

# **JOB-SEARCH METHODS, NEIGHBOURHOOD EFFECTS AND THE YOUTH LABOUR MARKET**

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## **Abstract**

Survey data suggest that unemployed teenagers look for work in ways that differ significantly from the ways which proved successful for teenagers who found work. This paper examines what factors affect the way teenagers look for work in order to explain why we observe this behaviour. We find that the single most important characteristic for explaining the job-search method choices of Australian teenagers is whether they receive unemployment benefits. Receiving benefits increases the probability of teenagers using the government employment agency as the main job-search method by almost 20 percentage points, and decreases their probability of using direct methods (such as contacting employers or friends and relatives) or newspapers by around 10 percentage points each. Personal characteristics and family background are also important for understanding the job-search methods chosen by unemployed teenagers.

Another interesting finding is that the local environment, especially the state of the local labour market, is important for explaining job-search method choice. Higher local unemployment rates decrease the probability that an unemployed teenager will use direct search methods, and increase the probability that they will use the government employment agency. These results may help to explain the recently documented evidence that unemployment has become increasingly concentrated in low-socioeconomic-status neighbourhoods (Gregory and Hunter 1995).

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# **JOB-SEARCH METHODS, NEIGHBOURHOOD EFFECTS AND THE YOUTH LABOUR MARKET**

**Alexandra Heath**

## **1. Introduction**

Survey data suggest that around one-third of teenagers successfully find work through friends and relatives, one-third find work by directly contacting employers and another third use indirect methods such as newspapers or employment agencies. In contrast, less than 10 per cent of unemployed teenagers report that they are using friends and relatives as their main job-search method, and two-thirds report that they are mainly using an indirect method of search. This paper examines what factors affect the way teenagers look for work in order to explain why we observe this behaviour.

To this end, a model of job-search behaviour is developed in which there are two job-search methods available. The first is a general job-search method whose success depends on aggregate labour-market conditions and the search effort chosen by the individual. The second is a local job-search method which only depends on local labour-market conditions, and its consideration is motivated by the possibility that information networks provided by friends and relatives are local in nature. Modelling the interaction of individuals, their neighbourhood and the aggregate labour market also provides an opportunity to explore the possibility that local job-information networks help to explain the unequal distribution of unemployment across Australian neighbourhoods documented by Gregory and Hunter (1995).

Finally, this paper estimates the factors which affect the search methods chosen by Australian teenagers. Our sample includes teenagers who were looking for work, but were not enrolled in full-time education, and who were respondents to the Australian Youth Survey (AYS) which covers the period 1989 and 1994. Data on individuals from the AYS allow us to control for individual characteristics, past education experience, family background and the characteristics of the neighbourhood the teenager is living in.

We find that the receipt of unemployment benefits is the single most important variable for predicting the method reported as the main search method. Benefit recipients are almost 20 percentage points more likely to report the CES as their main job-search method and are significantly less likely to report either newspapers or direct search methods.<sup>1</sup> There is some evidence that individuals who have a longer duration of unemployment are more likely to report newspapers as their main job-search method. This is consistent with the possibility that unemployed teenagers have tried search methods that have proved more successful for teenagers who found employment, have not obtained a job offer, and consequently have focused on alternative search methods.

Respondents whose parents are better educated and/or have higher status occupations are more likely to search using friends and relatives or directly contacting employers in preference to searching in the newspaper or through the CES. Respondents who left school in Year 10 or earlier and/or attended a government school are more likely to report that the CES is their main method of search.

There is also evidence that higher neighbourhood unemployment rates decrease the probability of using direct search methods and increase the probability of using the CES as the main method of search. This relationship can be explained if the effectiveness of direct search methods depends on the quality of local job-information networks, measured as the proportion of the neighbourhood who are employed. The presence of local job-information networks may also help explain the increasing concentration of unemployment documented by Gregory and Hunter (1995). If a neighbourhood experiences a negative employment shock, e.g. the closure of a local employer, the initial increase in unemployment may be amplified by a fall in the search effectiveness of the unemployed in the local area, due to the decrease in the quality of local job-information networks.

The rest of the paper is organised as follows. Section 2 provides some summary information about the search methods used in the youth labour market in Australia

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<sup>1</sup> The Commonwealth Employment Service (CES) was the main employment service available to the unemployed through the sample period being considered here, and was administered by the Federal Government. In 1998, it was replaced by Centrelink and a competitive employment services market known as the Jobs Network.

and reviews the international evidence on the effectiveness of different job-search methods. After discussing why friends and relatives would be a more successful method than other available search methods, this section briefly reviews the current empirical evidence for which factors affect the way individuals choose to search. Finally, a formal model to explain an individual's choice of job-search method is discussed. Details of this model are presented in Appendix A.

Section 3 provides a detailed description of the data. Section 4 lays out the econometric model explaining the job-search method choice of an unemployed individual and presents the estimation results. Section 5 concludes by summarising the results and examining their contribution to our understanding of the youth labour market in Australia.

## **2. Job-search Behaviour: What do we Already Know?**

### **2.1 Which Search Methods are Most Effective?**

Table 1 summarises the job-search methods reported by Australian teenagers who were respondents to the AYS, which covers the period 1989 to 1994. Information about which methods of search proved successful is derived from the responses of teenagers who were employed at the time of the interview and had obtained their job in the year prior to the interview. These responses are summarised in column 1. The number of respondents who have been continuously employed over the year since their previous interview is also included in the second last row of the table.

Roughly one-third of teenagers found their job through friends and relatives, one-third through directly contacting employers, and the final third through indirect search methods such as newspapers and the CES. This information is consistent with the successful methods reported by teenagers for the 12 months to July 1998 from an alternative source, although the proportion using direct

employer contact is slightly larger and the reported use of newspapers and the CES is correspondingly lower.<sup>2</sup>

**Table 1: Job-search Methods**  
16 to 19 year olds; 1989–94

	Used to obtain current job	Currently used by unemployed
Government program	438 (6%)	–
CES	671 (10%)	801 (27%)
Newspapers/media	1 209 (18%)	1 219 (40%)
Friends and relatives	2 228 (33%)	171 (6%)
Direct employer contact	1 929 (28%)	686 (23%)
Other	370 (5%)	145 (5%)
Total	6 845	3 022
Same job as last year	4 126	–
Total	10 971	–

Note: 'Other' includes unions, unemployed persons group, private agencies, advertising and other.

Respondents who reported that their main activity was looking for work were asked to list all the search methods they were using and, if more than one method was reported, to identify the main job-search method.<sup>3</sup> For comparison, the main job-search methods of unemployed teenagers are summarised in column 2 of Table 1.

The most striking difference between the two groups is that the unemployed are much less likely to report that friends and relatives are their main search method than the employed are to have used this method successfully.<sup>4</sup> The proportion of

<sup>2</sup> *Successful and Unsuccessful Job Search Experience*, ABS Cat. No. 6245.0. It should also be noted that the CES was replaced by Centrelink and a competitive employment services market, the Job Network, during the period covered by the survey. All services which replace the CES have been classified as the CES here for the purposes of comparison with the older survey data.

<sup>3</sup> Thus, teenagers looking for work, who are enrolled in full-time education are not included in this sample.

<sup>4</sup> Around one-third of the employed respondents moved directly into their current job from an earlier job. The differences observed in Table 1 could perhaps be explained if the job-search behaviour of on-the-job searchers was significantly different from that of individuals who are not already employed. An examination of the data suggests that this is not so.

unemployed teenagers reporting that their main search method is either newspapers or the CES is significantly higher.

This is consistent with evidence about the success of different job-search methods used by 15 to 26 year olds who were respondents to the first wave of the Australian Longitudinal Survey (ALS) in 1985. Miller and Volker (1987) show that respondents using the CES or newspapers are less likely to leave unemployment than those using friends and relatives or direct employer contact. Jobs obtained through the CES are also less successful if success is measured by the duration of employment.

The Australian data do not contain any direct measure of how much effort the unemployed apply to different job-search methods, or the success of such effort in terms of the number of job offers made. This information is available for the US and the UK, and it provides further evidence that friends and relatives and direct employer contact are the two most successful job-search methods.

Holzer (1988) finds that 16 to 23 year old males in the United States, who were unemployed the month before their interview, spend more hours searching through friends and relatives and direct employer contact than through state employment agencies or newspapers, and receive more job offers from these direct search methods.<sup>5</sup> He also shows that job offers generated through friends and relatives have an 81 per cent probability of being accepted, which is much higher than the acceptance rate for offers generated by other methods.

Jones (1989) presents similar evidence for the UK using a sample of unemployed people collected by the Economist Intelligence Unit in September 1982. He finds that there is some decline in the total hours spent on search as the duration of unemployment lengthens and that this is particularly noticeable for the number of hours spent using friends and relatives.

Jones also estimates the effects of hours spent using different search methods on measures of success such as the number of job offers received and the number of interviews obtained. He finds that hours spent using friends and relatives have no

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<sup>5</sup> The sample of 16 to 23 year old males is taken from the 1981 Youth Cohort of the National Longitudinal Survey.



effect on the number of interviews received, but increases the number of offers received. While this supports Holzer's finding that the probability of obtaining an acceptable offer using friends and relatives is very high, it makes it difficult to interpret the effect of spending more hours searching on the final outcome.

Another of Jones' results which is difficult to interpret is that as the number of hours spent using a government employment agency increases, the number of interviews and the number of offers decreases. This suggests that the hours spent using different types of search may be proxies for omitted personal or background characteristics which are important. More time spent using newspapers is found to increase the number of interviews, but not the number of offers.

Overall, the evidence suggests that using an employment agency or newspapers are relatively unsuccessful job-search methods, compared with using friends and relatives or direct employer contact. The question then arises: why do unemployed teenagers use job-search methods which are apparently less successful?

Assuming that these job seekers are acting in their own best interests, there are two explanations for this behaviour. One is that job-search methods which proved more successful, on average, for employed teenagers are tried first and when they do not result in an acceptable job offer, alternative job-search methods are pursued. If this is the explanation, we would expect to see that teenagers with longer durations of unemployment are less likely to use direct search methods. The second possibility is that some individuals are living in environments or have characteristics which make it optimal to choose indirect job-search methods, even though they are less successful on average. Before addressing this question more directly, it is useful to consider why direct methods would be more successful.

Motivated by the stylised fact that direct methods appear to be more successful than indirect methods, Montgomery (1991) develops a model of imperfect information to explain why this might be the case. His model assumes that employers cannot observe the quality of potential employees and that, without further information, employers will offer all potential employees a real wage equal to the average productivity of the unemployment pool.

Montgomery also assumes that there is a social structure within which high-productivity workers are more likely to associate with each other than with low-productivity workers. In this environment, one way for firms to increase the probability of hiring a high-productivity worker is to offer jobs to potential employees who are recommended by current high-productivity workers.

The net gain arises because both the employer and the potential employee have better information about each other, increasing the probability that there will be a successful match. This process has also been argued less formally by Rees (1966) who also suggests that employed individuals will only refer capable workers to ensure that their own reputation is not affected. These incentives will reinforce the mechanism described in the Montgomery model.

## **2.2 What Factors Affect the Choice of Search Method?**

Although the Montgomery model explains why friends and relatives will be a successful method of job search, it does not suggest that this method will increase the chances of finding an acceptable job for all the unemployed. In fact, the model relies on the fact that the unemployed are not homogenous in two respects. Firstly, for imperfect information to be an issue, potential workers must have different productivity levels when they are matched to a given job. Secondly, some are connected to more useful social networks than others.

McGregor (1983) considers the possibility that the job-information network provided by friends and relatives is local in nature. This would imply that the probability that friends and relatives constitute an effective job-search method would be highly dependent on local neighbourhood characteristics. In particular, he argues that information about jobs is more likely to come from employed people and consequently there will be less useful job information in high unemployment neighbourhoods. The expected probability of obtaining a job offer using information from friends and relatives in high unemployment areas is also likely to be lower as there will be more competition for any available jobs.

McGregor (1983) proceeds to test his hypothesis, that local labour market conditions affect job-search behaviour, using a sample of males who were unemployed in Glasgow in 1976. He finds that when personal characteristics are

controlled for, neighbourhood unemployment rates do not influence the probability that friends and relatives are used for search. Although this is a disappointing result, there are several technical reasons why these estimates should be treated with caution: the unemployment rates are presented in high, medium and low bands and the estimation technique does not take proper account of the nature of the data being used.<sup>6</sup>

Schmitt and Wadsworth (1993) find that the most important determinant of job-search method choice is the unemployed person's previous occupational status using a sample of unemployed male benefit recipients in Great Britain.<sup>7</sup> The other consistently important variables are the duration of unemployment and a dummy for the 50 to 65 year old age group. Unfortunately, however, the use of personal contacts is not available as a separate category, but is subsumed in 'other' job-search methods.

Jones (1989) estimates the relationship between the number of hours used on different search methods and individual characteristics. Being male increases the number of hours spent searching through all methods except newspapers. Older individuals were less likely to spend time searching through government employment agencies, and individuals with technical qualifications spent more time directly approaching employers. A more puzzling result is that individuals from high unemployment areas spent less time searching through government employment agencies or newspapers. Holzer (1988) examines the factors which affect the probability that an individual will use different search methods, although the results are only marginally significant at best.

### **2.3 A New Model of Job-search Method Choice**

In Appendix A, we develop an economic model to formalise the way in which characteristics of the local environment can affect the job-search behaviour of unemployed individuals. This is done by extending the job-search model

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<sup>6</sup> The dependent variable used by McGregor (1983) takes the value one if the individual is using friends and relatives as a search method and zero otherwise. The analysis uses a linear probability model to estimate the proposed relationship rather than a method designed to deal with dependent variables of this type, such as logit or probit.

<sup>7</sup> The sample includes unemployed male benefit recipients who were interviewed in the General Household Survey between 1979 and 1982.

developed by Pissarides (1990) to allow individuals to have access to two different search methods with characteristics reflecting the differences between the indirect and direct search methods discussed above.

The first job-search method, labelled the general search method, captures search methods such as newspapers and employment agencies which provide general job information. The probability that the general job-search method will create a match between an unemployed worker and an unfilled vacancy is assumed to be a function of aggregate labour market conditions and the search effort of the individual.

The second job-search method, labelled the local search method, is designed to capture job-search methods, such as information from friends and relatives or direct employer contact. The effectiveness of these methods is assumed to be influenced by conditions in the local labour market, but not by the amount of effort applied by the job seeker. This implicitly assumes that the job-information network provided by friends and relatives is confined to the local area, and that the employed neighbourhood residents receive job information at a fixed rate, which the unemployed teenager cannot influence.

Unemployed individuals decide how much effort to devote to the general search method, taking into account the direct costs and the expected benefits involved. This choice will be affected by factors such as the local unemployment rate, which affects the probability of finding a job through the local search method, and the aggregate unemployment rate, which affects the probability of finding work through the general search method. It is shown in Appendix A that the level of search effort chosen, and hence, the probability of reporting that the main method of search is a general search method, increases as the local unemployment rate rises and falls as the flow of benefits to being unemployed or the efficiency of the local search method increases.

This formalises the arguments put forward by McGregor (1983) that higher local unemployment rates should increase the amount of search effort put into newspapers and employment agencies, and that job seekers in low unemployment neighbourhoods are more likely to be using friends and relatives for information. Although this is a plausible theoretical argument, the importance of

job-information networks and local labour market conditions is essentially an empirical question which is addressed further in Section 4.

### 3. Data and the Basic Framework

The data used for the following analysis are from the AYS which covers the period from 1989 to 1994. The first wave, sampled in 1989, consists of 5 350 16 to 19 year olds. In each subsequent year roughly 1 500 16 year olds are interviewed for the first time, and all other panel members are re-interviewed where possible. Table 2 summarises the main activities of respondents of different ages.

Age	Main activity at the time of interview					Total
	School	Employed	Unemployed	Other study	Other	
16	6 705 (84.3)	812 (10.2)	303 (3.8)	60 (0.8)	78 (1.0)	7 958
17	4 644 (61.9)	1 894 (25.3)	598 (8.0)	206 (2.7)	155 (2.1)	7 497
18	1 253 (17.4)	3 915 (54.3)	1 058 (14.7)	747 (10.4)	233 (3.2)	7 206
19	144 (2.2)	4 348 (66.1)	1 057 (16.1)	777 (11.8)	253 (3.8)	6 579
20–24	23 (0.2)	9 788 (73.5)	1 745 (13.1)	1 047 (7.9)	705 (5.3)	13 308

The sample used in the following analysis includes all 16 to 19 year olds who reported that unemployment was their main activity at the time of their interview, and who provided information on all the variables used in the estimation. The restriction of the sample to teenagers ensures that the age composition of the sample does not vary significantly over time. The results presented in what follows do not rely on restricting the sample in this way.

The dependent variable used in the following analysis indicates which search methods were chosen by different individuals as their main search method. Given the information in Table 1, we restrict the choice set to include ‘direct employer contact’ or ‘friends and relatives’ (taken as one category), visiting the CES and searching in newspapers. Sample sizes do not permit us to consider ‘friends and relatives’ as a separate job-search method.

The respondent's age, marital status and their number of siblings are included in the analysis to control for personal characteristics. These variables may capture the extent to which the respondent faces financial constraints or is likely to be independent, and consequently the costs of unemployment faced by the individual.

To control for the effects of family background on behaviour, several characteristics of the respondent's parents are included. First, there is a variable indicating whether each parent was present in the household when the teenager was 14 years old. For each parent who was present, questions are asked about that parent's work experience and educational attainment. Work experience is captured by two variables. The first indicates if the parent was not employed (i.e. unemployed or not in the labour force) when the teenager was 14 years old. The second is an index of occupational status, ranging from 0 to 100, constructed for each employed parent. Educational attainment of each parent is captured by variables indicating the highest educational qualification achieved.

Previous education and labour market experience are also likely to be important variables for explaining job-search behaviour. A dummy variable indicating whether the teenager left school in Year 10 or earlier, and a dummy indicating whether the job seeker attended a government school are included to capture the education experience of the individual.

The current duration of unemployment has been included to capture the possibility that the effectiveness and availability of different search methods may change over the course of a spell of unemployment. To ensure that this is not picking up some measure of the time spent in the labour force, the number of years since leaving school has also been included in the specification. A dummy variable which indicates whether the individual receives unemployment benefits or the Job Search Allowance (JSA) is included to control for the fact that receipt of this benefit will affect the costs of unemployment.

As already discussed, another potentially important influence on the job-search behaviour of individuals is their local environment. The AYS provides information on the state of residence and the section of state the respondent spent most time in until the age of 14 years.<sup>8</sup> The information provided in the AYS also allows us to

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<sup>8</sup> Section of state is categorised as either capital city, other city, country town or rural area.

identify the postcode where the interview took place. This is more disaggregated than most neighbourhood level data which are available: the average postcode has 5 558 residents over the age of 15 years; the largest postcode has a population of 62 885; and the smallest has less than a hundred residents. The distribution is highly skewed with 90 per cent of postcodes having fewer than 15 131 residents.

Using postcode information, it is possible to match individuals with information about the average characteristics of all the other residents living in that postcode area from the 1991 Australian Census. This includes information about education attainment, household and personal income, and labour force status by gender. Of special interest, given the model developed in Appendix A, is the local unemployment rate which can be thought of as a proxy for the effectiveness of local job-information networks.

Table 3 summarises the mean values of the variables used in the estimation in Section 4. A more detailed description of data definitions is provided in Appendix B. For comparison, the average characteristics of teenagers who obtained employment in the survey year and reported their successful job-search method have also been included. Based on our observation that direct search methods are more successful than the CES or newspapers, we would expect that characteristics which are more prevalent in the employed sample would also be associated with an increased probability that an unemployed teenager would choose to use a direct search method.

There is a slightly higher proportion of males in the unemployed sample. The employed sample come from families where the parents have higher skill levels on average, as indicated by the higher proportion of parents with graduate qualifications and trade qualifications. Parents of the employed sample also have higher average occupational status, and a higher probability of being employed. Members of the employed sample are also more likely to have been living with both parents when they were 14 years old.

**Table 3: Sample Averages**  
Standard errors in parentheses where appropriate

	Sample of unemployed*	Sample of employed**
<b>Personal background</b>		
Male	0.52	0.51
Age	17.93 (0.99)	17.90 (0.99)
Married	0.06	0.04
Number of siblings	2.42 (1.76)	2.29 (1.57)
<b>Parents' characteristics</b>		
Father's occupational status @14	22.89 (22.84)	28.26 (23.08)
Mother's occupational status @14	14.95 (20.20)	17.95 (20.89)
Father not employed @14	0.08	0.04
Mother not employed @14	0.45	0.38
Father not present @14	0.22	0.15
Mother not present @14	0.05	0.04
<i>Father has:</i>		
Degree	0.10	0.12
Trade qualifications	0.13	0.18
Other post-school qualifications	0.08	0.09
Secondary education	0.34	0.37
No qualifications	0.35	0.24
<i>Mother has:</i>		
Degree	0.08	0.09
Trade qualifications	0.04	0.05
Other post-school qualifications	0.13	0.14
Secondary education	0.56	0.58
No qualifications	0.19	0.14
<b>School/work experience</b>		
Attended government school	0.79	0.74
Left school in year 10 or earlier	0.30	0.26
Years since leaving school	1.57 (1.13)	1.56 (1.00)
Current unemployment duration***	29.18 (31.13)	9.94 (14.45)
Receives unemployment benefits	0.53	0.04
<b>Neighbourhood</b>		
Average personal income	17.27 (3.01)	17.88 (3.31)
Unemployment rate	12.85 (4.81)	11.75 (4.31)
Per cent with vocational qualifications	14.51 (2.99)	14.95 (3.11)
Per cent with post-graduate qualifications	10.67 (6.40)	11.45 (6.65)

Notes: @14 indicates that the variable takes the characteristic of the parent when the respondent was 14 years old. Occupational status is an index ranging from 0, for low-status jobs, to 100 for high-status jobs.  
\* These are the average characteristics of those unemployed individuals used in the following estimation, i.e. 2 284 observations; \*\* these are the average characteristics for all the employed who became employed in the previous year and answered the question regarding how they obtained their current job. The actual sample size used will vary as some variables have missing information; \*\*\* this is the length of the previous unemployment spell for the employed.



Employed teenagers in the sample are less likely to have left school in Year 10 or earlier, and are less likely to have attended a government high school. Perhaps the most marked difference between the two samples is the average unemployment experience. The unemployed sample are experiencing an average incomplete duration of unemployment of 29 weeks, whereas the employed sample experienced an average completed duration of unemployment of 10 weeks. Roughly half the unemployed report that they receive unemployment benefits or the Job Search Allowance. A very small percentage of the employed report that they are also receiving benefits which is possible if they are earning a sufficiently small amount.

The neighbourhood composition variables tell a similar story to the family background characteristics. On average, respondents in the employed sample come from neighbourhoods where the unemployment rate is lower, and the average skill level measured as the proportion of the adult population with vocational or graduate qualifications is higher.

#### 4. Estimation Framework and Results

The dependent variable for the analysis below indicates which of the three alternative job-search methods has been chosen by the unemployed respondent. Because the choices of main job-search method are mutually exclusive and exhaustive, it is necessary to use an estimation technique which imposes this restriction. Labelling the choices available to an individual from 1 to  $M$ , the multinomial logit specification defines the probability of choosing option  $m$  as:

$$\Pr(y = m) = e^{x\beta_m} / \sum_{j=1}^M e^{x\beta_j} \quad m = 1, 2, \dots, M \quad (1)$$

There will be  $M$  such probabilities, which will sum to unity, as required. The coefficients will not be uniquely identified, however, without a further restriction. The standard restriction for multinomial logit models is to assume that the vector of coefficients for one alternative, known as the base category, is normalised to zero. The normalised coefficients are then interpreted as the effect of a given characteristic on the probability of choosing a given job-search method, relative to its effect on the probability of choosing the base category. For example, if the base

category is choosing to search through newspapers, a positive coefficient on age for the CES category indicates that older people are more likely to choose to search using the CES than to look in newspapers.

Because multinomial choice models are non-linear functions of their coefficients, the estimated coefficients provide information about the direction of the effect, but not about its size. The size will depend on the values taken by all the independent variables. Another way of presenting the results so that they are more meaningful is to express them in terms of the marginal effect a given variable has on the probability of choosing an outcome, given that all other variables are set to their mean value. In terms of Equation 1, this can be written as:

$$\left. \frac{\partial \Pr(y = m)}{\partial x_i} \right|_{x=\bar{x}} = \Pr(y = m) \Big|_{x=\bar{x}} \left( \sum_{j=1}^M (\beta_{im} - \beta_{ij}) \Pr(y = j) \Big|_{x=\bar{x}} \right) \quad (2)$$

The coefficients on dummy variables can be interpreted as the change in the probability of observing a given outcome if the value of the dummy variable is changed from zero to one. For example, in Table 4, the variable *male* takes the value one if the individual is male and zero if female. Therefore, being male increases the probability that the individual will use the CES as their main job-search method by 6.8 percentage points, all other variables held at the average values. Dummy variables are indicated by an asterisk. For continuous variables such as *age*, the coefficient is interpreted as the increase in the probability of the outcome if the explanatory variable increases by one unit. Therefore, if age increases by one year, the probability of using the CES as the main job-search method increases by 5.6 percentage points.

Table 4 presents the results of estimating the multinomial logit model for the choice of main job-search method. It should be noted that section of state, state and year indicators were included in the estimation, but have not been reported to minimise the volume of results. The sample includes all respondents who were unemployed at the time of the interview and provided information about the main job-search method being used. For each choice, the first column presents the marginal effects calculated at the sample averages, and the second presents the *t*-statistics.

**Table 4: Factors Affecting Choice of Main Job-search Method**

Sample size: 2 284 unemployed

	Direct methods		CES		Newspapers	
	$\partial\text{Pr}/\partial x$	<i>t</i> -stat	$\partial\text{Pr}/\partial x$	<i>t</i> -stat	$\partial\text{Pr}/\partial x$	<i>t</i> -stat
<b>Personal background</b>						
Male*	0.049	2.37	0.068	3.45	-0.116	-5.28
Age	0.036	2.20	-0.056	-3.74	0.020	1.16
Married*	-0.069	-1.49	-0.061	-1.46	0.129	2.81
Number of siblings	-0.004	-0.74	0.007	1.35	-0.003	-0.44
<b>Parents' characteristics</b>						
Father's occupational status @14	0.001	1.75	-0.001	-1.14	-0.000	-0.53
Mother's occupational status @14	0.000	0.21	-0.000	-0.44	0.000	0.22
Father not employed @14*	0.106	2.41	-0.012	-0.30	-0.093	-1.88
Mother not employed @14*	0.067	2.06	0.016	0.52	-0.083	-2.43
Father not present @14*	0.007	0.17	0.049	1.23	-0.057	-1.23
Mother not present @14*	0.055	0.89	-0.087	-1.60	0.032	0.50
<i>Father has:</i>						
Degree*	-0.022	-0.42	0.087	1.68	-0.065	-1.17
Trade qualifications*	-0.008	-0.19	0.066	1.57	-0.058	-1.21
Other post-school qualifications*	-0.027	-0.55	0.058	1.20	-0.031	-0.59
Secondary education*	-0.016	-0.42	0.075	2.11	-0.059	-1.47
<i>Mother has:</i>						
Degree*	0.096	1.81	-0.081	-1.55	-0.015	-0.25
Trade qualifications*	0.054	0.86	-0.128	-2.13	0.074	1.11
Other post-school qualifications*	0.080	1.81	-0.151	-3.56	0.071	1.49
Secondary education*	0.029	0.80	-0.086	-2.80	0.058	1.53
<b>School/work experience</b>						
Attended government school*	-0.025	-0.94	0.062	3.19	-0.037	-1.28
Left school in year 10 or earlier*	0.006	0.19	0.044	2.48	-0.050	-1.39
Years since leaving school	0.006	0.42	0.024	1.85	-0.030	-1.92
Current unemployment duration	-0.000	-1.24	-0.000	-0.96	0.001	1.96
Receives unemployment benefits	-0.106	-4.45	0.192	8.41	-0.086	-3.38
<b>Neighbourhood</b>						
Average personal income	-0.025	-3.37	0.007	1.03	0.018	2.23
Unemployment rate	-0.011	-3.35	0.005	1.54	0.006	1.83
Per cent with vocational qualifications	-0.006	-1.24	0.005	1.13	0.001	0.17
Per cent with post-graduate qualifications	0.005	1.39	-0.001	-0.42	-0.003	-0.92

Notes: Section of state and state of residence and year dummies have been included, but have not been presented.  
Direct methods includes both direct employer contact and friends and relatives.  
Dummy variables are indicated by an asterisk.

Gender and age are both important for explaining the observed job-search behaviour of unemployed teenagers. Males are 4.9 per cent more likely to choose direct methods, and are 6.8 per cent more likely to choose the CES than females. Because the predicted probabilities must sum to unity, this implies that females are 11.6 per cent more likely than males to use newspapers as their main job-search choice. Older teenagers are more likely to use direct methods and are less likely to use the CES.

Parents' characteristics have some effect on observed job-search behaviour. Unemployed teenagers are more likely to use direct methods and are less likely to use the CES as the occupational status of their parents, especially their father's, job increases. If either parent was not employed when the respondent was 14 years old, the respondent is more likely to use direct search methods and less likely to use newspapers. The effects of parents' education are difficult to interpret. More educated mothers, however, generally have children who are more likely to use direct search methods, and are less likely to use the CES.

Education and employment histories are also important determinants of the main job-search method. Respondents who attended government schools and/or left school in Year 10 or earlier are significantly more likely to use the CES as their main job-search method. The combined effect of having both these characteristics is to increase the probability of choosing the CES by 10.6 percentage points.

Teenagers who have been in the labour force for longer are more likely to be searching through the CES and are less likely to be using newspapers. Having controlled for the years since leaving school it is interesting that current unemployment duration significantly increases the probability that newspapers are the main job-search method and decreases the probability of using direct search methods. This provides some limited support for the hypothesis that the unemployed are less likely to be observed using direct methods because the expected benefits of these methods diminish over the duration of unemployment.

Perhaps the most important single variable for explaining the choice of main job-search method is the indicator for unemployment benefit receipt. Individuals receiving unemployment benefits are almost 20 percentage points more likely to use the CES as their main method of job search. One explanation for this is that

individuals receiving unemployment benefits are required to demonstrate that they are looking for work and registering with the CES offers an easy way of doing this. However, even if this were the case, the CES would not necessarily be reported as the main method of search.

Although receiving unemployment benefits would be expected to increase the flow of benefits to being unemployed all else being equal, unemployment benefits in Australia are subject to a means test. Therefore, individuals who receive benefits are likely to come from more financially constrained backgrounds and the net effect of these two financial considerations could easily be that benefit recipients have lower flows of income while unemployed on average. In light of this, another explanation for the significant effect of benefit receipt on the probability of using the CES is that eligible individuals have a lower flow of benefits to being unemployed on average. Following the model outlined in Appendix A, this would lead eligible individuals to search harder, increasing the probability that they are observed using indirect methods. However, this explanation also implies that the probability of observing that newspapers are the main method of job-search should be higher for eligible individuals. In fact teenagers receiving unemployment benefits are less likely to be observed using newspapers by around 8.6 percentage points.

The two explanations for the significance of the effect of benefit receipt on job-search behaviour are not inconsistent, and there is likely to be some truth in each. However, the argument for the work-test explanation is perhaps the most consistent with the effects of eligibility on the probability of choosing other job-search methods.

Two neighbourhood characteristics appear to be important. As hypothesised, a higher local unemployment rate decreases the probability that an unemployed teenager will choose direct search methods. An increase in the local unemployment rate of one percentage point will decrease the probability of using direct search methods by 1.1 percentage points. The marginal effect of a one percentage point increase in the local unemployment rate on the probability of using either the CES or newspapers is around 0.5 of a percentage point. Consequently, the degree of competition for jobs at a local level and the lack of access to a local job-information network, as proxied by the local unemployment rate, can help

explain why unemployed teenagers are less likely to be observed using direct search methods although they have proved to be the most successful methods of finding work for employed teenagers.

The other significant neighbourhood characteristic is the average level of personal income. Given that we have controlled for an extensive array of background characteristics as well as the proportion of the neighbourhood with either academic or vocational post-school training, it is puzzling that coming from a neighbourhood with higher average personal income seems to reduce the use of direct methods. Since high income is likely to be correlated with unobserved characteristics measuring success, the average level of personal income in the neighbourhood might have been expected to have the opposite effect.

## **5. Conclusions**

Australian and international evidence suggests that the most effective job-search methods are direct methods such as using family and friends for information or directly contacting employers. Over 60 per cent of Australian teenagers obtain their jobs using these methods, whereas only 30 per cent of unemployed Australian teenagers report these direct methods as their main method of job search.

We find that the single most important characteristic for explaining the job-search method choices of Australian teenagers is whether they receive unemployment benefits. Receiving benefits increases the probability of a teenager using the CES as the main job-search method by almost 20 percentage points, and decreases the probability of using direct methods or newspapers by around 10 percentage points each. Due to the means-tested nature of these benefits, this variable may be picking up unmeasured family characteristics. However, the fact that the CES offers a relatively easy way for benefit recipients to demonstrate that they are looking for work is likely to be a more significant effect.

Personal characteristics and family background are also important for understanding how unemployed teenagers search for work. In general, unemployed individuals with more highly skilled or better-educated parents are more likely to use direct methods than to use the CES. Males are more likely to use direct

methods or the CES than newspapers as their main job search activity. Older unemployed teenagers are also more likely to use direct methods than the CES. Individuals who attended government school or left school in Year 10 or earlier have a significantly higher probability of using the CES and a significantly lower probability of using newspapers.

One reason why unemployed teenagers may not be using job-search methods which appear to be more effective for teenagers who actually found work, is that these methods have been tried and their possibilities exhausted. This is supported by the finding that unemployed individuals with longer unemployment durations were significantly more likely to use newspapers as their main job-search method and were less likely to use direct search methods.

Another interesting finding is that the local environment, especially the state of the local labour market, is important for explaining job-search method choice. Higher local unemployment rates decrease the probability that an unemployed teenager will use direct search methods, and increase the probability that they will use the CES. These results are consistent with the economic model developed in Appendix A, which highlights the importance of local job-information networks and local labour market conditions for explaining job-search behaviour.

An interesting implication of these results is that they help explain the recently documented evidence that unemployment has become increasingly concentrated in low-socioeconomic status neighbourhoods (Gregory and Hunter 1995). An adverse labour demand shock in one neighbourhood will raise the local unemployment rate and lower the probability that individuals in that neighbourhood will obtain work through friends and relatives or direct employer contact. This increases the incentives for people in these areas to search using general search techniques such as newspapers or employment agencies, but their overall probability of finding work could easily fall despite this. Thus, the effects of an exogenous shock can be magnified within neighbourhoods if job-information networks are local in nature and provide the most successful means of finding employment.

If this is an important part of the explanation for the increasing concentration of unemployment in low-socioeconomic areas, it suggests that it is important for government policy to improve the effectiveness of general search methods in these areas. Steps in this direction have already been taken with recent changes to the operation of employment agencies in Australia.



## **Appendix A: An Economic Model of Job-search Method Choice**

In this appendix, we develop an economic model to formalise the way in which characteristics of the local environment can affect the job-search behaviour of unemployed individuals. This is done by extending the job-search model developed by Pissarides (1990) to allow individuals to have access to two different search methods with characteristics reflecting the differences between the indirect and direct search methods discussed above. The model presented here takes the demand side of the economy as given and does not develop any general equilibrium results. This is a relatively straightforward exercise, requiring some further modifications to the standard representation of the demand side presented in Pissarides (1990) and is available on request.

The first job-search method, labelled the general search method, captures search methods such as newspapers and employment agencies which provide general job information. The probability that the general job-search method will create a match between an unemployed worker and an unfilled vacancy is assumed to be a function of aggregate labour market conditions and the search effort of the individual.

The second job-search method, labelled the local search method, is designed to capture job-search methods, such as information from friends or direct employer contact. The effectiveness of these methods is assumed to be influenced by conditions in the local labour market, but not by the amount of effort applied by the job seeker. This implicitly assumes that the job-information network provided by friends and relatives is confined to the local area, and that the employed neighbourhood residents receive job information at a fixed exogenous rate. This is consistent with the assumptions, used below, that there is a fixed exogenous job-separation rate, and that jobs are not located in neighbourhoods, but in a Central Business District.

Introducing a local search method, which is dependent on local labour market conditions, requires assumptions to be made about the way the labour force is divided into neighbourhoods. We assume that the labour force is evenly distributed across  $n=1, \dots, N$  neighbourhoods and that the labour force in each neighbourhood is normalised to one. We assume that the proportion of neighbourhood  $n$  who are

unemployed is denoted  $u_n$  and, consequently, that the proportion of neighbourhood who are employed is denoted  $1 - u_n$ .

The aggregate unemployment rate is defined as:

$$u = \frac{\sum_{n=1}^N u_n}{N} \quad (\text{A1})$$

Individuals choose the optimal level of search effort given information about their local labour market and the aggregate labour market. This decision will be affected by the probability of matching a job, the value of the job, the costs of searching for work, and the value of being unemployed.

The probability of finding a job through the local search method for an unemployed person in neighbourhood  $n$  is assumed to be a decreasing function of local unemployment:

$$f_n = f(u_n) = \frac{\delta}{u_n} \quad (\text{A2})$$

where  $\delta$  is a measure of the efficiency of the local search method. This particular functional form has been chosen for algebraic convenience.

The probability of finding a job through the general search method will depend on the state of the aggregate labour market and the search effort applied to its use. Following Pissarides (1990), the number of job matches generated when the number of unemployed in the aggregate economy is  $Nu$ , the average search effort of the unemployed is  $c$ , and the aggregate number of vacancies is  $Nv$  can be expressed by the matching function  $H(cNu, Nv)$ . The parameter  $c$  can also be thought of as a technology parameter of this matching function which captures the average search effectiveness of the unemployed.

Assuming that this matching function exhibits constant returns to scale, the probability of an unemployed person with search effort  $c_n$  matching a vacancy can be expressed as the search effort of the individual relative to the average, multiplied by the probability that an unemployed person with average search effort makes a match:

$$p_n = \frac{c_n}{c} \bullet \frac{H(Ncu, Nv)}{Nu} = c_n H\left(1, \frac{Nv}{Ncu}\right) = c_n h(\theta) \quad (\text{A3})$$

where;

- $c_n$  is the search effort chosen by an individual in neighbourhood  $n$ ;
- $\theta = v/cu$  is the degree of labour market tightness, or the extent to which demand for labour exceeds supply;
- $Nv$  is the stock of vacancies in the economy;
- $Ncu$  is the stock of unemployment measured in search effort units; and
- $c$  is the average level of search effort in the economy, defined as:

$$c = \frac{\sum_{n=1}^N u_n c_n}{\sum_{n=1}^N u_n} \Rightarrow Ncu = \sum_{n=1}^N u_n c_n \quad (\text{A4})$$

Another factor which affects the individual's decision about how hard they should search using the general search method is the balance between the costs and benefits of being unemployed. We assume that the net flow of benefits to being unemployed for an individual in neighbourhood  $n$  can be represented by a function  $\sigma(c_n; z_n)$ , where  $z_n$  represents the exogenous flow of income and other benefits received by an unemployed individual in neighbourhood  $n$ . To conform to our priors that search effort is costly and to ensure that there is an interior solution to the individual's choice problem, the derivatives of this function are signed:  $\sigma_c(c_n; z_n) < 0$ ;  $\sigma_{cc}(c_n; z_n) < 0$ ; and  $\sigma_z(c_n; z_n) > 0$ .

An unemployed individual in neighbourhood  $n$  will choose  $c_n$  to maximise the present discounted value of being unemployed,  $U_n$ . The following equations describe the relationship between the present discounted value of being unemployed,  $U_n$ , and the present discounted value of being employed,  $E_n$ , for an individual in neighbourhood  $n$ :

$$\begin{aligned}(1+r)U_n &= \sigma(c_n; z_n) + (f_n + p_n)E_n + (1 - f_n - p_n)U_n \\ (1+r)E_n &= w + sU_n + (1-s)E_n\end{aligned}\tag{A5}$$

where;

- $r$  is the discount rate;
- $w$  is the wage rate received by employed individuals; and
- $s$  is the exogenous separation rate from employment.

The present discounted value of being in either of the two labour force states can be thought of as the flow of benefits from being in that state currently, plus the expected value of future labour market experience. This expected value will be the probability of remaining in the current state multiplied by the present discounted value of remaining, plus the probability of changing state multiplied by the present discounted value of being in the alternative state. By substituting out  $E_n$  and re-organising Equation A5, the present discounted value of being unemployed can be written as:

$$U_n = \frac{(r+s)\sigma(c_n; z_n) + (f(u_n) + c_n h(\theta))w}{r(r+s + f(u_n) + c_n h(\theta))}\tag{A6}$$

An important side condition that is required to ensure that the unemployed are willing to look for work in the first place is that the wage is greater than the net flow of benefits of being unemployed:

$$w > \sigma(c_n; z_n)\tag{A7}$$

The first order condition for an individual choosing search effort to maximise the present discounted value of unemployment will be:

$$\frac{\partial U_n}{\partial c_n} = \frac{(r+s)\sigma_c(c_n; z_n) + h(\theta)w}{r(r+s+f(u_n)+c_n h(\theta))} - \frac{(r+s)\sigma(c_n; z_n) + (f(u_n) + c_n h(\theta))w}{r(r+s+f(u_n)+c_n h(\theta))^2} \bullet h(\theta) = 0$$

(A8)

$$\Rightarrow (r+s+f(u_n)+c_n h(\theta)) \bullet \sigma_c(c_n; z_n) + (w - \sigma(c_n; z_n)) \bullet h(\theta) = 0$$

where  $\theta$ ,  $z_n$ ,  $w$ ,  $r$ ,  $s$  and  $u_n$  are taken as given by the individual. The condition that  $\sigma_{cc}(c_n; z_n) < 0$ , ensures that the solution to this first order condition will be an interior maximum.

This first order condition is the most important relationship for understanding the job-search behaviour of individuals. Partial differentiation of Equation A8 shows that the level of search effort chosen, and hence, the probability of reporting that the main method of search is a general search method, increases as the local unemployment rate rises and falls as the flow of benefits to being unemployed or the efficiency of the local search method increases. Other comparative static results are straightforward to derive and correspond to the partial equilibrium results presented in Pissarides (1990), Table 4.1.

Equation A8 defines the behaviour of individuals in a given neighbourhood. Defining a steady state condition for the local unemployment rate will enable us to tie down the local equilibrium. The local labour market will be in steady state when the flows into the local unemployment pool and the flows out are equal. This condition can be written as:

$$\begin{aligned} \dot{u}_n &= s(1-u_n) - (f(u_n) + c_n h(\theta))u_n \\ &= s(1-u_n) - \delta + c_n h(\theta)u_n = 0 \end{aligned}$$

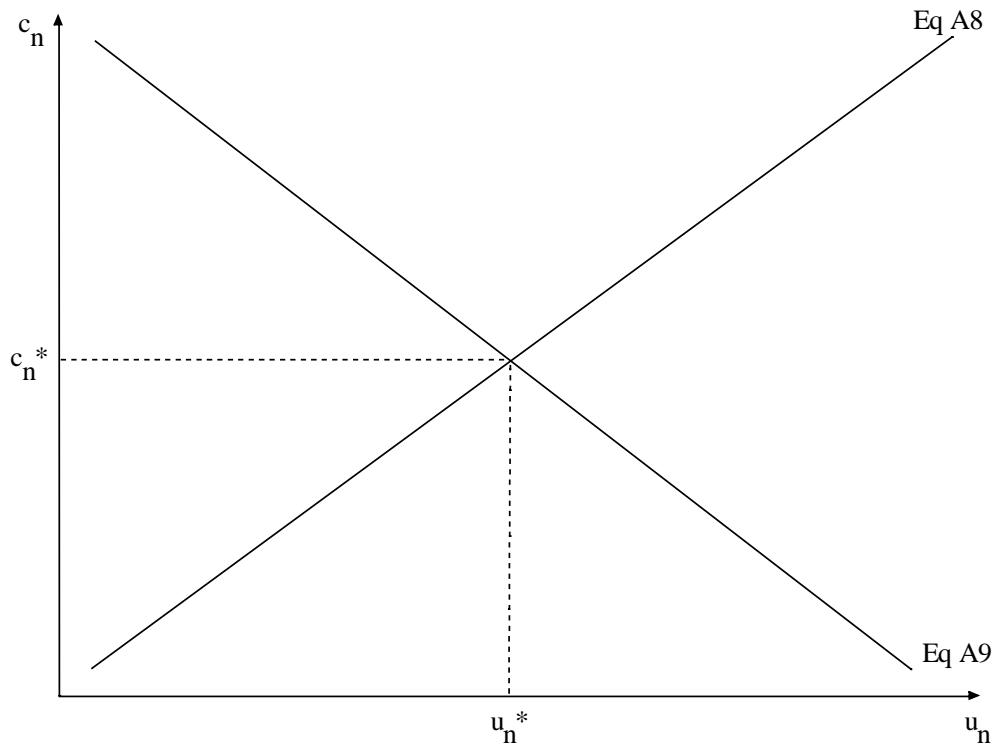
(A9)

$$\Rightarrow u_n = \frac{s - \delta}{s + c_n h(\theta)}$$

where  $s > \delta$  is required for steady state local unemployment to be non-zero.

Equations A8 and A9 provide us with two equations in terms of the two local endogenous variables,  $c_n$  and  $u_n$ , as a function of aggregate variables and exogenous parameters. A local equilibrium is guaranteed by the fact that the equilibrium unemployment rate condition is a decreasing function of local search effort (Figure 1).

**Figure 1: Local Equilibrium**



## **Appendix B: Variable Definitions**

Respondents are asked whether each of their parents was present in the household when they were 14. If a parent was present, further questions are asked about whether the parent was employed, the nature of their employment and their education level.

The following variables take the value one when the characteristic is present and zero otherwise:

- personal characteristics: male, married;
- parent's characteristics: parent not present in the household when the respondent was 14, parent not employed when the respondent was 14 (given that they were present in the household);
- parent's education: has a degree, has a trade qualification, has other post-school qualifications, has secondary education (omitted category: parent has less than secondary education);
- section of state: other city, rural area, country town (omitted category: capital city); and
- school/work experience: attended a government school (omitted category: attended a Catholic or other non-government school), left school in Year 10 or earlier, receives unemployment benefits or the Job Search Allowance.

The following variables are count variables:

- age (in years), number of siblings, years since leaving school and current unemployment duration (in weeks).
- parent's occupational status is measured as the socioeconomic status of the respondent's parent when the respondent was 14. If the parent was not present in the household or was not employed the index is set to zero.

The neighbourhood variables are defined as:

- ‘average personal income’ is the average personal income of the respondent’s postcode;
- ‘unemployment rate’ is the unemployment rate of the respondent’s postcode;
- ‘per cent with vocational qualifications’ is the proportion of the respondent’s postcode who recorded having skilled vocational training or basic vocational training; and
- ‘per cent with graduate qualifications’ is the proportion of the respondent’s postcode who recorded having a higher degree, a degree, a graduate diploma, or an undergraduate diploma.

The omitted education category is the proportion of the respondent’s postcode with high school education or less.



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