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## Preliminary

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# Job search methods, intensity and success in Britain in the 1990s

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**Abstract:** We investigate the use of various job search strategies and their impact on the probability of subsequent employment and the re-employment wage among working age men in Britain. We find that replying to advertisements and using Job Centres are the two most common methods of job search, and that job search intensity, and direct applications to employers in particular, result in a higher probability of subsequent employment. Conditional on finding work, replying to advertisements results in higher paying employment. Age, education, family circumstances and local labour demand, as well as unobserved individual specific effects, emerge as key determinants of job search strategy use and success.

**JEL classification:** J11, J20, J62, J64, C33

**Keywords:** Job Mobility, Unemployment, BHPS, Panel data, Job search

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## Non-technical Summary

Osberg (1993) famously compares the job search process to fishing. Like a fisherman, the job seeker will use various forms of lure and try different locations in an attempt to catch the big fish. However, the process of job search itself has received relatively little attention in the literature. Job search methods differ in their time and money costs and in their efficiency, while individuals differ in their motives for job search and in their job search competencies and constraints. Our aim in this paper is to investigate the use of various job search strategies among working age unemployed men in Britain, and to examine their impact on the probability of entering employment and on the re-employment wage.

Recent evidence for Britain suggests that visiting a Job Centre and studying the situations vacant columns in newspapers are the main job search methods for unemployed men, while informal contacts and strong social networks are important in finding a job. Although the latter has long been recognised by economists, there are few studies that explicitly incorporate search method and intensity. This is an important area as different job search strategies will typically be associated with different types of employment. If different strategies draw offers from different pools of potential employers with different distributions of potential wage offers, then it is desirable for individuals to vary their search effort across strategies as the marginal returns in each strategy will differ. An individual's choice of search strategy will reflect their perceived costs and benefits associated with each method.

We find that replying to advertisements and using Job Centres are the two most common methods of job search among unemployed men in Britain. The average unemployed male uses three search methods as part of his job search strategy. Education, age, family circumstances, and local labour market demand emerge as key determinants of individual's choice of job search strategy. Unobserved time-invariant individual specific effects are also found to be significant, emphasising the importance of panel data in analysing job search methods.

Our estimates show that, all things equal, direct application to potential employers is associated with a higher probability of employment at the subsequent date of interview, while replying to advertisements results in higher paying employment. Job search intensity, measured by the number of search methods used, has a positive impact on both the probability of employment and on the wage at the subsequent date of interview. The fact that individual characteristics determine the use of various job search strategies, and different strategies have different effects on labour market outcomes (employment and wages) suggests that job search strategy plays an important role in matching workers with jobs. This area requires further research to aid understanding of the job search and matching process, incorporating demand side factors such as how recruitment strategies vary across vacancy type.

## Introduction

Osberg (1993) famously compares job search to fishing. Like a fisherman, the job seeker uses various forms of lure and tries different locations in an attempt to catch the big fish. However, the actual process of job search has received relatively little attention in the job search literature, which has generally focussed on the determinants of the reservation wage in a framework that assumes the job offer arrival rate to be exogenous (e.g. Narendranathan and Nickell, 1985). The probability of receiving an offer is likely to depend on an individual's job search strategy. A greater investment in search activity will yield more information on vacancies which is likely to result in a higher probability of receiving a job offer. Furthermore job search methods differ in their time and money costs and in their efficiency, while individuals differ in their motives for job search, and their job search competence and constraints. Holzer (1988) suggests that "the use of specific job search methods varies across individuals with different opportunities in the labour market and different sources or needs for income" (Holzer, 1988, p.15). Our aim in this paper is to investigate the use of various job search strategies, and examine their impact on the probability of entering employment and on the re-employment wage. Panel data, allowing observation of the individuals on completion of the unemployment spell, are required to do this effectively.

Recent British studies have shown that unemployment has scarring effects on individuals. Arulampalam et al (2000) use the British Household Panel Survey to investigate the impact of past unemployment on current labour market behaviour and conclude that for mature men some 40% of the observed persistence in the unemployment probability is accounted for by state dependence. Gregg (2000) reaches similar conclusions using a cohort of British men (NCDS) – a man's previous unemployment experience has implications for his future labour market behaviour. Gregory and Jukes (2000) and Arulampalam (2000) provide evidence suggesting that unemployment also results in earnings some 10% lower than pre-unemployment earnings. This effect is found to persist. Gregory and Jukes (2000) also find unemployment duration to have a permanent impact on subsequent earnings, proportional to the length of the unemployment spell. The latter in particular highlights the importance of using efficient job search methods when unemployed if the loss of current income during

unemployment is not to be compounded by earnings reductions and further scarring on re-entry to work.

Sociologists have linked the probability of finding a job to 'social cohesion' – Granovetter (1974) finds that the majority of white collar workers report obtaining their current job through personal contacts, while more recently Hannan (1999) concludes that informal contacts and strong social networks are important in finding a job. This has also long been known to economists. Rees (1966) suggests that good jobs are usually found through informal information networks and personal contacts. More recently however Gregg and Wadsworth (1996) find such effects to be negligible for the long-term unemployed. Although Pissarides (1979) and Gregg and Wadsworth (1996) focus on the use of state employment agencies, and Jones (1989) presents evidence on search intensity in a variety of search methods, there are few British studies that explicitly incorporate search method and intensity into an economic model. Different job search strategies will typically attract different types of employment. Furthermore, if different strategies draw offers from different pools of potential employers with different distributions of potential wage offers, then it is desirable for individuals to vary their search effort across strategies as the marginal returns in each strategy will differ. An individual's choice of search strategy will reflect their perceptions of the costs and benefits associated with each method.

Previous research has shown that Job Centres and replying to advertisements are the two most commonly used methods of job search for the unemployed in Britain (Jones, 1989; Gregg and Wadsworth, 1996; Labour Market Trends, 1999). The most common ways of obtaining a job are from hearing from someone who already works in the establishment, and from replying to an advertisement (Labour Market Trends, 1999). In the U.S. and Canada, direct applications to firms and using friends and family contacts are more frequent methods of job search, and these are also associated with an above average probability of job search success (Holzer, 1988; Osberg, 1993). Holzer (1988) suggests that employers regard referrals from employees as more informative and reliable than direct applications and use them as a relatively cheap screening and signalling mechanism, while Rees (1966) indicates that employees only refer capable workers to ensure that their own reputation with their employer is not tarnished. Osberg (1993), using Canadian data, finds a negative relationship between public employment agency use and the probability of finding a job, and suggests that this may be

caused by selection bias. Such bias may be caused if individuals have common but unobserved characteristics which influence both the probability of using public employment agencies and that of finding a job. However, Gregg and Wadsworth (1996) find that controlling for selection effects has no significant impact on the effect of Job Centre use on the probability of re-employment in Britain.

An individual's choice of job search strategy will also reflect employers' recruitment policies, which vary according to firm and job characteristics (Gregg and Wadsworth, 1996; Manning, 2000). Manning (2000) finds that approaches to existing staff and Job Centres are the most frequently used recruitment methods, but his sample of employers in Britain is non-random and conclusions cannot be generalised to the behaviour of all British employers. Roper (1988) conducts a detailed analysis of employer variation in recruitment strategy. The author reports that all formal methods of recruitment are significantly slower in filling vacancies than Job Centres, and that newspaper advertisements are slowest of all. Informal methods are found to be fastest. The choice of recruitment method has the largest effect on the probability of filling a job vacancy.

Evidence suggests that job seekers in Britain use multiple search methods rather than rely on a single method strategy. Wanberg et al (1999) suggest that search intensity is determined by the degree of financial hardship and commitment to the labour market. Gregg and Wadsworth (1996) report that on average unemployed individuals in Britain use three job search methods, similar to the number used by unemployed youth in the U.S. (Holzer, 1988) but more than that recently found for the unemployed in Portugal (Addison and Portugal, 1998). A positive relationship between job search intensity and the probability of receiving and accepting a job offer is a common finding in the literature (Holzer, 1988; Gregg and Wadsworth, 1996).

We find that replying to advertisements and using Job Centres are the two most common methods of job search among unemployed men, while the average unemployed male in Britain uses three search methods as part of their job search strategy. Age, education, family circumstances and local labour demand emerge as key determinants of the choice of job search strategy. Unobserved time-invariant individual specific effects are also found to be significant in determining the choice of job search method. Our estimates, suitably corrected for selectivity, show that direct contact with employers is associated with a higher probability

of subsequent employment, all things equal. Conditional on finding work, replying to advertisements results in higher paying employment. Job search intensity, as measured by the number of search methods used, has a positive and significant association with both the probability of employment at the subsequent date of interview and with the wage, all things equal.

## Data

Panel data are required to satisfactorily address the impact of job search methods and intensity on the probability of finding a job. These enable us to observe the search methods and intensity of the unemployed at time  $t$  and any subsequent change in employment status between times  $t$  and  $t+1$ . They also allow us to use econometric techniques that control for different individual and household circumstances and unobservable characteristics. The latter is not possible with cross-sectional data. Our data source is waves 6, 7, 8 and 9 of the British Household Panel Survey (BHPS) which provides detailed information on individual, household and job related characteristics on an annual basis from 1996 to 1999.<sup>1</sup> The first wave was designed as a nationally representative random sample of the population of Great Britain living in private (non-institutional) households in the Autumn of 1991, consisting of 5,500 households covering approaching 10,000 individuals. These original respondents have been followed and they and any adult co-residents are interviewed at annual intervals. Children in original sample households are also interviewed when they reach the age of sixteen. The sample therefore remains broadly representative of the British population as it changes through the decade.<sup>2</sup> Our sub-sample consists of men who are unemployed for at least one of the dates of interview at wave 6, 7, 8, or 9 and who are under 65 years of age at the date of interview. We do not investigate the job search strategies of women because of small sample sizes – less than one hundred women considered themselves to be out of work and actively searching for employment at each wave. Our definition of unemployment is not currently working, having looked for work in the last four weeks, and being available to start work within the next two weeks. Respondents are not required to be interviewed at each wave

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<sup>1</sup> Respondents were not asked about their job search strategies prior to wave 6.

<sup>2</sup> In addition, weights are provided in the data to keep the sample representative of the British population.

to remain in the sample, and nor are new entrants to the survey prevented from entering our sample.

At each interview, respondents are asked detailed questions relating to their current employment status and their household composition, individual demographics and income. From this we can observe whether individuals are in work, whether they are out of work and looking for a job, or whether they are economically inactive. If in work, respondents are asked for their usual labour market earnings and working hours, allowing calculation of an hourly wage rate, and for information on a range of job characteristics. To these data we have matched the unemployment rate in each individual's travel-to-work area at each date of interview to provide information on local labour demand.<sup>3</sup> The job search questions which are of primary interest here are asked of all those in unemployment at the relevant date of interview. In particular, respondents are asked:

“In the past four weeks what active steps have you taken to find work?  
Have you.....  
Applied directly to an employer?  
Studied or replied to an advertisement?  
Used a Job Centre/employment agency?  
Asked friends or contacts?  
Taken steps to start your own business?”

Respondents are asked to list all which apply.<sup>4</sup> Relating the answers to this question to individual characteristics and demographics provides rich information on the determinants of job search strategies while unemployed, while relating them to subsequent labour market activity provides details regarding the effectiveness of various search methods. In addition, job search intensity can be estimated by adding together the number of search methods used by each unemployed individual. This allows investigation of the impact of search intensity on employment outcomes.

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<sup>3</sup> The local labour market information is taken from the National Online Manpower Information Service (NOMIS), and is matched into the BHPS by month of interview and travel-to-work area.

<sup>4</sup> This question is not ideal, as there is no 'other' category. There are a small proportion of the unemployed who do not use any of the listed search methods, and we therefore construct a sixth category to allow for this.



These data on the job search strategy of the unemployed are collected for each unemployed individual at each date of interview, rather than at regular periods throughout an unemployment spell. Therefore rather than investigating the impact of search strategy on the hazard rate from unemployment into employment, we focus on the employment status at the subsequent date of interview of currently unemployed individuals. Our estimates can be interpreted as the impact of job search strategy on the joint probability of receiving an acceptable job offer between the dates of interview (approximately 12 months apart), and of remaining in employment until the subsequent date of interview. Although this approach requires the individual to be interviewed at two consecutive waves, we implement a selection model to allow for non-random attrition across the period. This is discussed in more detail below.

Table 1 provides information on the proportion of unemployed men who use each job search method at each date of interview. This shows that, on average, the most commonly used methods of job search over the period under consideration are Job Centres, used by 76% of unemployed men, and replying to advertisements used by 74%. Friends and contacts are used by 66% of the unemployed and direct application to employers by 62%. Only 11% of the unemployed took steps to start their own business. These figures are consistent with previous findings for both Britain (Schmitt and Wadsworth, 1993; Gregg and Wadsworth, 1996; Labour Market Trends, 1999) and France (Sabatier, 2000), and contrast with the U.S. where 80% of the unemployed use direct applications and friends and family contacts (Holzer, 1988), and Canada, where direct application is the most common job search method (Osberg, 1993). Heath (1999) finds that using newspapers and the media are the most common search methods among unemployed young Australians, followed by the public employment service and direct employer contact. This evidence suggests that job search in Britain is more institutionalised than in other countries (see also Wadsworth, 1991).

Table 2 summarises the number of search methods used, which we use as our measure of job search intensity.<sup>5</sup> This shows that on average 1% of the unemployed, although currently

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<sup>5</sup> Of course this is only an approximation for search intensity. It is quite possible for an individual who uses one search method to be searching more intensively for work than another individual using three or four methods. Unfortunately the data do not provide information on the number of hours spent searching. Jones (1989) reports

searching for work, do not use any of the methods listed, while 11% use only one method. 22% of unemployed men use two job search methods, while the mode is three, used by 36%. 26% use four of the listed search methods while 4% use all five. This is reflected in a mean and median of 3 search methods per unemployed man. This is consistent with the average of three for unemployed men and women in Britain reported in Gregg and Wadsworth (1996), and of 3.3 for American unemployed youth (Holzer, 1988), and is greater than the mean of two found for the unemployed in Portugal (Addison and Portugal, 1998). Job search does not appear to be a single, uniform activity for the unemployed seeking work.

Table 3 examines the success of the various job search methods by focussing on the employment status of individuals currently unemployed at the following date of interview. In particular it provides the proportions using each job search method that are in employment at the next date of interview.<sup>6</sup> This shows that individuals who take steps to start their own business are the most likely to be employed (56% are in work at the subsequent wave), followed by men applying directly to firms (55%), those that reply to advertisements and who use friends and contacts (46%). The least successful search method in terms of employment at the subsequent date of interview is using a Job Centre or employment agency, 44% of those using this method are in work at the following date of interview. Labour Market Trends (1999) reports that hearing from someone already working at an establishment and replying to an advertisement are the two most common ways of finding a job. Gregg and Wadsworth (1996) similarly find personal contacts, media and Job Centre use as the most effective job search methods. These different results may be explained by different definitions of success. Gregg and Wadsworth (1996) and Labour Market Trends (1999) examine the re-employment probability, while we focus on the probability of employment at a point in the future.

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that the average unemployed individual spends six hours per week looking for work. St. Louis et al (1986) argue that the most appropriate measure of job search effort is the number of actual job contacts made. Such information is not available in the BHPS. Jackman et al (1991) report that unemployed men in Britain make only one or two job applications per month on average.

<sup>6</sup> This does not necessarily imply that individuals found employment as a direct result of using any particular job search method. We only have information on the methods used at the date of interview, and individuals may vary their strategy depending on their unemployment duration. Also, it is possible that an individual may have experienced other employment or even unemployment spells in between their unemployment spell at  $t$  and their job at  $t+1$ . This measure however provides an indicator of the probability of finding a job, and remaining in work, associated with each search method.

Table 4 reports the same employment probabilities by job search intensity, and reveals the expected result – a positive relationship between the number of search methods used by the unemployed and the probability of being employed at the subsequent date of interview. Less than 40% of men using one or two job search methods are subsequently employed, compared to 46% of those using three methods and 52% of men using four methods. Almost three quarters of men using all five listed methods are in work at the following date of interview. These findings are consistent with previous work (Holzer, 1988; Gregg and Wadsworth, 1996) and imply that greater investment in search effort yields more information on existing job vacancies and results in a higher probability of receiving an (acceptable) job offer (Sabatier, 2000).

## **Estimation Framework and model specification**

We investigate the decision of job search method choice within a random-effects panel probit framework, where the job search method used is characterised by a binary variable taking the value 1 if a particular method is used and zero otherwise, and modelled as a function of a range of individual, household and local labour market attributes. This approach allows us to benefit from the panel nature of the data by controlling for individual specific time-invariant unobserved heterogeneity, which is important given that individuals differ in their (unobservable) search efficiency. The search method questions are only asked of the currently employed. If individuals with particular characteristics are more able to conduct job search while remaining in employment, and therefore have a lower risk of unemployment, then any estimates may be biased.<sup>7</sup> We use a two step procedure to overcome this problem, which we discuss in more detail later in the paper.

The effectiveness of job search methods and intensity are modelled in a similar fashion. The probability of being employed at the subsequent date of interview is described by a binary variable, taking the value 1 if the individual is employed at the subsequent date of interview, and 0 otherwise. This variable is then modelled as a function of job search strategy, holding a range of other characteristics constant. To observe the individual's employment status at the

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<sup>7</sup> Blau and Robins (1990) and Belzil (1996) examine the relative efficiencies and advantages of employed and unemployed job search.

subsequent date of interview requires the respondent to be interviewed at two consecutive waves. If the probability of subsequent interview is correlated with either employment status or job search strategy then there will be some selection effects and the coefficients of interest will be biased. We return to this issue later in the paper.

The determinants of job search intensity are investigated using an ordered probit model.<sup>8</sup> Here job search intensity takes a value between 0 and 5, depending on the observed number of search methods used at the date of interview, and is modelled as a function of various individual, household and local labour market characteristics. The impact of job search strategies on the re-employment wage are estimated using a selectivity corrected ordinary least squares wage regression. The selection procedure again corrects for the fact that men have to be observed for at least two consecutive dates of interview in order to be included in the sample, and also for the fact that wages are only observed for those who have successfully made the transition into employment. These procedures are briefly summarised below.

### **Random Effects Probit**

We observe each individual  $i=1,2, \dots, N$  at times  $t=1, \dots, T$  and identify which job search method is being used at each date of interview. An individual's propensity to use a particular search method can be written:

$$y_{it}^* = X_{it}b + n_i + e_{it}$$

where

$$y_{it} = \begin{cases} 1 & \text{if } y_{it}^* > 0 \\ 0 & \text{otherwise,} \end{cases}$$

and  $n_i \sim \text{IN}(0, s_n^2)$  captures the individual-specific unobservable effect and  $e_{it} \sim \text{IN}(0, s_e^2)$  is random error.<sup>9</sup> Further,  $n_i$  and  $e_{it}$  are independent of each other and of  $X_{it}$ , the set of

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<sup>8</sup> We have also estimated the determinants of job search intensity using count data models. The results from doing so are almost identical to those from the ordered probit approach reported here.

<sup>9</sup> The zeros in our approach include both individuals not searching at all, and those using other methods of job search. A multinomial logit approach is not possible here because the use of search methods are not mutually exclusive.

explanatory variables.<sup>10</sup> To ensure identification  $s_e$  is set to one and the likelihood function is parameterised in terms of the within-subject correlation rho,

$$\text{rho} = s_n^2 / (s_n^2 + s_e^2).$$

This indicates the proportion of the variance that is explained by the panel-variance component,  $n_i$ , which captures time invariant unobserved differences between individuals. If rho is zero, then the panel-variance level component is unimportant and the panel estimator is not different from a cross-sectional (or pooled) estimation.

### **Ordered Probit**

In this framework, the underlying job search intensity is estimated as a linear function of a set of explanatory variables and a series of cut points. The probability of observing outcome  $n$  corresponds to the probability that the estimated linear function plus random error is within the range of the cut points estimated for the outcome:

$$\Pr(\text{Intensity}_i = n) = \Pr(k_{n-1} < \beta_1 x_{1i} + \beta_2 x_{2i} + \dots + \beta_k x_{ki} + u_i \leq k_n)$$

$u_i$  is assumed to be normally distributed. The  $\beta$  coefficients are estimated together with the cut points  $(k_1, k_2, k_3, k_4, k_5)$ . Although this approach does not capture time invariant unobserved differences between individuals, it does allow for repeated observations of the same individuals.

### **Wage regression**

We estimate the impact of job search strategy on the re-employment wage, defined as the hourly wage rate if employed at the subsequent date of interview, using a selectivity corrected ordinary least squares wage regression. The selection procedure corrects both for the fact that men are required to be interviewed at two consecutive waves, and that not all the unemployed are in work at the subsequent date of interview. The unobservable characteristics influencing the probability of employment and the wage received are likely to be correlated. We use a simple Heckman (1979) two step procedure, with the probability of being interviewed and in employment at the subsequent date of interview as the selection equation. The re-employment wage equation can therefore be specified as:

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<sup>10</sup> Greene (1997) and Baltagi (1995) provide more details on the random effects probit approach. In our specification,  $X_{it}$  also includes the inverse Mill's ratio from the selection equation.

$$\log Y_{i,t+1} = f(X_{i,t+1}, E_{i,t+1}, JS_{i,t}, \lambda_i)$$

where  $X_{i,t+1}$  is a vector of individual and local labour market characteristics at the subsequent date of interview,  $E_{i,t+1}$  is a vector of employer and job characteristics,  $JS_{i,t}$  is the vector representing the job search strategy used when unemployed, and  $\lambda_i$  is the selection correction term.

### **Model specification**

The vectors of explanatory variables we use in these analyses cover a range of individual, household and local labour market characteristics. An individual's age is likely to partly determine their number of contacts in the labour market, their attitude towards risk, their financial or familial responsibilities, and their level of savings. Labour market mobility is also known to be higher for younger individuals, for whom spells of unemployment are less likely to have a scarring effect (Arulampalam, Booth, and Taylor, 2000). Marital status, spouse's employment status, the number of children and education are all likely to help determine levels of attachment to and opportunities in the labour market, job search efficiency, the utility of leisure, the marginal value of income, constraints on job search and the number of contacts in the labour market. More highly educated individuals may have access to a geographically larger labour market and respond to advertisements placed in the national or international media, while the less educated may search more locally through friends and local labour market contacts. Montgomery (1991) suggests that there is a social structure within which highly skilled, high productivity workers are more likely to associate with each other rather than with lesser skilled, lower productivity workers. Demographic and family variables are also likely to affect both search intensity and marginal productivity, and therefore affect job offer arrival and retention rates. The number and age of children in the family, for example, may restrict the employment opportunities of parents (Wanberg et al, 1999). Household income captures the level of financial hardship which in other studies has been found to determine job search intensity (Wanberg et al, 1999). It may also determine the probability of accepting a job offer. Signing on implies a requirement for more visible, ascertainable job search activity which may induce a shift towards more demonstrable

methods.<sup>11</sup> It may also be an indicator of financial hardship. We include these variables in both the models determining job search methods and intensity, and job search success.

A key parameter in the job search literature is the reservation wage, the wage at which an individual is indifferent between accepting a job offer and rejecting it in favour of continued search. The BHPS data allow calculation of the reservation wage for each individual unemployed at the date of interview, defined in the survey as “the lowest weekly take home pay you would consider accepting for a job”. This is likely to be an important determinant of both choice of search method and intensity. By directly influencing the probability of receiving an acceptable job offer, the reservation wage also determines the likelihood of employment at the subsequent date of interview.

We might expect an individual’s job search strategy to vary according to the length of the unemployment spell, either because the unemployed change their strategies as different search methods are exhausted, or because of disincentive effects. Search effort may decline if unemployed workers contact their most favourable options at the start of the spell. Schmitt and Wadsworth (1993) find unemployment duration to be one of the most important determinants of job search method choice in Britain. There is also a consistent finding in the literature of negative duration dependence (e.g. Nickell, 1979; Van den Berg and Van Ours, 1994; Böheim and Taylor, 2000a), indicating that the probability of re-employment falls with the elapsed duration of the unemployment spell due to either scarring effects or unobserved heterogeneity. The current state of the labour market also affects the arrival rate of job offers, and there may be cyclical dependence in job search strategies. The local level of labour demand will constrain the job seeker, and men may change their job search behaviour in response to different labour market conditions (Osberg, 1993). In depressed labour markets for example, more of one’s normal contacts may be unemployed or working in establishments laying off rather than recruiting workers. McGregor (1983) hypothesises that higher local unemployment rates increase search through advertisements and employment agencies, while job seekers in low unemployment areas are more likely to use friends and contacts. He argues that information about jobs is more likely to originate from employed workers and therefore

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<sup>11</sup> “Signing on” means registration with the unemployment agency for the receipt of unemployment related

that there will be less information on available jobs in high unemployment neighbourhoods. Elapsed unemployment duration and the local unemployment rate are therefore included as explanatory variables in all models. To capture the impact of previous unemployment experience, we include a variable (“Recent unemployment experience”) measuring the proportion of previous dates of interview at which each sample member has been unemployed. Employers may use an individual’s previous unemployment record as a signal of low productivity, or previous unemployment may otherwise scar a worker (see, for example, Heckman and Borjas, 1980; Arulampalam et al, 2000; Böheim and Taylor, 2000b). We also include region of residence to capture any spatial dimension in job search strategy choice and success.

Other variables will influence only the choice of search strategy and intensity, and have no direct impact on the probability of re-employment. Wanberg et al (1999) show that commitment to the labour market has a direct impact on job search intensity. We capture this through a variable measuring the number of spells of economic inactivity an individual has had in the 12 months before being observed as unemployed. This may determine search intensity, but is unlikely to independently influence job search success. On the other hand, having a health condition that limits the type or amount of work possible is likely to affect the probability of receiving an acceptable offer, but not the choice of job search strategy. Similarly, the probability of unemployment has been linked to housing tenure, with the relative residential immobility of social tenants and owner-occupiers hypothesised to increase their propensity to experience unemployment and reduce their exit rate from it (Oswald, 1996, 1998; Böheim and Taylor, 1999). However, housing tenure is unlikely to directly influence the choice of job search strategy.

Our specification of the re-employment wage equation is empirically driven. We include a range of individual characteristics and demographics and employer, workplace and job characteristics which have a significant impact on the re-employment wage. These include age, education, occupation, marital status, spouse’s employment status, region of residence,

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benefits.



housing tenure, job tenure and job type (permanent, seasonal or temporary, fixed term contract) and the sample selection correction term.

## Estimation Results

The results from our multivariate analysis are presented in Table 5, Table 6, Table 7 and Table 8. We first discuss the determinants of each of the job search methods shown in Table 5.

### *Search method used.*

Table 5 presents the results from the pooled and random effects probit models estimating the determinants of the choice of search methods. As discussed previously, selection into this sample requires a man to be unemployed at the date of interview. If men with particular characteristics are more able to conduct search on-the-job, and therefore be less likely to experience unemployment, then any estimates may be biased. We overcome this problem by estimating a two stage model (Heckman, 1979). The first stage involves estimating a reduced form probit where the dependent variable takes the value 1 if a working age man is observed in unemployment at a date of interview, and 0 if in employment, self-employment or economic inactivity. The generalised error term (inverse Mill's ratio) from this probit is then entered as an additional regressor in the job search method equations. Pre-sample information and characteristics at the date of interview are used as explanatory variables in the first stage probit. Father's employment status, first labour market experience, school type and housing tenure are used to identify the job search method equations – these variables enter the reduced form unemployment probit, but not the job search method specifications. The full estimation results from this selection equation are presented in Appendix Table A.1 and are not discussed here.

Note that the estimates for rho are significantly different from zero, and the  $\chi^2$  test for rho=0 is rejected, in four out of the five job search method equations (the exception being replying to advertisements). The value for rho in these specifications vary from 0.27 in the direct application equation to 0.56 in the using friends and contacts equation. This suggests that between 27% and 56% of the variation in job search method use is attributable to time invariant unobserved individual specific effects, confirming the importance of allowing for unobserved heterogeneity in investigating the determinants of search methods. Although the

estimate for rho in the replying to advertisements equation lies outside this range, it is not statistically significant from zero.

The first set of estimates show that men aged under 35, and particularly those aged under 25, are more likely than those aged 45 and over to apply directly to firms (by 10-20 percentage points in the pooled specification – Schmitt and Wadsworth, 1993, report similar results).<sup>12</sup> Men educated to degree or ‘A’-Level standard are more likely than those educated to below ‘O’-Level standard to use this method of job search all things equal (by 8-10 percentage points in the pooled probit), although the coefficients have only weak statistical significance. Highly educated and skilled individuals may use a more pro-active approach to job search, and offer their skills directly to potential employers rather than respond to available opportunities (see also Heath, 1999; Sabatier, 2000). An inverse relationship emerges between the probability of direct application and the elapsed duration of the unemployment spell. This form of job search is less likely among men who have been unemployed for a longer period. This indicates that either men use direct application early in the job search process, or that individuals who use this search method find a job quickly (see also Schmitt and Wadsworth, 1993). Signing on and having an employed spouse are both associated with a significantly higher probability of applying directly to firms (by about 11 percentage points). A negative relationship emerges between applying directly to firms and the reservation wage – men requiring a relatively high wage to re-enter work are less likely to contact potential employers directly, while those with more recent unemployment experience have a higher probability of using this search method.

The second set of estimates show that replying to advertisements is less likely to be used by men aged under 35 than men aged 45 and above, reducing the probability by 12 percentage points. Unemployed men educated to ‘A’-Level or degree standard have a higher probability of replying to advertisements than those holding qualifications below ‘O’-Level standard (by 17 and 10 percentage points in the pooled specification. Schmitt and Wadsworth, 1993, and Sabatier, 2000 report similar findings for Britain and France respectively). A positive relationship emerges between household income and the probability of replying to

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<sup>12</sup> These marginal effects are estimated at the variable sample means.

advertisements which may suggest that men in households with higher income can afford to be more selective in their job search. This form of job search is also more likely to be used by individuals who are signing on (by 21 percentage points), perhaps reflecting institutional requirements of visible and demonstrable job search activity for the receipt of unemployment benefits. The probability of replying to advertisements declines with the local unemployment rate (see also Schmitt and Wadsworth, 1993), perhaps because fewer jobs are advertised during a recession. This highlights the importance of local labour market conditions in explaining job search behaviour, Heath (1999) reports similar results for young Australians.

Job Centre use is more prevalent among the young, all things equal (see also Osberg, 1993, Schmitt and Wadsworth, 1993, Heath, 1999). Men aged under 25 are 10 percentage points more likely to report using Job Centres or other employment agencies as part of their job search strategy. The probability of using a Job Centre or employment agency declines with the elapsed duration of the unemployment spell (see also Schmitt and Wadsworth, 1993), and is higher for men who sign on. The latter again reflects a visible commitment to finding work and institutional requirements.

The relatively high value for rho in the friends and contacts equation (0.556) suggests that job seekers who use informal networks are quite heterogeneous. The highly educated are less likely to use informal networks as part of their job search process. The coefficient on the degree level variable is particularly large and statistically significant, reducing the probability of using friends and contacts by 31 percentage points. This suggests that the less educated are more likely to use local information networks and search for work in their immediate labour market. The negative coefficient on household income is consistent with this argument. The more skilled, educated and wealthy operate within a geographically larger labour market and are less reliant on localised informal information networks in looking for work. Men who have experienced unemployment more recently have a lower probability of using friends and contacts as part of their job search strategy (by 22 percentage points), all things equal. It may be that such individuals, because of their more disrupted recent employment, have fewer contacts in employment, or perhaps have already exhausted their informal networks in previous spells of unemployment. Men who sign on have a higher probability of using friends and contacts when searching for work than those who do not.

Younger men are more likely than older workers to take steps to start a business as part of their job strategy – men aged 25-34 are 5 percentage points more likely than those aged 45 and over. This may reflect their lower levels of risk adversity and financial and family responsibilities. Unemployed men educated to degree or ‘A’-Level standard have a higher probability than those with no higher or further education qualifications of taking steps to start their own business (by 9-12 percentage points in the pooled specification). This could be caused by a greater ability to identify potential business opportunities. Men with an employed spouse also have a higher probability of taking steps to start a business, which suggests an alternative source of income in the household is an important consideration when contemplating self-employment. An inverse relationship between taking steps to start a business and the local unemployment rate emerges. Attempts at business start up are more common when labour demand is high. Men looking for a particular job have a higher probability of taking steps to start a business which for some may be the only way to ensure that the desired job is attained.

#### *Search intensity*

The results of the ordered probit estimates for job search intensity, measured by the number of search methods used, are shown in Table 6.<sup>13</sup> This reveals little relationship between age and search intensity, all things equal. We might expect older worker’s expected return from search to be lower given their shorter active labour market future and to therefore search less. Although the coefficients on the age variables are consistent with this, they are not significantly different from zero. Job search intensity increases with education, although only the coefficient on the ‘A’-Level variable is statistically significant. This relationship is consistent with previous research (Blau and Robins, 1990; Schmitt and Wadsworth, 1993; Wanberg et al, 1999; Sabatier, 2000). Unemployment deprives skilled individuals of their (high) wages and may also depreciate their human capital. Therefore the highly educated have a bigger incentive to exit unemployment rapidly and to adopt a greater search effort than the less educated. Differently qualified individuals may also search in different labour markets, which could partly determine their level of search effort. The number of search methods used is negatively related to elapsed unemployment duration – the longer the unemployment spell

the less intensively the unemployed worker searches. Schmitt and Wadsworth (1993) report similar findings for unemployed men in the early 1980s. This could be a disincentive effect, with individuals who have been unemployed for a relatively long time discouraged from searching. Alternatively, it may be caused by individuals exhausting search methods as their unemployment spell lengthens. Job search intensity is also inversely related to the local unemployment rate – the higher the local unemployment rate, the less intensely individuals search for work. Therefore individuals increase their search effort as job competition falls and the probability of receiving a job offer rises.<sup>14</sup> Individuals who have had a recent spell of economic inactivity have lower levels of search intensity, all things equal. Note that household income has no significant impact on job search intensity. This suggests that, all things equal, the level of financial well-being does not influence the job search intensity of an unemployed worker. This contrasts with the work of Wanberg et al (1999) who report the level of financial hardship to be an important predictor of search intensity. However, our results also suggest that job search intensity is positively related to signing on, which may indicate financial hardship and also reflect institutional factors.

#### *Probability of re-employment*

The results from the models estimating the probability of employment at  $t+1$  given that an individual is unemployed at  $t$  are presented in Table 7.<sup>15</sup> In estimating these models, the values for rho were consistently zero indicating that the time invariant individual specific unobserved effect is negligible, and that the random effects specifications yield the same results as the pooled models. The probable reason for this is the fact that only 70 men in our sample experienced multiple transitions between unemployment and employment in the period under consideration. For this reason we present only the results of the pooled specifications.

Inclusion in this analysis requires interview at two consecutive waves. Such a selection procedure can create a non-random sample – and if correlations exist between job search

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<sup>13</sup> Again, these estimates are corrected for the fact that the job search questions are only asked of the currently unemployed.

<sup>14</sup> Jones (1989) and Wadsworth (1991) report similar findings.

<sup>15</sup> Note that there is no omitted search category. This is because job seekers were able to specify multiple job search strategies.

strategy, the probability of re-employment and attrition, then the coefficients of interest will be biased. We control for these by estimating two-stage models following Heckman (1979), entering the generalised error term (inverse Mill's ratio) from a probit for being interviewed at two consecutive waves as an additional regressor in the employment equation. The dependent variable in the selection equation is a dummy variable taking the value 1 if a working age man unemployed at  $t$  is again interviewed at  $t+1$  between waves 6 and 9 of the BHPS. The dependent variable is set to zero if this is not satisfied – that is if a man observed to be unemployed at one date of interview is not interviewed at the following wave. Pre-sample information and recorded characteristics at the date of interview are used in the estimation procedure – variables affecting employment probabilities, mobility decisions, the likelihood of attrition etc. Identification of the parameters in the employment probit using the selected sample requires at least one variable in the selection equation that is not present in the employment probit – variables that influence the probability of remaining in the sample but not the probability of finding a job. We use father's employment status and occupation, pre-sample information on first labour market experiences and a dummy variable indicating whether the respondent is a new entrant at the current date of interview as identifying variables. The full estimation results from this selection equation are presented in Appendix Table A.1, and are not discussed here.

There is also the question of self-selection in the use of job search methods to be addressed. If job seekers do or do not use a particular search method because of a common but unobserved characteristic, then the estimated coefficients will be biased. Job Centre use, for example, may be an indicator of the relative unavailability of other labour market contacts – individuals who have relatively good contacts do not need to use Job Centres. We have estimated selectivity corrected models following Osberg (1993), Maddala (1993) and Gregg and Wadsworth (1996), including another selection correction term measuring the probability of using each method as an additional regressor. These probabilities are calculated from the estimates presented in Table 5. However, like Gregg and Wadsworth (1996), we find these terms to be always statistically insignificant and to have no impact on the size and

significance of the other coefficients. Therefore, for reasons of parsimony and simplicity, we report only the models without this second selectivity correction.<sup>16</sup>

Our estimates show that applying directly to an employer increases the probability of employment at the subsequent date of interview by 27 percentage points. This suggests that searching for a job through making direct applications has a very large positive impact on an individual's medium term employment prospects. Gregg and Wadsworth (1996) also report a positive (although smaller) effect of direct contact on the re-employment probability in Britain, as do Osberg (1993), Addison and Portugal (1998) and Sabatier (2000) for Canada, Portugal and France respectively. Using friends and contacts and a Job Centre/employment agency also have positive, although more modest and statistically insignificant impacts. Replying to advertisements and taking steps to start a business, however, reduce the probability of being employed at  $t+1$ , although these effects are not statistically significant.<sup>17</sup> The finding that Job Centre use is not an effective job search method is consistent with previous research. For example, Wielgosz and Carpenter (1987), using U.S. data, conclude that "almost all methods of job search are associated with significantly shorter durations of search when compared to the state employment service." Osberg (1993) and Sabatier (2000) report a negative relationship between public employment agency use and the probability of finding a job for Canada and France respectively. However, Gregg and Wadsworth (1996), using British data, report that Job Centres use is associated with a higher than average probability of re-entering work. These differences are not inconsistent and can be explained by different definitions of the dependent variable. The dependent variable in the Gregg and Wadsworth study is the probability of re-employment across a three month period while our dependent variable is the probability of being employed one year in the future. Combining these results suggests that although Job Centres may increase the short run probability of re-employment, individuals are no more likely to find themselves in employment in the near future. This implies that either the jobs people find through Job Centres are of low quality

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<sup>16</sup> We have also interacted job search method and intensity with age to investigate whether any differential re-employment effects exist for younger workers. No significant differences were found.

<sup>17</sup> This finding is robust to including the job search method dummy variables in independent equations. It is possible that these results reflect the time spent in each job search method. Holzer (1988) for example finds that young unemployed American men spend more hours search through friends and relatives and direct employer contact than through state employment agencies or newspapers. We have no information on this.

with relatively high rates of destruction, or that Job Centres are poor at matching unemployed workers with suitable jobs.

The second specification suggests that job search intensity, as measured by the number of search methods used, has a positive and statistically significant impact on the probability of employment at the subsequent date of interview, holding other characteristics constant. At the sample means, using one additional job search method (i.e. using 4 methods rather than 3) increases the probability of subsequent employment by 8 percentage points. This is consistent with previous studies, which typically find a positive association between job search intensity and the probability of re-employment (Holzer, 1988; Gregg and Wadsworth, 1996; Sabatier, 2000). A comparison of the log-likelihoods of the two specifications suggests, however, that the particular combination of search methods used is more informative than an aggregation.<sup>18</sup>

Other relationships of interest emerge from these analyses. Men aged under 45 are significantly more likely than those aged 45 and above to be in employment at the subsequent date of interview. The probability of being employed at  $t+1$  given unemployment at  $t$  increases with education. Those educated to degree level are about 30 percentage points more likely to be in employment at the subsequent date of interview than those with qualifications below 'O'-Level standard. This relationship between education and employment is frequently found; Arulampalam et al (2000) report an inverse relationship between educational achievement and unemployment persistence. This may be because more highly skilled workers are more attractive to potential employers, or they may search more effectively than less skilled workers. Men with two children are significantly less likely to be in employment than those with no offspring, as are those with a limiting health condition. Bad health may reduce search efficiency, or signal lower productivity to employers and thereby lower job offer arrival and retention rates. Owner-occupation is typically associated with a long-term financial commitment that may induce individuals to search more effectively for work. Oswald (1996, 1998) uses more aggregated data and estimates a significant and positive relationship between unemployment and owner-occupation rates. We find no significant

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<sup>18</sup> The LR test statistics is calculated as 14.2 with  $\chi^2(4)=9.5$ .



relationship between housing tenure and the probability of being in employment at the subsequent date of interview.

Two other variables significantly influence the probability of entering work. The probability falls with elapsed duration in unemployment, indicating negative duration dependence. Again this is a common finding in the literature (Narendranathan and Elias, 1993; Gregg and Wadsworth, 1996; Addison and Portugal, 1998; Böheim and Taylor, 2000a). This could reflect a disincentive effect, with the relatively long-term unemployed discouraged from looking for work, or a scarring effect. Employers may be less willing to hire workers who have been unemployed for long periods. Similarly, the probability of being in employment at the subsequent date of interview falls with recent unemployment experience. Again, this is consistent with scarring – employers may use recent unemployment history as a screening device, unemployment may depreciate skills and human capital, or unemployed workers may accept poor quality jobs which have high rates of job destruction (see also Arulampalam et al, 2000).

#### *Re-employment wage*

Finally we examine whether the job search strategy used by unemployed workers determines the quality of subsequent employment measured by the hourly wage.<sup>19</sup> Inclusion into this sample is conditional first on being interviewed at the wave following unemployment, and secondly on being in employment at this subsequent date of interview. To control for these selection effects, we again estimate a reduced form probit equation with the dependent variable taking the value 1 for a man unemployed at  $t$  and in employment at  $t+1$ . The dependent variable takes the value 0 if the man unemployed at  $t$  is either not contacted at  $t+1$ , or is not employed at  $t+1$ . The inverse Mill's ratio is calculated from this selection equation and entered as a correction term in the OLS wage regression. Father's employment status and occupation, pre-sample information on first labour market experiences and a dummy variable indicating whether the respondent is a new entrant at the current date of interview are again

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<sup>19</sup> We also examined other measures of job quality, such as job satisfaction. However, job search strategy was found to have no statistically significant impact on these. It is difficult to draw precise conclusions from this analysis, as we have no information on which job search method was successful in obtaining the subsequent job.

used as identifying variables. The full estimation results from this selection equation are presented in Appendix Table A.1, and are not discussed here.

Table 8 presents the selectivity corrected OLS estimates of the natural log of the usual hourly wage at the subsequent date of interview, with search method and intensity used when unemployed as explanatory variables. The coefficients on other variables are consistent with expectations and with previous work on wage determination, and we do not present or discuss them further. The results show that using a Job Centre or other employment agency, direct application to employers, friends or labour market contacts or steps to start a business as part of a job search strategy have small, positive and statistically insignificant impacts on the wage received at the subsequent date of interview, all things equal. The coefficients on these variables are poorly determined. However, replying to advertisements has a relatively large, positive and well determined effect on the hourly wage subsequently received.<sup>20</sup> The coefficient suggests that replying to advertisements while unemployed results in subsequently receiving approximately 22% higher earnings. Therefore using market methods to seek work are more successful in the sense of gaining relatively highly paid employment. The wage received at the subsequent date of interview also increases with the number of search methods used when unemployed. Therefore job search intensity not only increases the probability of subsequent employment, it also increases the subsequent wage, perhaps because search intensity increases the (unobserved) offer arrival rate, providing individuals with a wider draw from the wage offer distribution.

## Conclusions

The job search strategies used by unemployed individuals and their contribution to the job matching process is crucial to understanding individual's labour market behaviour. We contribute to this level of understanding by examining the determinants of job search strategies, and the impact these strategies have on subsequent employment and wages. This is important as different job search strategies will typically attract different types of employment

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<sup>20</sup> Clearly these coefficients will be biased if higher wage-earning workers select different job search strategies than lower wage-earning workers. To correct for this, we have also estimated an instrumental variables

and draw offers from different pools of potential employers with different distributions of potential wages. Furthermore, there is little work in the British literature that explicitly incorporates job search method and intensity in the analysis of labour market behaviour.

We find that replying to advertisements and using Job Centres or employment agencies are the two most common methods of job search, while the average unemployed man in Britain uses three search methods as part of their job search strategy. Age, education and family circumstances emerge as key determinants of which job search strategy individuals use. Unobserved time-invariant individual specific effects are also found to be significant, emphasising the importance of panel data in analysing job search methods.

Our estimates also show that applying directly to potential employers increases the probability of being employed at the subsequent date of interview. This finding persists even after controlling for possible selection effects. Therefore the most common methods of job search used by the unemployed do not correspond to the most successful in terms of the probability of subsequent employment. This suggests that policies aimed at returning the unemployed to work should focus on improving specific job search skills. Replying to advertisements results in higher paying employment, all things equal. Job search intensity, as measured by the number of search methods used, is positively related to both the probability of employment at the subsequent date of interview and, conditional on working, a higher wage.

Local labour demand is an important influence on the choice of job search strategy. In particular, unemployed individuals living in areas of low labour demand search less intensively than those in areas of high labour demand. It is therefore important to improve job search effectiveness of the unemployed in areas of high unemployment if the problem of persistent joblessness is not to deteriorate further, and if unemployment is not to become more spatially concentrated. Our analysis reveals significant differences in job search strategies between individuals, and furthermore that the choice of job search strategy influences the probability of re-entering employment. Our study, however, focuses only on the individual job seeker. Further research is required to aid understanding of the job search

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specification, replacing the job search method used with the probability of using each method. The results from

and matching process, incorporating demand side factors such as how recruitment strategies vary across vacancy type.

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doing so differ little from those reported here.

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## Tables

**Table 1: Job search method by wave of interview**

Search Method	Wave				Total
	6	7	8	9	
Direct application	57.4	70.8	50.2	72.2	61.9
Advertisements	69.0	76.5	75.1	75.7	73.5
Job centre	77.5	75.2	70.6	78.1	75.5
Friends and contacts	68.5	71.2	51.2	71.8	65.8
Steps to start own business	13.1	9.6	8.5	11.1	10.8
Other	0.6	0.0	4.0	0.0	1.1

Note: BHPS. Cross-sectional weights. Unweighted n=684.

**Table 2: Job search intensity by wave of interview:**

Search Intensity	Wave				Total
	6	7	8	9	
0	0.6	0.0	4.0	0.0	1.1
1	10.0	7.8	17.2	9.9	11.1
2	24.7	21.8	21.0	17.4	21.7
3	37.2	34.6	38.0	31.1	35.5
4	23.1	31.3	17.0	36.9	26.4
5	4.4	4.6	2.9	4.7	4.2
Mean number	2.85	3.03	2.56	3.09	2.87

Note: BHPS. Cross-sectional weights. Unweighted n=684.

**Table 3: Employment probabilities at t+1 by job search methods at t  
(percentages)**

Search method (t)	Employed t+1	Not employed t+1
Direct application	54.8	45.2
Advertisements	46.1	54.0
Job centre	44.3	55.8
Friends and contacts	45.5	54.6
Steps to start own business	55.8	44.2
Total	44.2	55.8

Note: BHPS. Cross-sectional weights. Unweighted N=385.

**Table 4: Employment probabilities at t+1 by job search intensity  
at t (percentages)**

Search intensity (t)	Employed t+1	Not employed t+1
1	30.4	69.6
2	35.4	64.6
3	45.9	54.1
4	51.5	48.5
5	73.3	26.7
Total	44.2	55.8

Note: BHPS. Cross-sectional weights. Unweighted N=385

**Table 5: Pooled and random effects probit estimates for choice of search methods**

Variable	Direct application			Advertisements			Job centre		
	<i>Pooled</i>	<i>Marg effect</i>	<i>RE probit</i>	<i>Pooled</i>	<i>Marg effect</i>	<i>RE Probit</i>	<i>Pooled</i>	<i>Marg effect</i>	<i>RE Probit</i>
Aged under 25	0.563 [3.00]	0.205	0.650 [2.97]	-0.389 [1.84]	-0.122	-0.423 [1.86]	0.357 [1.78]	0.102	0.503 [1.74]
Aged 25-34	0.270 [1.61]	0.101	0.321 [1.69]	-0.380 [2.03]	-0.120	-0.412 [2.02]	0.192 [1.12]	0.056	0.294 [1.16]
Aged 35-44	0.263 [1.45]	0.098	0.283 [1.36]	-0.221 [1.06]	-0.069	-0.244 [1.10]	0.199 [1.05]	0.057	0.291 [1.07]
Degree level	0.286 [1.34]	0.105	0.333 [1.40]	0.386 [1.61]	0.101	0.447 [1.74]	-0.255 [1.22]	-0.082	-0.350 [1.15]
A Levels	0.220 [1.45]	0.083	0.244 [1.38]	0.643 [3.78]	0.168	0.743 [3.55]	0.016 [0.10]	0.005	0.045 [0.19]
O Levels	-0.010 [0.06]	-0.004	0.014 [0.08]	0.200 [1.23]	0.056	0.239 [1.28]	-0.085 [0.48]	-0.026	-0.145 [0.60]
Married	-0.018 [0.10]	-0.007	-0.008 [0.04]	0.187 [0.98]	0.056	0.176 [0.87]	0.116 [0.64]	0.035	0.152 [0.59]
Spouse employed	0.306 [1.59]	0.113	0.357 [1.65]	0.182 [0.88]	0.052	0.203 [0.90]	-0.199 [0.98]	-0.063	-0.340 [1.20]
Has one child	0.288 [1.43]	0.106	0.322 [1.39]	-0.164 [0.82]	-0.051	-0.184 [0.80]	0.173 [0.79]	0.050	0.309 [1.04]
Has two children	-0.100 [0.50]	-0.038	-0.102 [0.44]	0.277 [1.16]	0.076	0.334 [1.29]	0.065 [0.30]	0.019	0.043 [0.14]
Has three or more children	-0.203 [0.85]	-0.079	-0.250 [0.85]	0.071 [0.26]	0.021	0.141 [0.44]	-0.032 [0.10]	-0.010	0.084 [0.22]
Log Household income	0.010 [0.26]	0.004	0.008 [0.17]	0.073 [1.97]	0.022	0.081 [1.78]	-0.057 [1.23]	-0.017	-0.086 [1.29]
Has had spell out of Labour market in last year	-0.185 [1.35]	-0.072	-0.175 [1.07]	0.089 [0.59]	0.026	0.089 [0.51]	-0.117 [0.80]	-0.036	-0.156 [0.74]
Unemployment rate	-0.030 [0.93]	-0.012	-0.038 [1.04]	-0.078 [2.28]	-0.023	-0.087 [2.23]	-0.020 [0.59]	-0.006	-0.026 [0.53]
Signs on	0.307 [2.30]	0.119	0.348 [2.30]	0.637 [4.85]	0.206	0.711 [4.31]	0.685 [5.11]	0.227	0.926 [4.30]
Elapsed duration	-0.007 [2.40]	-0.003	-0.008 [2.44]	-0.002 [0.72]	-0.001	-0.002 [0.65]	-0.004 [1.60]	-0.001	-0.008 [1.87]
Looking for particular job	0.130 [1.16]	0.050	0.150 [1.16]	-0.065 [0.53]	-0.019	-0.050 [0.37]	0.053 [0.46]	0.016	0.083 [0.49]
Log reservation wage	-0.285 [1.61]	-0.109	-0.297 [1.54]	-0.100 [0.53]	-0.030	-0.104 [0.52]	-0.135 [0.74]	-0.041	-0.177 [0.73]
Recent unemployment Experience <sup>a</sup>	0.598 [1.52]	0.229	0.732 [1.63]	-0.518 [1.23]	-0.154	-0.581 [1.25]	-0.045 [0.10]	-0.014	-0.021 [0.04]
Within subject correlation			0.269 [2.24]			0.203 [1.33]			0.496 [3.58]
N observations (persons)	655		(506)	655		(506)	655		(506)
Log likelihood	-405.6		-403.0	-328.0		-327.1	-334.7		-329.5
$\chi^2$	57.78		46.33	79.64		42.68	55.07		28.49
$\chi^2$ (rho=0)			5.32			1.78			10.47

Note: BHPS. Dependent variable is binary, =1 if stated job search method is used and 0 otherwise. Standard errors in the pooled models corrected for multiple observations on the same individuals. Also includes control variables for missing duration and reservation wage information and region of residence, ethnicity, year dummies and a selection correction term (see text for details). Marginal effects calculated at variable sample means. <sup>a</sup> Defined as the proportion of previous dates of interview at which the respondent has been unemployed.



**Table 5: (cont): Pooled and random effects probit estimates for choice of search methods**

Variable	Friends and contacts			Steps to start business			Means
	Pooled	Marg effect	RE	Pooled	Marg effect	RE	
Aged under 25	0.017 [0.09]	0.006	-0.065 [0.22]	0.055 [0.20]	0.006	0.077 [0.20]	0.301
Aged 25-34	0.234 [1.33]	0.078	0.329 [1.22]	0.384 [1.84]	0.051	0.477 [1.52]	0.249
Aged 35-44	0.007 [0.04]	0.003	-0.064 [0.23]	-0.372 [1.33]	-0.036	-0.488 [1.24]	0.192
Degree level	-0.813 [4.17]	-0.309	-1.211 [3.49]	0.591 [2.27]	0.096	0.830 [1.89]	0.105
A Levels	-0.256 [1.59]	-0.091	-0.389 [1.55]	0.802 [4.04]	0.124	1.131 [2.83]	0.266
O Levels	-0.494 [3.02]	-0.182	-0.638 [2.49]	0.269 [1.17]	0.035	0.396 [1.11]	0.194
Married	0.099 [0.54]	0.034	0.025 [0.10]	0.294 [1.19]	0.034	0.395 [1.13]	0.508
Spouse employed	-0.159 [0.78]	-0.057	-0.189 [0.65]	0.440 [1.72]	0.061	0.622 [1.61]	0.229
Has one child	0.202 [0.94]	0.067	0.488 [1.49]	-0.159 [0.66]	-0.017	-0.192 [0.50]	0.119
Has two children	0.015 [0.07]	0.005	0.217 [0.67]	-0.150 [0.55]	-0.016	-0.174 [0.46]	0.125
Has three or more children	-0.230 [0.83]	-0.084	-0.136 [0.34]	0.436 [1.27]	0.067	0.603 [1.24]	0.066
Log Household income	-0.095 [2.38]	-0.033	-0.139 [2.16]	0.008 [0.14]	0.001	0.006 [0.07]	6.490
Has had a spell out of labour Market in last year	-0.191 [1.36]	-0.068	-0.235 [1.11]	-0.288 [1.28]	-0.029	-0.369 [1.27]	0.227
Unemployment rate	0.022 [0.64]	0.007	0.036 [0.71]	-0.126 [2.73]	-0.014	-0.166 [2.29]	5.678
Signs on	0.388 [3.02]	0.140	0.604 [2.88]	0.045 [0.28]	0.005	0.060 [0.23]	0.724
Elapsed duration	-0.003 [1.01]	-0.001	-0.004 [0.93]	-0.002 [0.42]	-0.000	-0.001 [0.20]	15.704
Looking for particular job	-0.160 [1.37]	-0.055	-0.275 [1.54]	0.335 [1.92]	0.038	0.417 [1.73]	0.519
Log reservation wage	0.157 [0.91]	0.055	0.238 [0.93]	0.329 [1.25]	0.038	0.417 [1.37]	1.322
Recent unemployment Experience <sup>a</sup>	-0.635 [1.55]	-0.221	-1.049 [1.70]	-0.683 [1.28]	0.078	-0.907 [1.12]	0.263
Within subject correlation			0.556 [5.01]			0.460 [2.09]	
N observations (persons)	655		(506)	655		(506)	
Log likelihood	-365.3		-355.4	-167.5		-165.4	
$\chi^2$	80.41		35.98	63.01		18.52	
$\chi^2$ (rho=0)			19.75			4.18	

Note: BHPS. Dependent variable is binary, =1 if stated job search method is used and 0 otherwise. Standard errors in the pooled models corrected for multiple observations on the same individuals. Also includes control variables for missing duration and reservation wage information and region of residence, ethnicity, year dummies and a selection correction term (see text for details). Marginal effects calculated at variable sample means. <sup>a</sup> Defined as the proportion of previous dates of interview at which the respondent has been unemployed.

**Table 6: Ordered probit results for job search intensity**

Variable	Coeff	Robust t-stat	Mean
Aged under 25	0.207	[1.32]	0.301
Aged 25-34	0.209	[1.48]	0.249
Aged 35-44	0.049	[0.34]	0.192
Degree level	-0.072	[0.43]	0.105
A Levels	0.310	[2.46]	0.266
O Levels	-0.094	[0.77]	0.194
Married	0.177	[1.26]	0.508
Spouse employed	0.131	[0.80]	0.229
Has one child	0.119	[0.71]	0.119
Has two children	0.004	[0.02]	0.125
Has three or more children	-0.084	[0.43]	0.066
Log Household income	-0.018	[0.56]	6.490
Has had spell out of labour market	-0.204	[1.77]	0.227
Unemployment rate	-0.049	[1.72]	5.678
Signs on	0.670	[6.35]	0.724
Elapsed duration (months)	-0.006	[2.46]	15.704
Looking for a particular job	0.058	[0.65]	0.519
Recent unemployment experience <sup>a</sup>	-0.302	[0.93]	0.263
Log reservation wage	-0.080	[0.55]	1.322
N	655		
Pseudo R <sup>2</sup>	0.0560		
Log likelihood ( $\chi^2$ )	-914 (104.4)		

Note: BHPS. Dependent variable is the number of job search methods used. Standard errors corrected for multiple observations. Also includes control variables for missing duration and reservation wage information and region of residence, ethnicity, year dummies and a selection correction term (see text for details). <sup>a</sup> Defined as the proportion of previous dates of interview at which the respondent has been unemployed.

**Table 7: Probit estimates for the probability of employment at t+1 given unemployed at t**

Variable	Search Method		Search Intensity		Mean
	<i>Pooled</i>	<i>Marg effect</i>	<i>Pooled</i>	<i>Marg effect</i>	
Direct application	0.753 <i>[4.08]</i>	0.271			0.589
Job centre	0.006 <i>[0.03]</i>	0.002			0.744
Friends	0.167 <i>[0.95]</i>	0.062			0.645
Advertisements	-0.050 <i>[0.25]</i>	-0.019			0.752
Steps to start business	-0.280 <i>[1.03]</i>	-0.101			0.107
Search intensity			0.215 <i>[2.65]</i>	0.082	2.840
Aged under 25	0.720 <i>[2.46]</i>	0.278	0.828 <i>[2.95]</i>	0.319	0.251
Aged 25-34	0.640 <i>[2.46]</i>	0.247	0.679 <i>[2.72]</i>	0.262	0.259
Aged 35-44	0.797 <i>[2.90]</i>	0.308	0.774 <i>[2.98]</i>	0.300	0.203
Degree level	0.780 <i>[2.58]</i>	0.303	0.728 <i>[2.44]</i>	0.284	0.101
A Levels	-0.008 <i>[0.04]</i>	-0.003	0.020 <i>[0.10]</i>	0.008	0.280
O Levels	0.010 <i>[0.04]</i>	0.004	-0.004 <i>[0.02]</i>	-0.001	0.173
Log household income at t	0.103 <i>[1.59]</i>	0.039	0.092 <i>[1.50]</i>	0.035	6.549
Married	0.066 <i>[0.23]</i>	0.025	0.026 <i>[0.09]</i>	0.010	0.576
Spouse employed	0.205 <i>[0.81]</i>	0.078	0.319 <i>[1.30]</i>	0.123	0.293
Has one child	0.052 <i>[0.19]</i>	0.020	0.149 <i>[0.55]</i>	0.057	0.147
Has two children	-1.174 <i>[3.52]</i>	-0.338	-1.053 <i>[3.30]</i>	-0.319	0.125
Has three or more children	-0.006 <i>[0.02]</i>	-0.002	0.002 <i>[0.01]</i>	0.001	0.085
Limiting health condition	-1.085 <i>[5.04]</i>	-0.336	-0.974 <i>[4.94]</i>	-0.314	0.192
Owner occupier	0.236 <i>[1.12]</i>	0.089	0.286 <i>[1.45]</i>	0.109	0.408
Social tenant	0.042 <i>[0.18]</i>	0.016	-0.008 <i>[0.04]</i>	-0.003	0.357
Elapsed unemployment duration at t	-0.023 <i>[4.51]</i>	-0.009	-0.021 <i>[3.89]</i>	-0.008	17.034
Log reservation wage t	0.078 <i>[0.34]</i>	0.029	0.016 <i>[0.07]</i>	0.006	1.321
Signed on at t	0.111 <i>[0.53]</i>	0.041	0.064 <i>[0.31]</i>	0.024	0.715
Looking for a particular job	0.241 <i>[1.46]</i>	0.090	0.205 <i>[1.26]</i>	0.078	0.509
Recent unemployment experience	-0.601 <i>[2.14]</i>	-0.227	-0.531 <i>[1.89]</i>	-0.202	0.313
Unemployment rate	-0.046 <i>[0.98]</i>	-0.017	-0.043 <i>[0.92]</i>	-0.016	5.029
N	371		371		
Log likelihood ( $\chi^2$ )	-167.2 (156.7)		-174.3 (153.34)		

Note: Dependent variable =1 if individual unemployed at t is in employment (full-time, part-time or self-employed) at the subsequent date of interview, and =0 otherwise. Standard errors corrected for multiple observations. Also includes control variables for missing duration and reservation wage information, region of residence, year dummies, and selection correction term (see text for details).

**Table 8: Selectivity corrected OLS estimates for the hourly wage at t+1 given unemployed at t**

Variable	Search Method		Search Intensity	
	<i>Pooled</i>	<i>t-stat</i>	<i>Pooled</i>	<i>t-stat</i>
<i>Search method</i>				
Direct application	0.0004	[0.26]		
Advertisements	0.2178	[2.48]		
Job centre	0.0203	[0.26]		
Friends	0.0313	[0.47]		
Steps to start business	0.0148	[0.15]		
Search intensity			0.0765	[2.41]
N (individuals)	144 (140)		144 (140)	
R <sup>2</sup>	0.472		0.453	

Note: Dependent variable natural log of usual hourly earnings at subsequent date of interview for individuals unemployed at t. Standard errors corrected for multiple observations. Also includes age, gender, occupation marital status, spouses' employment status, region of residence, housing tenure, job tenure, job type (permanent, seasonal or temporary, fixed term contract) and a selection correction term (see text for details).

**Table A.1: Results of selection probits for inclusion in job search strategy, employment and wage regressions**

Variable	Selection into unemployment		Selection into employment		Selection into wage	
	Coefficient	t-stat	Coefficient	t-stat	Coefficient	t-stat
Direct application			-0.0292	0.16	0.4153	2.49
Job Centre			-0.0228	0.11	-0.1544	0.99
Friends & contacts			-0.0302	0.16	0.0363	0.24
Start business			0.3407	1.31	-0.0089	0.04
Advertisements			0.1903	1.05	0.0561	0.32
Unemployment duration			0.0017	0.34	-0.0184	3.96
Recent unemployment	1.5495	17.20	-0.1048	0.29	-0.6086	2.30
Has had spell out of labour market	0.1169	2.01	0.0518	0.23	-0.2257	1.25
Signed on			-0.4274	1.96	-0.0734	0.40
New entrant			-0.9679	3.63	-0.6490	2.73
Father non-manual worker	-0.0534	0.73	-0.3272	1.03	-0.1008	0.46
Father unemployed	0.0668	0.48	-0.7439	1.87	-1.2370	2.96
First labour market spell unemployed	0.0130	0.11	0.3493	0.70	0.0121	0.04
First occupation non-manual	-0.0007	0.01	0.5365	1.09	0.6829	2.11
Aged under 25	0.2753	2.92	-0.8623	1.88	0.6398	1.81
Aged 25-34	0.1135	1.22	-1.4674	3.31	0.3407	1.06
Aged 35-44	0.1483	1.56	-0.8393	1.78	0.5931	1.69
Aged 45-54	0.1634	1.87	-1.4849	3.17	0.0169	0.05
Degree or equivalent	0.0431	0.52	0.2598	0.70	0.6724	2.32
'A'-Levels or equivalent	-0.0794	1.31	0.5721	2.07	0.4056	1.95
'O'-Levels or equivalent	0.0193	0.29	0.0539	0.21	0.2305	1.01
Qualifications below 'O'-Level	0.0704	0.95	0.0532	0.19	0.4293	1.91
Attended fee-paying school	0.1799	0.56			1.5989	2.09
Married	-0.1038	1.48	0.2659	0.97	0.4540	2.05
Spouse employed	-0.2604	4.38	0.0194	0.07	-0.2781	1.17
One child	0.0690	0.97	0.0481	0.15	0.2832	1.12
Two children	0.0937	1.15	0.8889	2.31	-0.5568	2.00
Three or more children	-0.1844	1.76	0.4413	1.04	-0.0635	0.20
Previous job non-manual			-0.3192	1.37	-0.1064	0.54
Local unemployment rate	0.0347	3.23	-0.0486	1.12	-0.0999	2.81
Health limits type/amount work			-0.5992	2.85	-0.7271	3.99
Lives in London	-0.1257	1.59	0.3820	1.29	0.2922	1.17
Lives in rest of South East	-0.0919	1.28	-0.4230	1.74	-0.1656	0.80
Owner-occupier	-0.3304	5.82	0.2129	1.01	0.3069	1.71
Social tenant	0.1072	1.65	0.2107	0.95	0.0753	0.41
Constant	-2.0113	13.78	3.5132	4.90	-0.2586	0.53
N	16512		456		456	
Mean dependent variable	0.04		0.839		0.370	
Log-likelihood	-2266.8		-141.6		-221.4	
$\chi^2$	856.70		121.70		146.1	
Pseudo R <sup>2</sup>	0.1774		0.2995		0.2683	

Estimation also includes dummy variables for ethnicity, missing information on first employment spell and first job and year dummies.