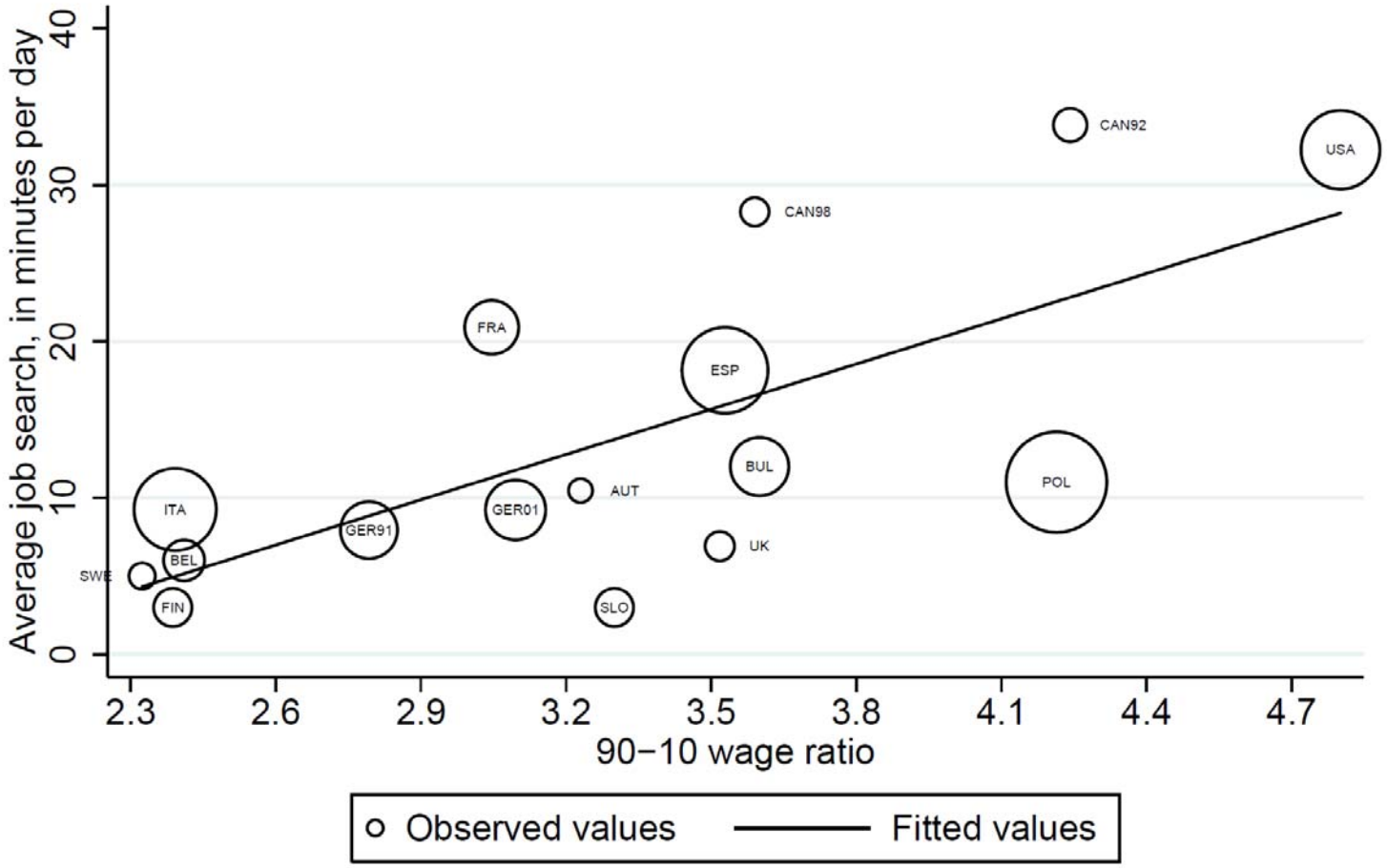
Note: The area between the dashed lines represents the 95% confidence interval (based on a bootstrap with 5000 repetitions).

Figure 2. The effect of age on job search



Sources: Authors, OECD and UNECE.
Linear weighted regression (s.e. in parentheses):
Search = 30.07(25.19) −22.54(34.63) * NRR. R−squared = .032.

Figure 3. Net replacement rates (NRRs) and job search



Sources: Authors, OECD Earnings Inequality Database and Rutkowski (2001).
Linear weighted regression (s.e. in parentheses):
Search = −18.09(8.62) + 9.64(2.56) * (90−10 wage ratio). R−squared = .504.

Figure 4. Wage dispersion and job search