

Employed and Unemployed Job Search Methods: Australian Evidence on Search Duration, Wages and Job Stability.*

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Abstract

This paper examines the use and impact of job search methods of both unemployed and employed job seekers. Informal job search methods are associated with relatively high levels of job exit and shorter search duration. Job exits through the public employment agency (PEA) display positive duration dependence for the unemployed. This may suggest that the PEA is used a job search method of last resort. Informal job search methods have lower associated duration in search and higher wages than the PEA or answering advertisements. However, informal job search methods are associated with a higher turnover level.

KEYWORDS: Job Search, Informal Networks, Turnover

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1 Introduction

How individuals move between labour market states is fundamental to understanding the operation of labour markets. Central to this is job search behaviour. Individuals' job search behaviour determines which jobs they enter, how long they spend in unemployment and when and if they change job. In recognition of this job search represents one of the major research areas in modern labour economics.

A body of research has developed that focuses specifically on the methods of job search used, in particular the use of informal job search networks (direct contact or use of family and friends), public employment agencies and formal methods such as answering advertisements. This paper contributes to this literature by examining the use and impact of job search methods for both unemployed and employed job seekers using Australian survey data. Specifically, we examine whether job search methods vary in their effectiveness, in terms of receiving a suitable job offer, between job searchers who are unemployed and those who are searching on the job. Furthermore, we provide econometric evidence on the relative association between job search methods and the quality of subsequent job matches, in terms of wages and job stability, for both the employed and unemployed. As such, it provides an expansion of research by Addison and Portugal (2002) that analysed the job search methods of the unemployed only.

There are reasons to believe that different job search methods should have an effect on the arrival of job offers. For instance, informal job search networks may serve to alleviate information problems in the hiring process (Montgomery

1991). It has been demonstrated that job search methods have a substantial impact on duration of job search and, more generally, the probability of gaining employment (Datcher 1983, Holzer 1987a, Holzer 1988, Osberg 1993, Gregg and Wadsworth 1996, Addison and Portugal 2002, Bentolila et al 2009). Generally, it has been found that informal job search methods are the most extensively used job search methods and are the most effective in terms of generating job offers (Holzer 1987a, Holzer 1987b, Blau and Robins 1990). A key concern in this literature is the efficacy of Public Employment Agencies (PEA). Evidence on this is mixed. US and Canadian research indicates that PEAs are a poor source of job offers and job matches, and are related to slower transitions from unemployment to employment (Blau and Robins 1990, Bishop 1993, Ports 1993). Addison and Portugal (2002) reported similar findings for Portugal. Evidence from the UK suggests a greater effectiveness of PEAs (Gregg and Wadsworth 1996).

Rather less is known about the effect of job search methods on job match quality, specifically wages and job stability. In a study of the Portuguese labour market Addison and Portugal (2002) demonstrated that the PEA is associated with lower wages for unemployed job seekers. They also provide some evidence that jobs found through informal job search methods have lower associated wages than those found through advertisements. Bentolila et al (2009) also provide evidence for the US and Europe that informal job search methods are associated with lower wages for unemployed job seekers.

In terms of job stability, the use of family/friends is associated with longer tenure in subsequent job matches (Datcher 1983, Simon and Warner 1992). The

intuition behind these results is that prior information to both parties (employer and job searcher) through informal contacts should reduce the likelihood of a job match being revealed as poor later on. However, Loury (2006) shows that in some cases the link between informal networks and job tenure may reflect a lack of outside opportunities for workers who gained jobs through friends/relatives.

The analysis is conducted in a number of steps. First, the impact of job search methods on search duration is investigated using competing risk models. Second, the effect of job search methods on wages is estimated. Finally, the analysis of job match quality is extended by examining the stability of employment according to the method through which the job was found. To summarise our findings, for both groups job search methods appear to affect the length of time in job search. Informal job search methods are associated with relatively high levels of job exit (shorter search duration) when compared with formal job search methods. Job exits through the public employment agency (PEA) display positive duration dependence for the unemployed, which may suggest that the public employment agency is used a job search method of last resort. The PEA is a poor source of suitable jobs for employed job seekers. Wages from jobs found through the PEA are lower than those found through informal methods. This provides an indication that the PEA is associated with poorer quality job matches than informal methods. Unlike previous research we find that the use of informal methods, especially contacting friends/relatives, is associated with higher wages than formal methods such as answering advertisements. Results on job stability vary markedly by whether the job seeker was employed

or unemployed. For the unemployed, job finding through friends/relatives is associated with less stable employment. Conversely, employed job seekers who found work through friends/relatives were less likely to leave that job.

The remainder of the paper is set out as follows. The following section provides background information on the data used. Section 3 outlines the empirical methodology, section 4 discusses the results and the final section provides a conclusion and summary.

2 Background and Data

The data source used is the Australian Bureau of Statistics (ABS) Survey of Employment and Unemployment Patterns (herein referred to as SEUP). SEUP covers the period from the start of September 1994 to the end of August 1997.

The survey was conducted in three waves:

1. Wave 1: 5th September 1994 to 3rd September 1995;
2. Wave 2: 4th September 1995 to 1st September 1996; and
3. Wave 3: 2nd September 1996 to 31st August 1997.

Whilst 7,572 people were originally interviewed, the sample size was reduced by attrition to 6,056 by the end of wave 3. Individuals selected for the survey were aged 15-59 and living in a private residence as at May 1995. SEUP has an unusual sample framework. Respondents were split into two subgroups, Jobseekers and a Population Reference Group (PRG). The PRG is a random sample of the population, the Jobseekers group oversamples those who are unemployed,

“it comprises individuals who were considered to be potential candidates for a labour market program at the time of recruitment” (Le and Miller 1998). It must be noted that the PRG and Jobseeker group are not mutually exclusive, the PRG contains some Jobseekers.

Two samples are generated by stratifying those respondents who were actively in the labour force into those who were unemployed and those who were employed at the start of SEUP.¹ Appendix Table A1 provides summary statistics on the 2,534 individuals who were unemployed and the 3,581 individuals who were employed at the commencement of SEUP.

INSERT TABLE 1

Our starting point is to examine *ex ante* job search method use. Table 1 provides preliminary evidence on job search methods used by the unemployed. A similar analysis cannot be conducted for employed job searchers as job search methods are not recorded in SEUP whilst an individual is employed. In line with existing studies we group job finding methods into 5 main categories, direct employer approach, advertisement, Public Employment Agency (PEA), Friends or Relatives and Other job search methods. Similar to evidence for the UK and Portugal (Gregg and Wadsworth 1996, Addison and Portugal 2002), registering with the PEA is the most frequently used job search method by the unemployed. Direct employer contact is also frequently used, with the methods friends and relatives and answering newspaper advertisements less frequently used. The third and fourth columns provide an indication of the relative effec-

¹Individuals who were not in the labour force at the start of SEUP are excluded from the analysis.

tiveness of different search methods. Overall job finding rates seem quite high when compared to existing research, this reflects the different time period of analysis in this study. That is, job finding rates are taken across a three year period whereas most existing research is based on quarterly or yearly surveys.² Australian job seekers do not generally follow a single strategy for seeking a job. On average, an unemployed individual used 2.8 different search methods during their unemployment spell. This is in line with existing evidence that suggests job seekers use multiple job search strategies.³

INSERT TABLE 2

Next we examine *ex post* job finding methods for both the unemployed and employed. For all employment episodes a job finding method is recorded. Table 2 displays summary statistics on the outcomes of the job match generated by each search method according to whether the individual was initially employed or unemployed. Substantial variation in average wage by job search method is apparent for both unemployed and employed job searchers. For the unemployed, finding a job by direct approach is associated with the highest average wage of approximately 416 dollars a week whereas for on-the-job searchers finding employment via advertisement is the most lucrative (427 dollars a week). On-the-job searchers receive a markedly higher average wage from jobs found through friends or relatives than the unemployed (339 dollars compared to 281 dollars). Gaining employment by use of the PEA is associated with an average wage of

²For instance Addison and Portugal (2002) report quarterly job finding rates (corresponding to column 4 of Table 5.2) that range from 1.5% for the PEA to 7.5% for friends/relatives.

³Both Blau and Robins (1990) and Addison and Portugal (2002) report unemployed individuals using 2.1 different search methods on average.

368 dollars for the unemployed, but for the employed PEA job matches generate clearly inferior wages (328 dollars). This could reflect the greater potential for adverse selection of employed job seekers who use the PEA (compared to the unemployed). Unlike unemployed job searchers, direct approach is associated with a relatively low wage for employed job searchers. Differences in (censored) average tenure by job search method exist, but these are not marked.⁴ There is some evidence that the PEA is associated with shorter tenure jobs. Generally, tenure variations follow the same pattern evident for average wages.

3 Methodology:

3.1 Modelling Transitions to Employment via Multiple Job Search Methods

For both the unemployed and employed at the start of SEUP we observe respondents who have been in this state for some period of time. We denote this duration of time for individual i as a_i . We then observe some duration (b_i) in unemployment or employment, respectively, until either the individual exits to a new job or SEUP ends. In the case of employed job searchers they may also exit to unemployment/not in the labour force. In any of these cases, excluding movement to a new job, this spell is treated as censored at that point. Hence, total duration until exit can be specified as $d_i = a_i + b_i$ that is either censored or uncensored. The individual likelihood contribution is given by

⁴Tenure data is censored due to the relatively short time period of SEUP.

$$L_i = c_i \ln h_i(a_i + b_i) + \sum_{t=a_i+1}^{a_i+b_i-1} \ln \{1-h_i(t)\} \quad (1a)$$

$$= c_i \ln \left(1 - \exp \left[- \exp \{x_i(d_i)' \beta + \gamma(a_i + b_i)\} \right] \right) - \sum_{t=a_i+1}^{a_i+b_i-1} \exp \{x_i' \beta + \gamma(t)\} \quad (1b)$$

This specifies a single risk model where the γ 's are interpreted as the log of a non-parametric piece-wise linear baseline hazard. The data form a panel with each individual supplying $j = 1, 2, \dots, d_i$ observations. Each exit state denotes an exit to employment via a different job search method. For each exit state, all observations are zero except the last, where the last is unity only if the individual exits to that state. Hence, there is a hazard for each j for each individual exit state of which there are 6. As a result the data forms an unbalanced panel. In this analysis we use 16 duration intervals for analysis. These intervals cover 30 quarters (7.5 years), where the first 12 intervals are quarterly, due to data thinning the last 4 intervals cover longer periods.

Equation (1) is estimated separately for each exit state. We assume proportional hazards and so the covariates affect the hazard through the complementary log-log link. In an attempt to control for unobserved heterogeneity a gamma frailty term is included as per equation (2).

$$L_i = \ln \left[\begin{array}{l} \left(1 + \sigma^2 \sum_{t=a_i+1}^{a_i+b_i-1} \exp \{x_i' \beta + \gamma(t)\} \right)^{-\frac{1}{\sigma^2}} \\ -c_i \left(1 + \sigma^2 \sum_{t=a_i+1}^{a_i+b_i-1} \exp \{x_i' \beta + \gamma(t)\} \right)^{-\frac{1}{\sigma^2}} \end{array} \right] \quad (2)$$

Following Andrews et al (2002), we note that the coefficient estimates on the covariates in these competing risk regressions are difficult to interpret. The exit risk to state m (Π_m) and the expected waiting time until exit via risk m (E_m) both depend on hazards to each state, through the overall survival function as shown by:

$$\Pi_m = \sum_{t=1}^{\infty} \theta_{mt} S_{t-1}, E_m = \frac{1}{\Pi_m} \sum_{t=1}^{\infty} t \theta_{mt} S_{t-1}, S_t = \prod_{s=1}^M \left(1 - \sum_{m=1}^M \theta_{ms} \right) \quad (3)$$

Where s is the survival function at time t .

Hence, we estimate the probability of exit via state m conditional on exiting during interval t denoted as:

$$P_{mt} = \frac{\theta_{mt}}{\sum_t \theta_{mt}}, m = 1, 2, \dots, M. \quad (4)$$

The baseline hazards used to compute the probabilities are:

$$\hat{\theta}_{mt} = 1 - \exp \left[- \exp \left\{ \bar{x}' \hat{\beta} + \hat{\lambda}_{mt} \right\} \right] m = 1, 2, \dots, M. \quad (5)$$

where \bar{x} is the sample mean. In the empirical chapters we report the marginal effect of x on the conditional exit probability, which is given by:

$$\delta_m \equiv \frac{\partial P_{mt}}{\partial x} = \frac{\theta_{mt} \sum_{k \neq m} \theta_{kt} (\beta_m - \beta_k)}{\left[\sum_{m=1}^M \theta_{mt} \right]^2} \quad (6)$$

3.2 Wages and Job Search Methods

Initially for both groups we estimate a simple OLS regression for both the unemployed and employed sample of the impact of job search methods on wages:

$$\ln w_i = \beta_0 + \beta_1 X_i + \beta_2 J_i + \beta_3 JSM_i + \mu_i \quad (7)$$

The dependent variable is generated dividing weekly wage by hours worked and then taking its natural log. X_i is a vector of personal characteristics, J_i is a vector workplace characteristics and JSM_i is a range of dummy variables indicating the method through which the job was found (job finding through the PEA is used as the omitted case).⁵

Wages are only observed for those of the unemployed who successfully transit to employment. Those who make the transition to employment are unlikely to be a random subsample of the unemployed in terms of unobservables. As a result, OLS wage regressions may generate biased estimates of the impact of job search methods (and all other covariates) on wages. To address this we estimate log hourly wage regressions using a two-stage approach that seeks to control for bias due to sample selectivity (Heckman 1979). This takes the form of an initial selection model into employment (E):

$$E_i = \alpha_0 + \alpha_1 X_i + \alpha_2 J_i + \alpha_3 Z_i + \epsilon_i \quad (8)$$

⁵As individuals who enter self-employment often do not record a wage, and this wage may not reflect all job related earnings (such as profits), we exclude those who exited to self-employment from these regressions.

Where X_i is a vector of personal characteristics, J_i is a vector workplace characteristics and Z_i are the instrumental variables used to identify the two equation model. The wage regression is simply (7) above.

In the case where the error terms in the two equations are correlated, i.e. $\text{corr}(\epsilon_i, \mu_i) \neq 0$, unobservable characteristics affecting the likelihood of finding employment also influence subsequent wage determination and (7) is misspecified. In principle the standard Heckman selection approach does not require an instrumental variable approach *per se*, instead identification is possible through the inverse mills ratio alone. Nonetheless, we choose to adopt an instrumental variable approach. This requires a valid instrument for gaining employment to be used in the second stage wage regression. Despite the range of information available in SEUP, it was difficult to find a variable that was unrelated to wages but strongly predictive of gaining employment. We use duration of time in unemployment. The expectation of a link between wages and time in search is unclear. There are two theoretical reasons why time in unemployment may be related to subsequent wages. First, all else equal longer periods of search increase the probability of gaining a higher wage offer. If individual's reservation wages are stationary and they accept the first suitable job offer (i.e. they adopt a stopping rule) then this may weaken any link between time in search and wages in their first post-unemployment job. Second, if replacement ratios of unemployment benefits decline over time in unemployment this may cause unemployed job seekers to revise their reservation wage downwards. This is less problematic as replacement ratios were constant over time in unemployment in

Australia at the time of SEUP. Hence, there exist no direct reason why time in unemployment should influence reservation wages. Tests of instrument validity are discussed when the estimates are presented in section 4.1.

Likewise, not all employed individuals change job and this will bias parameter estimates in the case where those individuals who are observed to have moved job are not a random subsection of all employed workers. In the case of the employed there is an added dimension, that is we might be more interested in the effect of job search methods on the change of wage rate between the initial and subsequent job. This provides a measure of the benefit of changing job using a particular job search method. Although SEUP is structured into three waves, its episodic nature means that we can, in effect, observe the employment status, and if they are employed, the wages and employment details of an individual at any point in time within these three waves. This information can be used to construct a fixed interval panel data set of wages. The structure of SEUP allows the specification of any frequency interval of observation up to daily. However, we need to find a trade-off between increasing the number of observations (by using higher frequency intervals) and variability in wages and job search method. To determine an optimal interval length a number of different intervals were utilised, ranging from monthly through to yearly observations. We settle on the use of half yearly intervals in the subsequent analysis.

A benefit from moving to a panel estimation approach is the ability to introduce individual fixed effects in an attempt to control for unobserved individual heterogeneity that may bias point estimates of the wage premia associated with

differing job search methods. In this approach the wage effects of job search methods are identified separately from the individual fixed effects by those individuals who move jobs between periods (and use different job search methods to do this). A number of other time-varying covariates are included in the regression, such as occupation and industry, to control for other differences between jobs taken by a given individual. This leads to the following equation:

$$\ln w_{it} = \alpha_i + \beta_0 + \beta_1 JSM_{it} + \beta_2 X_{it} + \beta_3 W_{it} + \varepsilon_{it}, t = 1, 2, \dots, 13 \quad (9)$$

Where α_i is an individual level time invariant error term and ε_{it} is a standard I.I.D. error term with zero mean and constant variance. JSM is a vector of job search methods, X and W are vectors of time varying individual and workplace characteristics, respectively.

4 Results - Duration of Job Search

INSERT FIGURE 1 AND 2

Figure 1 and 2 present the estimated baseline hazards for exits from unemployment and employment, respectively. These are displayed for each job finding method, and in each case the baseline hazard estimates are reported for the models estimated with (solid lines) and without (dashed lines) a gamma frailty term for unobserved heterogeneity. These hazards are generated from complementarity log-log estimates of probability to exit unemployment to each exit state separately, where the inclusion of 16 interval dummies provide point

estimates of the hazard of exit across these intervals. Hence, the baseline hazards provide the duration conditional probability of exit to each state once observable, and for the solid lines, unobservable characteristics have been controlled for. Not all employed individuals are engaged in job search; SEUP provides information on whether the individual was engaged in job search. One approach would be to exclude all employed individuals who did not report engaging in job search. However, employment to employment transitions occur even when individuals do not report job search activity. As a result our choice of approach is to include a control for whether the employed individual was actively seeking work.

We focus on the baseline hazards results from the heterogeneous models. For the unemployed both direct approach and the use of friends/relatives there is some evidence of positive duration dependence. This suggests that unemployed job seekers do not appear to exhaust effective informal job networks relatively early during an unemployment spell. The baseline hazards for exits through the PEA and other methods also exhibit positive duration dependence. Thomas (1997) suggests that the baseline hazard generally reported for exit via the PEA pattern may reflect timing of job search method use by the unemployed. That is, if the use of the PEA is seen as a source of poorer quality job matches, the baseline hazard for the exit to PEAs will be biased downwards in the earlier period of job search. Our baseline hazard for exits via the PEA provides some support for this view as it is relatively low early in the search period. The hazard to exit via advertisement is essentially flat and near zero for unemployed job

seekers.

Employed searchers exits via the two informal job search methods, direct approach and friends/relatives, increase markedly in the first 10 to 20 months. Again it does not seem that employed job searchers exhaust informal job search networks that will generate acceptable job offers early in the search period. Exits via advertisement are again very low, although there is some increase with duration. Finally, it appears that the PEA is a relatively poor source of acceptable job offers for the employed. This is reflected in a consistently low exit probability via this method.

INSERT TABLE 3 & 4

Covariate estimates from the competing risks models are presented in Tables 3 and 4 for the unemployed and employed sample, respectively. For each exit state and covariate, the raw coefficient, estimated marginal effect of probability of exit and standard error are reported. For the sake of brevity, we omit the results for exits to self-employment, which cannot be considered as a job finding method *per se*.⁶ In the following discussion we focus on the estimated marginal effects of probability of exit to each risk state. These, unlike the raw estimates, provide a measure of the impact of a given covariate on the likelihood of exit to a given risk state taking into account all other risk states.

Looking first at the unemployed sample, there are noticeable age effects. Those aged 25 years or older are less likely to exit via friends/relatives (from -9 to -14 percentage points), and those 30 years or older are also less likely

⁶Moreover, due to the relatively small numbers of individuals exiting to self-employment, covariate estimates for this exit state were not statistically significant at standard levels.

to find employment through the PEA. Those 50 years or older are 9, 7 and 4 percentage points more likely to exit to employment through direct approach to the employer, through other methods and through adverts, respectively. The pattern of the age coefficients for both friends/relatives and PEAs indicates that the likelihood of exiting to employment via these methods declines with age. The PEA appears to best serve younger unemployed job seekers.

Educational qualifications have marked effects on job finding methods for the unemployed. Those with high school completion as their highest qualification level are 5 per cent more likely to gain employment through friends/relatives, and marginally more likely to gain employment through other methods or exit to self-employment. Degree holders are more likely to exit to employment through direct approach. Unemployed individuals with disabilities were less likely to exit to employment through direct approach, friends/relatives or the use of advertisements, but more likely to exit through other methods or the use of the PEA. This latter result suggests that PEAs have an important role in finding work for individuals who might experience difficulties in gaining employment through other methods.

For the employed sample a number of additional covariates are included such as dummy variables for occupation type and industry of employment. Additionally, a dummy variable (looking for work) is included that signifies the individual was actively seeking work in the sample period. The age patterns evident for the employed are different to those seen for the unemployed. For instance, older employed individuals are less likely to move job by direct approach. In addition,

the inverse age relationship for job finding through friends/relatives is no longer apparent.

There are associations between occupation and job search methods. Professionals/managers are 13 percentage points less likely to exit through the use of friends/relatives. This may indicate a lesser role for informal job networks in professional and managerial occupations insofar as more formalised job application processes may be commonplace in these occupations. It is possible though that we do not capture the case where formal job applications are required by law, but information about the job are passed through informal networks. Across all job finding methods, there are no significant industry effects on exit to employment. Although a number of coefficients are significant for exit through the PEA, generally the marginal effects are very small.

4.1 Job Match Quality

The evidence presented so far sheds light on the role of job search methods in both the unemployed to employed transition, and the transition between jobs. This section examines job match quality related to different job finding methods. Specifically, we examine the relationship with wages and with job stability.

INSERT TABLE 5

Column 1 of Table 5 displays OLS wage estimates for unemployed job seekers. The results suggest that unemployed job searchers who gain employment by direct approach gain an hourly wage premium of 14 per cent above those who gain employment through use of the PEA. The corresponding premium for the

use of friends/relatives is 11 per cent, while there is a 7 per cent premium for those who use other methods. There is no evidence that employment gained via advertisement is associated with a higher hourly wage than through the use of the PEA. Column 2 has the corresponding OLS estimates for the employed sample. The wage premia associated with the two informal job search methods relative to the PEA is essentially the same for on the job searchers, between 12 and 13 percent. The key difference is that there is also a premium associated with job finding through advertisements of 14 percent.

As mentioned in section 3 these results are potentially biased by non-random sample selection. This potential bias is examined using a Heckman two stage selection model. This model is instrumented by unemployment duration prior to gaining employment. This is negatively related to the probability of gaining employment (p-value < 0.001). To test for the exclusion validity of the instrument in the wage equation a necessary compromise was to estimate (8) by OLS so as to retrieve the residuals. This test indicates that the instrument is (weakly) exogenous to log wages.⁷ Corrected wage estimates for the unemployed are reported in column 3 Table 4 suggests that while there was some slight bias in the earlier OLS parameter estimates, all estimates of job search method effects on wages remain with 0.01 of the OLS estimates. These results suggest that the use of informal job search methods (direct approach and friends/relatives) generates substantially higher hourly wages for the unemployed than formal methods. They do not support previous evidence that the use of friends and relatives gen-

⁷F(1,1552) = 2.02, p-value = 0.156.

erates lower wages than formal job search methods for the unemployed (Addison and Portugal 2002, Bentolila et al 2009).

Estimates from the fixed effects wage regression for the employed are presented in column 4, Table 5. The results for the impact of job search methods differ markedly from the cross-sectional OLS estimates. The wage premia associated with direct approach or advertisements are no longer statistically significant. This may indicate that the OLS estimates for these covariates may have been spurious, although in the case of direct approach it may reflect the imprecision of the fixed effects estimates. The premium associated with the use of friends/relatives maintains its significance and roughly doubles in magnitude. Hence, the wage return to this form of job search by the employed does not appear to be a result of time invariant individual unobserved characteristics. Together these results indicate distinctly different effects of job search methods than were suggested by the summary statistics presented in table 2. These are new results and there is no comparative evidence available.

Do these results differ by gender? In unreported estimates for unemployed males we find that the Heckman corrected wage estimates of job search methods association with wages is essentially the same as for the pooled sample. Similarly, the fixed effects estimates of job search methods for employed males are also proximate to those reported for the pooled sample. With females we are hampered by a fairly small number of observations and unable to gain precise estimates. Nonetheless the male estimates suggests that the wage returns to job search methods do not vary substantially by gender for either unemployed or

employed job searchers.

We now examine job stability and search methods. Search methods that lead to superior quality job matches should, on average, be associated with longer subsequent job durations. It is in the interest of employers and employees to terminate poor quality job matches, and the less satisfactory the job match the shorter the expected time period until it is revealed as poor. Hence, a positive relationship between job duration and job match quality might be expected (Jovanovic 1979, Pries 2004). Table 6 provides summary statistics on the duration of the first job found (for the unemployed) and the first job moved to (for the employed) split by the job finding method through which the job was gained. The job duration figures need to be viewed with some caution as some job episodes will be censored at the end of the sample period of SEUP. Hence the mean figures displayed are subject to observation bias. To aid analysis, the proportion of individuals who had left this job before the end of the sample period is also provided. Finally, we also report the reason why the individual left the job.

INSERT TABLE 6

For the unemployed, those who found employment by direct approach or advertisement have longer expected job durations than those who found their job by other methods, friends/relatives or the PEA. Job finding via the PEA is associated with substantially lower average job duration, some 65 days less than those jobs found by direct approach. Additionally, 89 per cent of the unemployed who used the PEA to gain employment subsequently left this job during

the sample period. This suggests that the average employment duration (178 days) is subject to less severe observation bias for this job search method. The corresponding figure for direct approach is that 75 per cent left the job within the sample period, which suggests greater censoring, and hence, a greater potential for observation bias. This means that the difference in employment episode durations between direct approach and PEAs is likely to be a downwardly biased estimate. Marked differences exist in the reason for job loss/quit across job finding methods. For instance, 27 per cent and 25 per cent of those who found employment through friends/relatives and the PEA were fired (left involuntarily), respectively. In contrast, for all other job finding methods the proportion fired ranged between 17 and 21 percent.

The patterns of job loss and job duration differ for employed job searchers. Employed job searchers who gain a job through direct approach or the PEA subsequently have the lowest average job duration. The proportion of job to job movers who subsequently leave their jobs in sample are generally lower than that for the unemployed to job movers. Due to this, the average job duration figures for employed job searchers should be viewed with caution. In contrast to the results for the unemployed, those who found work through friends/relatives were less likely to leave that job than for all other job finding methods except ‘other’ methods.

INSERT TABLE 7

The link between job finding methods and job stability is examined in a multivariate setting using duration analysis. In particular, we consider the impact

of job search methods on two exit states, involuntary exits (fires)⁸ and voluntary exits (quits).⁹ Competing risk models are estimated for both the unemployed and employed job searcher samples, with 7 duration parameters. Table 7 displays covariate estimates for voluntary and involuntary exits from the first job for the unemployed at start sample and the second job for the sample who were initially employed. The omitted category is that the job was found through the PEA.

For those initially unemployed, job finding through friends/relatives or other methods is associated with an increased likelihood of involuntary job loss when compared to job finding using the PEA. Job finding through friends/relatives, along with the use of advertisements, is also associated with increased likelihood of quitting. Together, these results suggest that for the unemployed the use of friends/relatives is associated with less stable employment. Hence, this method, whilst useful in gaining employment, may provide less desirable (in the long term) and/or less stable employment. The estimates for the employed sample suggest that jobs found via direct approach are associated with a heightened risk of being fired from that job. Again this provides evidence that informal job search methods are associated with less stable employment.

⁸It is perhaps unclear how temporary/seasonal exits should be treated as perhaps these may have an involuntary component. In the following empirical work we include these as involuntary exits. Unreported estimates demonstrate that their inclusion/exclusion does not materially affect the estimates of job search method effects.

⁹For simplicity, and partly due to a lack of data, all other exits are treated as censored outcomes.

5 Summary

Using Australian survey data this paper has examined the role of search methods on job finding and subsequent job match quality for unemployed and employed job seekers separately. Specifically, we have focused on the effect of job finding methods on time in search, wage determination in any subsequent job, and the duration and stability of these jobs. Along with providing the first evidence for Australia, it extends previous work by Addison and Portugal (2002) by examining the impact of job finding methods on match quality for employed job searchers. A number of findings can be highlighted.

There appear to be marked differences in the impact of job search methods on time in search between unemployed and employed job searchers. The likelihood of exit from search is generally higher via friends/relatives or direct approach than it is for using advertisements or the PEA. The PEA appears to be a poor source of jobs, and a source of poor jobs. The evidence provided in Table 1 for instance suggests that the two informal job search methods, direct approach and friends/relatives are associated with greater job finding success. In terms of individual characteristics of job searchers, the PEA is a relatively poor source of jobs particularly for older workers and females. As noted by Thomas (1997) negative results for the efficacy of job search through PEAs may just reflect an unobserved timing dimension to job search. Hence, the estimated likelihood (hazard) of job finding through the PEA may be biased downwards in the earlier periods of job search. The extent of this bias cannot be directly assessed using our data. Instead, we demonstrate that jobs found through the PEA are, in

general, associated with lower wages. For instance, they are associated with a lower wage than job finding through all other methods except advertisements. This is true for both unemployed and employed job seekers. There is also some evidence that PEA found jobs are associated with subsequent shorter durations.

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Figure 1: Estimated Baseline Hazards by Job Search Method, Unemployed Sample.

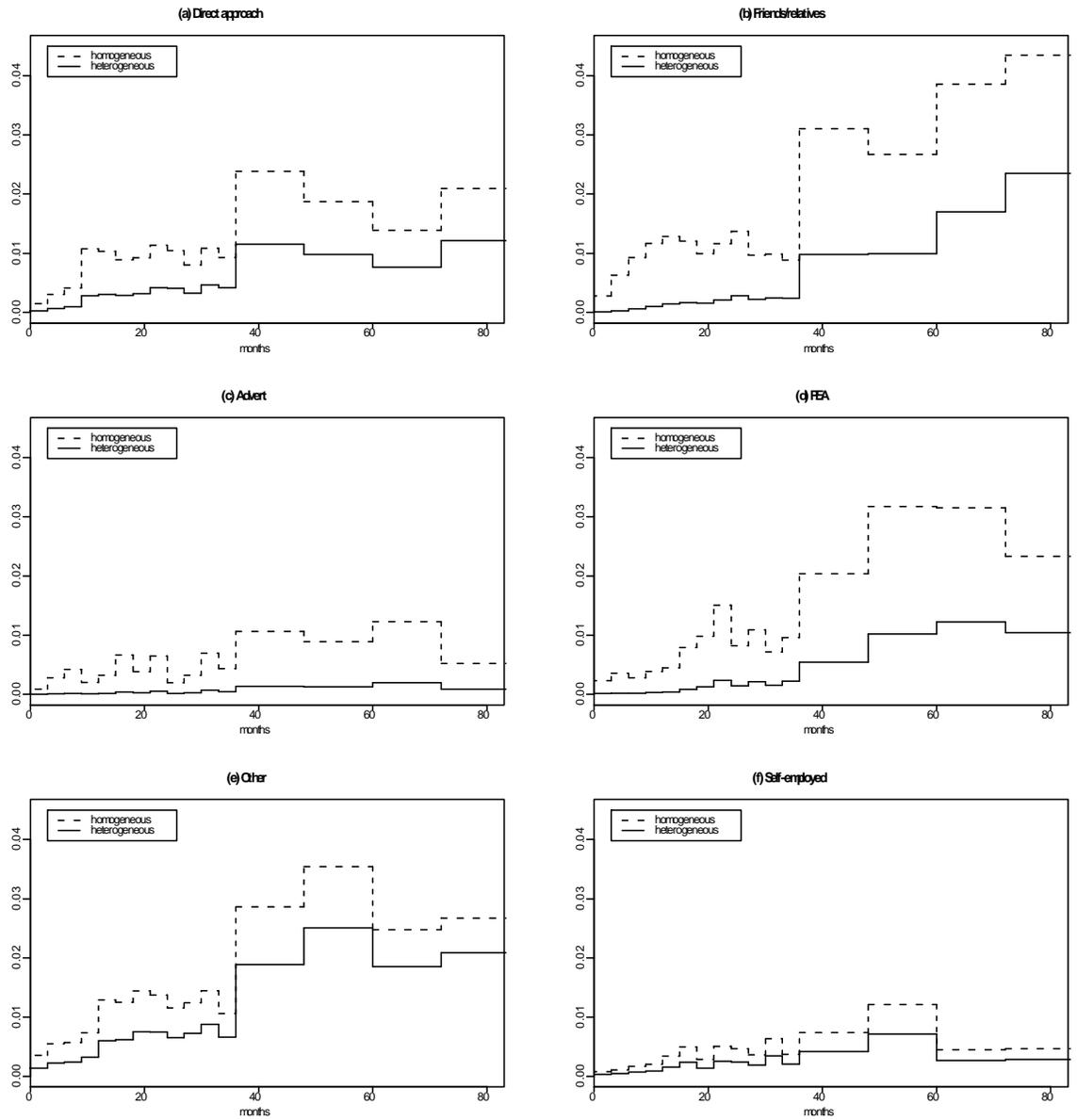


Figure 2: Estimated Baseline Hazards by Job Search Method, Employed Sample.

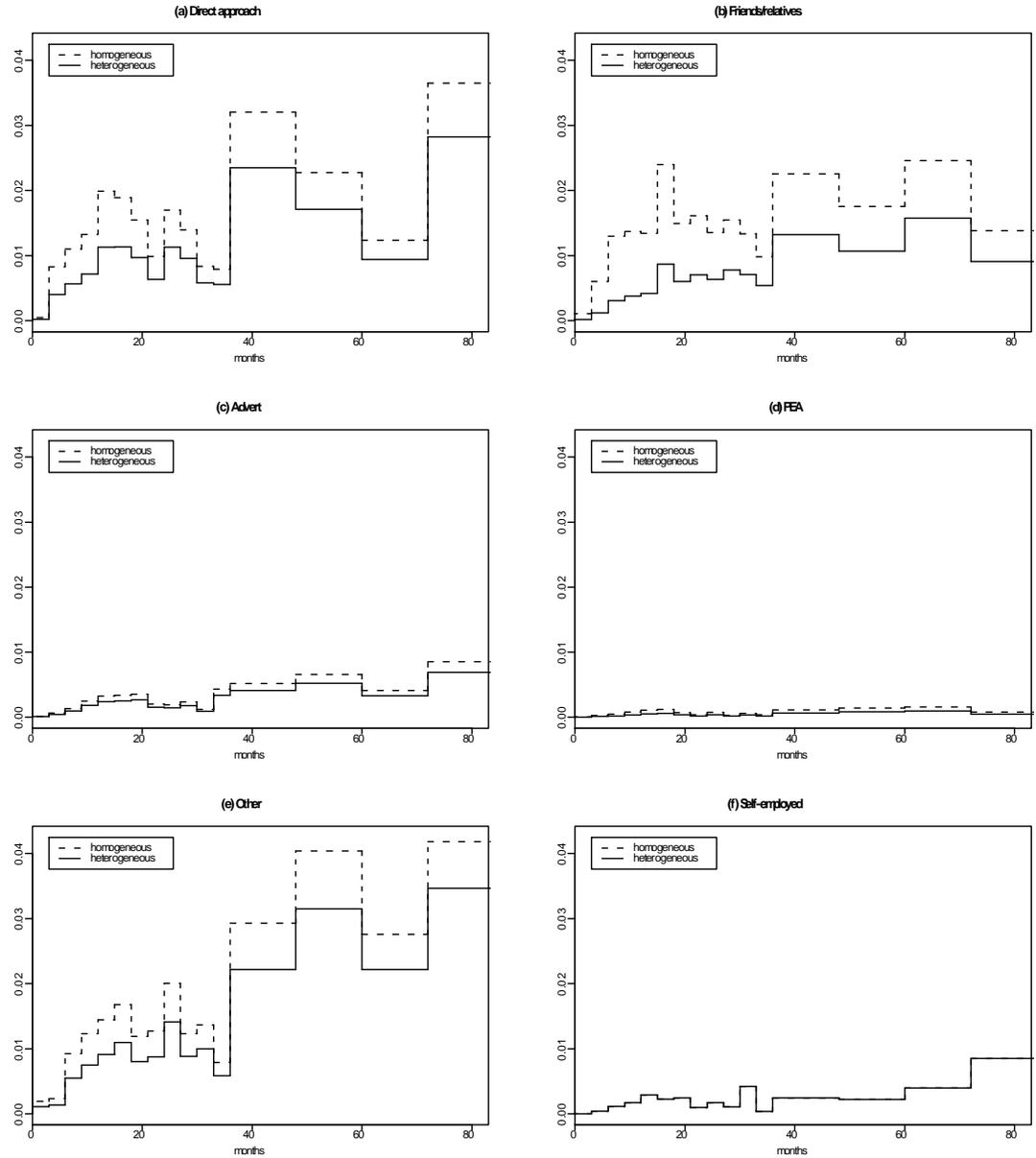


Table 1: Summary of Job Search Methods, Unemployed Job Searchers

Job Search Method	Number Using Method	Number (%) Finding Job	Number (%) using job search method that report job finding by that method
Direct Employer Contact	2307	1576 (68.3)	478 (20.7%)
Advertisement	1042	739 (70.9)	62 (6.0%)
PEA	2403	1592 (66.3)	307 (12.8%)
Friends / Relatives	1203	843 (70.1)	248 (20.6%)
Other	411	302 (73.5)	32 (7.8%)
Average Number of Search Methods Used = 2.79			
Number of Observations = 2,543			

Source: *SEUP*.

Table 2: Tenure and Wages, Destination Job

	Unemployed				
	Direct Approach	Advertisement	PEA	Friends/Relatives	Other
Tenure (days)	186	172	157	175	167
Weekly Wage (\$AUD)	415.80	389.52	368.42	281.14	338.12
Observations	1559				
	Employed				
Tenure (days)	261	304	251	282	281
Weekly Wage (\$AUD)	358.86	426.79	328.12	339.30	410.09
Observations	1336				

Table 3: Covariate Estimates from Competing Risk Models, Unemployed Job Searchers

	Direct Approach (309 Exits)	Friends/Relatives (425 Exits)	Advert (144 Exits)	PEA (309 Exits)	Other (422 Exits)
Age 25 to 29	0.22 [0.09] (0.19)	-0.57* [-0.11] (0.16)	0.27 [0.03] (0.27)	-0.28 [-0.02] (0.18)	-0.23 [-0.01] (0.16)
Age 30 to 34	-0.14 [0.08] (0.21)	-0.77* [-0.09] (0.17)	-0.08 [0.03] (0.30)	-0.59* [-0.02] (0.20)	-0.57* [-0.02] (0.18)
Age 35 to 39	0.03 [0.09] (0.20)	-0.65* [-0.09] (0.17)	-0.15 [0.01] (0.30)	-0.58* [-0.04] (0.20)	-0.30*** [0.01] (0.17)
Age 40 to 44	-0.10 [0.10] (0.20)	-0.86* [-0.09] (0.17)	-0.02 [0.04] (0.29)	-0.91* [-0.07] (0.22)	-0.61* [-0.01] (0.18)
Age 45 to 49	-0.15 [0.11] (0.22)	-1.08* [-0.13] (0.21)	-0.16 [0.03] (0.33)	-0.99* [-0.06] (0.25)	-0.50* [0.03] (0.19)
Age 50 to 59	-0.83* [0.09] (0.23)	-1.68* [-0.14] (0.21)	-0.68** [0.04] (0.34)	-1.63* [-0.08] (0.24)	-0.84* [0.07] (0.17)
Male	0.11 [-0.02] (0.12)	0.31* [0.03] (0.10)	-0.06 [-0.02] (0.17)	0.37* [0.03] (0.12)	0.10 [-0.02] (0.10)
Working Partner	0.06 [-0.05] (0.16)	0.61* [0.10] (0.13)	0.36*** [0.01] (0.22)	-0.14 [-0.08] (0.20)	0.20 [-0.01] (0.14)
NEB - Working Partner	0.22 [0.03] (0.14)	0.05 [-0.01] (0.13)	-0.07 [-0.003] (0.22)	0.06 [-0.01] (0.15)	0.04 [0.002] (0.13)
NEB	-0.47* [-0.05] (0.16)	0.17 [0.12] (0.12)	-0.42** [-0.01] (0.22)	-0.07 [0.04] (0.15)	-0.84* [-0.11] (0.15)
Year 12	0.13 [-0.03] (0.16)	0.42* [0.05] (0.12)	0.26 [0.001] (0.23)	0.01 [-0.05] (0.16)	0.34** [0.02] (0.13)
Vocational Training	0.40* [0.03] (0.15)	0.17 [-0.03] (0.13)	0.26 [-0.002] (0.22)	0.24 [-0.01] (0.15)	0.35* [0.01] (0.13)
Diploma	0.24 [-0.05] (0.30)	0.36 [-0.03] (0.26)	0.51 [0.003] (0.40)	0.55** [0.02] (0.27)	0.71* [0.05] (0.22)
Degree	0.91* [0.14] (0.22)	-0.25 [-0.16] (0.29)	0.83* [0.04] (0.33)	-0.43 [-0.14] (0.39)	0.96* [0.12] (0.21)
Capital City/Urban Area	-0.48* [-0.08] (0.14)	-0.24*** [-0.03] (0.13)	0.22 [0.02] (0.26)	0.03 [0.03] (0.18)	0.11 [0.05] (0.15)
Disability	-0.63* [-0.05] (0.15)	-0.46* [-0.01] (0.13)	-0.57* [-0.01] (0.23)	-0.27** [0.03] (0.14)	-0.25** [0.03] (0.12)
Job Seeker	-0.73** [0.001] (0.33)	-0.68** [0.02] (0.27)	-0.62 [0.01] (0.46)	-0.59 [0.03] (0.36)	-1.06* [-0.06] (0.24)
Log Likelihood					
Person-Time Observations	28,653				

Note: / / are the simulated marginal effects; () are the standard errors; *, **, *** indicate statistical significance at the 1%, 5% and 10% level, respectively. Exits to self-employment estimated but not reported. Omitted categories are age 20-24, no partner, less than year 12 education and rural area.

Table 4: Covariate Estimates from Competing Risk Models, Employed Job Searchers

	Direct Approach (336 exits)	Friends/Relatives (290 Exits)	Advert (186 exits)	PEA (122 Exits)	Other (446 Exits)
Looking for a Job	1.35*[-0.01](0.21)	0.88* [0.04] (0.22)	1.57* [0.01] (0.29)	2.22[-0.00](0.53)	0.73*[-0.06](0.16)
Age 25 to 29	-0.36** [-0.01](0.18)	-0.18 [0.04](0.18)	-0.16 [0.01] (0.23)	-0.38** [-0.001](0.28)	-0.44* [-0.06](0.17)
Age 30 to 34	-0.57* [-0.02] (0.19)	-0.50** [-0.01] (0.21)	-0.56** [-0.01](0.28)	-0.82** [-0.002](0.35)	-0.44* [0.01](0.16)
Age 35 to 39	-0.56 [0.02] (0.19)	-0.59* [0.01] (0.21)	-0.63** [-0.001](0.28)	-0.78** [-0.001](0.36)	0.74* [-0.05](0.17)
Age 40 to 44	-0.94* [-0.02] (0.22)	-0.96* [-0.03] (0.25)	-0.51** [-0.01](0.27)	-0.99* [-0.001](0.38)	-0.73* [-0.02](0.18)
Age 45 to 49	-1.15* [-0.06] (0.25)	-0.73* [0.04] (0.25)	-0.46 [0.02](0.28)	-0.91** [-0.0002](0.39)	-0.95* [-0.03](0.20)
Age 50 to 59	-1.48* [-0.06] (0.25)	-1.25* [-0.01] (0.25)	-1.29* [-0.004] (0.28)	-1.09* [0.001](0.36)	-1.09* [0.05](0.19)
Male	-0.06[-0.004] (0.12)	0.10 [0.04] (0.13)	0.04 [0.01](0.16)	0.13 [0.001](0.20)	-0.22** [-0.06](0.11)
Working Partner	-0.01[-0.02] (0.14)	-0.28** [-0.09] (0.15)	-0.24 [-0.02](0.18)	-0.43 [-0.003](0.26)	0.33* [0.10](0.11)
Non - Working Partner	0.02 [0.01] (0.17)	-0.17 [-0.04] (0.18)	-0.39 [-0.02](0.25)	0.32 [0.002](0.21)	0.07 [0.04](0.16)
NESB	-0.31*** [-0.04] (0.18)	0.13 [0.07] (0.17)	-0.70* [-0.03](0.27)	0.34 [0.002](0.23)	-0.22 [-0.03](0.15)
Disability	-0.09[-0.01](0.16)	-0.21 [-0.04](0.18)	-0.58* [-0.03](0.26)	-0.46 [-0.002](0.29)	0.16 [0.08](0.13)
Year 12	-0.04 [-0.01] (0.16)	0.06 [0.02] (0.16)	0.16 [0.01] (0.22)	0.29 [0.002](0.25)	-0.08 [-0.02](0.14)
Vocational Training	-0.20[-0.03] (0.15)	-0.03 [0.02] (0.16)	0.14 [0.01](0.21)	0.45** [-0.003](0.24)	-0.11 [-0.01](0.13)
Diploma	-0.47*** [-0.09] (0.26)	-0.08 [0.01] (0.25)	-0.08 [0.002](0.32)	0.44 [0.003](0.36)	0.01 [0.05](0.19)
Degree	0.07 [-0.01] (0.21)	-0.02 [-0.03] (0.24)	0.55** [0.02](0.26)	-0.18 [-0.002](0.42)	0.22 [0.05](0.17)
Capital City	-0.16 [0.01] (0.15)	-0.29** [-0.05] (0.16)	0.25 [0.02](0.23)	0.94** [0.01](0.40)	0.02 [0.05](0.14)
Prof / Manager	-0.19 [0.02] (0.21)	-0.69* [-0.13] (0.26)	0.15 [0.02](0.28)	-0.82** [-0.004](0.44)	0.02 [0.08](0.18)
Para-Professional	0.01 [0.003] (0.15)	-0.21 [-0.06] (0.17)	0.38** [0.02](0.22)	-0.53** [0.004](0.27)	0.11 [0.02](0.14)
Intermediate Skill	-0.26*** [-0.04] (0.14)	-0.16 [-0.03] (0.15)	0.21 [0.01](0.20)	-0.04 [-0.00001](0.22)	0.08 [0.04](0.13)
Manufacturing/Construction	-0.08 [-0.02] (0.21)	0.20 [0.04] (0.22)	0.30 [0.01](0.31)	0.41 [0.002](0.37)	0.06 [0.01](0.19)
Services	0.05 [0.01] (0.17)	0.06 [0.01] (0.19)	0.35 [0.02](0.26)	0.36 [0.002](0.32)	-0.02 [-0.2](0.15)
Job Seeker	1.70* [0.01] (0.13)	0.72* [0.02](0.22)	0.57** [-0.004](0.26)	1.22 [0.003](0.44)	0.62* [-0.02](0.17)
Log Likelihood	-1304.49	-1200.47	-749.68	-534.84	-1564.46
Person - Time Observations	31,820				

Note: [] are the simulated marginal effects; () are the standard errors. *, **, *** indicate statistical significance at the 1%, 5% and 10% level, respectively. Exits to self-employment estimated but not reported. Omitted categories are age 20-24, no partner, less than year 12 education, low skill occupation, primary industry and rural area.

Table 5: Wage Estimates, Destination Job

	Unemployed	Employed	Heckman - Unemployed	FE Employed
Direct Approach	0.14*[0.03]	0.13*[0.04]	0.14*[0.04]	0.07[0.05]
Friends/Relatives	0.11*[0.03]	0.12*[0.04]	0.10*[0.04]	0.24*[0.05]
Advertisement	0.02[0.05]	0.14*[0.05]	-0.01 [0.05]	0.002 [0.06]
Other	0.07**[0.03]	0.15*[0.04]	0.05 [0.04]	
Constant		2.10*[0.08]	1.85* [0.09]	
r ²	0.12	0.24		0.06
Observations	1559	1336	1559	21697 (4576 individuals)

Note: [] are Huber-White robust standard errors. *, **, *** indicate statistical significance at the 1%, 5% and 10% level, respectively. Controls included but not reported: age, gender, partner, ethnicity, education, occupation, industry and urban area.

Table 6: Summary Statistics, Destination Job Length and Exit Reason

Job Duration(days)	Unemployed					Employed				
	Direct Approach	Friends/Relatives	Advertisement	PEA	Other	Direct Approach	Friends/Relatives	Advertisement	PEA	Other
Left Job	243.12	190.31	222.72	178.83	199.62	255.10	268.08	300.43	255.02	275.85
Reason for Leaving:	0.75	0.85	0.82	0.89	0.77	0.79	0.65	0.73	0.80	0.65
Involuntary	0.21	0.27	0.17	0.25	0.20	0.20	0.24	0.18	0.11	0.15
Quit	0.08	0.12	0.28	0.11	0.08	0.18	0.18	0.24	0.19	0.10
Temporary/Seasonal	0.26	0.30	0.17	0.36	0.33	0.21	0.29	0.09	0.19	0.22
Ill Health/Injury	0.05	0.04	0.04	0.04	0.04	0.03	0.03	0.03	0.03	0.02
Other/Not Stated	0.15	0.12	0.16	0.13	0.11	0.17	0.29	0.19	0.30	0.17
No of Obs	309	425	144	309	422	336	425	186	122	446

Source: *SEUP*.

Table 7: Competing Risk Covariate Estimates, Exit from Destination Job

	Unemployed			Employed		
	Involuntary (850 Exits)	Voluntary (187 Exits)	Involuntary (504 Exits)	Voluntary (208 Exits)	Involuntary (504 Exits)	Voluntary (208 Exits)
Direct Approach	0.01[0.11] (-0.04)	-0.20[0.27] (0.04)	0.43**[0.19] (0.08)	0.08[0.25] (-0.08)	0.43**[0.19] (0.08)	0.08[0.25] (-0.08)
Friends/Relatives	0.23**[0.10] (-0.05)	0.45**[0.23] (0.05)	0.31[0.20] (0.14)	-0.32[0.27] (-0.14)	0.31[0.20] (0.14)	-0.32[0.27] (-0.14)
Advertisement	-0.28***[0.16] (-0.32)	1.22* [0.24] (0.32)	0.02[0.22] (-0.08)	0.36[0.26] (0.08)	0.02[0.22] (-0.08)	0.36[0.26] (0.08)
Other	0.25**[0.10] (0.04)	0.06[0.24] (-0.04)	0.47**[0.19] (0.20)	-0.44[0.27] (-0.20)	0.47**[0.19] (0.20)	-0.44[0.27] (-0.20)
Observations	5236		4647			

Notes: () are the simulated marginal effects; [] are the standard errors. *, **, *** denote significance at the 1%, 5% and 10% level, respectively. Other controls included but not reported gender, age, working/non-working partner, disability, ethnicity, education level, occupation, industry, unemployment duration/tenure in previous job, location and job seeker.

Table A1: Summary Statistics by Employment Status at Start of SEUP

	Unemployed	Employed
Age:		
15 to 19	0.11	0.08
20 to 24	0.16	0.15
25 to 29	0.12	0.13
30 to 34	0.11	0.13
35 to 39	0.12	0.15
40 to 44	0.11	0.12
45 to 49	0.09	0.10
50 to 59	0.16	0.13
Male	0.62	0.55
Less Than High School	0.56	0.41
High School	0.16	0.16
Basic Vocational Training	0.06	0.06
Skilled Vocational Training	0.13	0.17
Diploma	0.04	0.08
Degree	0.05	0.12
NESB	0.23	0.15
Disability	0.20	0.12
Working Partner	0.17	0.37
Non Working Partner	0.23	0.13
Capital City	0.46	0.51
Urban Area	0.28	0.24
Rural Area	0.26	0.25
Work Experience (years)	12.11	13.80
Never Had a Job	0.14	N/A
Observations	2534	3581

Source: SEUP.